INTERNATIONAL COURT OF JUSTICE

CASE CONCERNING
MARITIME DELIMITATION IN THE INDIAN OCEAN

SOMALIA
v.
KENYA

MEMORIAL OF SOMALIA

VOLUME IV

13 JULY 2015

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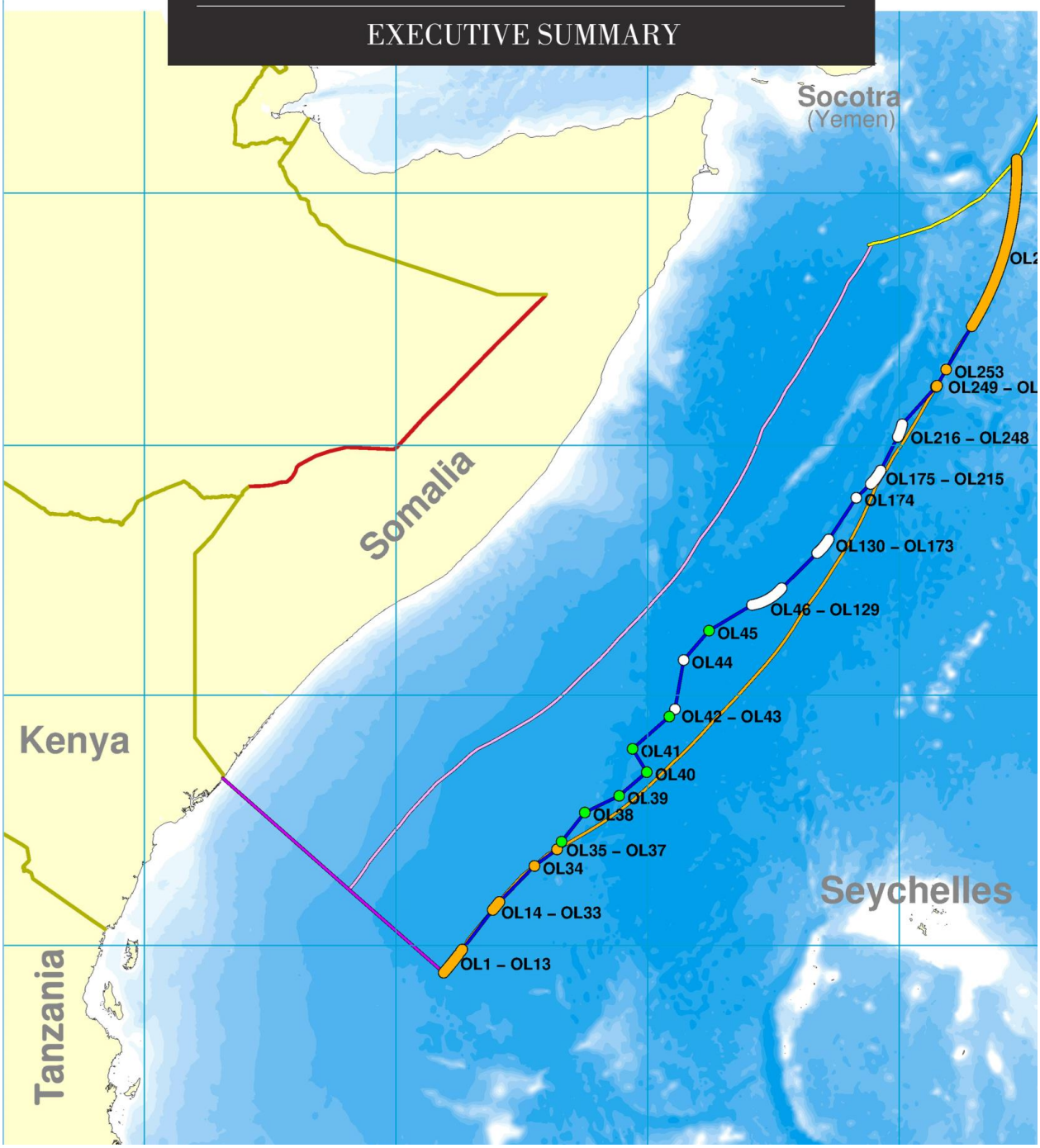
CONTINENTAL SHELF SUBMISSION OF THE FEDERAL REPUBLIC OF SOMALIA

EXECUTIVE SUMMARY



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1. INTRODUCTION

Somalia ratified the United Nations Convention on the Law of the Sea, hereinafter referred to as "the Convention", on 24 July 1989. The Convention entered into force for Somalia on 16 November 1994.

Article 4 of Annex II to the Convention stipulates that where a coastal State intends to establish, in accordance with article 76, the outer limits of its continental shelf beyond 200 nautical miles from the baselines from which the breadth of the territorial sea is measured, it should submit particulars of such limits to the Commission on the Limits of the Continental Shelf, hereinafter referred to as "the Commission", along with supporting scientific and technical data as soon as possible, but in any case within ten years from the entry into force of the Convention for that State.

In 2001 the Eleventh Meeting of States Parties to the Convention decided that in the case of a State Party for which the Convention entered into force before 13 May 1999, it is understood that the ten-year time period referred to in article 4 of Annex II to the Convention shall be taken to have commenced on 13 May 1999 (document SPLOS/72, paragraph (a)). This decision applied to Somalia. Consequently, in the case of Somalia the ten-year time period referred to in article 4 of Annex II of the Convention expired on 13 May 2009.

The Eleventh Meeting of States Parties to the Convention also decided that the general issue of the ability of States, particularly developing States, to fulfil the requirements of article 4 of Annex II to the Convention be kept under review (document SPLOS/72, paragraph (b)). Due to lack of financial and technical resources, relevant capacity and expertise, or other similar constraints, many developing countries were facing particular challenges in meeting these requirements.

In June 2008 the Eighteenth Meeting of States Parties to the Convention therefore decided that it is understood that the ten-year period condition referred to in article 4 of Annex II to the Convention may be satisfied by submitting preliminary information indicative of the outer limits of the continental shelf beyond 200 nautical miles from the baselines from which the breadth of the territorial sea is measured, together with a descriptive report on the status of preparation and intended date of the final submission (document SPLOS/183, paragraph 1 (a)).

Due to a lack of financial and technical resources and relevant capacity and expertise, Somalia was among the developing States that faced particular challenges in fulfilling the requirements of article 4 of Annex II to the Convention. Moreover, Somalia continues to experience a number of other constraints relating to the political and security situation in the country, substantially hindering the fulfilment of these requirements.

On this basis, in October 2008, the Special Representative of the Secretary-General of the United Nations for Somalia (SRSG), Mr. Ahmedou Ould Abdallah, initiated the preparation of preliminary information, as defined above, regarding the outer limits of the continental shelf of Somalia beyond 200 nautical miles from the baselines from which the breadth of the territorial sea is measured, with the aim of submitting this to the Secretary-General in accordance with the decision set out in SPLOS/183. In order to prepare this material, the SRSG accepted an offer of assistance from the Government of Norway. On 14 April 2009 the Transitional Federal Government (TFG) of the Republic of Somalia submitted such preliminary information to the Secretary-General of the United Nations.

In August 2009, at the request of the TFG, the Norwegian Government agreed to proceed with providing assistance towards the preparation of a full submission. The work has been carried out jointly by the Royal Norwegian Ministry of Foreign Affairs, the Norwegian Mapping Authority, the Norwegian Petroleum Directorate and GRID-Arendal.

This submission fulfils the obligations Somalia has under article 76 and article 4 of Annex II of

the Convention and supplements the preliminary information submitted by Somalia on 14 April 2009 in accordance with the decisions contained in documents SPLOS/72 and SPLOS/183, requiring the submission of information on the outer limits of its continental shelf beyond 200 nautical miles from the baselines from which the breadth of the territorial sea is measured, in respect of areas offshore Somalia. The Main Body of this submission contains a detailed description of the scientific and technical data, maps, technical procedures and scientific methodologies that were applied in the establishment of the outer limits of the continental shelf of Somalia where those limits extend beyond 200 nautical miles.

The submission is intended to serve and safeguard the present and future interests of the Somali state and its people.

2. MARITIME AREAS, MAPS AND COORDINATES

The data and information contained in this submission are intended to enable the establishment of the outer limits of the continental shelf of Somalia where those limits extend beyond 200 nautical miles from the baselines in the high seas in the north-western Indian Ocean.

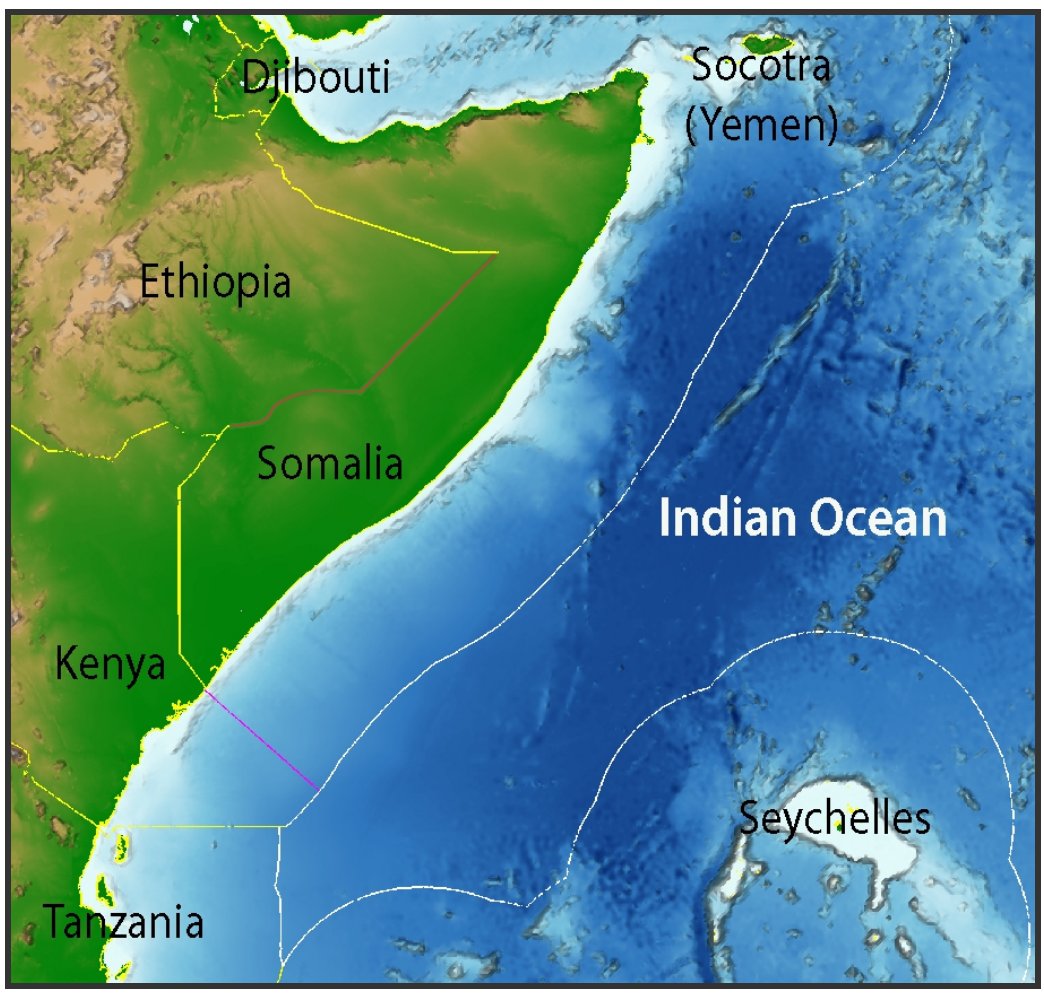

Figure 1. **Overview of the African landmass and maritime areas of the north-western Indian Ocean.** White lines – 200 nautical mile limits, yellow/red lines – land and maritime bilateral boundaries, pink line – computed equidistance line. The map figure is made for illustrative purposes only.

In accordance with the Scientific and Technical Guidelines of the Commission this executive summary includes a map showing the outer limits of the continental shelf (Figure 6) and a list of the coordinates of the fixed points used to define the outer limits of the continental shelf beyond 200 nautical miles, the distance in nautical miles between adjacent points, and the provision of article 76 on which each point is based (Appendix 1).

3. ASSISTANCE AND ADVICE RECEIVED DURING THE PREPARATION OF THIS SUBMISSION

The Government of Norway has provided assistance and advice to the Federal Government of Somalia (FGS) in the preparation of the present submission, and the Royal Norwegian Ministry of Foreign Affairs, the Norwegian Petroleum Directorate and the Norwegian Mapping Authority have been involved in this work.

Based on open and accessible sources and modern Geographical Information System (GIS) technology, the UNEP Shelf Programme, represented by GRID-Arendal, has carried out the technical analyses and prepared the material contained in the Main Body document and the annexes to this submission.

The FGS were also assisted in the preparation of the present submission by Mr. Harald Brekke, a former member of the Commission (1997-2012). No advice was provided by any other member of the Commission.

All expenses related to the preparation of the present submission have been covered by the Government of Norway.

The Norwegian assistance was based on the following premises:

- Assistance should include the preparation of a submission to the Commission in accordance with article 76 of the Convention and article 4 of Annex II to the Convention, as well as the decisions contained in SPLOS/72, paragraph (a), and SPLOS/183, paragraph 1 (a), and the Somali preliminary information submitted on 14 April 2009.
- Norway takes no position on, nor does it accept any responsibility for, any legal or other issues pertaining to the preparation of the submission, including issues pertaining to baselines or maritime delimitation. The same applies as regards the assistance provided by the UNEP Shelf Programme/GRID-Arendal.
- Assistance and advice provided by Norway should be based on open and accessible sources, and in particular should include technical analyses and preparation of a draft Main Body document based on modern Geographical Information System (GIS) technology provided by the UNEP Shelf Programme/GRID-Arendal.
- A major aim of the Norwegian assistance has been to ensure that Somalia meets the time period condition referred to in article 4 of Annex II to the Convention, the decisions contained in SPLOS/72 and SPLOS/183, and provides supplements the Somali preliminary information submitted on 14 April 2009.

4. THE OUTER LIMITS OF THE CONTINENTAL SHELF OF SOMALIA – BASELINES

The present submission deals with the establishment of the outer limits of the continental shelf of Somalia, without prejudice to any issues of bilateral maritime delimitation with neighbouring States. Such issues will be referred to under item 7 below.

Somalia is of the view that the normal baseline from which the breadth of the territorial sea is measured is defined at the low-water line along the coast, unless specifically stipulated otherwise. In accordance with the pertinent provisions of the Convention, and with the assistance of satellite imagery, the Norwegian Mapping Authority has identified a total of 608 baseline points along the coast of Somalia from the border with Djibouti in the north to the starting point of Kenya-Somalia maritime boundary, hereinafter "S608/K1" as depicted in Figure 4.

With a few exceptions, these points constitute a normal baseline in accordance with the provisions set out in the Convention. The length of the Somali coastline, as computed from the sum of the distances between these 608 baseline points from the Djibouti to the S608/K1, is 3050 km. The baselines points are established with an accuracy of one second of arc (30 m).

5. PROVISIONS OF ARTICLE 76 INVOKED IN SUPPORT OF THIS SUBMISSION

Somalia invokes the provisions of paragraphs 1, 3 and 4 of article 76 in support of the establishment of the outer limits of the continental shelf beyond 200 nautical miles, based on the considerations outlined in Section 6. Both the "Hedberg" and "Gardiner" formulae lines have been used in this submission. The outer limits of the continental shelf have been delineated by fixed points connected by straight lines not exceeding 60 nautical miles in length, as set out in the provisions of article 76, paragraph 7 (see Figure 6).

6. GENERAL DESCRIPTION OF THE CONTINENTAL MARGIN OF SOMALIA

The Somali continental margin is characterised by a narrow continental shelf which broadens slightly to the north. A pronounced submarine spur (the Central Somali Spur) is observed extending to the east midway between S608/K1 in the south and the tip of the Horn of Africa in the north. South of the Central Somali Spur, the continental slope exhibits a smooth gradient, in contrast to the more complex morphology to the north. The slope extends to the deep abyssal plain of the Somali Basin at a depth of about 5000 m.

The Somali Basin is subdivided into three sub-basins. The Central Somali Spur separates the Northern Somali Basin in the north from the Western Somali Basin in the south. The Eastern Somali Basin is located to the east, separated from the two aforementioned sub-basins by south-west and south-trending seafloor ridges, including the Chain Ridge (Figure 2).

The Chain Ridge extends northwards until it links with the southern flank of the Carlsberg Ridge whence it merges with the southern termination of the Owen Fracture Zone, which in turn connects the Carlsberg Ridge to the Sheba Ridge to the north.

The Carlsberg Ridge constitutes the northern extension of the Central Indian Ridge, which is the active spreading ridge of the Indian Ocean. The Sheba Ridge continues westwards from the Owen Fracture Zone, extending north of Socotra and into the Gulf of Aden and the Red Sea.

The details of the opening of the Indian Ocean are still subject to ongoing research, but it is clear that the margin of Somalia is part of a passive continental margin. The margin was formed in Jurassic times as a result of continental break-up between the African continent and the continental block containing Madagascar and India.

In the Jurassic, as part of the Gondwana supercontinent, Somalia was juxtaposed with Madagascar in the south (south of the Central Somali Spur), and with northern India in the north.

The initial rifting of this region of Gondwana began in the Middle Jurassic, prior to the opening of the Somali Basin. Magnetic anomalies from both the Western and Eastern Somali Basins indicate the presence of old oceanic crust. The magnetic anomalies in the Western Somali Basin are interpreted to represent both limbs of an extinct spreading segment. The crust beneath the small Northern Somali Basin also exhibits relatively low amplitude magnetic anomalies indicative of oceanic crust.

The magnetic anomalies suggest that seafloor spreading commenced in the Late Jurassic (the age of the oldest M22 anomaly), and ceased at anomaly M0 time in the Early Cretaceous. A phase of renewed spreading started in the Late Cretaceous causing India to migrate northwards along with the eastern parts of the then single Somali Basin, which was subsequently split by the formation of the Chain Ridge which developed a result of this transcurrent plate movement process.

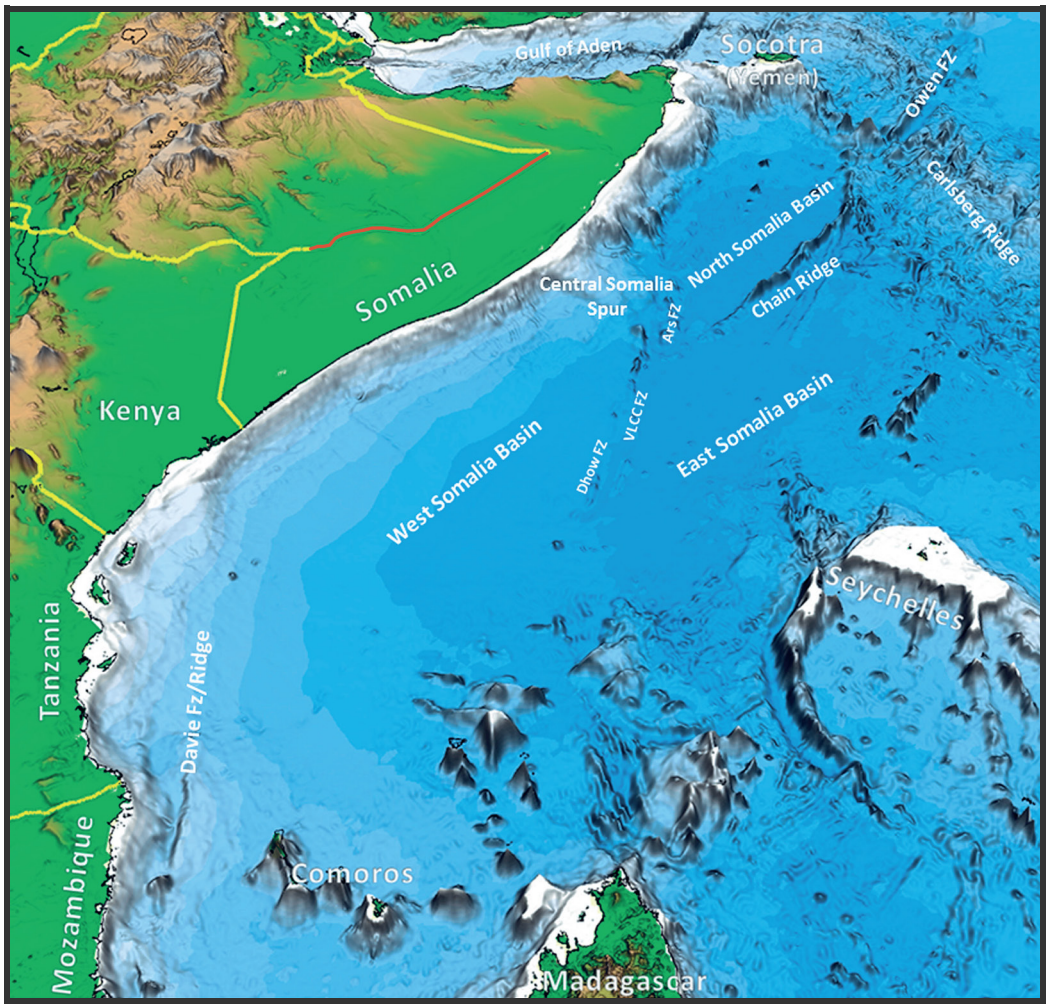

Figure 2. **Geomorphological structural setting of the East African Continental Margin.** Remarks on the names of fracture zones SW of the Central Somali Spur: These zones are named after the three principal types of vessels encountered sailing in these waters; the Dhow is an Arab merchant ships, VLCC stands for Very Large Crude Carrier, and ARS for Auxiliary Rescue and Salvage.

7. MARITIME DELIMITATIONS AND OTHER ISSUES

All information and maps contained in this submission are without prejudice to issues of maritime delimitation.

There remain unresolved issues in relation to the bilateral delimitation of the continental shelf with the Federal Republic of Somalia's neighbouring states Kenya and Yemen and potentially Tanzania. These issues will have to be considered by reference to Rule 46 and Annex I of the Rules of Procedure of the Commission.

Somalia's approach regarding maritime delimitation with neighbouring States is based on the international law of the sea and are in keeping with the settled jurisprudence of the International Court of Justice on maritime delimitation, the first stage in the process leading to the delimitation of the continental shelf may be to establish a provisional equidistance line.

7.1 Maritime areas between Somalia and Kenya

The delimitation of the continental shelf between the Federal Republic of Somalia and the Republic of Kenya has not yet been resolved. On the basis of the jurisprudence of the International Court of Justice on maritime delimitation, Somalia's continental shelf claim may extend south at least up to a line of equidistance drawn from S608/K1 (Figure 3).

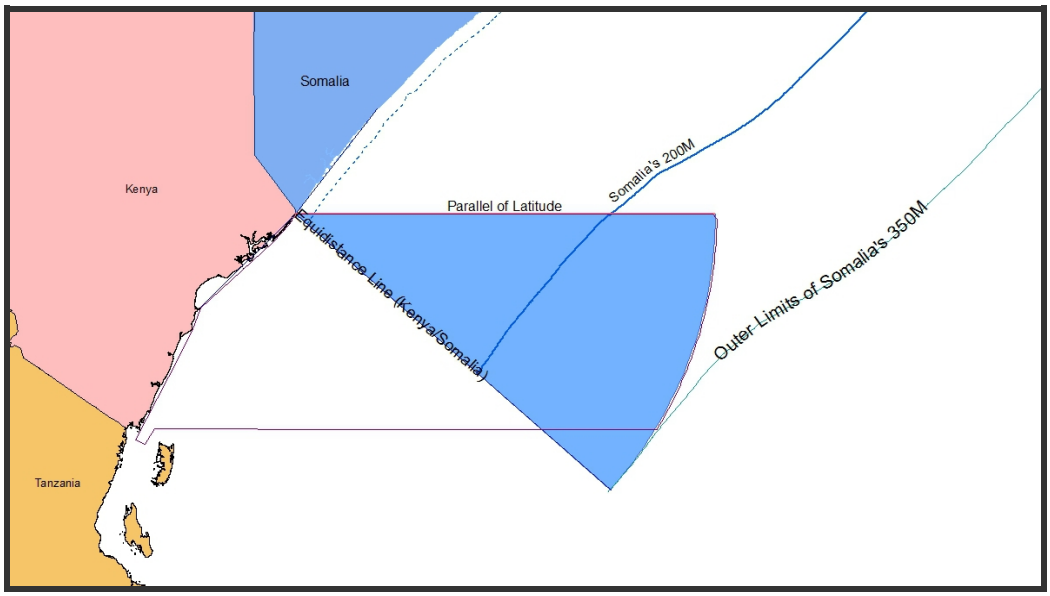

Figure 3. **Map figure showing the equidistance line of Somalia, representing the Somali claim (see text below for details), and the 200 M limit line and 350 M maximum constraint line as measured from the baseline of Somalia.** The blue maritime areas indicate possible overlap with Kenyan claims. The map figure is made for illustrative purposes only.

The coastlines of both Somalia and Kenya are generally rather straight and featureless, with the exception of a protuberance at S608/K1. Over a distance of about 200 km in a northerly direction from the point S608/K1, the Somali coast exhibits a general azimuth of 38 degrees off north. For a distance of about 200 km south of the point S608/K1, the general azimuth of the Kenyan coast is 225 degrees off north.

On the basis of these data, Somalia claims a continental shelf area, based on a line of equidistance **extending from point S608/K1 (see Figure 4) with an azimuth (225 + 38)/2 = 131.5 degrees off north.**

The equidistance line is described by the following coordinates:

Latitude South			Longitude East			Point Number
Deg.	Min.	Sec.	Deg.	Min.	Sec.	
-1	39	43.1	41	33	33.2	1 (base point S608)
-2	13	02.8	42	11	00.4	2
-2	46	21.6	42	48	29.4	3
-3	19	39.1	43	26	00.4	4
-3	52	55.2	44	03	33.9	5
-4	26	09.5	44	41	10.4	6
-4	59	22.0	45	18	50.3	7
-5	32	32.2	45	56	33.9	8
-5	33	15.1	45	57	22.7	9
-5	32	47.4	45	56	51.1	10

(Geodetic datum: WGS84)

The equidistance line intersects	Latitude South			Longitude East		
	Deg.	Min.	Sec.	Deg.	Min.	Sec.
the 12 nautical mile territorial sea limit at	-1	48	13.9	41	43	07.0
the 24 nautical mile contiguous zone at	-1	56	13.7	41	52	06.1
the 200 nautical mile EEZ at	-3	53	18.3	44	04	00.0
the 350 nautical mile limit at	-5	32	47.4	45	56	51.1

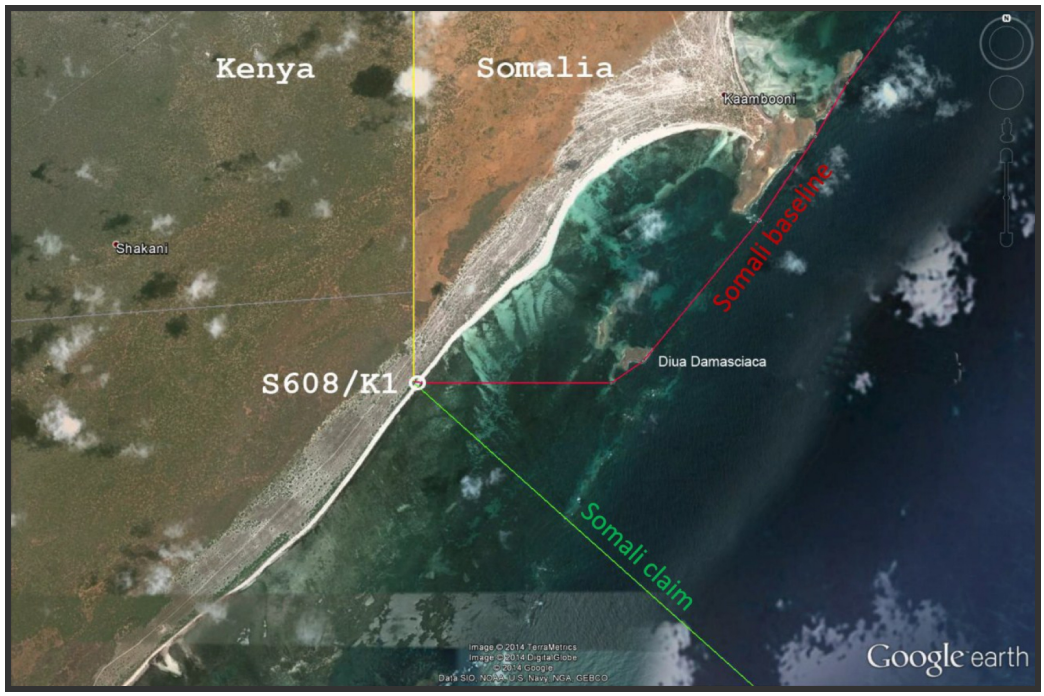

Figure 4. **The starting point for the Somali claim is point S608/K1.** The full extent of the claim is shown Figure 5. The map figure is made for illustrative purposes only.

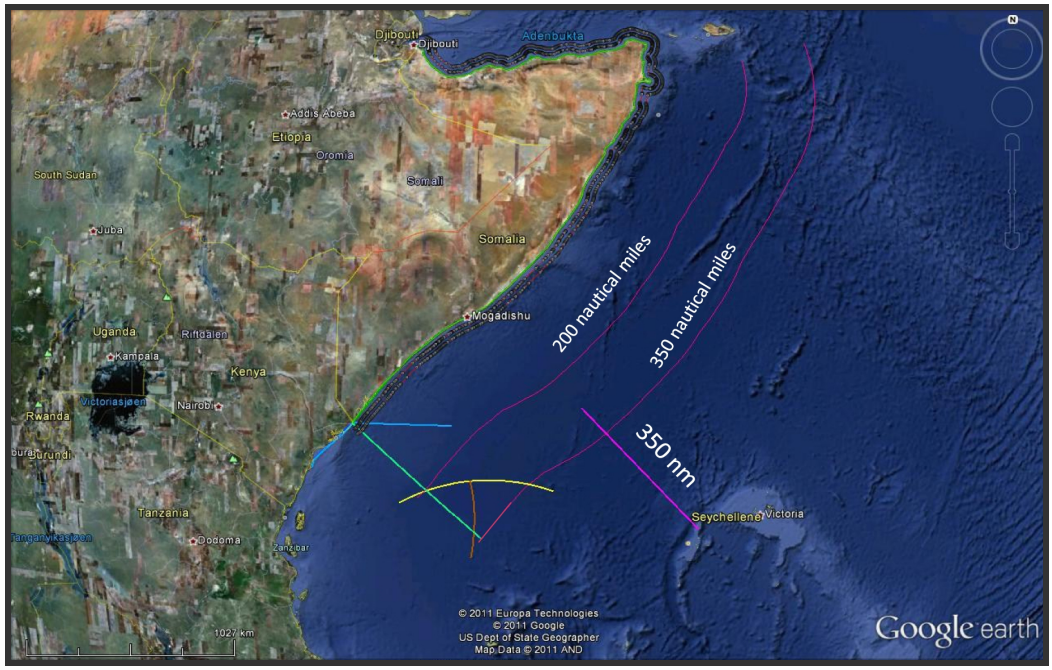

Figure 5. **Limit lines and geodetic constructions illustrating the relationships between the maritime spaces of Somalia and its neighbouring countries.** Blue lines: Kenya's claim. Yellow line: 350 nautical miles from Aldabra (Seychelles). Brown line: 350 nautical miles from Pemba (Tanzania). Pink line: Illustrating 350 nautical miles possible overlap between Somalia and main plateau of Seychelles. The map figure is made for illustrative purposes only.

The unresolved issue of delimitation of the continental shelf between the Federal Republic of Somalia and the Republic of Kenya is to be regarded as a "maritime dispute" for the purposes of rule 5 (a) of Annex I of the Rules of Procedure of the Commission. The purported claim by the Republic of Kenya includes maritime areas claimed by the Federal Republic of Somalia, thereby resulting in an overlapping area which, for the same purposes, constitutes "the area under dispute".

The present submission by the Federal Republic of Somalia includes the areas under dispute between the two coastal States. Somalia is ready to enter into consultations with the Republic of Kenya with a view to reaching an agreement or understanding which will allow the Commission to consider and make recommendations on submissions by each of the two coastal States in the areas under dispute without prejudice to the final delimitation of the continental shelf to be concluded subsequently in the areas under dispute by the two coastal States. Pending such an agreement or understanding, Somalia requests the Commission not to take any steps that would prejudice any future bilateral delimitation in the maritime area concerned.

7.2 Maritime areas between Somalia and Yemen

The delimitation of the continental shelf between the Federal Republic of Somalia and the Republic of Yemen has not yet been resolved. Based on the current submission and the information published on the Commission's website regarding the Executive Summary of the submission made by the Republic of Yemen, it is evident that there is an overlap between Somali and Yemeni claims as regards the areas of the continental shelf beyond 200 nautical miles.

Unresolved delimitation issues between two coastal States, as well as any overlap between the areas of the continental shelf beyond 200 nautical miles claimed by them, should be considered by reference to rule 46 and Annex I of the Rules of Procedure of the Commission. For the purpose of article 5 (a) of Annex I of these Rules of Procedure, such unresolved delimitation issues should be regarded as a "maritime dispute". Areas covered by overlapping claims made by the two coastal States constitute for the same purposes "the areas under dispute".

Somalia is ready to enter into consultations with the Republic of Yemen with a view to reaching an agreement or understanding which would allow the Commission to consider and make recommendations on submissions by each of the two coastal States in the areas under dispute without prejudice to the final delimitation of the continental shelf to be concluded subsequently in the areas under dispute by the two coastal States. Pending such an agreement or understanding, Somalia requests the Commission not to take any steps that would prejudice any future bilateral delimitation in the maritime area concerned.

7.3 Maritime delimitation between Somalia and Tanzania

Based on the current submission and the information published on the Commission's website regarding the Executive Summary of the submission made by the Federal Republic of Somalia, there is a potential overlap between the Somali and the Tanzanian claims as regards the areas of the continental shelf beyond 200 nautical miles (Figure 3).

Unresolved delimitation issues between two coastal States, as well as any overlap between the areas of the continental shelf beyond 200 nautical miles claimed by them, should be considered by reference to rule 46 of Annex I of the Rules of Procedure of the Commission. For the purpose of article 5 (a) of Annex I of these Rules of Procedure, such unresolved delimitation issues should be regarded as a "maritime dispute". Areas covered by overlapping claims made by the two coastal States constitute for the same purposes "the areas under dispute".

Somalia is ready to enter into consultations with the United Republic of Tanzania with a view to reaching an agreement or understanding which will allow the Commission to consider and make recommendations on submissions by each of the two coastal States in the areas under dispute without prejudice to the final delimitation of the continental shelf to be concluded subsequently in the areas under dispute by the two coastal States. Pending such an agreement or understanding, Somalia requests the Commission not to take any steps that would prejudice any future bilateral delimitation in the maritime area concerned.

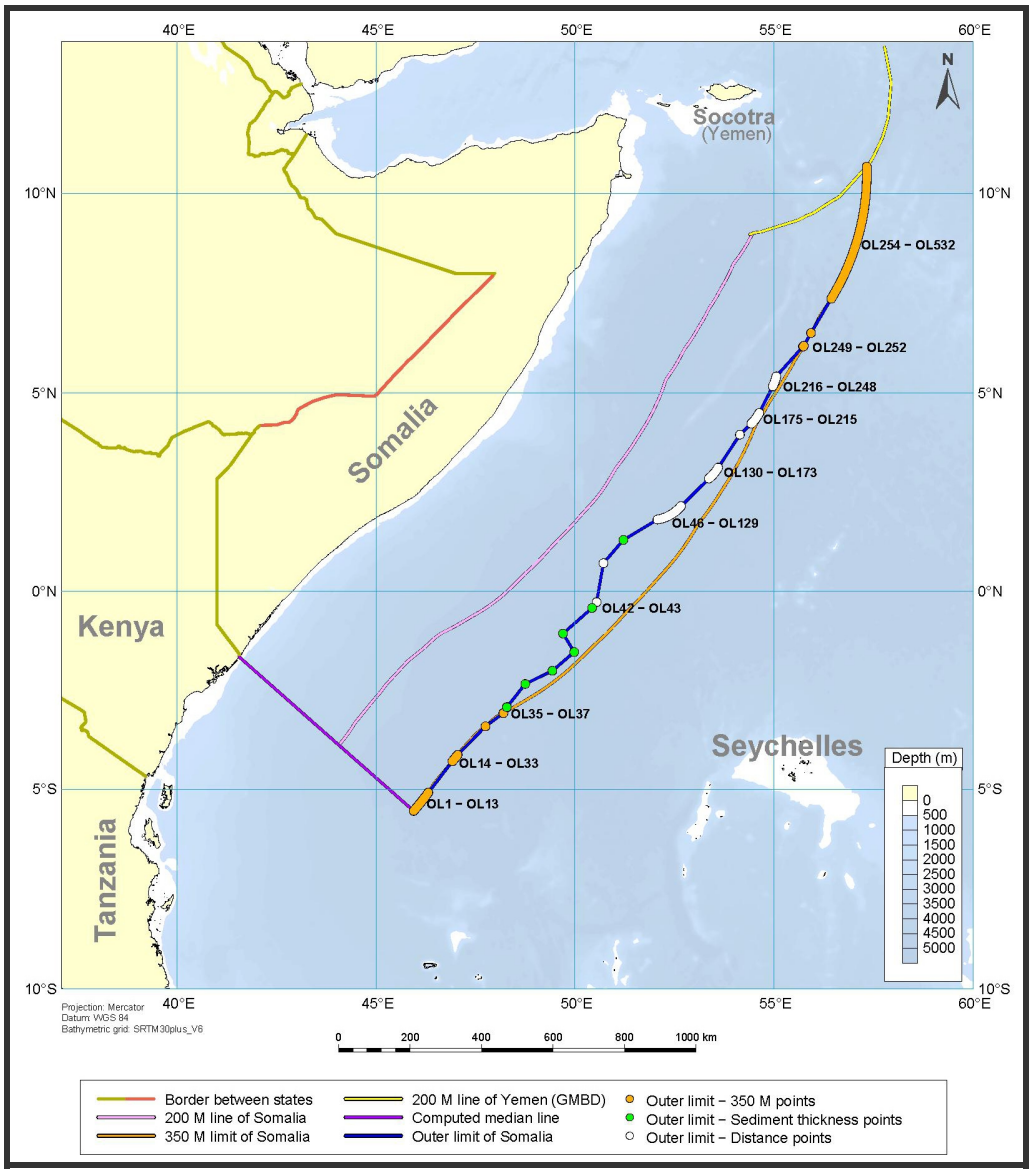

Figure 6. **The outer limits of the continental shelf of Somalia.**

8. THE OUTER LIMITS OF THE SOMALI CONTINENTAL SHELF

The outer limits of the Somali continental shelf beyond 200 nautical miles is defined by 532 fixed points established in accordance with article 76 of the Convention. These are as follows:

- 8 points defined by the sediment thickness formula set out in article 76, paragraph 4(a)(i);
- 206 points defined by arcs constructed 60 nautical miles from the foot of the continental slope in accordance with article 76, paragraph 4(a)(ii); and

- 318 points defined in accordance with the constraint criterion of 350 nautical miles distance from the baseline, provided for in article 76, paragraph 5.

The 532 fixed points are connected by straight lines not exceeding 60 nautical miles in length, as provided for in article 76, paragraph 7. The fixed points and connecting lines are shown in Figure 6. A colour code has been used to indicate under which article 76 criterion each point has been established. (Further details can be found in Appendix 1).

For the purpose of this submission, the northernmost fixed point of the outer limit of the Somali continental shelf is established on the Yemeni 200 nautical miles line at a distance of 60 nautical miles from the northernmost foot of the continental slope point submitted by Somalia (Figure 6).

The southernmost fixed point of the outer limits of the Somali continental shelf is established at the intersection of the 350 nautical miles constraint line and the calculated equidistance line between Somalia and Kenya.

For both the northern- and southernmost fixed points described above, reference is made to the list of coordinates of fixed points contained in Appendix 1. The final delimitation between Somalia and Yemen in the north and Kenya and Tanzania in the south would have to be determined through bilateral agreements (reference is made to Section 7 above), in accordance with international law.

APPENDIX 1

List of coordinates

ECS Point	Longitude East	Latitude	Long E Deg.	Long E Min.	Long E Sec.	Lat Deg.	Lat Min.	Lat Sec.	Article 76 provision invoked
OL1	45,947529	-5,546500	45	56	51,10	-5	32	47,40	Art. 76(5): 350 M line
OL2	45,974721	-5,515278	45	58	28,99	-5	30	55,00	Art. 76(5): 350 M line
OL3	46,004168	-5,481111	46	0	15,00	-5	28	52,00	Art. 76(5): 350 M line
OL4	46,033336	-5,446667	46	2	0,01	-5	26	48,00	Art. 76(5): 350 M line
OL5	46,062500	-5,411943	46	3	45,00	-5	24	42,99	Art. 76(5): 350 M line
OL6	46,091111	-5,376943	46	5	28,00	-5	22	37,00	Art. 76(5): 350 M line
OL7	46,124165	-5,336111	46	7	26,99	-5	20	10,00	Art. 76(5): 350 M line
OL8	46,152223	-5,300833	46	9	8,00	-5	18	3,00	Art. 76(5): 350 M line
OL9	46,179999	-5,265278	46	10	48,00	-5	15	55,00	Art. 76(5): 350 M line
OL10	46,207780	-5,229445	46	12	28,01	-5	13	46,00	Art. 76(5): 350 M line
OL11	46,234999	-5,193612	46	14	5,99	-5	11	37,00	Art. 76(5): 350 M line
OL12	46,288889	-5,120833	46	17	20,00	-5	7	15,00	Art. 76(5): 350 M line
OL13	46,315277	-5,084444	46	18	55,00	-5	5	4,00	Art. 76(5): 350 M line
OL14	46,921891	-4,294806	46	55	18,81	-4	17	41,30	Art. 76(5): 350 M line
OL15	46,927779	-4,287945	46	55	40,01	-4	17	16,60	Art. 76(5): 350 M line
OL16	46,939471	-4,274195	46	56	22,10	-4	16	27,10	Art. 76(5): 350 M line
OL17	46,945305	-4,267306	46	56	43,10	-4	16	2,30	Art. 76(5): 350 M line
OL18	46,951140	-4,260389	46	57	4,10	-4	15	37,40	Art. 76(5): 350 M line
OL19	46,956943	-4,253500	46	57	25,00	-4	15	12,60	Art. 76(5): 350 M line
OL20	46,962751	-4,246584	46	57	45,90	-4	14	47,70	Art. 76(5): 350 M line
OL21	46,968554	-4,239666	46	58	6,79	-4	14	22,80	Art. 76(5): 350 M line
OL22	46,974335	-4,232721	46	58	27,60	-4	13	57,80	Art. 76(5): 350 M line
OL23	46,980111	-4,225777	46	58	48,40	-4	13	32,80	Art. 76(5): 350 M line
OL24	46,991641	-4,211889	46	59	29,91	-4	12	42,80	Art. 76(5): 350 M line
OL25	47,003112	-4,197945	47	0	11,20	-4	11	52,60	Art. 76(5): 350 M line
OL26	47,014530	-4,183944	47	0	52,31	-4	11	2,20	Art. 76(5): 350 M line
OL27	47,020225	-4,176945	47	1	12,81	-4	10	37,00	Art. 76(5): 350 M line
OL28	47,025916	-4,169945	47	1	33,30	-4	10	11,80	Art. 76(5): 350 M line
OL29	47,031584	-4,162917	47	1	53,70	-4	9	46,50	Art. 76(5): 350 M line
OL30	47,037248	-4,155889	47	2	14,09	-4	9	21,20	Art. 76(5): 350 M line
OL31	47,042917	-4,148833	47	2	34,50	-4	8	55,80	Art. 76(5): 350 M line
OL32	47,048553	-4,141806	47	2	54,79	-4	8	30,50	Art. 76(5): 350 M line
OL33	47,054195	-4,134751	47	3	15,10	-4	8	5,10	Art. 76(5): 350 M line
OL34	47,751252	-3,415723	47	45	4,51	-3	24	56,60	Art. 76(5): 350 M line
OL35	48,199138	-3,084250	48	11	56,90	-3	5	3,30	Art. 76(5): 350 M line
OL36	48,202161	-3,082570	48	12	7,78	-3	4	57,25	Art. 76(5): 350 M line
OL37	48,289051	-2,930817	48	17	20,58	-2	55	50,94	Art. 76(4)(a)(i): 1% Sediment Thickness
OL38	48,750568	-2,347258	48	45	2,05	-2	20	50,13	Art. 76(4)(a)(i): 1% Sediment Thickness
OL39	49,434750	-2,013248	49	26	5,10	-2	0	47,69	Art. 76(4)(a)(i): 1% Sediment Thickness
OL40	49,982426	-1,539175	49	58	56,73	-1	32	21,03	Art. 76(4)(a)(i): 1% Sediment Thickness
OL41	49,700268	-1,073034	49	42	0,96	-1	4	22,92	Art. 76(4)(a)(i): 1% Sediment Thickness
OL42	50,430958	-0,426509	50	25	51,45	0	-25	35,43	Art. 76(4)(a)(i): 1% Sediment Thickness
OL43	50,543964	-0,278753	50	32	38,27	0	-16	43,51	Art. 76(4)(a)(i): 1% Sediment Thickness

ECS Point	Longitude East	Latitude	Long E Deg.	Long E Min.	Long E Sec.	Lat Deg.	Lat Min.	Lat Sec.	Article 76 provision invoked
OL44	50,716095	0,705004	50	42	57,94	0	42	18,01	Art. 76(4)(a)(ii): FOS + 60M
OL45	51,219421	1,293256	51	13	9,92	1	17	35,72	Art. 76(4)(a)(i): 1% Sediment Thickness
OL46	52,074196	1,806946	52	4	27,11	1	48	25,01	Art. 76(4)(a)(ii): FOS + 60M
OL47	52,082390	1,808415	52	4	56,60	1	48	30,30	Art. 76(4)(a)(ii): FOS + 60M
OL48	52,090569	1,809952	52	5	26,05	1	48	35,83	Art. 76(4)(a)(ii): FOS + 60M
OL49	52,098740	1,811559	52	5	55,46	1	48	41,61	Art. 76(4)(a)(ii): FOS + 60M
OL98	52,471584	1,970696	52	28	17,70	1	58	14,50	Art. 76(4)(a)(ii): FOS + 60M
OL99	52,478405	1,975488	52	28	42,26	1	58	31,76	Art. 76(4)(a)(ii): FOS + 60M
OL100	52,485195	1,980339	52	29	6,70	1	58	49,22	Art. 76(4)(a)(ii): FOS + 60M
OL101	52,491940	1,985245	52	29	30,98	1	59	6,88	Art. 76(4)(a)(ii): FOS + 60M
OL102	52,498646	1,990210	52	29	55,12	1	59	24,75	Art. 76(4)(a)(ii): FOS + 60M
OL103	52,505306	1,995228	52	30	19,10	1	59	42,82	Art. 76(4)(a)(ii): FOS + 60M
OL104	52,511929	2,000304	52	30	42,94	2	0	1,09	Art. 76(4)(a)(ii): FOS + 60M
OL105	52,518509	2,005434	52	31	6,63	2	0	19,56	Art. 76(4)(a)(ii): FOS + 60M
OL106	52,525044	2,010620	52	31	30,16	2	0	38,23	Art. 76(4)(a)(ii): FOS + 60M
OL107	52,531532	2,015859	52	31	53,52	2	0	57,09	Art. 76(4)(a)(ii): FOS + 60M
OL108	52,537983	2,021154	52	32	16,74	2	1	16,15	Art. 76(4)(a)(ii): FOS + 60M
OL109	52,544392	2,026502	52	32	39,81	2	1	35,41	Art. 76(4)(a)(ii): FOS + 60M
OL110	52,550751	2,031904	52	33	2,70	2	1	54,85	Art. 76(4)(a)(ii): FOS + 60M
OL111	52,557068	2,037358	52	33	25,44	2	2	14,49	Art. 76(4)(a)(ii): FOS + 60M
OL112	52,563339	2,042864	52	33	48,02	2	2	34,31	Art. 76(4)(a)(ii): FOS + 60M
OL113	52,569565	2,048423	52	34	10,43	2	2	54,32	Art. 76(4)(a)(ii): FOS + 60M
OL114	52,575741	2,054035	52	34	32,67	2	3	14,53	Art. 76(4)(a)(ii): FOS + 60M
OL115	52,581871	2,059698	52	34	54,74	2	3	34,91	Art. 76(4)(a)(ii): FOS + 60M
OL116	52,587956	2,065413	52	35	16,64	2	3	55,49	Art. 76(4)(a)(ii): FOS + 60M
OL117	52,593994	2,071177	52	35	38,38	2	4	16,24	Art. 76(4)(a)(ii): FOS + 60M
OL118	52,599983	2,076993	52	35	59,94	2	4	37,18	Art. 76(4)(a)(ii): FOS + 60M
OL119	52,605923	2,082858	52	36	21,32	2	4	58,29	Art. 76(4)(a)(ii): FOS + 60M
OL120	52,611816	2,088773	52	36	42,54	2	5	19,58	Art. 76(4)(a)(ii): FOS + 60M
OL121	52,617661	2,094737	52	37	3,58	2	5	41,05	Art. 76(4)(a)(ii): FOS + 60M
OL122	52,623451	2,100750	52	37	24,42	2	6	2,70	Art. 76(4)(a)(ii): FOS + 60M
OL123	52,629196	2,106813	52	37	45,11	2	6	24,53	Art. 76(4)(a)(ii): FOS + 60M
OL124	52,634892	2,112921	52	38	5,61	2	6	46,51	Art. 76(4)(a)(ii): FOS + 60M
OL125	52,640533	2,119077	52	38	25,92	2	7	8,68	Art. 76(4)(a)(ii): FOS + 60M
OL126	52,646126	2,125281	52	38	46,05	2	7	31,01	Art. 76(4)(a)(ii): FOS + 60M
OL127	52,651665	2,131531	52	39	5,99	2	7	53,51	Art. 76(4)(a)(ii): FOS + 60M
OL128	52,657154	2,137828	52	39	25,75	2	8	16,18	Art. 76(4)(a)(ii): FOS + 60M
OL129	52,662590	2,144171	52	39	45,32	2	8	39,02	Art. 76(4)(a)(ii): FOS + 60M
OL130	53,367645	2,845146	53	22	3,52	2	50	42,52	Art. 76(4)(a)(ii): FOS + 60M
OL131	53,374062	2,850482	53	22	26,62	2	51	1,74	Art. 76(4)(a)(ii): FOS + 60M
OL132	53,380436	2,855873	53	22	49,57	2	51	21,14	Art. 76(4)(a)(ii): FOS + 60M
OL133	53,386761	2,861316	53	23	12,34	2	51	40,74	Art. 76(4)(a)(ii): FOS + 60M
OL134	53,393044	2,866813	53	23	34,96	2	52	0,53	Art. 76(4)(a)(ii): FOS + 60M
OL135	53,399284	2,872363	53	23	57,42	2	52	20,51	Art. 76(4)(a)(ii): FOS + 60M
OL136	53,405476	2,877964	53	24	19,71	2	52	40,67	Art. 76(4)(a)(ii): FOS + 60M
OL137	53,411621	2,883617	53	24	41,84	2	53	1,02	Art. 76(4)(a)(ii): FOS + 60M
OL138	53,417717	2,889322	53	25	3,78	2	53	21,56	Art. 76(4)(a)(ii): FOS + 60M
OL139	53,423771	2,895078	53	25	25,58	2	53	42,28	Art. 76(4)(a)(ii): FOS + 60M
OL140	53,429771	2,900883	53	25	47,18	2	54	3,18	Art. 76(4)(a)(ii): FOS + 60M

ECS Point	Longitude East	Latitude	Long E Deg.	Long E Min.	Long E Sec.	Lat Deg.	Lat Min.	Lat Sec.	Article 76 provision invoked
OL141	53,435726	2,906739	53	26	8,61	2	54	24,26	Art. 76(4)(a)(ii): FOS + 60M
OL142	53,441635	2,912645	53	26	29,89	2	54	45,52	Art. 76(4)(a)(ii): FOS + 60M
OL143	53,447491	2,918600	53	26	50,97	2	55	6,96	Art. 76(4)(a)(ii): FOS + 60M
OL144	53,453301	2,924604	53	27	11,88	2	55	28,57	Art. 76(4)(a)(ii): FOS + 60M
OL145	53,459053	2,930656	53	27	32,59	2	55	50,36	Art. 76(4)(a)(ii): FOS + 60M
OL146	53,464760	2,936754	53	27	53,14	2	56	12,32	Art. 76(4)(a)(ii): FOS + 60M
OL147	53,470417	2,942903	53	28	13,50	2	56	34,45	Art. 76(4)(a)(ii): FOS + 60M
OL148	53,476021	2,949097	53	28	33,67	2	56	56,75	Art. 76(4)(a)(ii): FOS + 60M
OL149	53,481579	2,955338	53	28	53,68	2	57	19,22	Art. 76(4)(a)(ii): FOS + 60M
OL150	53,487076	2,961625	53	29	13,47	2	57	41,85	Art. 76(4)(a)(ii): FOS + 60M
OL151	53,492527	2,967959	53	29	33,10	2	58	4,65	Art. 76(4)(a)(ii): FOS + 60M
OL152	53,497921	2,974337	53	29	52,52	2	58	27,61	Art. 76(4)(a)(ii): FOS + 60M
OL153	53,503269	2,980761	53	30	11,77	2	58	50,74	Art. 76(4)(a)(ii): FOS + 60M
OL154	53,508560	2,987228	53	30	30,82	2	59	14,02	Art. 76(4)(a)(ii): FOS + 60M
OL155	53,513794	2,993739	53	30	49,66	2	59	37,46	Art. 76(4)(a)(ii): FOS + 60M
OL156	53,518974	3,000296	53	31	8,31	3	0	1,06	Art. 76(4)(a)(ii): FOS + 60M
OL157	53,524105	3,006896	53	31	26,78	3	0	24,82	Art. 76(4)(a)(ii): FOS + 60M
OL158	53,529179	3,013538	53	31	45,04	3	0	48,74	Art. 76(4)(a)(ii): FOS + 60M
OL159	53,534195	3,020222	53	32	3,10	3	1	12,80	Art. 76(4)(a)(ii): FOS + 60M
OL160	53,539158	3,026947	53	32	20,97	3	1	37,01	Art. 76(4)(a)(ii): FOS + 60M
OL161	53,544064	3,033713	53	32	38,63	3	2	1,37	Art. 76(4)(a)(ii): FOS + 60M
OL162	53,548920	3,040522	53	32	56,11	3	2	25,88	Art. 76(4)(a)(ii): FOS + 60M
OL163	53,553711	3,047369	53	33	13,36	3	2	50,53	Art. 76(4)(a)(ii): FOS + 60M
OL164	53,558445	3,054257	53	33	30,40	3	3	15,33	Art. 76(4)(a)(ii): FOS + 60M
OL165	53,563129	3,061186	53	33	47,27	3	3	40,27	Art. 76(4)(a)(ii): FOS + 60M
OL166	53,567753	3,068153	53	34	3,91	3	4	5,35	Art. 76(4)(a)(ii): FOS + 60M
OL167	53,572315	3,075159	53	34	20,33	3	4	30,57	Art. 76(4)(a)(ii): FOS + 60M
OL168	53,576828	3,082202	53	34	36,58	3	4	55,93	Art. 76(4)(a)(ii): FOS + 60M
OL169	53,581272	3,089283	53	34	52,58	3	5	21,42	Art. 76(4)(a)(ii): FOS + 60M
OL170	53,585663	3,096400	53	35	8,39	3	5	47,04	Art. 76(4)(a)(ii): FOS + 60M
OL171	53,589993	3,103554	53	35	23,97	3	6	12,79	Art. 76(4)(a)(ii): FOS + 60M
OL172	53,594261	3,110743	53	35	39,34	3	6	38,67	Art. 76(4)(a)(ii): FOS + 60M
OL173	53,598476	3,117969	53	35	54,52	3	7	4,69	Art. 76(4)(a)(ii): FOS + 60M
OL174	54,145798	3,950133	54	8	44,87	3	57	0,48	Art. 76(4)(a)(ii): FOS + 60M
OL175	54,433037	4,227287	54	25	58,93	4	13	38,23	Art. 76(4)(a)(ii): FOS + 60M
OL176	54,439011	4,233127	54	26	20,44	4	13	59,26	Art. 76(4)(a)(ii): FOS + 60M
OL177	54,444939	4,239016	54	26	41,78	4	14	20,46	Art. 76(4)(a)(ii): FOS + 60M
OL178	54,450821	4,244955	54	27	2,96	4	14	41,84	Art. 76(4)(a)(ii): FOS + 60M
OL179	54,456650	4,250942	54	27	23,94	4	15	3,39	Art. 76(4)(a)(ii): FOS + 60M
OL180	54,462429	4,256978	54	27	44,74	4	15	25,12	Art. 76(4)(a)(ii): FOS + 60M
OL181	54,468163	4,263062	54	28	5,39	4	15	47,02	Art. 76(4)(a)(ii): FOS + 60M
OL182	54,473843	4,269195	54	28	25,83	4	16	9,10	Art. 76(4)(a)(ii): FOS + 60M
OL183	54,479473	4,275374	54	28	46,10	4	16	31,34	Art. 76(4)(a)(ii): FOS + 60M
OL184	54,485050	4,281599	54	29	6,18	4	16	53,76	Art. 76(4)(a)(ii): FOS + 60M
OL185	54,490574	4,287873	54	29	26,07	4	17	16,34	Art. 76(4)(a)(ii): FOS + 60M
OL186	54,496048	4,294192	54	29	45,77	4	17	39,09	Art. 76(4)(a)(ii): FOS + 60M
OL187	54,501473	4,300556	54	30	5,30	4	18	2,00	Art. 76(4)(a)(ii): FOS + 60M
OL188	54,506840	4,306965	54	30	24,62	4	18	25,07	Art. 76(4)(a)(ii): FOS + 60M
OL189	54,512157	4,313419	54	30	43,77	4	18	48,31	Art. 76(4)(a)(ii): FOS + 60M

ECS Point	Longitude East	Latitude	Long E Deg.	Long E Min.	Long E Sec.	Lat Deg.	Lat Min.	Lat Sec.	Article 76 provision invoked
OL190	54,517418	4,319919	54	31	2,70	4	19	11,71	Art. 76(4)(a)(ii): FOS + 60M
OL191	54,522625	4,326461	54	31	21,45	4	19	35,26	Art. 76(4)(a)(ii): FOS + 60M
OL192	54,527779	4,333046	54	31	40,00	4	19	58,97	Art. 76(4)(a)(ii): FOS + 60M
OL193	54,532875	4,339675	54	31	58,35	4	20	22,83	Art. 76(4)(a)(ii): FOS + 60M
OL194	54,537922	4,346345	54	32	16,52	4	20	46,84	Art. 76(4)(a)(ii): FOS + 60M
OL195	54,542912	4,353057	54	32	34,48	4	21	11,01	Art. 76(4)(a)(ii): FOS + 60M
OL196	54,547844	4,359812	54	32	52,24	4	21	35,32	Art. 76(4)(a)(ii): FOS + 60M
OL197	54,552715	4,366608	54	33	9,78	4	21	59,79	Art. 76(4)(a)(ii): FOS + 60M
OL198	54,557533	4,373443	54	33	27,12	4	22	24,39	Art. 76(4)(a)(ii): FOS + 60M
OL199	54,562302	4,380319	54	33	44,29	4	22	49,15	Art. 76(4)(a)(ii): FOS + 60M
OL200	54,567001	4,387235	54	34	1,20	4	23	14,05	Art. 76(4)(a)(ii): FOS + 60M
OL201	54,571652	4,394189	54	34	17,95	4	23	39,08	Art. 76(4)(a)(ii): FOS + 60M
OL202	54,576241	4,401182	54	34	34,47	4	24	4,25	Art. 76(4)(a)(ii): FOS + 60M
OL203	54,580772	4,408211	54	34	50,78	4	24	29,56	Art. 76(4)(a)(ii): FOS + 60M
OL204	54,585247	4,415279	54	35	6,89	4	24	55,00	Art. 76(4)(a)(ii): FOS + 60M
OL205	54,589665	4,422385	54	35	22,79	4	25	20,59	Art. 76(4)(a)(ii): FOS + 60M
OL206	54,594017	4,429526	54	35	38,46	4	25	46,29	Art. 76(4)(a)(ii): FOS + 60M
OL207	54,598312	4,436705	54	35	53,92	4	26	12,14	Art. 76(4)(a)(ii): FOS + 60M
OL208	54,602551	4,443920	54	36	9,18	4	26	38,11	Art. 76(4)(a)(ii): FOS + 60M
OL209	54,606728	4,451168	54	36	24,22	4	27	4,21	Art. 76(4)(a)(ii): FOS + 60M
OL210	54,610844	4,458452	54	36	39,04	4	27	30,43	Art. 76(4)(a)(ii): FOS + 60M
OL211	54,614903	4,465769	54	36	53,65	4	27	56,77	Art. 76(4)(a)(ii): FOS + 60M
OL212	54,618893	4,473121	54	37	8,01	4	28	23,23	Art. 76(4)(a)(ii): FOS + 60M
OL213	54,622829	4,480506	54	37	22,19	4	28	49,82	Art. 76(4)(a)(ii): FOS + 60M
OL214	54,626701	4,487923	54	37	36,12	4	29	16,52	Art. 76(4)(a)(ii): FOS + 60M
OL215	54,630512	4,495372	54	37	49,84	4	29	43,34	Art. 76(4)(a)(ii): FOS + 60M
OL216	54,970539	5,165201	54	58	13,94	5	9	54,72	Art. 76(4)(a)(ii): FOS + 60M
OL217	54,974304	5,172677	54	58	27,50	5	10	21,64	Art. 76(4)(a)(ii): FOS + 60M
OL218	54,978001	5,180183	54	58	40,80	5	10	48,66	Art. 76(4)(a)(ii): FOS + 60M
OL219	54,981644	5,187722	54	58	53,92	5	11	15,80	Art. 76(4)(a)(ii): FOS + 60M
OL220	54,985218	5,195290	54	59	6,78	5	11	43,04	Art. 76(4)(a)(ii): FOS + 60M
OL221	54,988731	5,202887	54	59	19,43	5	12	10,39	Art. 76(4)(a)(ii): FOS + 60M
OL222	54,992180	5,210515	54	59	31,85	5	12	37,85	Art. 76(4)(a)(ii): FOS + 60M
OL223	54,995567	5,218169	54	59	44,04	5	13	5,41	Art. 76(4)(a)(ii): FOS + 60M
OL224	54,998886	5,225852	54	59	55,99	5	13	33,07	Art. 76(4)(a)(ii): FOS + 60M
OL225	55,002148	5,233562	55	0	7,73	5	14	0,82	Art. 76(4)(a)(ii): FOS + 60M
OL226	55,005341	5,241300	55	0	19,23	5	14	28,68	Art. 76(4)(a)(ii): FOS + 60M
OL227	55,008472	5,249064	55	0	30,50	5	14	56,63	Art. 76(4)(a)(ii): FOS + 60M
OL228	55,011536	5,256852	55	0	41,53	5	15	24,67	Art. 76(4)(a)(ii): FOS + 60M
OL229	55,014534	5,264668	55	0	52,32	5	15	52,80	Art. 76(4)(a)(ii): FOS + 60M
OL230	55,017471	5,272508	55	1	2,90	5	16	21,03	Art. 76(4)(a)(ii): FOS + 60M
OL231	55,020344	5,280371	55	1	13,24	5	16	49,34	Art. 76(4)(a)(ii): FOS + 60M
OL232	55,023151	5,288258	55	1	23,35	5	17	17,73	Art. 76(4)(a)(ii): FOS + 60M
OL233	55,025890	5,296169	55	1	33,21	5	17	46,21	Art. 76(4)(a)(ii): FOS + 60M
OL234	55,028561	5,304102	55	1	42,82	5	18	14,77	Art. 76(4)(a)(ii): FOS + 60M
OL235	55,031166	5,312057	55	1	52,20	5	18	43,41	Art. 76(4)(a)(ii): FOS + 60M
OL236	55,033711	5,320034	55	2	1,36	5	19	12,12	Art. 76(4)(a)(ii): FOS + 60M
OL237	55,036182	5,328031	55	2	10,26	5	19	40,91	Art. 76(4)(a)(ii): FOS + 60M
OL238	55,038597	5,336049	55	2	18,95	5	20	9,78	Art. 76(4)(a)(ii): FOS + 60M

ECS Point	Longitude East	Latitude	Long E Deg.	Long E Min.	Long E Sec.	Lat Deg.	Lat Min.	Lat Sec.	Article 76 provision invoked
OL239	55,040936	5,344088	55	2	27,37	5	20	38,72	Art. 76(4)(a)(ii): FOS + 60M
OL240	55,043213	5,352145	55	2	35,57	5	21	7,72	Art. 76(4)(a)(ii): FOS + 60M
OL241	55,045418	5,360220	55	2	43,50	5	21	36,79	Art. 76(4)(a)(ii): FOS + 60M
OL242	55,047562	5,368315	55	2	51,22	5	22	5,93	Art. 76(4)(a)(ii): FOS + 60M
OL243	55,049637	5,376426	55	2	58,69	5	22	35,13	Art. 76(4)(a)(ii): FOS + 60M
OL244	55,051640	5,384555	55	3	5,90	5	23	4,40	Art. 76(4)(a)(ii): FOS + 60M
OL245	55,053581	5,392700	55	3	12,89	5	23	33,72	Art. 76(4)(a)(ii): FOS + 60M
OL246	55,055454	5,400861	55	3	19,64	5	24	3,10	Art. 76(4)(a)(ii): FOS + 60M
OL247	55,057255	5,409037	55	3	26,12	5	24	32,53	Art. 76(4)(a)(ii): FOS + 60M
OL248	55,058987	5,417228	55	3	32,35	5	25	2,02	Art. 76(4)(a)(ii): FOS + 60M
OL249	55,728966	6,164019	55	43	44,28	6	9	50,47	Art. 76(4)(a)(ii): FOS + 60M
OL250	55,736954	6,166506	55	44	13,03	6	9	59,42	Art. 76(4)(a)(ii): FOS + 60M
OL251	55,740046	6,167493	55	44	24,16	6	10	2,97	Art. 76(5): 350 M line
OL252	55,750556	6,185557	55	45	2,00	6	11	8,00	Art. 76(5): 350 M line
OL253	55,932501	6,507778	55	55	57,00	6	30	28,00	Art. 76(5): 350 M line
OL254	56,439806	7,365749	56	26	23,30	7	21	56,70	Art. 76(5): 350 M line
OL255	56,444473	7,373472	56	26	40,10	7	22	24,50	Art. 76(5): 350 M line
OL256	56,449140	7,381222	56	26	56,90	7	22	52,40	Art. 76(5): 350 M line
OL257	56,453807	7,389001	56	27	13,71	7	23	20,40	Art. 76(5): 350 M line
OL258	56,458447	7,396751	56	27	30,41	7	23	48,30	Art. 76(5): 350 M line
OL259	56,467694	7,412306	56	28	3,70	7	24	44,30	Art. 76(5): 350 M line
OL260	56,472307	7,420084	56	28	20,31	7	25	12,30	Art. 76(5): 350 M line
OL261	56,481470	7,435667	56	28	53,29	7	26	8,40	Art. 76(5): 350 M line
OL262	56,486057	7,443473	56	29	9,80	7	26	36,50	Art. 76(5): 350 M line
OL263	56,490610	7,451306	56	29	26,20	7	27	4,70	Art. 76(5): 350 M line
OL264	56,499692	7,466945	56	29	58,89	7	28	1,00	Art. 76(5): 350 M line
OL265	56,504220	7,474779	56	30	15,19	7	28	29,21	Art. 76(5): 350 M line
OL266	56,508721	7,482611	56	30	31,39	7	28	57,40	Art. 76(5): 350 M line
OL267	56,517721	7,498305	56	31	3,80	7	29	53,90	Art. 76(5): 350 M line
OL268	56,538999	7,535472	56	32	20,40	7	32	7,70	Art. 76(5): 350 M line
OL269	56,543499	7,543333	56	32	36,60	7	32	36,00	Art. 76(5): 350 M line
OL270	56,547973	7,551194	56	32	52,70	7	33	4,30	Art. 76(5): 350 M line
OL271	56,552447	7,559056	56	33	8,81	7	33	32,60	Art. 76(5): 350 M line
OL272	56,561389	7,574778	56	33	41,00	7	34	29,20	Art. 76(5): 350 M line
OL273	56,570251	7,590556	56	34	12,90	7	35	26,00	Art. 76(5): 350 M line
OL274	56,574666	7,598445	56	34	28,80	7	35	54,40	Art. 76(5): 350 M line
OL275	56,583474	7,614278	56	35	0,51	7	36	51,40	Art. 76(5): 350 M line
OL276	56,592197	7,630111	56	35	31,91	7	37	48,40	Art. 76(5): 350 M line
OL277	56,596553	7,638028	56	35	47,59	7	38	16,90	Art. 76(5): 350 M line
OL278	56,600915	7,645971	56	36	3,29	7	38	45,50	Art. 76(5): 350 M line
OL279	56,605249	7,653916	56	36	18,89	7	39	14,10	Art. 76(5): 350 M line
OL280	56,609556	7,661862	56	36	34,40	7	39	42,70	Art. 76(5): 350 M line
OL281	56,613859	7,669807	56	36	49,89	7	40	11,30	Art. 76(5): 350 M line
OL282	56,618167	7,677777	56	37	5,40	7	40	40,00	Art. 76(5): 350 M line
OL283	56,626723	7,693722	56	37	36,20	7	41	37,40	Art. 76(5): 350 M line
OL284	56,630972	7,701695	56	37	51,50	7	42	6,10	Art. 76(5): 350 M line
OL285	56,635222	7,709695	56	38	6,80	7	42	34,90	Art. 76(5): 350 M line
OL286	56,639470	7,717695	56	38	22,09	7	43	3,70	Art. 76(5): 350 M line
OL287	56,643692	7,725695	56	38	37,29	7	43	32,50	Art. 76(5): 350 M line

ECS Point	Longitude East	Latitude	Long E Deg.	Long E Min.	Long E Sec.	Lat Deg.	Lat Min.	Lat Sec.	Article 76 provision invoked
OL288	56,652109	7,741695	56	39	7,59	7	44	30,10	Art. 76(5): 350 M line
OL289	56,660473	7,757750	56	39	37,70	7	45	27,90	Art. 76(5): 350 M line
OL290	56,668778	7,773834	56	40	7,60	7	46	25,80	Art. 76(5): 350 M line
OL291	56,672915	7,781862	56	40	22,49	7	46	54,70	Art. 76(5): 350 M line
OL292	56,677029	7,789916	56	40	37,30	7	47	23,70	Art. 76(5): 350 M line
OL293	56,681139	7,797973	56	40	52,10	7	47	52,70	Art. 76(5): 350 M line
OL294	56,685249	7,806028	56	41	6,89	7	48	21,70	Art. 76(5): 350 M line
OL295	56,693419	7,822195	56	41	36,31	7	49	19,90	Art. 76(5): 350 M line
OL296	56,705582	7,846444	56	42	20,09	7	50	47,20	Art. 76(5): 350 M line
OL297	56,709611	7,854556	56	42	34,60	7	51	16,40	Art. 76(5): 350 M line
OL298	56,713613	7,862667	56	42	49,01	7	51	45,60	Art. 76(5): 350 M line
OL299	56,721612	7,878889	56	43	17,80	7	52	44,00	Art. 76(5): 350 M line
OL300	56,729553	7,895139	56	43	46,39	7	53	42,50	Art. 76(5): 350 M line
OL301	56,733502	7,903278	56	44	0,61	7	54	11,80	Art. 76(5): 350 M line
OL302	56,737445	7,911445	56	44	14,80	7	54	41,20	Art. 76(5): 350 M line
OL303	56,741362	7,919583	56	44	28,90	7	55	10,50	Art. 76(5): 350 M line
OL304	56,749195	7,935888	56	44	57,10	7	56	9,20	Art. 76(5): 350 M line
OL305	56,753084	7,944056	56	45	11,10	7	56	38,60	Art. 76(5): 350 M line
OL306	56,756970	7,952251	56	45	25,09	7	57	8,10	Art. 76(5): 350 M line
OL307	56,760833	7,960417	56	45	39,00	7	57	37,50	Art. 76(5): 350 M line
OL308	56,764695	7,968611	56	45	52,90	7	58	7,00	Art. 76(5): 350 M line
OL309	56,772363	7,985000	56	46	20,51	7	59	6,00	Art. 76(5): 350 M line
OL310	56,776167	7,993195	56	46	34,20	7	59	35,50	Art. 76(5): 350 M line
OL311	56,779971	8,001416	56	46	47,90	8	0	5,10	Art. 76(5): 350 M line
OL312	56,783749	8,009611	56	47	1,50	8	0	34,60	Art. 76(5): 350 M line
OL313	56,791304	8,026055	56	47	28,69	8	1	33,80	Art. 76(5): 350 M line
OL314	56,798804	8,042528	56	47	55,70	8	2	33,10	Art. 76(5): 350 M line
OL315	56,802529	8,050778	56	48	9,10	8	3	2,80	Art. 76(5): 350 M line
OL316	56,806252	8,059027	56	48	22,51	8	3	32,50	Art. 76(5): 350 M line
OL317	56,813640	8,075527	56	48	49,10	8	4	31,90	Art. 76(5): 350 M line
OL318	56,824640	8,100362	56	49	28,71	8	6	1,30	Art. 76(5): 350 M line
OL319	56,828279	8,108638	56	49	41,80	8	6	31,10	Art. 76(5): 350 M line
OL320	56,831916	8,116917	56	49	54,90	8	7	0,90	Art. 76(5): 350 M line
OL321	56,835528	8,125221	56	50	7,90	8	7	30,80	Art. 76(5): 350 M line
OL322	56,842723	8,141806	56	50	33,80	8	8	30,50	Art. 76(5): 350 M line
OL323	56,849860	8,158445	56	50	59,50	8	9	30,40	Art. 76(5): 350 M line
OL324	56,853418	8,166751	56	51	12,30	8	10	0,30	Art. 76(5): 350 M line
OL325	56,860474	8,183417	56	51	37,71	8	11	0,30	Art. 76(5): 350 M line
OL326	56,863973	8,191750	56	51	50,30	8	11	30,30	Art. 76(5): 350 M line
OL327	56,867472	8,200084	56	52	2,90	8	12	0,30	Art. 76(5): 350 M line
OL328	56,870971	8,208444	56	52	15,50	8	12	30,40	Art. 76(5): 350 M line
OL329	56,874442	8,216805	56	52	27,99	8	13	0,50	Art. 76(5): 350 M line
OL330	56,877915	8,225166	56	52	40,49	8	13	30,60	Art. 76(5): 350 M line
OL331	56,881359	8,233527	56	52	52,89	8	14	0,70	Art. 76(5): 350 M line
OL332	56,884805	8,241889	56	53	5,30	8	14	30,80	Art. 76(5): 350 M line
OL333	56,888223	8,250251	56	53	17,60	8	15	0,90	Art. 76(5): 350 M line
OL334	56,891641	8,258638	56	53	29,91	8	15	31,10	Art. 76(5): 350 M line
OL335	56,902390	8,285222	56	54	8,60	8	17	6,80	Art. 76(5): 350 M line
OL336	56,909113	8,302001	56	54	32,81	8	18	7,20	Art. 76(5): 350 M line

ECS Point	Longitude East	Latitude	Long E Deg.	Long E Min.	Long E Sec.	Lat Deg.	Lat Min.	Lat Sec.	Article 76 provision invoked
OL337	56,912473	8,310417	56	54	44,90	8	18	37,50	Art. 76(5): 350 M line
OL338	56,915806	8,318807	56	54	56,90	8	19	7,70	Art. 76(5): 350 M line
OL339	56,922445	8,335639	56	55	20,80	8	20	8,30	Art. 76(5): 350 M line
OL340	56,929002	8,352500	56	55	44,41	8	21	9,00	Art. 76(5): 350 M line
OL341	56,932276	8,360945	56	55	56,19	8	21	39,40	Art. 76(5): 350 M line
OL342	56,935528	8,369389	56	56	7,90	8	22	9,80	Art. 76(5): 350 M line
OL343	56,942027	8,386278	56	56	31,30	8	23	10,60	Art. 76(5): 350 M line
OL344	56,945248	8,394722	56	56	42,89	8	23	41,00	Art. 76(5): 350 M line
OL345	56,951639	8,411639	56	57	5,90	8	24	41,90	Art. 76(5): 350 M line
OL346	56,957973	8,428583	56	57	28,70	8	25	42,90	Art. 76(5): 350 M line
OL347	56,961139	8,437056	56	57	40,10	8	26	13,40	Art. 76(5): 350 M line
OL348	56,967418	8,454027	56	58	2,70	8	27	14,50	Art. 76(5): 350 M line
OL349	56,981221	8,491750	56	58	52,40	8	29	30,30	Art. 76(5): 350 M line
OL350	56,984307	8,500279	56	59	3,50	8	30	1,00	Art. 76(5): 350 M line
OL351	56,987361	8,508778	56	59	14,50	8	30	31,60	Art. 76(5): 350 M line
OL352	56,990415	8,517277	56	59	25,49	8	31	2,20	Art. 76(5): 350 M line
OL353	56,993474	8,525807	56	59	36,51	8	31	32,90	Art. 76(5): 350 M line
OL354	56,996501	8,534332	56	59	47,40	8	32	3,60	Art. 76(5): 350 M line
OL355	56,999529	8,542861	56	59	58,30	8	32	34,30	Art. 76(5): 350 M line
OL356	57,002529	8,551390	57	0	9,11	8	33	5,00	Art. 76(5): 350 M line
OL357	57,005530	8,559917	57	0	19,91	8	33	35,70	Art. 76(5): 350 M line
OL358	57,011472	8,577027	57	0	41,30	8	34	37,30	Art. 76(5): 350 M line
OL359	57,014418	8,585555	57	0	51,90	8	35	8,00	Art. 76(5): 350 M line
OL360	57,017360	8,594112	57	1	2,50	8	35	38,80	Art. 76(5): 350 M line
OL361	57,026110	8,619806	57	1	34,00	8	37	11,30	Art. 76(5): 350 M line
OL362	57,031859	8,636973	57	1	54,69	8	38	13,10	Art. 76(5): 350 M line
OL363	57,034721	8,645556	57	2	4,99	8	38	44,00	Art. 76(5): 350 M line
OL364	57,037582	8,654140	57	2	15,29	8	39	14,90	Art. 76(5): 350 M line
OL365	57,040415	8,662723	57	2	25,49	8	39	45,80	Art. 76(5): 350 M line
OL366	57,043223	8,671305	57	2	35,60	8	40	16,70	Art. 76(5): 350 M line
OL367	57,046030	8,679916	57	2	45,71	8	40	47,70	Art. 76(5): 350 M line
OL368	57,048833	8,688528	57	2	55,80	8	41	18,70	Art. 76(5): 350 M line
OL369	57,051613	8,697111	57	3	5,81	8	41	49,60	Art. 76(5): 350 M line
OL370	57,054389	8,705723	57	3	15,80	8	42	20,60	Art. 76(5): 350 M line
OL371	57,059891	8,722973	57	3	35,61	8	43	22,70	Art. 76(5): 350 M line
OL372	57,062613	8,731584	57	3	45,41	8	43	53,70	Art. 76(5): 350 M line
OL373	57,065335	8,740222	57	3	55,20	8	44	24,80	Art. 76(5): 350 M line
OL374	57,068030	8,748861	57	4	4,91	8	44	55,90	Art. 76(5): 350 M line
OL375	57,073415	8,766140	57	4	24,29	8	45	58,10	Art. 76(5): 350 M line
OL376	57,078724	8,783416	57	4	43,41	8	47	0,30	Art. 76(5): 350 M line
OL377	57,081361	8,792084	57	4	52,90	8	47	31,50	Art. 76(5): 350 M line
OL378	57,083970	8,800723	57	5	2,29	8	48	2,60	Art. 76(5): 350 M line
OL379	57,086584	8,809388	57	5	11,70	8	48	33,80	Art. 76(5): 350 M line
OL380	57,089194	8,818056	57	5	21,10	8	49	5,00	Art. 76(5): 350 M line
OL381	57,091777	8,826723	57	5	30,40	8	49	36,20	Art. 76(5): 350 M line
OL382	57,094332	8,835389	57	5	39,59	8	50	7,40	Art. 76(5): 350 M line
OL383	57,099444	8,852750	57	5	58,00	8	51	9,90	Art. 76(5): 350 M line
OL384	57,104501	8,870112	57	6	16,20	8	52	12,40	Art. 76(5): 350 M line
OL385	57,109500	8,887500	57	6	34,20	8	53	15,00	Art. 76(5): 350 M line

ECS Point	Longitude East	Latitude	Long E Deg.	Long E Min.	Long E Sec.	Lat Deg.	Lat Min.	Lat Sec.	Article 76 provision invoked
OL386	57,114446	8,904917	57	6	52,01	8	54	17,70	Art. 76(5): 350 M line
OL387	57,116889	8,913612	57	7	0,80	8	54	49,00	Art. 76(5): 350 M line
OL388	57,119333	8,922334	57	7	9,60	8	55	20,40	Art. 76(5): 350 M line
OL389	57,124166	8,939750	57	7	27,00	8	56	23,10	Art. 76(5): 350 M line
OL390	57,126555	8,948472	57	7	35,60	8	56	54,50	Art. 76(5): 350 M line
OL391	57,128945	8,957194	57	7	44,20	8	57	25,90	Art. 76(5): 350 M line
OL392	57,133665	8,974666	57	8	1,19	8	58	28,80	Art. 76(5): 350 M line
OL393	57,136028	8,983417	57	8	9,70	8	59	0,30	Art. 76(5): 350 M line
OL394	57,140667	9,000889	57	8	26,40	9	0	3,20	Art. 76(5): 350 M line
OL395	57,142971	9,009639	57	8	34,70	9	0	34,70	Art. 76(5): 350 M line
OL396	57,149808	9,035889	57	8	59,31	9	2	9,20	Art. 76(5): 350 M line
OL397	57,152054	9,044666	57	9	7,39	9	2	40,80	Art. 76(5): 350 M line
OL398	57,154277	9,053416	57	9	15,40	9	3	12,30	Art. 76(5): 350 M line
OL399	57,158724	9,070944	57	9	31,41	9	4	15,40	Art. 76(5): 350 M line
OL400	57,163112	9,088500	57	9	47,20	9	5	18,60	Art. 76(5): 350 M line
OL401	57,165277	9,097277	57	9	55,00	9	5	50,20	Art. 76(5): 350 M line
OL402	57,169584	9,114862	57	10	10,50	9	6	53,50	Art. 76(5): 350 M line
OL403	57,171695	9,123639	57	10	18,10	9	7	25,10	Art. 76(5): 350 M line
OL404	57,173806	9,132444	57	10	25,70	9	7	56,80	Art. 76(5): 350 M line
OL405	57,175918	9,141251	57	10	33,30	9	8	28,50	Art. 76(5): 350 M line
OL406	57,178002	9,150028	57	10	40,81	9	9	0,10	Art. 76(5): 350 M line
OL407	57,180085	9,158834	57	10	48,31	9	9	31,80	Art. 76(5): 350 M line
OL408	57,184196	9,176444	57	11	3,10	9	10	35,20	Art. 76(5): 350 M line
OL409	57,188252	9,194083	57	11	17,71	9	11	38,70	Art. 76(5): 350 M line
OL410	57,190250	9,202890	57	11	24,90	9	12	10,40	Art. 76(5): 350 M line
OL411	57,192249	9,211722	57	11	32,09	9	12	42,20	Art. 76(5): 350 M line
OL412	57,196192	9,229362	57	11	46,29	9	13	45,70	Art. 76(5): 350 M line
OL413	57,200082	9,247028	57	12	0,30	9	14	49,30	Art. 76(5): 350 M line
OL414	57,202027	9,255861	57	12	7,30	9	15	21,10	Art. 76(5): 350 M line
OL415	57,205831	9,273556	57	12	20,99	9	16	24,80	Art. 76(5): 350 M line
OL416	57,207722	9,282389	57	12	27,80	9	16	56,60	Art. 76(5): 350 M line
OL417	57,211446	9,300111	57	12	41,21	9	18	0,40	Art. 76(5): 350 M line
OL418	57,213278	9,308945	57	12	47,80	9	18	32,20	Art. 76(5): 350 M line
OL419	57,215111	9,317804	57	12	54,40	9	19	4,10	Art. 76(5): 350 M line
OL420	57,216943	9,326667	57	13	0,99	9	19	36,00	Art. 76(5): 350 M line
OL421	57,218749	9,335528	57	13	7,50	9	20	7,90	Art. 76(5): 350 M line
OL422	57,222306	9,353250	57	13	20,30	9	21	11,70	Art. 76(5): 350 M line
OL423	57,224085	9,362140	57	13	26,71	9	21	43,70	Art. 76(5): 350 M line
OL424	57,227557	9,379889	57	13	39,21	9	22	47,60	Art. 76(5): 350 M line
OL425	57,229277	9,388749	57	13	45,40	9	23	19,50	Art. 76(5): 350 M line
OL426	57,232668	9,406529	57	13	57,61	9	24	23,50	Art. 76(5): 350 M line
OL427	57,234362	9,415418	57	14	3,70	9	24	55,50	Art. 76(5): 350 M line
OL428	57,236028	9,424305	57	14	9,70	9	25	27,50	Art. 76(5): 350 M line
OL429	57,237695	9,433195	57	14	15,70	9	25	59,50	Art. 76(5): 350 M line
OL430	57,239334	9,442083	57	14	21,60	9	26	31,50	Art. 76(5): 350 M line
OL431	57,240946	9,450972	57	14	27,41	9	27	3,50	Art. 76(5): 350 M line
OL432	57,244167	9,468778	57	14	39,00	9	28	7,60	Art. 76(5): 350 M line
OL433	57,245748	9,477666	57	14	44,69	9	28	39,60	Art. 76(5): 350 M line
OL434	57,247306	9,486584	57	14	50,30	9	29	11,70	Art. 76(5): 350 M line

ECS Point	Longitude East	Latitude	Long E Deg.	Long E Min.	Long E Sec.	Lat Deg.	Lat Min.	Lat Sec.	Article 76 provision invoked
OL435	57,248861	9,495500	57	14	55,90	9	29	43,80	Art. 76(5): 350 M line
OL436	57,250415	9,504417	57	15	1,49	9	30	15,90	Art. 76(5): 350 M line
OL437	57,251947	9,513306	57	15	7,01	9	30	47,90	Art. 76(5): 350 M line
OL438	57,253473	9,522222	57	15	12,50	9	31	20,00	Art. 76(5): 350 M line
OL439	57,254974	9,531139	57	15	17,90	9	31	52,10	Art. 76(5): 350 M line
OL440	57,257942	9,549000	57	15	28,59	9	32	56,40	Art. 76(5): 350 M line
OL441	57,259389	9,557917	57	15	33,80	9	33	28,50	Art. 76(5): 350 M line
OL442	57,260835	9,566834	57	15	39,01	9	34	0,60	Art. 76(5): 350 M line
OL443	57,262277	9,575778	57	15	44,20	9	34	32,80	Art. 76(5): 350 M line
OL444	57,263696	9,584694	57	15	49,31	9	35	4,90	Art. 76(5): 350 M line
OL445	57,265111	9,593639	57	15	54,40	9	35	37,10	Art. 76(5): 350 M line
OL446	57,266499	9,602555	57	15	59,40	9	36	9,20	Art. 76(5): 350 M line
OL447	57,269248	9,620444	57	16	9,29	9	37	13,60	Art. 76(5): 350 M line
OL448	57,270581	9,629390	57	16	14,09	9	37	45,80	Art. 76(5): 350 M line
OL449	57,271916	9,638334	57	16	18,90	9	38	18,00	Art. 76(5): 350 M line
OL450	57,273250	9,647278	57	16	23,70	9	38	50,20	Art. 76(5): 350 M line
OL451	57,274557	9,656222	57	16	28,41	9	39	22,40	Art. 76(5): 350 M line
OL452	57,275859	9,665166	57	16	33,09	9	39	54,60	Art. 76(5): 350 M line
OL453	57,277140	9,674111	57	16	37,70	9	40	26,80	Art. 76(5): 350 M line
OL454	57,278415	9,683084	57	16	42,29	9	40	59,10	Art. 76(5): 350 M line
OL455	57,279668	9,692027	57	16	46,80	9	41	31,30	Art. 76(5): 350 M line
OL456	57,280917	9,700973	57	16	51,30	9	42	3,50	Art. 76(5): 350 M line
OL457	57,282139	9,709944	57	16	55,70	9	42	35,80	Art. 76(5): 350 M line
OL458	57,284555	9,727862	57	17	4,40	9	43	40,30	Art. 76(5): 350 M line
OL459	57,286918	9,745806	57	17	12,90	9	44	44,90	Art. 76(5): 350 M line
OL460	57,289195	9,763722	57	17	21,10	9	45	49,40	Art. 76(5): 350 M line
OL461	57,290331	9,772694	57	17	25,19	9	46	21,70	Art. 76(5): 350 M line
OL462	57,291445	9,781667	57	17	29,20	9	46	54,00	Art. 76(5): 350 M line
OL463	57,292555	9,790639	57	17	33,20	9	47	26,30	Art. 76(5): 350 M line
OL464	57,294724	9,808611	57	17	41,01	9	48	31,00	Art. 76(5): 350 M line
OL465	57,295779	9,817583	57	17	44,81	9	49	3,30	Art. 76(5): 350 M line
OL466	57,296835	9,826555	57	17	48,61	9	49	35,60	Art. 76(5): 350 M line
OL467	57,298887	9,844528	57	17	55,99	9	50	40,30	Art. 76(5): 350 M line
OL468	57,300891	9,862500	57	18	3,21	9	51	45,00	Art. 76(5): 350 M line
OL469	57,302831	9,880472	57	18	10,19	9	52	49,70	Art. 76(5): 350 M line
OL470	57,303779	9,889472	57	18	13,60	9	53	22,10	Art. 76(5): 350 M line
OL471	57,304722	9,898472	57	18	17,00	9	53	54,50	Art. 76(5): 350 M line
OL472	57,305639	9,907473	57	18	20,30	9	54	26,90	Art. 76(5): 350 M line
OL473	57,307444	9,925444	57	18	26,80	9	55	31,60	Art. 76(5): 350 M line
OL474	57,309196	9,943445	57	18	33,10	9	56	36,40	Art. 76(5): 350 M line
OL475	57,310889	9,961445	57	18	39,20	9	57	41,20	Art. 76(5): 350 M line
OL476	57,312502	9,979472	57	18	45,01	9	58	46,10	Art. 76(5): 350 M line
OL477	57,313306	9,988472	57	18	47,90	9	59	18,50	Art. 76(5): 350 M line
OL478	57,314082	9,997473	57	18	50,70	9	59	50,90	Art. 76(5): 350 M line
OL479	57,314860	10,006500	57	18	53,49	10	0	23,40	Art. 76(5): 350 M line
OL480	57,315610	10,015500	57	18	56,20	10	0	55,80	Art. 76(5): 350 M line
OL481	57,316360	10,024500	57	18	58,89	10	1	28,20	Art. 76(5): 350 M line
OL482	57,317806	10,042527	57	19	4,10	10	2	33,10	Art. 76(5): 350 M line
OL483	57,319194	10,060556	57	19	9,10	10	3	38,00	Art. 76(5): 350 M line

ECS Point	Longitude East	Latitude	Long E Deg.	Long E Min.	Long E Sec.	Lat Deg.	Lat Min.	Lat Sec.	Article 76 provision invoked
OL484	57,319864	10,069584	57	19	11,51	10	4	10,50	Art. 76(5): 350 M line
OL485	57,320528	10,078611	57	19	13,90	10	4	43,00	Art. 76(5): 350 M line
OL486	57,321166	10,087610	57	19	16,20	10	5	15,40	Art. 76(5): 350 M line
OL487	57,322415	10,105667	57	19	20,69	10	6	20,40	Art. 76(5): 350 M line
OL488	57,322998	10,114666	57	19	22,79	10	6	52,80	Art. 76(5): 350 M line
OL489	57,323583	10,123695	57	19	24,90	10	7	25,30	Art. 76(5): 350 M line
OL490	57,324167	10,132722	57	19	27,00	10	7	57,80	Art. 76(5): 350 M line
OL491	57,324723	10,141749	57	19	29,00	10	8	30,30	Art. 76(5): 350 M line
OL492	57,325276	10,150778	57	19	30,99	10	9	2,80	Art. 76(5): 350 M line
OL493	57,325806	10,159806	57	19	32,90	10	9	35,30	Art. 76(5): 350 M line
OL494	57,326331	10,168834	57	19	34,79	10	10	7,80	Art. 76(5): 350 M line
OL495	57,326834	10,177861	57	19	36,60	10	10	40,30	Art. 76(5): 350 M line
OL496	57,327333	10,186889	57	19	38,40	10	11	12,80	Art. 76(5): 350 M line
OL497	57,327805	10,195917	57	19	40,10	10	11	45,30	Art. 76(5): 350 M line
OL498	57,328249	10,204945	57	19	41,70	10	12	17,80	Art. 76(5): 350 M line
OL499	57,328694	10,213972	57	19	43,30	10	12	50,30	Art. 76(5): 350 M line
OL500	57,329139	10,223000	57	19	44,90	10	13	22,80	Art. 76(5): 350 M line
OL501	57,329974	10,241055	57	19	47,91	10	14	27,80	Art. 76(5): 350 M line
OL502	57,330751	10,259112	57	19	50,70	10	15	32,80	Art. 76(5): 350 M line
OL503	57,331110	10,268167	57	19	52,00	10	16	5,40	Art. 76(5): 350 M line
OL504	57,331780	10,286223	57	19	54,41	10	17	10,40	Art. 76(5): 350 M line
OL505	57,332112	10,295250	57	19	55,60	10	17	42,90	Art. 76(5): 350 M line
OL506	57,332723	10,313333	57	19	57,80	10	18	48,00	Art. 76(5): 350 M line
OL507	57,333001	10,322361	57	19	58,80	10	19	20,50	Art. 76(5): 350 M line
OL508	57,333527	10,340445	57	20	0,70	10	20	25,60	Art. 76(5): 350 M line
OL509	57,333751	10,349472	57	20	1,50	10	20	58,10	Art. 76(5): 350 M line
OL510	57,334196	10,367555	57	20	3,11	10	22	3,20	Art. 76(5): 350 M line
OL511	57,334389	10,376583	57	20	3,80	10	22	35,70	Art. 76(5): 350 M line
OL512	57,334722	10,394667	57	20	5,00	10	23	40,80	Art. 76(5): 350 M line
OL513	57,334888	10,403722	57	20	5,60	10	24	13,40	Art. 76(5): 350 M line
OL514	57,335166	10,421778	57	20	6,60	10	25	18,40	Art. 76(5): 350 M line
OL515	57,335279	10,430834	57	20	7,00	10	25	51,00	Art. 76(5): 350 M line
OL516	57,335530	10,457946	57	20	7,91	10	27	28,61	Art. 76(5): 350 M line
OL517	57,335584	10,467000	57	20	8,10	10	28	1,20	Art. 76(5): 350 M line
OL518	57,335611	10,476028	57	20	8,20	10	28	33,70	Art. 76(5): 350 M line
OL519	57,335665	10,494111	57	20	8,39	10	29	38,80	Art. 76(5): 350 M line
OL520	57,335665	10,503167	57	20	8,39	10	30	11,40	Art. 76(5): 350 M line
OL521	57,335584	10,530278	57	20	8,10	10	31	49,00	Art. 76(5): 350 M line
OL522	57,335530	10,539306	57	20	7,91	10	32	21,50	Art. 76(5): 350 M line
OL523	57,335445	10,548362	57	20	7,60	10	32	54,10	Art. 76(5): 350 M line
OL524	57,335360	10,557389	57	20	7,30	10	33	26,60	Art. 76(5): 350 M line
OL525	57,335252	10,566444	57	20	6,91	10	33	59,20	Art. 76(5): 350 M line
OL526	57,335027	10,584529	57	20	6,10	10	35	4,30	Art. 76(5): 350 M line
OL527	57,334888	10,593557	57	20	5,60	10	35	36,80	Art. 76(5): 350 M line
OL528	57,334555	10,611640	57	20	4,40	10	36	41,90	Art. 76(5): 350 M line
OL529	57,334362	10,620668	57	20	3,70	10	37	14,40	Art. 76(5): 350 M line
OL530	57,333971	10,638749	57	20	2,30	10	38	19,50	Art. 76(5): 350 M line
OL531	57,333751	10,647779	57	20	1,50	10	38	52,00	Art. 76(5): 350 M line
OL532	57,333270	10,665681	57	19	59,77	10	39	56,45	Art. 76(5): 350 M line

Annex 71

United Nations, Commission on the Limits of the Continental Shelf, *Progress of work in the Commission on the Limits of the Continental Shelf: Statement by the Chair*, U.N. Doc. CLCS/85 (24 Sept. 2014)

United Nations Convention on the Law of the Sea CLCS/85

Commission on the Limits of the Continental Shelf

Distr.: General
24 September 2014

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Thirty-fifth session
New York, 21 July-5 September 2014

Progress of work in the Commission on the Limits of the Continental Shelf

Statement by the Chair

Summary

The present statement provides information on the work carried out by the Commission on the Limits of the Continental Shelf and its subcommissions during its thirty-fifth session. In particular, it contains an overview of the progress made in the examination of the submissions made by the following: Uruguay; Cook Islands, in respect of the Manihiki Plateau; Argentina; Ghana; Iceland, in respect of the Ægir Basin area and the western and southern parts of Reykjanes Ridge; Pakistan; Norway, in respect of Bouvetøya and Dronning Maud Land; South Africa, in respect of the mainland of the territory of the Republic of South Africa; Federated States of Micronesia, Papua New Guinea and Solomon Islands, concerning the Ontong Java Plateau; France and South Africa, in the area of the Crozet Archipelago and the Prince Edward Islands; and Mauritius, in the region of Rodrigues Island. The statement also contains information about a presentation made by Kenya to the Commission. In addition, the statement addresses the following issues: conditions of service and attendance of the members of the Commission; and future sessions of the Commission.

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held two meetings with the delegation on 22 and 24 July, during which the delegation had made a presentation on key elements of its submission, and the subcommission had made a presentation of its preliminary views, which had been transmitted to the delegation in written format following the meeting.

53. The subcommission had also concluded that it was not necessary to recommend seeking the advice of specialists, in accordance with rule 57 of the rules of procedure, or cooperation with relevant international organizations, in accordance with rule 56. The subcommission had also concluded that further time would be required to examine all the data and prepare recommendations for transmittal to the Commission.

54. The subcommission had decided that its members would continue to work on the submission individually during the intersessional period and at the thirty-sixth session, particularly its consideration under annex III to the rules of procedure, with the aim of making a detailed presentation of its preliminary analysis to the delegation at the next session.

55. The Commission subsequently decided that the meetings of the subcommission during the thirty-sixth session would be held from 3 to 14 November 2014. The subcommission had invited the delegation to meet during the second of those two weeks.

Item 17
Presentation of the submission made by Kenya[9]

56. In a note verbale dated 7 July 2014, the Government of Kenya requested the opportunity to make another presentation of its submission of 6 May 2009 to the Commission in view of the partial change in the latter's membership that had occurred since the twenty-fourth session of the Commission held in August and September 2009, at which Kenya had originally presented its submission (see CLCS/64, paras. 93-97).

57. The presentation of the submission of Kenya was made on 3 September 2014, by the Head of the delegation, Githu Muigai, Attorney General, and by Michael Gikuhi, Geophysicist and member of the task force on delineation of Kenya's outer continental shelf. The delegation of Kenya also included the Permanent Representative of Kenya to the United Nations, Macharia Kamau, and the Deputy Permanent Representative of Kenya to the United Nations, Koki Muli Grignon, as well as a number of scientific, legal and technical advisers.

58. In addition to elaborating on substantive points of the submission, Mr. Muigai noted that one member of the Commission, Mr. Njuguna, had provided Kenya with advice and assistance concerning the submission.

59. In reference to paragraph 2 (a) of annex I to the rules of procedure, Mr. Muigai indicated that Kenya had entered into a maritime boundary agreement with the United Republic of Tanzania on 23 June 2009, which applied to the territorial sea, exclusive economic zone and continental shelf, including the continental shelf beyond 200 nautical miles upon the finalization of its delineation.

[9] Submission made on 6 May 2009; see www.un.org/depts/los/clcs_new/submissions_files/submission_ken_35_2009.htm.

60. Mr. Muigai observed that Kenya had yet to conclude a maritime boundary agreement with Somalia, although negotiations were ongoing. He noted that provisional arrangements of a practical nature had been entered into, in accordance with article 83, paragraph 3, of the Convention, as contained in a memorandum of understanding signed on 7 April 2009, whereby the parties had undertaken not to object to the examination of their respective submissions. Mr. Muigai noted that the note verbale from Somalia dated 19 August 2009 affirmed the position mutually agreed upon by the two States in the memorandum of understanding. Mr. Muigai also referred to communications from Somalia, dated 10 October 2009 (see CLCS/66, para. 48) and 4 February 2014, in which Somalia had respectively, requested that the memorandum of understanding be treated as "non-actionable" and had objected to the consideration of Kenya's submission. In addition, Mr. Muigai noted that Somalia had instituted proceedings against Kenya at the International Court of Justice with regard to a dispute concerning maritime delimitation in the Indian Ocean. In that respect, Mr. Muigai observed that, pursuant to the Convention and the rules of procedure of the Commission, the actions of the Commission would not prejudice matters relating to the delimitation of boundaries between States. Mr. Muigai submitted that the Commission was not stopped from considering Kenya's submission, notwithstanding paragraph 5(a) of annex I to the rules of procedure; otherwise, Kenya would be prejudiced with respect to time and resources and its rights under the Convention.

61. In respect of the communication from Sri Lanka dated 22 July 2009 (see CLCS/64, paras. 3(d) and 96), in which Sri Lanka had indicated that "the principal State referred to in paragraph 3 of the statement of understanding is Sri Lanka", Mr. Muigai emphasized that neither the Convention nor the statement of understanding had made any reference to a "principal State". He further affirmed that, in the view of the Government of Kenya, the principles contained in the statement of understanding could apply whenever a State was able to demonstrate the existence of the special conditions envisaged in the statement. Mr. Muigai also noted that in the note verbale, Sri Lanka had not raised any objection to the consideration of the submission made by Kenya in terms of annex I to the rules of procedure.

62. In respect of the legal basis for delineation of the continental shelf beyond 200 nautical miles, Mr. Muigai emphasized that Kenya's continental margin had exhibited special characteristics similar to those stipulated in paragraph 1 of the statement of understanding and that the application of article 76, paragraph 4 (a), of the Convention would give rise to an inequity, as specified in paragraph 2 of the statement of understanding. He indicated that Kenya, therefore, had applied that exception in establishing the outer edge of its continental margin.

63. Mr. Muigai subsequently urged the Commission to establish a subcommission when the submission was next in line for consideration, as queued in the order in which it was received.

64. The Commission subsequently continued its meeting in private. Recalling the decision taken at its thirty-fourth session (see CLCS/83, para. 18), and taking note of the presentation made by Kenya on 3 September 2014, the Commission, in keeping with its practice, reiterated its decision to defer further consideration of the submission and the communications from Kenya and Somalia.

65. Following that decision, the Commission received a note verbale dated 2 September 2014 from Somalia. The Commission took note of it and determined that no change in the aforementioned decision would be required.

Item 18
Report of the Chair of the Commission on the twenty-fourth Meeting of States Parties to the United Nations Convention on the Law of the Sea

66. The Chair of the Commission provided an overview of the proceedings of the twenty-fourth Meeting of States Parties to the United Nations Convention on the Law of the Sea held in June 2014, which were deemed of relevance to the Commission (see SPLOS/270 and SPLOS/277, sect. VII). In particular, he drew the attention of the members to the decision of the Meeting of States Parties regarding the conditions of service of the members of the Commission (see SPLOS/276).

67. The Commission took note of the information reported by the Chair and, in particular, of the decision of the twenty-fourth Meeting of States Parties (see also paras. 9-12 above).

Item 19
Report of the Chair of the Committee on Confidentiality

Referral of a matter to the Committee

68. On 4 August 2014, the Commission was informed by its Chair of a potential breach of confidentiality that had allegedly taken place during the international workshop on the new developments on the Law of the Sea, which was held at the University of Xiamen, China, from 24 to 25 April 2014. The allegations concerned the potential disclosure of internal procedures of the Commission and the disclosure of information contained in a note verbale from a State, which was not in the public domain.

69. In accordance with the rules of procedure of the Commission (CLCS/40/Rev.1) related to an alleged breach of confidentiality by a member of the Commission, and considering the nature of the allegation, the Commission decided to refer the matter to the Committee on Confidentiality in order to establish the facts. The Committee constituted an investigating body comprising all five of its members (Messrs. Park (Chair), Heinesen, Kalngui, Marques and Uścinowicz).

Report by the Chairman of the Committee

70. The Chair of the Committee on Confidentiality, Mr. Park, reported that the Committee and its investigating body had held meetings to consider the case referred to the Committee and to investigate the allegations. He presented to the Commission a report providing information on the work carried out by the Investigating Body to ascertain whether any behaviour contrary to annex II to the rules of procedure had occurred during the international workshop. The Chair informed the Commission that, after a thorough examination of the report of the investigating body, the Committee had endorsed it by consensus, on 2 September 2014, and had subsequently reached the conclusions set out below.

Annex 72

United Nations, Office of Legal Affairs, Division for Ocean Affairs and the Law of the Sea, *Table recapitulating the status of the Convention and of the related Agreements* (10 Oct. 2014), *available at* http://www.un.org/depts/los/reference_files/status2010.pdf

Status of the United Nations Convention on the Law of the Sea, of the Agreement relating to the implementation of Part XI of the Convention and of the Agreement for the implementation of the provisions of the Convention relating to the conservation and management of straddling fish stocks and highly migratory fish stocks

Table recapitulating the status of the Convention and of the related Agreements, as at 10 October 2014

This consolidated table, prepared by the Division for Ocean Affairs and the Law of the Sea, Office of the Legal Affairs, provides unofficial, quick reference information related to the participation in UNCLOS and the two implementing Agreements. For official information on the status of these treaties, please refer to the publication entitled "*Multilateral Treaties deposited with the Secretary-General*" (http://untreaty.un.org). The symbol "🗋" indicates (i) that a declaration or statement was made at the time of signature; at the time of ratification/accession or anytime thereafter, or (ii) declarations confirmed upon succession. A double icon (🗋🗋) indicates that two declarations were made by the State. The abbreviation (fc) indicates a formal confirmation; (a) an accession; (s) a succession; (ds) a definitive signature; (p) the consent to be bound; (sp) a simplified procedure. Names of States in *italics* indicate non-members of the United Nations; shaded rows indicate landlocked States.

State or entity	UNCLOS (in force as from 16/11/1994)			Agreement on Part XI (in force as from 28/07/1996)		UN Fish Stocks Agreement (in force as from 11/12/2001)		
	Signature dd/mm/yy	Ratification/ accession; dd/mm/yy	Declaration	Signature dd/mm/yy	Ratification/ accession; dd/mm/yy	Signature dd/mm/yy	Ratification/ accession; dd/mm/yy	Declaration
TOTALS	157	166		79	146	59	82	
Afghanistan	18/03/83							
Albania		23/06/03(a)			23/06/03(p)			
Algeria	10/12/82🗋	11/06/96	🗋	29/07/94	11/06/96(p)			
Andorra								
Angola	10/12/82🗋	05/12/90	🗋		07/09/2010(p)			
Antigua and Barbuda	07/02/83	02/02/89						
Argentina	05/10/84🗋	01/12/95	🗋	29/07/94	01/12/95	04/12/95		
Armenia		09/12/02(a)			09/12/02(a)			
Australia	10/12/82	05/10/94	🗋	29/07/94	05/10/94	04/12/95	23/12/99	
Austria	10/12/82	14/07/95	🗋	29/07/94	14/07/95	27/06/96	19/12/03	🗋
Azerbaijan								
Bahamas	10/12/82	29/07/83		29/07/94	28/07/95(sp)		16/01/97(a)	
Bahrain	10/12/82	30/05/85						
Bangladesh	10/12/82	27/07/01	🗋🗋		27/07/01(a)	04/12/95	05/11/12	
Barbados	10/12/82	12/10/93		15/11/94	28/07/95(sp)		22/09/00(a)	

State or entity	UNCLOS (in force as from 16/11/1994)			Agreement on Part XI (in force as from 28/07/1996)		UN Fish Stocks Agreement (in force as from 11/12/2001)		
	Signature dd/mm/yy	Ratification/ accession; dd/mm/yy	Declaration	Signature dd/mm/yy	Ratification/ accession; dd/mm/yy	Signature dd/mm/yy	Ratification/ accession; dd/mm/yy	Declaration
Belarus	10/12/82	30/08/06			30/08/06(a)			
Belgium	05/12/84	13/11/98		29/07/94	13/11/98(p)	03/10/96	19/12/03	
Belize	10/12/82	13/08/83			21/10/94(ds)	04/12/95	14/07/05	
Benin	30/08/83	16/10/97			16/10/97(p)			
Bhutan	10/12/82							
Bolivia (Plurinational State of)	27/11/84	28/04/95			28/04/95(p)			
Bosnia and Herzegovina		12/01/94(s)						
Botswana	05/12/84	02/05/90			31/01/05(a)			
Brazil	10/12/82	22/12/88		29/07/94	25/10/07	04/12/95	08/03/00	
Brunei Darussalam	05/12/84	05/11/96			05/11/96(p)			
Bulgaria	10/12/82	15/05/96			15/05/96(a)		13/12/06(a)	
Burkina Faso	10/12/82	25/01/05		30/11/94	25/01/05(p)	15/10/96		
Burundi	10/12/82							
Cambodia	01/07/83							
Cabo Verde	10/12/82	10/08/87		29/07/94	23/04/08			
Cameroon	10/12/82	19/11/85		24/05/95	28/08/02			
Canada	10/12/82	07/11/03		29/07/94	07/11/03	04/12/95	03/08/99	
Central African Republic	04/12/84							
Chad	10/12/82	14/08/09			14/08/09(p)			
Chile	10/12/82	25/08/97			25/08/97(a)			
China	10/12/82	07/06/96		29/07/94	07/06/96(p)	06/11/96		
Colombia	10/12/82							
Comoros	06/12/84	21/06/94						
Congo	10/12/82	09/07/08			09/07/08(p)			
Cook Islands	10/12/82	15/02/95			15/02/95(a)		01/04/99(a)	

State or entity	UNCLOS (in force as from 16/11/1994)			Agreement on Part XI (in force as from 28/07/1996)		UN Fish Stocks Agreement (in force as from 11/12/2001)		
	Signature dd/mm/yy	Ratification/ accession; dd/mm/yy	Declaration	Signature dd/mm/yy	Ratification/ accession; dd/mm/yy	Signature dd/mm/yy	Ratification/ accession; dd/mm/yy	Declaration
Costa Rica	10/12/82	21/09/92			20/09/01(a)		18/06/01(a)	
Côte d'Ivoire	10/12/82	26/03/84		25/11/94	28/07/95(sp)	24/01/96		
Croatia		05/04/95(s)			05/04/95(p)		10/09/13(a)	
Cuba	10/12/82	15/08/84			17/10/02(a)			
Cyprus	10/12/82	12/12/88		01/11/94	27/07/95		25/09/02(a)	
Czech Republic	22/02/93	21/06/96		16/11/94	21/06/96		19/03/07(a)	
Democratic People's Republic of Korea	10/12/82							
Democratic Republic of the Congo	22/08/83	17/02/89						
Denmark	10/12/82	16/11/04		29/07/94	16/11/04	27/06/96	19/12/03	
Djibouti	10/12/82	08/10/91						
Dominica	28/03/83	24/10/91						
Dominican Republic	10/12/82	10/07/09			10/07/09(p)			
Ecuador		24/09/12(a)			24/09/12(p)			
Egypt	10/12/82	26/08/83		22/03/95		05/12/95		
El Salvador	05/12/84							
Equatorial Guinea	30/01/84	21/07/97			21/07/97(p)			
Eritrea								
Estonia		26/08/05(a)			26/08/05(a)		07/08/06(a)	
Ethiopia	10/12/82							
European Union	07/12/84	01/04/98(fc)		29/07/94	01/04/98(fc)	27/06/96	19/12/03	
Fiji	10/12/82	10/12/82		29/07/94	28/07/95	04/12/95	12/12/96	
Finland	10/12/82	21/06/96		29/07/94	21/06/96	27/06/96	19/12/03	
France	10/12/82	11/04/96		29/07/94	11/04/96	04/12/96	19/12/03	
Gabon	10/12/82	11/03/98		04/04/95	11/03/98(p)	07/10/96		
Gambia	10/12/82	22/05/84						
Georgia		21/03/96(a)			21/03/96(p)			

State or entity	UNCLOS (in force as from 16/11/1994)			Agreement on Part XI (in force as from 28/07/1996)		UN Fish Stocks Agreement (in force as from 11/12/2001)		
	Signature dd/mm/yy	Ratification/ accession; dd/mm/yy	Declaration	Signature dd/mm/yy	Ratification/ accession; dd/mm/yy	Signature dd/mm/yy	Ratification/ accession; dd/mm/yy	Declaration
Germany		14/10/94(a)		29/07/94	14/10/94	28/08/96	19/12/03	
Ghana	10/12/82	7/06/83						
Greece	10/12/82	21/07/95		29/07/94	21/07/95	27/06/96	19/12/03	
Grenada	10/12/82	25/04/91		14/11/94	28/07/95(sp)			
Guatemala	08/07/83	11/02/97			11/02/97(p)			
Guinea	04/10/84	06/09/85		26/08/94	28/07/95(sp)		16/09/05(a)	
Guinea-Bissau	10/12/82	25/08/86				04/12/95		
Guyana	10/12/82	16/11/93			25/09/08(a)			
Haiti	10/12/82	31/07/96			31/07/96(p)			
Holy See								
Honduras	10/12/82	05/10/93			28/07/03(a)			
Hungary	10/12/82	05/02/02			05/02/02(a)		16/05/08(a)	
Iceland	10/12/82	21/06/85		29/07/94	28/07/95(sp)	04/12/95	14/02/97	
India	10/12/82	29/06/95		29/07/94	29/06/95		19/08/03(a)	
Indonesia	10/12/82	03/02/86		29/07/94	02/06/00	04/12/95	28/09/09	
Iran (Islamic Republic of)	10/12/82						17/04/98(a)	
Iraq	10/12/82	30/07/85						
Ireland	10/12/82	21/06/96		29/07/94	21/06/96	27/06/96	19/12/03	
Israel						04/12/95		
Italy	07/12/84	13/01/95		29/07/94	13/01/95	27/06/96	19/12/03	
Jamaica	10/12/82	21/03/83		29/07/94	28/07/95(sp)	04/12/95		
Japan	07/02/83	20/06/96		29/07/94	20/06/96	19/11/96	07/08/06	
Jordan		27/11/95(a)			27/11/95(p)			
Kazakhstan								
Kenya	10/12/82	02/03/89			29/07/94(ds)		13/07/04(a)	
Kiribati		24/02/03(a)			24/02/03(p)		15/09/05(a)	

State or entity	UNCLOS (in force as from 16/11/1994)			Agreement on Part XI (in force as from 28/07/1996)		UN Fish Stocks Agreement (in force as from 11/12/2001)		
	Signature dd/mm/yy	Ratification/ accession; dd/mm/yy	Declaration	Signature dd/mm/yy	Ratification/ accession; dd/mm/yy	Signature dd/mm/yy	Ratification/ accession; dd/mm/yy	Declaration
Kuwait	10/12/82	02/05/86			02/08/02(a)			
Kyrgyzstan								
Lao People's Democratic Republic	10/12/82	05/06/98		27/10/94	05/06/98(p)			
Latvia		23/12/04(a)			23/12/04(a)		05/02/07(a)	
Lebanon	07/12/84	05/01/95			05/01/95(p)			
Lesotho	10/12/82	31/05/07			31/05/07(p)			
Liberia	10/12/82	25/09/08			25/09/08(p)		16/09/05(a)	
Libya	03/12/84							
Liechtenstein	30/11/84							
Lithuania		12/11/03(a)			12/11/03(a)		01/03/07(a)	
Luxembourg	05/12/84	05/10/00		29/07/94	05/10/00	27/06/96	19/12/03	
Madagascar	25/02/83	22/08/01			22/08/01(p)			
Malawi	07/12/84	28/09/10			28/09/10(p)			
Malaysia	10/12/82	14/10/96		02/08/94	14/10/96(p)			
Maldives	10/12/82	07/09/00		10/10/94	07/09/00(p)	08/10/96	30/12/98	
Mali	19/10/83	16/07/85						
Malta	10/12/82	20/05/93		29/07/94	26/06/96		11/11/01(a)	
Marshall Islands		09/08/91(a)				04/12/95	19/03/03	
Mauritania	10/12/82	17/07/96		02/08/94	17/07/96(p)	21/12/95		
Mauritius	10/12/82	04/11/94			04/11/94(p)		25/03/97(a)	
Mexico	10/12/82	18/03/83			10/04/03(a)			
Micronesia (Federated States of)		29/04/91(a)		10/08/94	06/09/95	04/12/95	23/05/97	
Monaco	10/12/82	20/03/96		30/11/94	20/03/96(p)		09/06/99(a)	
Mongolia	10/12/82	13/08/96		17/08/94	13/08/96(p)			
Montenegro		23/10/06(d)			23/10/06(d)			
Morocco	10/12/82	31/05/07		19/10/94	31/05/07	04/12/95	19/09/2012	

State or entity	UNCLOS (in force as from 16/11/1994)			Agreement on Part XI (in force as from 28/07/1996)		UN Fish Stocks Agreement (in force as from 11/12/2001)		
	Signature dd/mm/yy	Ratification/ accession; dd/mm/yy	Declaration	Signature dd/mm/yy	Ratification/ accession; dd/mm/yy	Signature dd/mm/yy	Ratification/ accession; dd/mm/yy	Declaration
Mozambique	10/12/82	13/03/97			13/03/97(a)		10/12/08(a)	
Myanmar	10/12/82	21/05/96			21/05/96(a)			
Namibia	10/12/82	18/04/83		29/07/94	28/07/95(sp)	19/04/96	08/04/98	
Nauru	10/12/82	23/01/96			23/01/96(p)		10/01/97(a)	
Nepal	10/12/82	02/11/98			02/11/98(p)			
Netherlands	10/12/82	28/06/96		29/07/94	28/06/96	28/06/96	19/12/03	
New Zealand	10/12/82	19/07/96		29/07/94	19/07/96	04/12/95	18/04/01	
Nicaragua	09/12/84	03/05/00			03/05/00(p)			
Niger	10/12/82	07/08/13			07/08/13(p)			
Nigeria	10/12/82	14/08/86		25/10/94	28/07/95(sp)		02/11/09(a)	
Niue	05/12/84	11/10/06			11/10/06(p)	04/12/95	11/10/06	
Norway	10/12/82	24/06/96			24/06/96(a)	04/12/95	30/12/96	
Oman	01/07/83	17/08/89			26/02/97(a)		14/05/08(a)	
Pakistan	10/12/82	26/02/97		10/08/94	26/02/97(p)	15/02/96		
Palau		30/09/96(a)			30/09/96(p)		26/03/08(a)	
Panama	10/12/82	01/07/96			01/07/96(p)		16/12/08(a)	
Papua New Guinea	10/12/82	14/01/97			14/01/97(p)	04/12/95	04/06/99	
Paraguay	10/12/82	26/09/86		29/07/94	10/07/95			
Peru								
Philippines	10/12/82	08/05/84		15/11/94	23/07/97	30/08/96	24/09/14	
Poland	10/12/82	13/11/98		29/07/94	13/11/98(p)		14/03/06(a)	
Portugal	10/12/82	03/11/97		29/07/94	03/11/97	27/06/96	19/12/03	
Qatar	27/11/84	09/12/02			09/12/02(p)			
Republic of Korea	14/03/83	29/01/96		07/11/94	29/01/96	26/11/96	01/02/08	
Republic of Moldova		06/02/07(a)			06/02/07(p)			
Romania	10/12/82	17/12/96			17/12/96(a)		16/07/07(a)	

State or entity	UNCLOS (in force as from 16/11/1994)			Agreement on Part XI (in force as from 28/07/1996)		UN Fish Stocks Agreement (in force as from 11/12/2001)		
	Signature dd/mm/yy	Ratification/ accession; dd/mm/yy	Declaration	Signature dd/mm/yy	Ratification/ accession; dd/mm/yy	Signature dd/mm/yy	Ratification/ accession; dd/mm/yy	Declaration
Russian Federation	10/12/82	12/03/97			12/03/97(a)	04/12/95	04/08/97	
Rwanda	10/12/82							
Saint Kitts and Nevis	07/12/84	07/01/93						
Saint Lucia	10/12/82	27/03/85				12/12/95	09/08/96	
Saint Vincent and the Grenadines	10/12/82	01/10/93					29/10/10(a)	
Samoa	28/09/84	14/08/95		07/07/95	14/08/95(p)	04/12/95	25/10/96	
San Marino								
Sao Tome and Principe	13/07/83	03/11/87						
Saudi Arabia	07/12/84	24/04/96			24/04/96(p)			
Senegal	10/12/82	25/10/84		09/08/94	25/07/95	04/12/95	30/01/97	
Serbia	[1]	12/03/01(s)		12/05/95	28/07/95(sp)[1]			
Seychelles	10/12/82	16/09/91		29/07/94	15/12/94	04/12/96	20/03/98	
Sierra Leone	10/12/82	12/12/94			12/12/94(p)			
Singapore	10/12/82	17/11/94			17/11/94(p)			
Slovakia	28/05/93	08/05/96		14/11/94	08/05/96		06/11/08(a)	
Slovenia		16/06/95(s)		19/01/95	16/06/95		15/06/06(a)	
Solomon Islands	10/12/82	23/06/97			23/06/97(p)		13/02/97(a)	
Somalia	10/12/82	24/07/89						
South Africa	05/12/84	23/12/97		03/10/94	23/12/97		14/08/03(a)	
South Sudan								
Spain	04/12/84	15/01/97		29/07/94	15/01/97	03/12/96	19/12/03	
Sri Lanka	10/12/82	19/07/94		29/07/94	28/07/95(sp)	09/10/96	24/10/96	

[1] For further details, see Chapter XXI of the publication entitled "*Multilateral Treaties deposited with the Secretary-General*" (http://untreaty.un.org/ENGLISH/bible/englishinternetbible/partI/chapterXXI/chapterXXI.asp)

State or entity	UNCLOS (in force as from 16/11/1994)			Agreement on Part XI (in force as from 28/07/1996)		UN Fish Stocks Agreement (in force as from 11/12/2001)		
	Signature dd/mm/yy	Ratification/ accession; dd/mm/yy	Declaration	Signature dd/mm/yy	Ratification/ accession; dd/mm/yy	Signature dd/mm/yy	Ratification/ accession; dd/mm/yy	Declaration
State of Palestine		02/01/15(a)			02/01/15(p)			
Sudan	10/12/82	23/01/85		29/07/94				
Suriname	10/12/82	09/07/98			09/07/98(p)			
Swaziland	18/01/84	24/09/12		12/10/94	24/09/12(p)			
Sweden	10/12/82	25/06/96		29/07/94	25/06/96	27/06/96	19/12/03	
Switzerland	17/10/84	01/05/09		26/10/94	01/05/09			
Syrian Arab Republic								
Tajikistan								
Thailand	10/12/82	15/05/11			15/05/11(a)			
The former Yugoslav Republic of Macedonia		19/08/94(s)			19/08/94(p)			
Timor-Leste		08/01/13(a)			08/01/13(p)			
Togo	10/12/82	16/04/85		03/08/94	28/07/95(sp)			
Tonga		02/08/95(a)			2/08/95(p)	04/12/95	31/07/96	
Trinidad and Tobago	10/12/82	25/04/86		10/10/94	28/07/95(sp)		13/09/06(a)	
Tunisia	10/12/82	24/04/85		15/05/95	24/05/02			
Turkey								
Turkmenistan								
Tuvalu	10/12/82	09/12/02			09/12/02(p)		02/02/09(a)	
Uganda	10/12/82	09/11/90		09/08/94	28/07/95(sp)	10/10/96		
Ukraine	10/12/82	26/07/99		28/02/95	26/07/99	04/12/95	27/02/03	
United Arab Emirates	10/12/82							
United Kingdom		25/07/97(a)		29/07/94	25/07/97	04/12/95	10/12/01 19/12/03[1]	
United Republic of Tanzania	10/12/82	30/09/85		07/10/94	25/06/98			
United States of America				29/07/94		04/12/95	21/08/96	

State or entity	UNCLOS (in force as from 16/11/1994)			Agreement on Part XI (in force as from 28/07/1996)		UN Fish Stocks Agreement (in force as from 11/12/2001)		
	Signature dd/mm/yy	Ratification/ accession; dd/mm/yy	Declaration	Signature dd/mm/yy	Ratification/ accession; dd/mm/yy	Signature dd/mm/yy	Ratification/ accession; dd/mm/yy	Declaration
Uruguay	10/12/82	10/12/92		29/07/94	07/08/07	16/01/96	10/09/99	
Uzbekistan								
Vanuatu	10/12/82	10/08/99		29/07/94	10/08/99(p)	23/07/96		
Venezuela (Bolivarian Republic of)								
Viet Nam	10/12/82	25/07/94			27/04/06(a)			
Yemen	10/12/82	21/07/87			13/10/14(a)			
Zambia	10/12/82	07/03/83		13/10/94	28/07/95(sp)			
Zimbabwe	10/12/82	24/02/93		28/10/94	28/07/95(sp)			
TOTALS	157	166		79	146	59	82	

Annex 73

United Nations, Statistics Division, National Accounts Main Aggregates Database, "Per Capita GDP in US Dollars" (Dec. 2014), *available at* http://unstats.un.org/unsd/snaama/dnllist.asp (last accessed 26 June 2015)

Per Capita GDP at current prices in US Dollars (all countries)

Country	2005	2006	2007	2008	2009	2010	2011	2012	2013
Afghanistan	266	293	394	398	454	566	659	715	708
Albania	2,532	2,806	3,353	4,081	3,822	3,786	4,087	3,904	4,066
Algeria	3,039	3,391	3,846	4,787	3,771	4,350	5,274	5,401	5,325
Andorra	39,990	43,192	49,338	50,036	46,401	42,953	44,015	40,150	41,015
Angola	1,983	2,441	3,413	4,596	3,989	4,221	5,159	5,540	5,668
Anguilla	18,121	21,970	27,028	26,541	20,824	19,478	21,027	20,163	19,886
Antigua and Barbuda	12,080	13,600	15,276	15,786	13,979	13,017	12,786	13,405	13,790
Argentina	5,768	6,790	8,438	10,292	9,506	11,508	13,759	14,725	14,760
Armenia	1,625	2,126	3,079	3,917	2,914	3,125	3,422	3,354	3,504
Aruba	23,303	24,015	25,921	27,549	24,640	23,529	25,014	24,805	25,156
Australia	37,152	39,249	46,432	48,776	45,878	57,593	67,407	68,459	65,600
Austria	38,191	40,386	46,495	51,261	47,490	46,377	50,884	48,154	50,420
Azerbaijan	1,547	2,421	3,768	5,503	4,929	5,817	7,167	7,485	7,814
Bahamas	23,417	23,734	24,321	23,674	22,061	21,941	21,651	22,096	22,313
Bahrain	18,156	19,459	21,049	23,038	19,251	20,546	22,467	23,339	24,695
Bangladesh	463	479	538	618	685	758	809	833	980
Barbados	14,225	15,692	16,336	16,358	16,461	15,812	15,503	14,917	14,854
Belarus	3,126	3,842	4,723	6,358	5,166	5,818	6,321	6,764	7,664
Belgium	36,824	38,788	44,229	48,281	44,723	44,273	47,993	45,104	47,261
Belize	4,098	4,364	4,509	4,662	4,441	4,527	4,702	4,857	4,894
Benin	533	557	633	739	713	690	745	751	805
Bermuda	75,902	84,155	91,379	94,483	89,588	88,442	85,284	84,911	85,302
Bhutan	1,259	1,349	1,761	1,818	1,795	2,211	2,495	2,458	2,363
Bolivia	1,021	1,203	1,356	1,696	1,735	1,935	2,320	2,579	2,868
Bosnia and Herzegovina	2,810	3,239	3,991	4,846	4,480	4,380	4,771	4,410	4,662
Botswana	5,294	5,341	5,712	5,747	5,178	6,980	7,697	7,191	7,312
Brazil	4,739	5,790	7,194	8,623	8,373	10,978	12,576	11,320	11,199
British Virgin Islands	37,550	39,345	40,741	38,575	33,004	32,840	33,033	32,375	32,307
Brunei Darussalam	25,914	30,613	32,108	37,095	27,213	30,882	41,060	41,127	38,563
Bulgaria	3,813	4,414	5,770	7,105	6,737	6,587	7,605	7,226	7,543
Burkina Faso	407	421	475	570	553	579	672	682	741
Burundi	144	158	163	187	199	220	237	246	251
Cabo Verde	2,309	2,614	3,130	3,692	3,524	3,413	3,801	3,552	3,731
Cambodia	471	537	628	743	735	783	878	945	1,008
Cameroon	915	965	1,070	1,190	1,163	1,145	1,257	1,220	1,329
Canada	36,095	40,195	44,197	46,226	40,614	47,297	51,866	52,607	52,270
Cayman Islands	62,558	64,107	68,309	67,049	61,485	58,857	59,047	59,246	59,448
Central African Republic	357	381	427	486	476	468	511	494	343
Chad	586	608	655	757	657	736	813	820	816
Chile	7,532	9,371	10,383	10,672	10,120	12,685	14,502	15,254	15,723
China	1,735	2,106	2,626	3,387	3,778	4,375	5,345	5,976	6,626
China: Hong Kong SAR	26,327	28,005	30,513	31,470	30,548	32,433	35,020	36,739	38,039
China: Macao SAR	25,190	30,364	36,607	40,847	40,860	53,046	67,062	77,196	91,377
Colombia	3,394	3,709	4,661	5,403	5,105	6,180	7,125	7,763	7,826
Comoros	644	654	735	810	791	781	842	800	846

Per Capita GDP at current prices in US Dollars (all countries)

Country	2005	2006	2007	2008	2009	2010	2011	2012	2013
Congo	1,718	2,120	1,978	2,625	2,338	2,987	3,502	3,149	3,153
Cook Islands	9,411	9,557	11,478	11,663	10,726	12,653	14,193	14,978	16,002
Costa Rica	4,621	5,128	5,898	6,583	6,386	7,773	8,704	9,443	10,185
Côte d'Ivoire	982	978	1,097	1,275	1,239	1,208	1,242	1,244	1,407
Croatia	10,348	11,519	13,751	16,158	14,399	13,754	14,394	13,114	13,490
Cuba	3,776	4,667	5,185	5,383	5,499	5,702	6,165	6,498	6,985
Curaçao	18,120	18,659	19,207	20,371	20,010	20,001	20,054	20,163	19,830
Cyprus	24,444	26,199	30,306	34,667	31,991	31,410	31,837	28,987	27,662
Czech Republic	13,292	15,106	18,265	22,590	19,619	19,616	21,422	19,395	19,510
Czechoslovakia (Former)									
D.P.R. of Korea	548	575	597	551	494	570	638	643	621
D.R. of the Congo	221	257	286	327	302	347	404	446	484
Denmark	48,832	52,006	58,436	64,153	57,882	57,614	61,231	57,469	59,921
Djibouti	912	976	1,062	1,213	1,277	1,353	1,464	1,575	1,668
Dominica	5,049	5,408	5,829	6,379	6,795	6,676	6,881	6,919	6,915
Dominican Republic	3,578	3,775	4,259	4,636	4,703	5,089	5,463	5,731	5,826
Ecuador	3,013	3,337	3,575	4,256	4,237	4,637	5,200	5,656	6,003
Egypt	1,316	1,476	1,780	2,184	2,448	2,749	2,911	3,223	3,110
El Salvador	2,815	3,043	3,284	3,484	3,341	3,444	3,699	3,782	3,826
Equatorial Guinea	11,937	13,737	16,928	24,884	16,433	19,237	25,129	26,622	24,480
Eritrea	226	241	253	256	334	369	440	504	543
Estonia	10,566	12,865	16,925	18,471	15,081	15,010	17,616	17,556	19,328
Ethiopia	160	191	236	310	332	302	335	455	489
Ethiopia (Former)									
Fiji	3,655	3,747	4,076	4,175	3,367	3,649	4,201	4,401	4,578
Finland	38,966	41,106	48,254	53,354	47,060	46,165	50,783	47,292	49,265
France	34,825	36,497	41,553	45,363	41,567	40,617	43,680	40,763	42,339
French Polynesia	22,374	22,786	25,435	27,039	24,709	23,583	24,699	22,731	23,162
Gabon	6,944	7,303	8,594	10,459	7,942	8,278	10,652	9,781	10,151
Gambia	434	442	522	612	553	566	521	510	488
Georgia	1,433	1,742	2,298	2,900	2,446	2,652	3,300	3,636	3,715
Germany	34,085	35,807	41,105	44,940	41,027	41,100	45,265	42,672	45,091
Ghana	804	930	1,099	1,234	1,097	1,326	1,579	1,646	1,846
Greece	22,430	24,724	28,795	31,997	29,720	26,967	25,975	22,430	21,768
Greenland	28,977	31,818	35,904	40,614	40,919	40,447	44,216	41,370	42,437
Grenada	6,754	6,766	7,324	7,947	7,395	7,366	7,411	7,598	7,843
Guatemala	2,146	2,326	2,561	2,867	2,697	2,882	3,240	3,341	3,478
Guinea	306	311	466	515	501	481	502	541	615
Guinea-Bissau	413	407	469	570	533	533	600	546	608
Guyana	1,729	1,906	2,259	2,478	2,593	2,874	3,258	3,585	3,739
Haiti	411	476	575	609	610	621	683	704	745
Honduras	1,414	1,551	1,722	1,896	1,953	2,078	2,277	2,339	2,293
Hungary	11,083	11,337	13,774	15,586	12,896	12,939	13,949	12,713	13,403
Iceland	56,609	56,872	70,327	56,883	40,866	41,696	45,539	43,523	46,520
India	743	829	1,041	1,102	1,124	1,414	1,581	1,530	1,548

Per Capita GDP at current prices in US Dollars (all countries)

Country	2005	2006	2007	2008	2009	2010	2011	2012	2013
Indonesia	1,273	1,601	1,871	2,178	2,272	2,947	3,470	3,551	3,475
Iran (Islamic Republic of	2,931	3,433	4,347	4,997	4,978	5,663	7,629	7,285	6,363
Iraq	1,325	1,944	2,606	3,495	3,635	3,783	4,949	5,619	5,790
Ireland	50,591	54,547	62,762	62,903	52,952	48,893	52,571	48,508	50,155
Israel	21,061	22,339	25,248	29,989	28,292	31,222	34,234	33,703	37,704
Italy	31,590	32,896	37,051	39,950	36,302	35,146	37,515	34,356	35,243
Jamaica	4,190	4,424	4,725	5,042	4,442	4,827	5,245	5,354	5,126
Japan	36,005	34,268	34,235	38,087	39,537	43,151	46,384	46,663	38,528
Jordan	2,403	2,773	3,025	3,717	3,854	4,094	4,285	4,414	4,618
Kazakhstan	3,792	5,320	6,810	8,571	7,324	9,299	11,682	12,508	13,650
Kenya	601	702	846	911	930	970	972	1,149	1,227
Kiribati	1,240	1,180	1,400	1,480	1,350	1,567	1,762	1,794	1,705
Kosovo	1,484	1,580	1,940	2,394	2,338	2,413	2,857	2,734	2,972
Kuwait	35,186	42,011	44,869	54,540	37,180	38,579	49,296	53,544	52,198
Kyrgyzstan	488	558	741	989	891	899	1,147	1,207	1,303
Lao People's DR	469	601	701	861	891	1,054	1,236	1,414	1,589
Latvia	7,673	9,839	14,280	16,682	12,383	11,417	13,658	13,857	15,064
Lebanon	5,390	5,404	6,008	6,982	8,354	8,850	8,949	9,490	9,793
Lesotho	711	736	817	827	859	1,083	1,226	1,135	1,075
Liberia	186	207	232	250	268	271	378	414	453
Libya	8,124	9,686	10,838	16,221	11,542	13,400	6,650	15,566	12,029
Liechtenstein	105,307	114,197	130,323	142,810	125,642	140,707	157,736	149,710	152,933
Lithuania	7,953	9,327	12,455	15,237	12,070	12,089	14,286	14,143	15,381
Luxembourg	80,865	89,614	103,314	112,791	100,662	102,668	114,179	107,481	113,373
Madagascar	275	293	379	472	417	415	458	447	463
Malawi	283	300	323	376	425	464	463	349	315
Malaysia	5,554	6,180	7,218	8,454	7,278	8,754	10,050	10,422	10,514
Maldives	3,666	4,860	5,769	6,774	6,786	7,169	7,168	7,700	8,220
Mali	459	497	561	665	661	672	739	696	715
Malta	15,414	16,282	18,943	21,335	20,166	20,579	22,479	21,563	23,243
Marshall Islands	2,677	2,791	2,994	3,178	3,151	3,379	3,537	3,566	3,586
Mauritania	694	939	1,008	1,178	1,042	1,202	1,384	1,276	1,418
Mauritius	5,350	5,533	6,387	7,881	7,201	7,897	9,112	9,231	9,593
Mexico	7,810	8,610	9,188	9,579	7,674	8,906	9,797	9,802	10,293
Micronesia (FS of)	2,354	2,396	2,433	2,503	2,668	2,841	2,996	3,155	3,216
Monaco	124,319	133,339	167,598	181,493	150,146	145,541	163,193	153,249	173,377
Mongolia	999	1,334	1,632	2,136	1,715	2,286	3,181	3,691	4,056
Montenegro	3,665	4,370	5,938	7,306	6,686	6,630	7,244	6,514	7,109
Montserrat	10,382	10,798	11,166	11,828	12,248	11,651	12,454	12,252	11,565
Morocco	1,976	2,160	2,453	2,871	2,907	2,869	3,095	2,949	3,146
Mozambique	361	378	415	484	459	424	539	593	605
Myanmar	238	274	359	505	639	799	1,107	1,166	1,183
Namibia	3,582	3,886	4,247	4,024	4,070	5,113	5,615	5,931	5,462
Nauru	2,599	2,513	2,292	4,131	5,404	6,234	8,567	12,022	15,211
Nepal	327	351	422	445	480	607	680	656	654

Per Capita GDP at current prices in US Dollars (all countries)

Country	2005	2006	2007	2008	2009	2010	2011	2012	2013
Netherlands	41,243	43,929	50,669	56,430	51,810	50,339	53,627	49,248	50,930
Netherlands Antilles (for	18,086	18,556	19,112	20,127	19,920	18,090			
New Caledonia	27,266	30,015	37,341	37,719	35,688	36,789	39,195	36,415	37,862
New Zealand	27,833	26,629	32,314	30,838	27,867	33,260	37,640	39,191	41,952
Nicaragua	1,159	1,228	1,333	1,498	1,459	1,535	1,676	1,777	1,851
Niger	256	267	302	367	353	360	388	390	415
Nigeria	1,293	1,632	1,819	2,213	1,754	2,311	2,508	2,730	2,966
Norway	66,760	73,982	84,914	96,683	79,903	87,611	100,765	102,066	103,586
Oman	12,323	14,566	16,377	23,484	18,169	20,923	22,984	23,385	21,929
Pakistan	745	847	928	905	950	1,008	1,202	1,201	1,238
Palau	9,446	10,117	10,414	10,480	10,387	10,028	10,254	10,888	11,480
Panama	4,594	4,998	5,670	6,473	6,683	7,355	8,374	9,452	10,472
Papua New Guinea	798	885	991	1,221	1,209	1,415	1,841	2,152	2,106
Paraguay	1,479	1,770	2,252	2,967	2,510	3,103	3,819	3,678	4,294
Peru	2,744	3,163	3,608	4,213	4,164	5,026	5,783	6,429	6,593
Philippines	1,201	1,399	1,681	1,928	1,832	2,136	2,358	2,588	2,765
Poland	7,968	8,987	11,227	13,883	11,428	12,479	13,725	12,986	13,760
Portugal	18,771	19,793	22,751	24,789	23,035	22,503	23,108	20,559	21,429
Puerto Rico	23,205	23,875	25,045	25,851	26,455	27,051	27,309	27,918	28,509
Qatar	54,229	62,920	69,167	84,813	62,528	71,510	88,861	92,633	93,352
Republic of Korea	19,096	21,395	23,599	20,937	18,726	22,588	24,675	24,954	26,482
Republic of Moldova	793	917	1,198	1,665	1,509	1,627	1,980	2,073	2,285
Romania	4,509	5,599	7,792	9,478	7,640	7,685	8,499	7,908	8,853
Russian Federation	5,308	6,888	9,048	11,560	8,509	10,618	13,280	14,091	14,680
Rwanda	274	322	380	469	504	526	575	637	645
Saint Kitts and Nevis	11,109	12,831	13,578	14,469	13,793	13,695	14,185	14,267	13,710
Saint Lucia	5,662	6,290	6,733	6,854	6,735	7,060	7,230	7,289	7,328
Samoa	2,414	2,488	3,009	2,955	2,827	3,211	3,572	3,637	3,632
San Marino	68,092	71,868	81,889	90,079	76,967	69,322	66,153	57,625	57,293
Sao Tome and Principe	807	869	924	1,192	1,253	1,216	1,423	1,474	1,770
Saudi Arabia	13,303	14,855	16,051	19,714	16,013	19,327	24,116	25,946	25,962
Senegal	773	808	948	1,094	1,015	998	1,078	1,023	1,072
Serbia	3,528	4,130	5,458	6,702	5,821	5,412	6,386	5,626	6,313
Seychelles	10,553	11,523	11,597	10,759	9,356	10,635	11,706	12,224	15,565
Sierra Leone	322	357	399	453	435	448	500	633	809
Singapore	27,901	31,644	37,670	39,252	38,306	45,933	52,447	53,608	54,649
Sint Maarten (Dutch par	18,843	19,543	20,246	20,921	20,558	20,986	21,442	22,170	22,572
Slovakia	9,079	10,554	14,185	17,749	16,337	16,381	17,928	17,031	17,928
Slovenia	18,169	19,704	23,816	27,352	24,577	23,352	24,856	22,374	23,161
Solomon Islands	915	980	1,195	1,265	1,240	1,367	1,618	1,776	1,912
Somalia	273	275	279	284	214	111	108	128	133
South Africa	5,344	5,553	6,036	5,705	5,815	7,295	8,019	7,586	6,936
South Sudan				1,706	1,289	1,581	1,717	957	1,045
Spain	26,672	28,713	33,120	36,139	32,762	30,999	32,132	28,997	29,685
Sri Lanka	1,223	1,404	1,593	1,991	2,042	2,388	2,828	2,816	3,159

Per Capita GDP at current prices in US Dollars (all countries)

Country	2005	2006	2007	2008	2009	2010	2011	2012	2013
St. Vincent and the Gren	5,064	5,608	6,273	6,371	6,177	6,234	6,185	6,339	6,484
State of Palestine	1,357	1,349	1,478	1,748	1,857	2,221	2,544	2,674	2,908
Sudan				1,422	1,385	1,513	1,519	1,393	1,438
Sudan (Former)	888	1,110	1,417	1,482	1,365	1,528			
Suriname	4,390	5,199	5,753	6,855	7,450	8,321	8,349	9,378	9,826
Swaziland	2,339	2,636	2,679	2,607	2,698	3,262	3,374	3,055	2,819
Sweden	43,083	46,209	53,260	55,657	46,148	52,053	59,595	57,182	60,566
Switzerland	55,009	57,360	63,112	72,069	69,679	74,223	87,967	83,290	84,854
Syrian Arab Republic	1,563	1,761	2,059	2,583	2,573	2,808	2,462	1,896	1,606
Tajikistan	340	407	523	709	669	740	835	953	1,036
TFYR of Macedonia	2,994	3,277	3,976	4,722	4,476	4,475	4,988	4,628	5,110
Thailand	2,881	3,355	3,966	4,384	4,224	5,102	5,512	5,887	6,270
Timor-Leste	1,821	2,774	2,862	4,226	3,099	3,905	5,224	5,008	4,362
Togo	381	390	434	529	515	503	570	587	610
Tonga	2,613	2,887	2,991	3,318	3,152	3,593	4,287	4,437	4,173
Trinidad and Tobago	12,323	14,092	15,957	19,726	15,964	15,495	17,660	17,365	18,240
Tunisia	3,211	3,383	3,787	4,317	4,134	4,143	4,266	4,150	4,263
Turkey	7,130	7,736	9,312	10,379	8,627	10,135	10,605	10,661	10,972
Turkmenistan	2,989	3,380	3,807	4,398	4,060	4,393	5,725	6,798	7,987
Turks and Caicos Island	21,877	26,116	27,009	29,262	23,248	22,159	22,971	22,112	21,338
Tuvalu	2,259	2,353	2,768	3,095	2,763	3,238	3,994	4,044	3,882
U.R. of Tanzania: Mainla	479	472	538	662	673	686	720	817	933
Uganda	428	454	540	631	614	636	670	702	704
Ukraine	1,893	2,387	3,188	4,049	2,627	3,066	3,697	4,010	4,163
United Arab Emirates	43,534	45,556	44,489	46,403	32,850	33,886	38,930	40,444	43,049
United Kingdom	40,008	42,606	48,602	45,519	37,421	38,796	41,518	41,650	42,423
United States	43,914	46,042	47,657	47,997	46,588	47,925	49,277	50,907	52,392
Uruguay	5,222	5,879	7,013	9,068	9,065	11,531	13,961	14,727	16,351
USSR (Former)									
Uzbekistan	553	660	838	1,097	1,236	1,423	1,618	1,801	1,977
Vanuatu	1,886	2,047	2,393	2,697	2,643	2,966	3,276	3,155	3,165
Venezuela	5,445	6,748	8,330	11,223	11,525	13,559	10,728	12,729	12,213
Viet Nam	623	710	820	1,043	1,102	1,302	1,507	1,716	1,868
Yemen	945	1,104	1,210	1,401	1,280	1,358	1,334	1,345	1,422
Yemen Arab Republic (Former)									
Yemen Democratic (Former)									
Yugoslavia (Former)									
Zambia	626	908	953	1,175	998	1,225	1,408	1,463	1,540
Zanzibar	407	444	517	604	585	593	658	758	848
Zimbabwe	490	480	473	430	633	721	820	903	953

Annex 74

Letter from Dr. Abdirahman D. Beileh, Ministry of Foreign Affairs & Investment Promotion of the Federal Republic of Somalia, to Mr. Paolo Scaroni, Chief Executive Officer of Eni S.p.A., No. MOFA/MO/1043/2014 (24 Apr. 2014)

JAMHUURIYADDA FEDERAALKA SOOMAALIYA
WASAARADDA ARRIMAHA DIBADDA IYO
DHIIRAGALINTA MAALGASHIGA

جمهورية الصومال الفيدرالية
وزارة الشؤون الخارجية
وتشجيع الإستثمارات

FEDERAL REPUBLIC OF SOMALIA
Ministry of Foreign Affairs & Investment Promotion

REF: MOFA/MO/1043/2014 Date: 24/04/2014

Paolo Scaroni
Chief Executive Officer
Eni, Sp.A
Piazzale Mattei, 100144
Roma, Italy

Dear Mr. Scaroni,

Reference is made to the press release issued by Eni Sp.A. ("Eni"), dated February 2, 2012, in connection with Eni's acquisition of three product sharing contracts, awarded by the Government of the Republic of Kenya, for the acquisition of exploration blocks (L-21, L-23 and L-24) (the "Specified Area").

The Government of the Federal Republic of Somalia (the "Somali Government") hereby informs you that the Specified Area lies within the maritime zones of Somalia. The Somali Government strongly condemns Eni's illegal activities in the Specified Area as a grave violation of its sovereignty with severe repercussions, including permanent damages to its environmental and economic well-being. The Somali Government, therefore, urges Eni to immediately cease and desist from such illegal activities.

Senior officials of the Somali Government have, in the past, strongly urged Eni to cease and desist from such activities. We regret that Eni did

not heed the Somali Government's request then, as such we strongly urge it to do so now. Furthermore, the Somali Government requests Eni to promptly provide it with all documents relating to its activities in the Specified Area, including an inventory of all fees and financial compensation provided to the Government of the Republic of Kenya and/or any other public or private entity. Mona Al-Sharmani, Senior Legal Advisor to the Somali Government will contact the office of your Chief Legal Officer to set up a meeting to further discuss this matter.

We look forward to a speedy resolution of this matter.

Dr. Abdirahman D. Beileh

Somali Federal Republic
Ministry of Foreign Affairs and
Investment Promotion

Annex 75

Letter from Mr. Massimo Mantovani, Senior Executive Vice President, General Counsel Legal Affairs Department, Eni S.p.A., to H.E. Abdirahman D. Beileh, Minister of Foreign Affairs of the Federal Republic of Somalia, No. Prot. Dialeg 10 (9 June 2014)

General Counsel Legal Affairs Department
Senior Executive Vice President

Sede legale in Roma,
Piazzale Enrico Mattei, 1
00144 Roma
Tel. centralino +39 06598.21
www.eni.it

H.E. Minister of Foreign Affairs Dr Abdirahman D. Beileh
Ministry of Foreign Affairs
Afgoye Road
KM5
Mogadishu
Federal Republic of Somalia

Rome June, 9 2014

Ref. No. Prot. Dialeg 10

Your Excellency,

We make reference to your letter of 24 April 2014, Ref: MOFA/MO/1043/2014, addressed to Mr. Paolo Scaroni, former Chief Executive Officer of eni spa.

Firstly, I would like to inform you that on 9 May 2014 the Board of Directors of eni spa has appointed Mr. Claudio Descalzi as the new Chief Executive Officer of our company and he has requested me to reply to your letter referenced above.

I would like also to inform you that I had the opportunity to meet at our offices in Rome with Ms. Mona Al-Sharmani, Senior Legal Advisor to the Somali Government, with whom I have discussed the issues of the maritime border dispute between Somalia and Kenya and of the offshore activities of our affiliate eni Kenya BV.

On the merit, we note the contents of your letter and your claim that the Specified Area lies within the maritime zones of Somalia. You will be aware that the Government of the Republic of Kenya would dispute your claim.

./.

Eni's position is that it was lawfully awarded the three production sharing contracts by the Government of the Republic of Kenya and that these licences are consistent with Kenya's maritime zone, and therefore Eni's activities in the Specified Area are not *"illegal"* as described in your letter.

In those circumstances, we respectfully ask you to understand that eni is not prepared to and cannot cease and desist from continuing its activities pursuant to the three production sharing contracts entered into with the Government of the Republic of Kenya.

We note your request for *"all documents relating to its [eni's] activities in the Specified Area, including an inventory of all fees and financial compensation provided to the Government of the Republic of Kenya and/or any other public or private entity"*. Unfortunately, eni is not in a position to provide this information and documentation as we are bound by confidentiality obligations towards the Government of the Republic of Kenya.

Yours faithfully.

(Massimo Mantovani)

Annex 76

Letter from H.E. Ahmed Ali Dahir, Attorney-General of the Federal Republic of Somalia, to Mr. Claudio Descalzi, Chief Executive Officer of Eni S.p.A., No. 01/115/XIG/2014 (16 Sept. 2014)

JAMHUURIYADDA FEDERALKA SOOMAALIYA
XAFIISKA XEERILAALIYAHA GUUD EE QARANKA

THE ATTORNEY GENERAL'S OFFICE مكتب النا ئب العام

SUM: 01/115/XIG/2014 TR: 16/09/2014

Claudio Descalzi
Chief Executive Officer
Eni, Sp.A
Piazzale Mattei, 1 -00144
Roma,Italy

Dear Mr. Descalzi,

Reference is made to that certain letter from Eni Sp.A. ("Eni"), dated 9 June 2014 (Ref. No. Prot. Dialeg 10), in response to a letter from the Ministry of Foreign Affairs of the Federal Republic of Somalia (the "Ministry of Foreign Affairs"), dated 24 April 2014 (Ref MOFA/MO/1043/2014) in connection with Eni's acquisition of three product sharing contracts, awarded by the Government of the Republic of Kenya (the "Government of Kenya"), for the acquisition of exploration blocks (L-21, L-23 and L-24) (the "Specified Area").

The Federal Government of Somalia (the "Somali Government") indicated, as reflected in a letter from the Ministry of Foreign Affairs, dated July 26, 2014 with Ref:MOFA/SFR/OM/950/2014, that the Specified Area lies within the Exclusive Economic Zone of Somalia. The outer-limits of Somalia's Exclusive Economic Zone are reflected in the Proclamation of the President of the Federal Republic of Somalia dated 30 June 2014 (posted on the website of the Division for Ocean Affairs and the Law of the Sea, Office of Legal Affairs of the United Nations, at: www.un.org/Depts/los).

Furthermore, on 28 August 2014, the Somali Government filed an Application instituting legal proceedings against the Government of Kenya before the International Court of Justice in connection with the maritime dispute between Somalia and Kenya.

Tell:00252617166121 – 002521690000557 Email: garaad125@gmail.com,dahir119@hotmail.com

Therefore, given Eni's continued gross violations of Somalia's sovereignty and territorial integrity and of applicable Somali laws, including Somali Maritime Law of 1988.

The office of the Attorney-General of Somalia hereby imposes on Eni a penalty fine of thirty Euros per square kilometer per day. The ("fine"), which is equivalent to €1,005,660 (Euro) per day, payable immediately, for each day that fails to cease and desist from all illegal activities in the Somali maritime zones. Such Fine shall accrue and be payable as of 1st July 2014, the day following the Somali Government's proclamation of its Exclusive Economic Zone. All outstanding Fines due and payable shall accrue interest at a rate of London Interbank Offered Rate plus 2% per annum. Furthermore, the Fine shall continue to accrue and be payable in full until such date that the Somali Government and Eni enter into an amicable agreement and in accordance with the terms of such agreement.

Failure to pay such fine may result in legal proceedings with a competent court.

We look forward to a speedy resolution of this matter.

Sincerely,

H.E Ahmed Ali Dahir

Attorney General

SOMALI REPUBLIC
JAMHUURIYADDA SOOMAALIYA
ATTORNEY GENERAL OFFICE
XEER MAALIYAHA GUUD EE QARANKA

Claudio Descalzi

Chief Executive Officer

Eni, Sp.A

cc: Ms. Federica Mogherini, Minister for Foreign Affairs of the Republic of Italy

cc: H.E. Dr. Abdirahman Beileh Minister for Foreign Affairs and Investment Promotion

Tell:00252617166121 – 002521690000557 Email: garaad125@gmail.com,dahir119@hotmail.com

Annex 77

Letter from H.E. Ahmed Ali Dahir, Attorney-General of the Federal Republic of Somalia, to Mr. Peter Worthington, Chief Executive Officer of Midway Resources International, No. 02/124/XIG/2014 (20 Sept. 2014)

JAMHUURIYADDA FEDERALKA SOOMAALIYA
XAFIISKA XEERILAALIYAHA GUUD EE QARANKA

THE ATTORNEY GENERAL'S OFFICE مكتب النا ئب العام

SUM: 02/124/XIG/2014 TR: 20/09/2014

Peter Worthington
Chief Executive Officer
Midway Resources International
15 Half Moon Street
London, W1J 7DZ

Dear Mr. Worthington,

Reference is made to the information posted on Midway Resources International ("MRI") website in connection with a production sharing contract it has entered with the Government of the Republic of Kenya (the "Kenyan Government") for Block L13 (the "Specified Area"), which MRI operates through its subsidiary Zarara Oil & Gas Limited.

A portion of the Specified Area lies within the Exclusive Economic Zone of Somalia. The outer-limits of Somalia's Exclusive Economic Zone are reflected in the Proclamation of the President of the Federal Republic of Somalia, dated 30 June 2014, posted on the website of the Division for Ocean Affairs and the Law of the Sea, Office of Legal Affairs of the United Nations (www.un.org/Depts/los).

Furthermore, on 28 August 2014, the Ministry of Foreign Affairs and Investment Promotion (the "Somali Government") filed an application instituting legal proceedings against the Kenyan Government before the International Court of Justice in connection with the maritime dispute between Somalia and Kenya.

Tell: 00252617166121 , 00252690000557 Email:garaad125@gmail.com, dahir119@hotmail.com

Therefore, given MRI's continued gross violations of Somalia's sovereignty and territorial integrity and of applicable Somali laws, including the Somali Maritime Law of 1988, the office of the Attorney-General of Somalia hereby imposes on MRI a fine equal to thirty (30) Euros per square kilometer (which is equal to a total amount of € 05010) per day. The fine shall be payable immediately for each day that MRI fails to cease and desist from all illegal activities in the Somali maritime zones. Such fine shall accrue and be payable as of 1 July 2014, the day following the Somali Government's proclamation of its Exclusive Economic Zone. All outstanding fines due and payable shall accrue interest at a rate of the London Interbank Offered Rate plus two percent per annum. Furthermore, the fine shall continue to accrue and be payable in full until such date that the Somali Government and MRI enter into an amicable agreement and in accordance with the terms of such agreement.

We look forward to a speedy resolution of this matter.

Sincerely,

H.E. Ahmed Ali Dahir

Attorney General

Cc: H.E Dr. Abdirahman Beileh, Minister of Foreign Affairs and Investment Promotion of the Federal Republic of Somalia

Tell: 00252617166121 , 00252690000557 Email:garaad125@gmail.com, dahir119@hotmail.com

Annex 78

Letter from H.E. Ahmed Ali Dahir, Attorney-General of the Federal Republic of Somalia, to Mr. Christophe de Margerie, Chief Executive Officer of Total S.A., No. 03/125/XIG/2014 (20 Sept. 2014)

JAMHUURIYADDA FEDERALKA SOOMAALIYA
XAFIISKA XEERILAALIYAHA GUUD EE QARANKA

THE ATTORNEY GENERAL'S OFFICE مكتب النا ئب العام

SUM: 031/25/XIG/2014 TR: 20/09/2014

Christophe de Margerie
Chief Executive Officer
TOTAL S.A.
Tour Coupole
2, place Jean Millier
Arche Nord - Coupole/Regnault
92078 Paris La Défense Cedex
France

Dear Mr. de Margerie,

Reference is made to the letter from the Ministry of Foreign Affairs and Investment Promotion of the Federal Republic of Somalia (the "Somali Government"), dated 6 September 2014 (Ref # MOFA/SFR/PS/2351/2014), to Total S.A. ("Total") in connection with Total's execution of a production sharing contract with the Government of the Republic of Kenya (the "Kenyan Government") for Block L22 (the "Specified Area"), which Total operates with a 100% interest.

In said letter the Somali Government indicated that the Specified Area lies within the Exclusive Economic Zone of Somalia. The outer-limits of Somalia's Exclusive Economic Zone are reflected in the Proclamation of the President of the Federal Republic of Somalia, dated 30 June 2014, posted on the website of the Division for Ocean Affairs and the Law of the Sea, Office of Legal Affairs of the United Nations (www.un.org/Depts/los).

Tell: 00252617166121, 00252690000557 Email:garaad125@gmail.com, dahir119@hotmail.com

Annex 78

Furthermore, on 28 August 2014, the Somali Government filed an application instituting legal proceedings against the Kenyan Government before the International Court of Justice in connection with the maritime dispute between Somalia and Kenya.

Therefore, given Total's continued gross violations of Somalia's sovereignty and territorial integrity and of applicable Somali laws, including the Somali Maritime Law of 1988, the office of the Attorney-General of Somalia hereby imposes on Total a fine equal to thirty (30) Euros per square kilometer (which is equal to a total amount of €109230) per day. The fine shall be payable immediately for each day that Total fails to cease and desist from all illegal activities in the Somali maritime zones. Such fine shall accrue and be payable as of 1 July 2014, the day following the Somali Government's proclamation of its Exclusive Economic Zone. All outstanding fines due and payable shall accrue interest at a rate of the London Interbank Offered Rate plus two percent per annum. Furthermore, the fine shall continue to accrue and be payable in full until such date that the Somali Government and Total enter into an amicable agreement and in accordance with the terms of such agreement.

We look forward to a speedy resolution of this matter.

Sincerely,

H.E. Ahmed Ali Dahir

Acting Attorney General

SOMALI REPUBLIC
JAMHUURIYADDA SOOMAALIYA
ATTORNEY GENERAL OFFICE
XEER ILAALIYAHA GUUD EE QARANKA

cc: H.E. Laurent Fabius, Minister of Foreign Affairs and International Development of the Republic of France

cc: H.E Dr. Abdirahman Beileh, Minister of Foreign Affairs and Investment Promotion of the Federal Republic of Somalia

Tell: 00252617166121, 00252690000557 Email:garaad125@gmail.com, dahir119@hotmail.com

Annex 79

Letter from Mr. Claudio Descalzi, Chief Executive Officer of Eni S.p.A., to H.E. Abdirahman D. Beileh, Minister of Foreign Affairs of the Federal Republic of Somalia, and H.E. Ahmed Ali Dahir, Attorney-General of the Federal Republic of Somalia, No. 85 (3 Oct. 2014)

Claudio Descalzi
Chief Executive Officer

eni spa
Piazzale Enrico Mattei, 1
00144 Rome - Italy
Ph. +39 065982332 Fax +39 0659822492

Piazza Ezio Vanoni, 1
20097 San Donato Milanese (Milan) - Italy
Ph. + 39 0252061009 - 31001
Fax +39 0252041990
claudio.descalzi@eni.com

San Donato Milanese, October 3rd,2014
Ref. 85

H.E. Minister of Foreign Affairs Dr
Abdirahman D. Beileh
Ministry of Foreign Affairs
Afgoye Road
KM5
Mogadishu
Federal Republic of Somalia

- and –

H.E. Attorney-General Ahmed Ali Dahir
Attorney-General's OfficeKM5
Mogadishu
Federal Republic of Somalia

Your Excellencies,

I make reference to the letters of 26 July 2014 (received on 5 August 2014), Ref: MOFA/SFR/OM/1950/2014 and 16 September 2014 (received on 17 September 2014), Ref. (SUM: 01/115/XIG/2014) addressed to our Chief Executive Officer and copied to Ms. Federica Mogherini, Ministry for Foreign Affairs of the Republic of Italy.

I would like to emphasize that the maritime border dispute between the Federal Republic of Somalia ("Somalia") and the Republic of Kenya ("Kenya") is a matter that can only be resolved between the two sovereign States. Indeed, Somalia has recently instituted proceedings against Kenya before the International Court of Justice.

In this respect, we would like to clarify that three production sharing contracts have been awarded by Kenia to our affiliate **eni** Kenia B.V. and we cannot cease and desist from our activities given our existing contractual obligations towards Kenya. Nonetheless, **eni** Kenya B.V. has formally informed the Ministry of Foreign Affairs of Kenya of your position and of your request that all the activities are suspended. **eni** Kenya B.V. has also provided copy of the letter from the Attorney-General of Somalia to the Ministry of Foreign Affairs and the Attorney-General's office of Kenya.

I would also like to respectfully underline that the activities carried out so far and those scheduled in the near term have not and will not cause any damage to Somalia's environmental and economic well-being.

Considering the situation, we consider not applicable the 'penalty fine' purported by the letter of 16 September 2014 sent to us by the Attorney-General.

I hope that the two States will be able to find a mutually acceptable solution to their dispute for their benefit and for that of the companies investing in the area.

I am available for discussing the matter further in a meeting. In this respect I understand that H.E Mr. Daud Mohamed Omar, Minister of Petroleum and Mineral Resources of Somalia, will be in Rome on October 14th for the Ministerial Conference "Italy-Africa, working together for a sustainable energy future" and I could meet him at that time.

Yours faithfully,

Claudio Descalzi

Annex 80

Lindsay Parson, Expert Review Paper, *Geology and Geomorphology of the East Africa Continental Margin, Indian Ocean* (6 July 2015)

Geology and geomorphology of the East Africa continental margin in the Indian Ocean

Expert Report
prepared by

Dr Lindsay Parson,
Maritime Zone Solutions Ltd.

July 2015

1 Introduction

I am the Managing Director of a technical maritime consultancy (Maritime Zone Solutions Ltd.) based in Romsey, Hampshire, UK. I started the company in May 2010 when I left the UK National Oceanography Centre (NOC), Southampton, where I had worked for the previous 15 years as Head of the Law of the Sea Group in the Marine Geology and Geophysics Department. Among other areas, the Group was responsible for UK maritime delineation with respect to the continental shelf beyond 200 nautical miles. Prior to my position at NOC, I was Principal Scientific Officer at the Institute of Oceanographic Sciences (IOS), Wormley in Surrey, where I carried out two parallel marine research programmes; one investigating geological processes at continental margins and active plate boundaries, and the other the technical implementation of United Nations Convention on the Law of the Sea (UNCLOS) provisions. From 1980 onwards, when I joined IOS, I was involved in providing advice to the Department of Energy and the UK Foreign and Commonwealth Office. I have authored more than 100 peer-reviewed articles in scientific literature and more recently a number of commentaries on the technical-legal interface and implementation of UNCLOS.

In 2003 I was asked by the UK Foreign and Commonwealth Office to assist with the preparation of the four UK submissions to the Commission on the Limits of the Continental Shelf in accordance with Article 76 of UNCLOS. These were completed and submitted by 2009 and two have been defended in front of the Commission. I remain the Lead Technical Advisor to the Legal Advisors Office on delimitation issues on the continental shelf. Over my 35-year career, both the Law of the Sea Group and Maritime Zone Solutions Ltd. have been commissioned by many non-UK coastal states to assist them with their submissions. I developed a training programme for international experts to learn about UNCLOS Article 76, which ran between 2000 and 2006, and since then I have managed and lectured at the graduate and post-graduate level on the Law of the Sea modules offered in the ‘Marine Science Policy and Law’ Masters degree programme at the University of Southampton. I have supervised seven PhD students and acted as a national and international

external examiner for many others.

My company retains a wide range of associate consultants, all expert practitioners in UNCLOS, and especially on continental shelf areas beyond 200 nautical miles. Two have been, or currently are, members of the Commission on the Limits of the Continental Shelf (CLCS), and we have worked with more than thirty coastal States on issues relevant to continental shelf delineation or delimitation. I have provided technical advisory services to counsel on a number of occasions, including for cases at the International Tribunal for the Law of the Sea, the International Court of Justice and the Permanent Court of Arbitration. I was elected as the UK member of the Legal and Technical Commission at the International Seabed Authority between 2000 and 2006. I have published widely on the geology and legislative context of ocean space. I am a member of the International Law Association's Committee on Maritime Delimitation, a Chartered UK and European Geologist, and a member of a number of international advisory boards world-wide.

This report provides a summary of the geology and geomorphology of the East Africa continental margin[1] from the Horn of Africa to a latitude of 5°S, a distance of more than 2000 km encompassing the coast of Kenya and the part of the Somali coastline facing the Indian Ocean. It draws from available published literature, which confirms that this ancient margin is characterised by a history of extensive sedimentation, coupled with an almost complete absence of tectonic activity since the area's formation more than 150 million years ago. The land and offshore geology vary in detail. Regionally, however, there is some consistency: The submarine prolongation along the margin is unbroken from Somalia south to Kenya, and out into the Western Somali Basin; and both the physical continental shelf and juridical Continental Shelf beyond 200 nautical miles are continuous.

[1] To avoid any confusion, this report (review) will normally use the words (continental) 'margin', (continental) 'shelf', (continental) 'slope' and (continental) 'rise' in their geoscientific sense, and and as defined by the Oxford Dictionary of Earth Sciences (Oxford University Press, 2008). If it is necessary to refer to the same terms in a juridical sense, the feature will be capitalised (e.g.'Continental Margin', etc.).

This report will be organised into five sections, each refering to either a specific part of the margin, or physical processes that have characterised its development. These will be followed by a concluding summary section.

Section 2 describes the configuration of the coastline, and the relief and form of the adjacent land and marine areas. Section 3 discusses the evolution of the landforms and the offshore ocean basins as they have resulted from plate tectonic movements. Section 4 addresses the geology and geomorphology of the margin, and Section 5 provides a detailed overview of the offshore seafloor geology adjacent to the coast. Section 6 contains a number of summary observations derived from the review of the margin in the context of implementation of Article 76 of the 1982 Convention.

2 Coastline geometry, relief and morphology

The coastal margin of Somalia and Kenya separates the terrestrial cratonic continental block of Africa, which is the stable portion of Africa's continental crust, from the oceanic basins and sub-basins of the western Indian Ocean (see Figure 1).

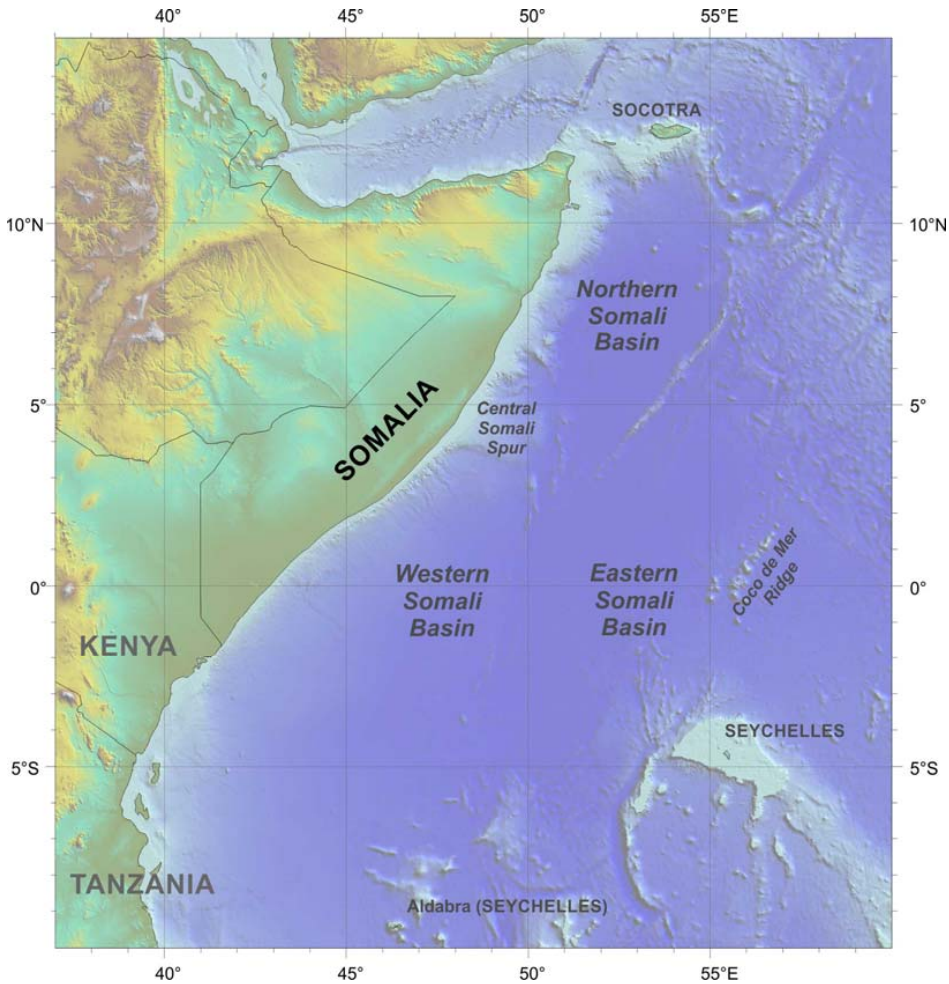

Figure 1: Land topography of northeast Africa margin and seafloor relief in the adjacent northwest Indian Ocean.

In general, apart from the approximately 500 km coastal section north of latitude 7º N, the Indian Ocean coastline of northeast Africa follows an approximately north-northeast orientation from the Somalia-Kenya land boundary for nearly 2000 km, before turning abruptly westwards at the Horn of Africa into the Gulf of Aden. South of Kismaayo (0°25'30"S, 42°34'43"E), the small, reef-related islets of the Baajuun chain are offset from the mainland by less than 5 km, and are located in a strikingly linear band parallel with the coast.

The East Africa shoreline is remarkably regular for much of its length. North of

approximately latitude 2ºS, the coastal area is sandy and backed immediately by dunes and further inland by low relief scrub. South of approximately 2°S, Kenya's shoreline is slightly more mixed, comprising a mixture of rocky headlands and smaller, discrete sandy bays.

3 Plate-tectonic evolution

The evolution of the Indian Ocean began with the separation of west and east Gondwanaland during the Mesozoic era, approximately 160 Ma[2]. The continental margins of eastern Africa are marked by a series of basins formed by the separation of the India-Madagascar-Antarctica land masses from Africa-Arabia land mass that occurred as part of the Gondwanaland separation. This separation ceased about 120 Ma[3].

Magnetic anomalies[4] show that the crust in the Western Somali Basin was formed by seafloor spreading and the generation of new oceanic crust as Madagascar moved south with respect to Africa (Eagles & König, 2008). This movement led to the creation of the Davie Fracture Zone and a sheared margin[5] along the edge of the continent from southernmost Kenya down to Mozambique. This corresponds to the section of the East African coastline that trends roughly north-south. To the north, however, the northeast-southwest trending coastline off Kenya and southern Somalia corresponds to a 'rifted' margin, i.e., one which has resulted from the stretching, fracturing and rupture of continental crust. This formed during the same period of seafloor spreading as the Davie Fracture Zone. These margin segments have both been largely tectonically inactive since their formation, albeit subject to occasional vertical movements in the south.

[2] "Ma" signifies "million years ago".

[3] *See* Cochran, J. R. 1988. Somali Basin, Chain Ridge, and origin of the Northern Somali Basin gravity and geoid low Journal of Geophysical Research: Solid Earth, 1988.

[4] Geophysical surveys commonly identify parallel magnetic striping patterns, normally referred to as 'magnetic anomalies', in ocean basins, which can be used to accurately record the date the seafloor was created.

[5] 'Sheared' or 'transform' margins are common features generated where continental blocks slide past one another along faults in the earth's crust.

4 Continental margin

The continental margin for the coastal section under consideration in this report is wholly 'passive' in that it is inactive and none of it has been characterized by excessive volcanism or compressive/subduction 'active' plate motions. It has all been formed either as continental blocks were extended, thinned and, finally, ruptured during continental break-up, or as continental blocks slid past one another to form a sheared margin.

The Northern and Western Somali Basins were formed as a consequence of the plate movement mentioned above and consequential subsidence of certain areas of the sea floor. Such plate movements and subsidence actions are typically accompanied by sedimentary infill, continued subsidence, and sedimentation, and the Northern and Western Somali Basins are no exception.

The continental margin of East Africa flanking the Western Somali Basin includes the southern part of Somalia's Indian Ocean coastline and all of Kenya's coastline, in a single and continuous, robust feature more than 2000 km in length. Sedimentary materials shed from the continental landmass for the 160 million years of the Basin's existence have steadily been deposited across its entire floor. The closer one is to the mainland, the greater the amount of sediment cover on the basin floor. These deposits have reached many kilometres in thickness at their closest point to the land, but still retain at least 7 km thickness at a distance of more than 400 km[6].

[6] Coffin, M.F., Rabinowitz, P.D & Houtz, R.E. 1986. Crustal structure in the Western Somali Basin. Geophys. J. R. astr. Soc. 86, 331-369.

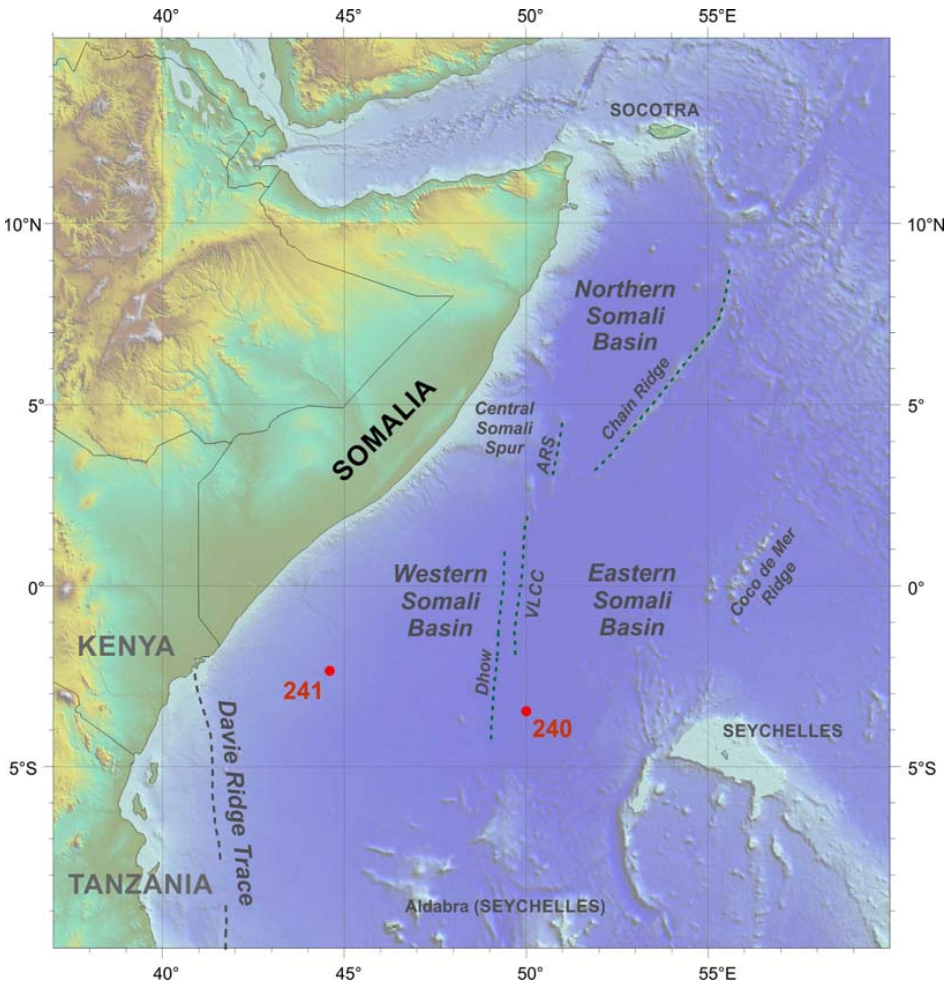

Figure 2: Principal geomorphological features of the continental margin of Somalia, including: the Somali Basin and its constituent sub-basins (Northern, Eastern and Western Somali Basins); key bathymetric relief features (Dhow, VLCC and ARS fracture zone complex), as dashed lines; Central Somali Spur; and land boundaries. Deep Sea Drilling Project (DSDP) sites are located as numbered red dots[7].

At the southern limit of the Northern Somali Basin, a major submarine feature referred to informally as the Central Somali Spur marks a large prolongation that extends as a single block more than 300 km from the coast. (See Figure 2.) South of this feature, the continent-ocean transition continues as an oblique section of rifted margin, which originated approximately 160 Ma.

[7] Simpson, E.W. & Schlich, R., et al., 1974, Initial Reports of the Deep Sea Drilling Project, Volume 25. Washington (U.S. Government Printing Office) pp. 679-684.

Seafloor spreading occurred for approximately 35 million years as the northeast-trending rift opened, allowing the Western Somali Basin to form along an approximately N-S azimuth. This directional movement can be seen in Figure 3.

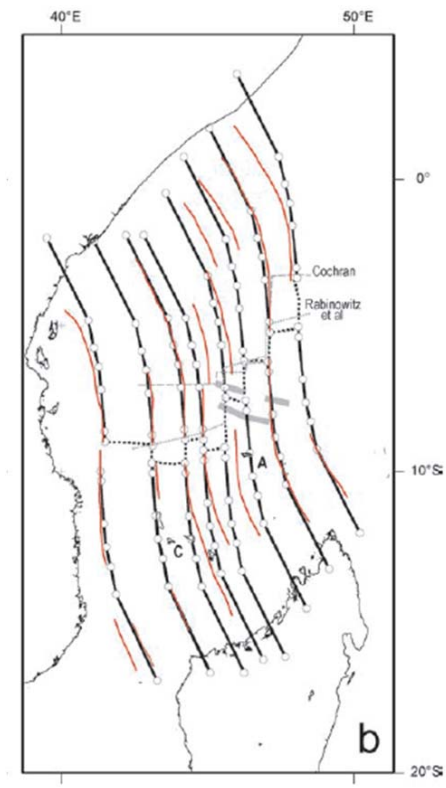

Figure 3: Interpretation of the southern Western Somali Basin from Eagles and Konig (2008), revealing traces of directional movement between Madagascar and East Africa.

The coastal margin bordering most of Kenya (between latitudes 15°S and 2°S) has formed by shearing along the Davie Ridge Fracture Zone between Madagascar and Africa. By contrast, the margin of northeast Kenya and southeast Somalia (between latitudes 2°S and 6°N) was formed between 160 and 125 Ma between the Jurassic and early Cretaceous periods by the rifting and drifting of Madagascar away from Africa (See Figure 3).

At its northern end, the Kenyan margin is also intersected by other faults,

including those associated with a southeasterly branch of the continental East Africa Rift system[8]. Present day records of earthquake activity also confirm that, unlike the Somali margin to the north, the Kenyan margin is not entirely tectonically passive. This localised combination of fault systems has led to the formation of islands, the weakening of coastal rock formations, and enhanced erosion along the Kenya and Tanzania coastline.

5 Offshore geology

The Somali Basin dominates the northwestern Indian Ocean adjacent to the East African coast. It comprises a roughly bean-shaped area covering more than two million square miles (5 million square kilometres). It is bounded by the African coasts of Somalia, Kenya, and Tanzania on the west, Socotra Island in the north, the broad flanks of the Carlsberg Ridge to the east, and a rough line linking the Coco-de-Mer Seamounts, Amirante Ridge-trench complex, and the Aldabra and Comoros Islands to the east and south (see Figure 1).

South of the Central Somali Spur in the Western Somali Basin, the shallow water platform is consistently very straight and narrow with an average width to the 200 m isobath of much less than 20 nautical miles (37 km). However, the seafloor descends at a modest gradient as it moves offshore, reaching the deepest parts of the basin at between 4500 and 4800 m in water depth. At this depth, the seafloor is largely flat and uninterrupted by significant features.

Recent bathymetric models are helpful for identifying the sedimentation patterns in this area[9]. These data show a large amount of sediment discharge from the upper parts of the slope into the basin. This sediment moves along sediment fan channels, submarine canyons, and smaller scale gullying systems out into the basin. (See Figure 4.)

[8] Chorowitz, J. 2005. The East African Rift System. Journal of African Earth Sciences, 43, pp 379-410.

[9] *See* http://topex.ucsd.edu/marine_topo/ and Smith, W. H. F., and D. T. Sandwell, Global seafloor topography from satellite altimetry and ship depth soundings, Science, v. 277, pp. 1957-1962, 26 Sept., 1997.

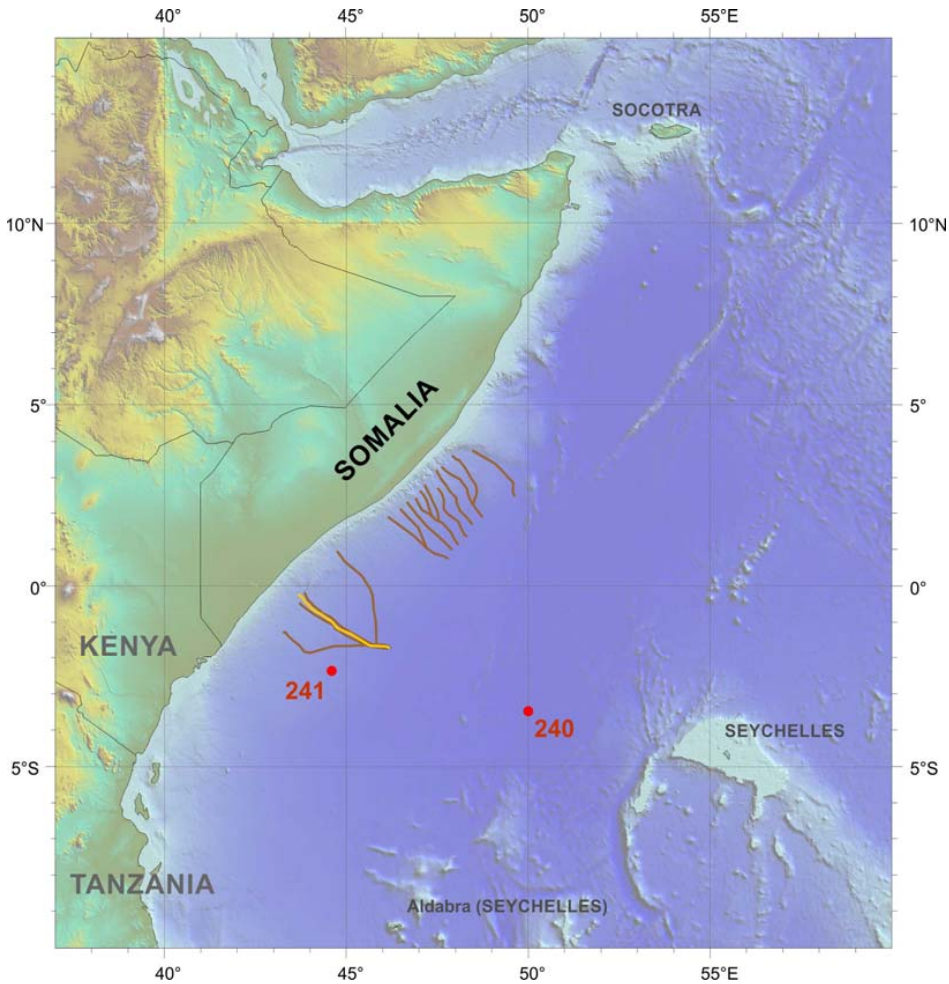

Figure 4: Sediment distribution features offshore Somalia: gully and canyon features (in brown), as well as a single major fan channel (in orange), known as the Somali Channel.

In deeper water, the largest of these transport/depositional features, the Somali Channel, follows a weakly sinuous course to beyond 200 M of the coast (see Figure 4). Beyond that, the seabed is an abyssal floor without a gradient, where the sediment supply is dominated by pelagic or other marine sources. Sediment studies in the Somali Basins, including deep drilling studies, have revealed a range of deposits including turbidites[10], pelagic

[10] 'Turbidites' are a mixed rock type of sediment which derives from a sudden submarine avalanche of sediment from the shallower basin margin, and which commonly exist at great distances from land.

rocks[11] and sands in deep water (see Sites 234, 235, 240 and 241 - DSDP Leg 25; Simpson and Schlich 1974). It is likely that discharge from Somali, Kenyan and Tanzanian river systems delivered sediments to the Somalia Basin.

The sands recovered from the Somali Basin are of particular interest for studying the region, as they have been transported considerable distances on very low gradients from the continental source, probably in deep-water channels. Turbidite flows recorded at DSDP Site 241 demonstrate a common sedimentary process of passive continental margins. Sediments deposited by such flows on the open slope are typically found on low angle slopes of 0.1-0.7 degrees. Turbidity currents will continue to flow, however, until they completely run out of slope[12]. They then deposit their remaining bedload by settling in flat-floored basins, an abyssal plain or sometimes slope basins.

Data show this has occurred off Somalia. Regional studies indicate contemporaneous accumulation of massive sand along the African margin, including in the Somali sub-basins. Although it is not possible to establish the exact source area for the massive sand, detailed mineralogy clearly indicates that it is derived from the crustal rocks of Africa and Madagascar (Girdley et al 1974). In the Somali Basin, sediments such as those found at DSDP Site 241 (see Figure 2), are of the same age as the massive sand recovered at DSDP Site 240, and are graded beds interlayered with pelagic deposits. These graded beds have similar compositions as the sands from DSDP Site 240 and apparently represent overbank, or flood, deposits from channelized density flows that bypassed the graded bed area.

The sedimentary section in the Western Somali Basin sampled at the DSDP deep drill sites can be extrapolated southwards to offshore Kenya using geophysical data (for example, Coffin et al 1986). Along the

[11] Pelagic rocks include fine grained sediments, deposited slowly and derived from continental run-off and settling of material from the water column.

[12] Jeff Peakall, Ian A. Kane, Doug G. Masson, Gareth Keevil, William McCaffrey, and Ransome Corney. 2012. Global (latitudinal) variation in submarine channel sinuosity. Geology, v. 40.1, pp 11-14.

Kenyan/Tanzanian margin, there is a wider geological shelf that is, in part, a function of a near-shore build-up in broad sediment aprons, which are cut with numerous gullies and channels. The sediment types present in these aprons are broadly uniform along the margin, although in distribution they generally thicken towards the south.

6 Summary

The Continental Margin of East Africa between the Horn of Africa and southern Kenya has evolved through different styles of geological development. The East African margin is covered by the enormous Somali Basin, which comprises three sub-basins, two of which (the Northern Somali Basin and the Western Somali Basin) form marginal basins.

The southernmost of these, the Western Somali Basin, is characterised in the north by a narrow physical shelf, cut by canyons and gullies which transport sediment out to the abyssal floor via sheet flows and/or via a major fan channel system. In the south, while the shallow water part of the Margin is appreciably wider and less regular, its sediment transportation downslope appears to be characterised by a similar pattern of canyons, gullies and a single major fan channel, known as the Tanzania Channel. The continental blocks (that resulted from the break-up of Gondwanaland) that underpin the basin may differ deep along the margin, but the sedimentary processes of the basin's evolution have been largely the same, and the sequence of sediment filling along the Western Somali Basin can be broadly followed from north to south.

The sediments in the Somali Basin originate from river discharge along the coast, entering the ocean from outflow points along the Somalia, Kenya and Tanzania coasts. The gradient from the coast into the deep basin is gentle and not a barrier to the distribution of sediments through sheet flows. Sediment-laden sheet flows can carry finer grades of the sediments great distances over very low gradients, arguably across the whole basin to the natural ridges and other topographical features in the east that define the

Western Basin. This process continues to this day.

As in most ancient passive margins, the continuous delivery of sediment over the eons to the marginal basin off the East African coast has resulted in enormously thick sediments layers. Such an accumulation provides the opportunity for the establishment of continental-shelf outer limits beyond 200 M to both Somalia and Kenya in an implementation of UNCLOS Article 76, paragraph 4(a)(i)[13]. Notwithstanding this, Kenya has chosen to use the Statement of Understanding/Annex II of the Final Act of the Conference to define its outer limit of its continental shelf, but there seems little doubt that a construction along their margin in accordance with Article 76, paragraph 4(a)(i) would have resulted in a broadly similar location.

Signed:

Dr Lindsay Parson
Maritime Zone Solutions Ltd

6 July 2015

* * *

[13] UNCLOS, Art. 76 4.(a) reads, in relevant part:

"For the purposes of this Convention, the coastal State shall establish the outer edge of the continental margin wherever the margin extends beyond 200 nautical miles from the baselines from which the breadth of the territorial sea is measured, by either:

> (i) a line delineated in accordance with paragraph 7 by reference to the outermost fixed points at each of which the thickness of sedimentary rocks is at least 1 per cent of the shortest distance from such point to the foot of the continental slope…".

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Annex 81

L.N. King, "The Work of the Jubaland Boundary Commission", *The Geographical Journal*, Vol. 72, No. 5 (Nov. 1928)

THE WORK OF THE JUBALAND BOUNDARY COMMISSION: *A paper read at the Meeting of the Society on 7 May 1928, by Capt. E. H. M. Clifford, M.C., R.E., Assistant Commissioner, in the absence of the author, the Senior British Commissioner*

LIEUT.-COL. L. N. KING, R.E.

THE Pact of London of 1915 heralded Italy into the Great War as our ally, and it was the natural outcome of this alliance that the fruits of victory should be shared. In due course it was decided that, in lieu of acquiring an actual portion of conquered territory, Italy should receive the Province of Jubaland, to be shorn from the Colony and Protectorate of Kenya. The cession took place on 29 June 1925, and was signalized by the change of the national flags at Kismayu on that day. It was my lot to be present at this ceremony, and I do not think that our friends and late allies could grudge the feeling of regret that fell upon the small band of Britishers who supported our High Commissioner, the late Mr. J. O. W. Hope, C.M.G., on the occasion.

For exactly a year from the date of cession Jubaland, renamed Oltre-Giuba, existed and flourished as a separate Italian colony under the High Commissionership of H.E. Corrado Zoli. Road construction and building advanced apace, and many great improvements were worked in Kismayu. On 29 June 1926 the colony was absorbed by Italian Somaliland and forthwith completely lost its entity in a number of pre-existent provinces. Signor Zoli, having handed over his responsibilities to the Governor, H.E. de Vecchi, returned to Italy to take up a senior post in the Colonial Office.

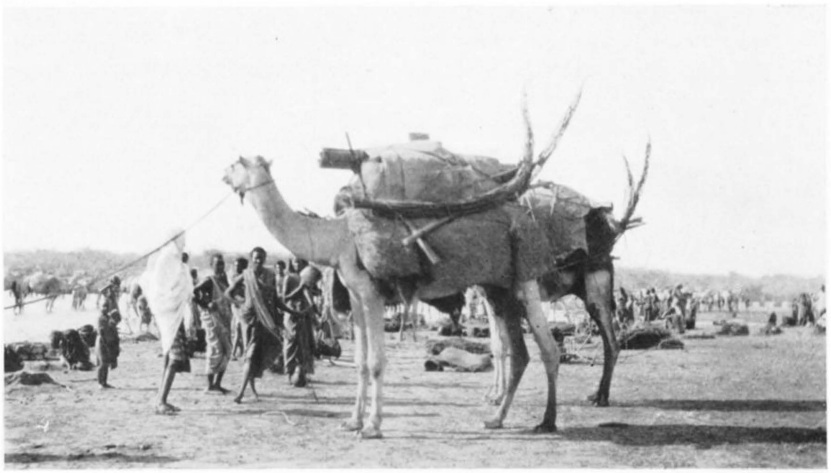
The authority for the cession of Jubaland was the Anglo-Italian Treaty of 15 July 1924, ratified by Parliament on 27 March 1925. Under Article 12 of this treaty there was authorized the appointment of an Anglo-Italian Commission, later known as the Jubaland Commission, with power to investigate and decide certain matters specifically stated in the treaty, and also to decide generally on the manner in which the treaty should be put into force. The Jubaland Boundary Commission, on the other hand, did not receive its charter directly from the treaty, but was naturally a servant of the Jubaland Commission, owing allegiance to it in all matters regarding delimitation, survey, and demarcation of the boundary. It might well be imagined that this overshadowing of the junior commission by another field commission would have led to confusion in many directions, but fortunately during the period of field activities the Senior Commissioners of both nationalities held their titles with respect to both commissions, and on occasions when a decision had been made, it was a nice point as to whether the responsibility was due to the senior or to the junior commission.

Early in 1925 the leadership of the British Section of the Commission was offered to me, and my acceptance was not delayed many hours. Then there followed a month or so before the appointment was finally approved by higher authority, and I devoted a portion of this time to a very careful perusal of the treaty description of the boundary, which ran as follows:

> "From the confluence of the rivers Ganale and Daua, along the course of the Daua upstream to the southern point of the small southerly bend of the latter river in the vicinity of Malka Re ; thence in a south-westerly direction

Ferry on the Juba river at Dolo

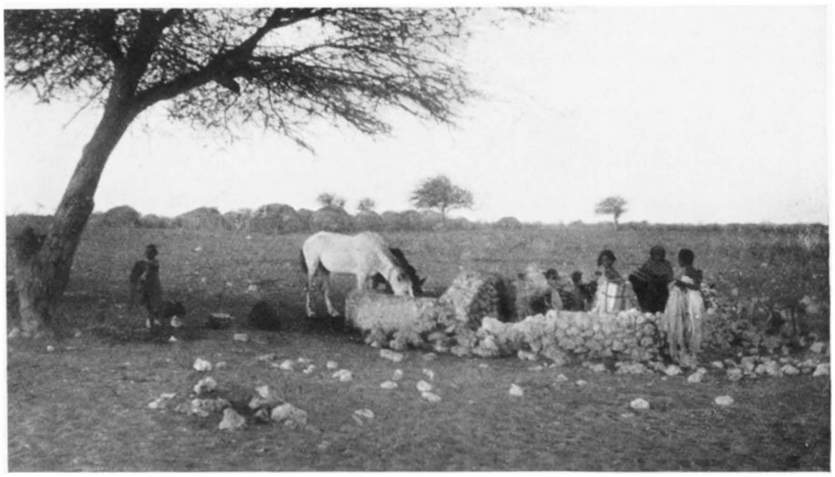
The Webi Daua, looking east from Malka Rie boundary pillar



Somali camels at Yaqali

The Wajer-El Wak road

A road crossing the boundary



A well at El Sadi, Wajer Dima

in a straight line to the centre of the pool of Dumasa; thence in a south-westerly direction in a straight line towards Eilla Kalla (which remains in British territory) to such meridian east of Greenwich as shall leave in Italian territory the well of El Beru; thence along the same meridian southwards until it reaches the boundary between the provinces of Jubaland and Tanaland; thence along that provincial boundary to a point due north of the point on the coast due west of the southernmost of the four islets in the immediate vicinity of Ras Kiambone (Dick's Head); thence due southwards to such point on the coast. Ras Kiambone (Dick's Head) and the four islets above mentioned shall fall within the territory to be transferred to Italy.

"In the event, however, of it being found by the Commission referred to in Article 12 that the well of El Beru does not contain water either sufficient or suitable for the maintenance at that point of an Italian frontier post, then the line, as between El Beru and Eilla Kalla, shall be so drawn by the Commission as to include in Italian territory the neighbouring well of El Shama."

There were several points in this description that promised to produce difficult but interesting problems on the ground, but there was one which appeared to me to need immediate amendment. The inland terminal of the old Jubaland–Tanaland boundary was a little shaky. Measurement on the 1/M treaty map showed the pivotal point of the international boundary in this region as occurring at 0° 50′ S. latitude. My proposal that this latitude should in fact be adopted was accepted without demur, and subsequently this corner point was very conveniently named "Zero Cinquanta."

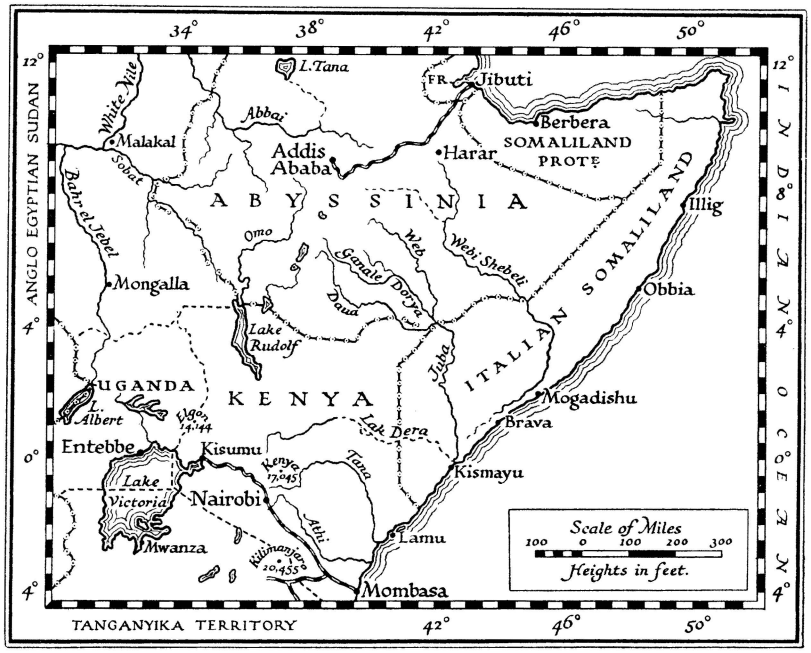
As my knowledge of Jubaland was very small, I requested that I might proceed to Kenya forthwith with one non-commissioned officer and reconnoitre. This request was accorded, and I sailed from England in March 1925 with Sergeant Foster, R.E. Captain E. H. M. Clifford, M.C., R.E., and another non-commissioned officer topographer were earmarked to follow me when required.

Arrived in Kenya, I found that Mr. J. O. W. Hope, C.M.G., the duly accredited High Commissioner for the cession of Jubaland, was on the point of proceeding to Kismayu, and I arranged to accompany him, as this appeared to be the surest way of establishing contact with the Italians. Unfortunately, I was somewhat in advance of useful events, as there then ensued two most unprofitable months of waiting. At last, on 29 June 1925, as already related, Jubaland ceased to fly the British Flag. I then appreciated the situation as follows: The Italian Mission was fast approaching. Work on the boundary would undoubtedly begin in the region of El Wak as soon as the Jubaland Mission had decided which well should determine the "long meridian." Wajer would be the British advanced base in the first instance. I then made my request that my reinforcements should be made available in Kenya as soon as possible. Unfortunately the Kenya Government was not able to abide by its contract regarding the provision of personnel for the Boundary Commission, as originally schemed, to the extent of a Political Officer, a Doctor, and a Topographer.

By good luck, however, I had on my staff as interpreter in Italian to the Senior Commission, Captain E. N. Erskine, M.C., son of St. Vincent Erskine, whose name will be remembered in connection with the exploratory work of the 'seventies. This officer, who had just severed his connection with the

Kenya Government, had obtained wide experience of administration in Jubaland and the N.F.D. whilst soldiering with the K.A.R. I engaged him forthwith as Political Officer to the Boundary Commission, pending confirmation from the Colonial Office, and a most "Admirable Crichton" he proved to be. The deficient topographer was made good from home. At an early period I tried, in conjunction with my Italian colleagues, to obtain the services of a doctor of the Oltre-Giuba Administration. When the news of failure arrived much time had passed, and as the transport question had become extremely acute, I very foolishly decided to save the extra lift involved.

As soon as the Senior Commission began to function an itinerary was



The Jubaland Boundary

The old Province of Jubaland comprised the area between the Juba and the new International Boundary, plus a triangle with vertex in the Lorian Swamp (about the L in Lak Dera) and base the meridional section of the boundary

arranged to Wajer via the Juba River, Serenli, and El Wak. Captain Erskine hurried ahead to Serenli in order to assist Lieut.-Col. Costa over the purchase of camels, whilst Mr. Hope, Sergeant Foster, and I ascended the Juba to the same place in the *Buffin Bird*, a powerful little river steamer named after the mythical bird of Jubaland which is reputed to fly backwards, as it dislikes to have dust in its eyes! The Italian Mission followed us by land a month later and reported two amusing incidents on the way. The survey chronometer, which had been nursed with such infinite care ever since a tram conductor in Florence was requested to drive carefully because of his precious burden, was projected by an angry mule into the bush with such force that it parted company not only with the European who shared its degradation, but also with the

wooden case in which it was securely locked. On another occasion the intrepid Major Zammarano was requested by some villagers to destroy a lion which had worked sad havoc in the countryside. He spent a watchful night in a tree over a specially prepared bait, but to no purpose, for the lion preferred to stroll to the other side of the camp, where he deliberately killed and ate his fill of a grazing camel belonging to the Commission.

The Italian Section of the Boundary Commission was now completely assembled at Serenli and consisted of Lieut.-Col. Giovanni Dotto in command, assisted by two topographers, Captains Armando Marino and Cosimo Bertacchi, and a wireless operator, Sergeant-Major Angelo Branco. It will be noted that there was no Political Officer, no escort officer, and at this time no special transport officer.

As the British Section was now also in Africa, though not assembled, it is convenient here to detail its full composition: Senior Commissioner, myself, Lieut.-Col. L. N. King, O.B.E., R.E.; Assistant Commissioner, Captain E. H. M. Clifford, M.C., R.E.; Political Officer, Captain E. N. Erskine, M.C.; escort officer, Lieut. C. B. G. Watson, K.A.R.; wireless operator, Mr. A. Kane; topographers: Sergeant C. W. R. Foster, Corporal L. T. Higson, and Corporal J. Keleher, all of the Royal Engineers. In addition to his duties as Political Officer, Captain Erskine was responsible for all matters pertaining to transport, supply, water supply and discipline, other than military discipline.

Up to this date all arrangements had been made in anticipation of Lieut.-Col. Dotto's arrival, and it was fortunate that he was able to accept them in every detail. As soon as the transport was ready we bade adieu to our very true friend, Lieut.-Col. Costa, who had entertained us so kindly for many weeks, and the two Missions moved in echelon to Wajer, via El Wak, along one of the oldest slave routes in Africa.

Two days after my arrival in Wajer I left my Italian colleagues in the sympathetic charge of Captain Mahoney, who was administering the station and district, and made a flying visit to Nairobi by car, bringing back with me Captain Clifford and Mr. Kane, the two non-commissioned officers being left on the road to expedite the forwarding of stores. The question of transport between Nairobi and Wajer had caused Captain Clifford immense trouble. He was eventually compelled to make private motor contracts at ruinous prices, as the K.A.R. transport was more than fully occupied with the change of administration from military to civil. My return to Wajer was most opportune, as I had evidently been racing the "short" rains which now, November 1925, broke with exceptional violence and rendered the earth road behind me quite impassable for many weeks.

Mr. Hope, whose work with the Senior Commission was concluded for the time being, was just able to escape with the returning car, and this was the last sight I ever had of my very dear friend.

Previous to Mr. Hope's departure the Jubaland Commission had decided that the well of El Shama, and not that of El Beru, should define the boundary in this region.

From personal observation of the type of country already traversed from Serenli, combined with comparative information supplied by Captain Erskine regarding the various portions of the frontier, it was apparent that the topo-

graphical conditions were as follows: Hills from Malka Rie to El Wak and slightly farther south; then an immense plain extending to the sea; a ridge or two of coral outcrop near the coast. The vegetation, dense camel thorn about 12 feet high from Malka Rie to Zero Cinquanta; thence rather more open gladey country to Jibichilaowa; then a dense tropical forest, giving place again to camel thorn near the coast. The conditions of water supply were likely to prove extremely precarious, as there was no permanent water adjacent to the boundary other than the wells of Wajer Bor and the El Wak group; elsewhere surface water after rain was all that could be expected.

In a country overgrown for the greater part with dense bush and harbouring nomad tribes by whom trespass and pillage were considered virtues, it seemed obvious that, in the interests of subsequent administration, the boundary should be demarcated most clearly. The British proposal that it should be marked throughout its length by a lane cut through the bush was accepted by the Italian Mission after long deliberation.

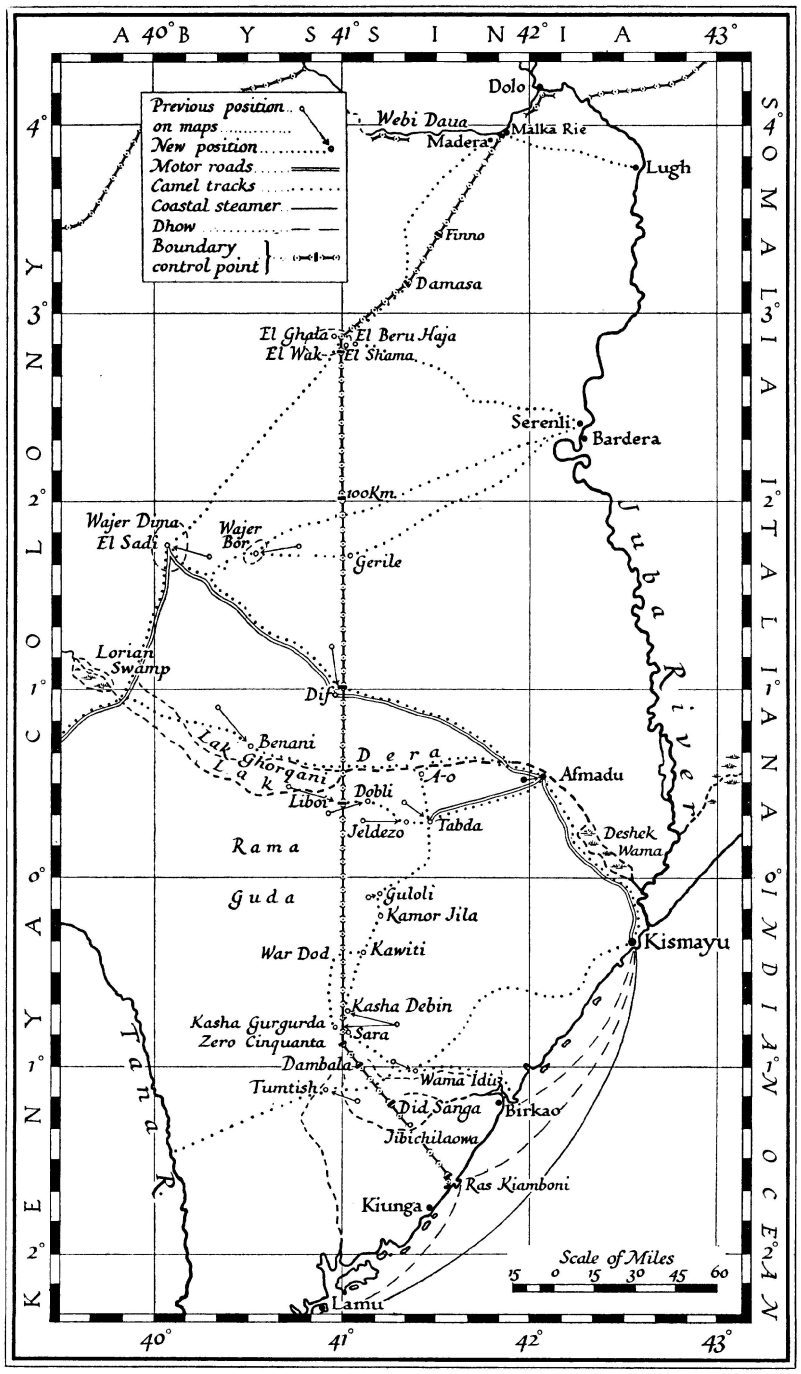
Further arguments in favour of the proposal were that such a line would be unmistakable to the local tribes, that the bush was of a very slow-growing variety, that the lane once cut would undoubtedly be kept open by natives driving their stock between pasturages, that it provided the first element of a motor road, and that it assisted the boundary survey.

On first consideration it appeared reasonable that triangulation might be adopted with profit in the north, that accurate traversing would be necessary elsewhere, and that the whole should be stiffened by astronomical determinations of position and direction. On closer examination it transpired that triangulation was inadvisable for both technical and economic reasons. Technically it failed as a proper scheme, in that plane-tabling was impossible owing to the universal thorn bush, and the topographical detail, consisting chiefly of tracks and water-holes, could best be tied to points on the actual boundary-line by traverse. Economically it failed owing to the difficulty of rapid transport, supply, watering, and defence measures for the various parties in this dry and inhospitable country, where concentration of force and effort was clearly indicated.

It was therefore decided that all the main control points should be fixed astronomically in combination with wireless time signals, and that the topography should be surveyed normally by compass traverse, supplemented when possible by the plane-table or theodolite, and that a key for the topography should be obtained by running a taped traverse between main control points. The resulting field sheets were to be on the 1:100,000 scale with a vertical interval of 30 metres, and were to cover a strip of country extending 4 kilometres on either side of the boundary-line. Both Missions were to fix the main control points sympathetically, but the topography between El Wak and Malka Rie was to be shared, as an experiment, each Mission being responsible for its own side of the boundary, a scheme which was very soon discarded.

Having made these weighty decisions, the Italian Mission proceeded to El Wak, whither I followed them shortly in company with Mr. Kane. Captains Clifford and Erskine remained behind at Wajer until the supply question was completely solved. At El Shama I made the first astronomical fixation jointly

Annex 81



The New Western Boundary of Italian Somaliland

with the Italian Mission, and Sergeant Foster with a self-contained unit started cutting and beaconing the boundary-lane in a southerly direction. I then proceeded to Damasa and fixed that point astronomically in conjunction with my Italian colleagues, returning to El Wak in time for Christmas celebrations. Sergeant Foster's party then reversed the direction of its work and started cutting towards Damasa.

Meanwhile the Italians had fixed Dolo and Malka Rie, and we shortly followed suit with regard to the latter point. The fact that there was no most southerly bend of the river at this place did not seriously upset matters, as the Commission quickly decided on a convenient starting-point for the boundary which would leave Malka Rie in Italian territory.

No sooner was this last operation completed than Lieut.-Col. Dotto informed me that his local Government considered his programme of work to be too generous in every direction, and had given him definite instructions regarding curtailment.

I immediately cabled home to the Colonial Office requesting support for the fuller proposals, and arranged with Lieut.-Col. Dotto a temporary scheme which would permit of reversion to the original programme if matters shaped their course as we hoped. The British were to fix a point near the hill of Finno alone, and one or two points to the south of El Wak in conjunction with the Italians. The Commission was then to leave the British non-commissioned officers surveying and demarcating in the north (though of course Lieut.-Col. Dotto did not participate in these instructions), and to proceed to Ras Kiamboni, where the boundary breaks out to the coast.

Immediately after having made this compact, Lieut.-Col. Dotto was compelled, through ill health, to break off his connection with the Commission and return to Italy. We were all very sorry to lose our courteous and friendly collaborator.

The interim programme which we had arranged was of necessity further abridged after the fixation of Finno, as the Italians found their transport and supply in such a bad state that an immediate return to Kismayu was imperative. The British Mission moved via Wajer, Dif, and Afmadu, and at the latter place met the new Italian Senior Commissioner, Major Aniello Napolitano.

On 3 April 1926 the joint headquarters was assembled at Kismayu, and on the 8th the High Commissioner called a conference at which he informed the Commissioners that the Italian Government had reconsidered its views regarding the survey and demarcation of the boundary. He then advanced certain proposals which were sufficiently close to those originally formulated to warrant my acceptance.

We then sailed by dhow for Kiamboni, leaving Captain Erskine behind to purchase more camels, and to close the Wajer base in favour of Dif. The work at Kiamboni involved the selection of a point on the headland on to which the boundary-line emerging from the interior would be directed, to fix this point astronomically, to unite the small islands and various other points in a small triangulation scheme and to demarcate the boundary in its small deflection near the coast. All this was completed by the end of May 1926, when we returned to Kismayu. My companions then proceeded to Dif,

where they resumed work. I, unfortunately, was put out of action for some time by ill health, and was unable to join headquarters before July 13, when I found the situation as follows: The British non-commissioned officers had completed survey and demarcation to a point 100 kilometres south of El Wak, and had then betaken themselves to Dif some days in advance of headquarters for economic reasons. About 90 per cent. of the camels had died, and Captain Erskine was still struggling with the replacement problem. Captain Clifford, in conjunction with the Italians, had fixed a control point. Lieutenant Holmes had relieved Lieutenant Watson in command of the escort.

It was then decided that the British Mission should fix a control point where their non-commissioned officers had interrupted their work, that survey and demarcation should be continued thence southwards by this latter party, and that the Italian Mission should survey and demarcate northwards and southwards of Dif with two field parties. These decisions were then put into operation.

As soon as the two parties working north of Dif had joined hands, the Italians accepted responsibility for demarcation and survey southwards as far as Zero Cinquanta, whilst the British were to complete the line from that point to the sea.

Based now on Tabda, the British fixed the Liboi point alone, the Guloli point in conjunction with the Italians, and the Dambala point alone. The non-commissioned officers, who had been filling in time with a little work on the line at Guloli, were then put in at this last-mentioned point and started working towards Zero Cinquanta.

At this period the transport question began to assume the difficulties that had been predicted, our camels dying at the rate of approximately one per diem owing to infection by "baal" fly. The water question was also becoming somewhat alarming as the local rain pools were reduced almost to mud, and the "short" rains, which were long overdue, threatened to fail completely.

Towards the end of October the two headquarter parties assembled at Zero Cinquanta, and by November 5 this important control point was jointly fixed. From this date immediate contact with the Italian Mission was lost until the end of their field activities.

The British headquarters remained at Zero Cinquanta until their demarcation party had closed on that point. Both parties then moved south-east, the former proceeding to the Italian post of Wama Idu, where a base had now been formed, and the latter cutting from Dambala towards the sea. The rains had now broken, and the flat parched land became a veritable morass, thus rendering the supply duties, with rapidly disappearing camel transport, increasingly difficult.

Abreast of Wama Idu the nature of the vegetation changed completely, the normal Jubaland bush giving place to occasional large grassy expanses. In such instances the "cut" was not considered to be sufficiently impressive and was therefore supplemented by intervisible cement pillars.

At this time Lieutenant Holmes, the escort officer, very kindly volunteered to proceed to Lamu, there to recruit labour, himself start a fresh No. 2 demarcation party working from the coast, and at the same time to replenish the labour suitable for No. 1 demarcation party. This proposal I gratefully

accepted, and after receiving instruction for a few hours in the use of a theodolite, Lieutenant Holmes started on his special mission. Meanwhile the British headquarters proceeded to "cut-head" and there, alone, fixed the control point Did Sanga.

Since many tales were current as to the inhospitable nature of the country ahead, Captain Erskine set out on a reconnaissance from this camp, and after working his way with a compass through almost impenetrable bush, he joined hands with Lieutenant Holmes, who was well started on his task of demarcation, and returned to camp on Christmas Day with most valuable information, including traverse sketches. The report which was credited by the native staff that there existed a dense forest, harbouring masses of ferocious elephants and buffalo, was apparently mythical, though the vegetation was certainly very much thicker than had been experienced hitherto, and contained patches of trees of considerable girth.

On December 30 I quitted the field party in order to confer with Major Napolitano at Kismayu, and left the conduct of the technical work in the hands of Captain Clifford: the supply, transport, political and other services being under Captain Erskine as hitherto. Mr. Kane quitted the field at the same time, as his most admirable work in connection with wireless reception was now completed.

Major Napolitano reported that the Italian demarcation party had reached Zero Cinquanta on December 12, that the whole Mission had then returned to Kismayu, that Captains Marino and Bertacchi had sailed for Europe in January, and that he was due to follow them on February 9. It was then arranged that the Commission should reassemble in Florence early in May 1927.

On February 3 I took steamer to Lamu, whence I proceeded immediately to Kiamboni in order to establish touch with my field parties. I found that Lieutenant Holmes of the escort had cut 17 kilometres of the boundary, unassisted by any other Europeans, and that he had held his direction with accuracy, the whole constituting a performance of great merit. The direct result of this officer's action was a saving of approximately one month in the duration of the work. On February 10 the junction between the two working parties was effected, and on February 18 I dispatched a telegram to the Governor of Kenya to the effect that the boundary was then completely demarcated.

The evacuation of personnel and stores to Kiamboni was effected by February 24. This was mainly by porter transport, as, owing to disease, less than twelve very weak camels remained out of some 250. Lamu was reached by dhow on February 25.

From February 25 to the dates of sailing in early April the Mission busied itself in Lamu, Mombasa, and Nairobi with sales, packing, accounts, etc., and with the preparation of tracings of such portions of the boundary survey as were effected by itself. The British non-commissioned officers sailed from Mombasa on 2 April 1927, and thus concluded their labours with the Commission. Four days later Captains Clifford and Erskine and I set sail from the same port for Italy.

On April 28 the Commission resumed its duties in Florence, and as the

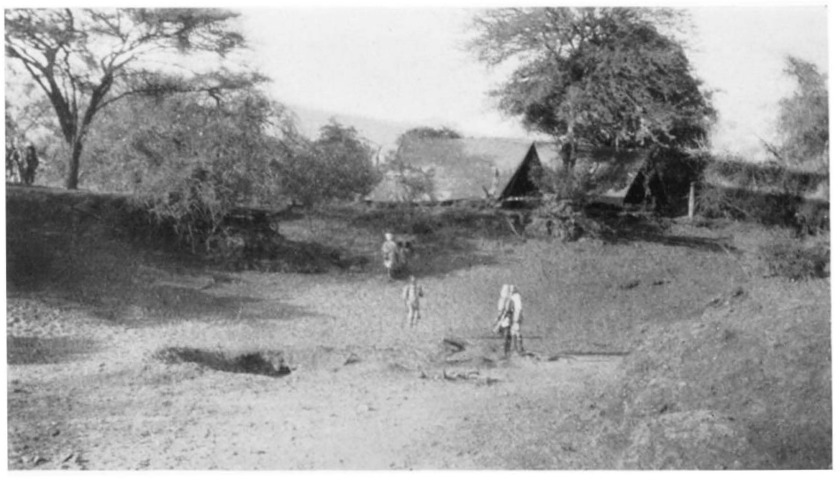
Annex 81

Wireless receiving set

One of the A-o wells

"River Durnford"

Jirma



Water-pits, Baghtili, Mada Marodi

Boundary pillar on coast, south of Ras Kiamboni, and islets of Dhiwa Dhamashaka

majority of its members were at this time accredited to the Senior Commission also, they found themselves confronted mainly with political business. Of boundary work there was little more to occupy us beyond the plotting of the Italian field work and the reproduction of the final map. General Vacchelli very kindly accommodated us all in the Istituto Geografico Militare, of which he is the Chief, and our grateful thanks are due to him for this courtesy and for undertaking all the processes of reproduction from the fair drawing to the final printing of the map.

The end of my narrative appears to be a fitting place to say that our relations with the Italians were of the most friendly, and in some cases almost affectionate, nature. It would take much to efface the memory of the impartiality and friendship of H.E. Signor Zoli both in Africa and Italy, the kindness and hospitality extended to us by the Officers' Club in Kismayu, by Lieut.-Col. Costa at Serenli, by the Marchese della Stufa at the humble station of El Beru, and by the administrative officers of Afmadu. Within the Commission we were the happiest of families, free from the usual international suspicions, and it would be a sad day for me were I to know that I would not see every one of these good friends again.

Finally, I would say a word regarding the help afforded to the Commission by our own people. In Kenya I found most ready assistance everywhere, but there were certain individuals who added a large measure of personal interest and friendship to what might otherwise be considered as a duty. My friends of olden days in the Survey Department, Mr. Baker and his staff officer Mr. Williams, did not always wait to be asked but often sought ways in which they might help us. Captain Mahoney at Wajer, well-nigh swamped with work due to the coming change of administration, dreaded the approach of the Commission, and yet when we materialized he was most open-handed in his hospitality and general help. Captain Legge, and later Mr. Pease, at Madera made us thoroughly realize that to help us was a real pleasure. Mr. Platts was of very material assistance to us over the question of labour in the later stages of the work, and he and his wife extended to us the first hospitality of real civilization whilst we were winding up affairs in Lamu. Mr. Doherty in his capacity as Government Coast Agent at Mombasa must have thought unkindly of us on many occasions, as we threw a very heavy burden upon him with respect to general agency services. Lastly I mention my good friend Mr. Dick, the whilom British Consul at Kismayu, who most willingly, and quite outside the call of his office, performed most laborious duties for us, and who ever held the doors of his bungalow at Halwalud wide open to any member of the Commission. As regards the members of my staff on the Commission, I would like to give full rein to my praise, but let it suffice that one and all gave of their very best under most trying conditions, and by their excellent team work and unfailing loyalty brought to a successful issue a small task in the interests of Empire.

APPENDIX A. TRANSPORT AND LABOUR

Two main supply bases were established, at Wajer and Kismayu, and the lines of communication connecting these with the civilized world and also with the advanced bases, are shown on the map. Connection between the advanced bases and the field working parties was effected by camel, Europeans were

mounted on mules whenever possible, but this was rarely the case when actually in the "cut," owing to the water shortage.

Owing to the insufficiency of camels in the Wajer District, permission was obtained for purchases to be made at Serenli to the extent of 100. At a later date the full complement of 250 and replacements had to be made good from the very scanty supply available in Kenya. A camel troop comprised 50 beasts in the charge of two Lance-Naiks, and each syce was responsible for three camels.

In the north animal mortality was very light, but directly the southern area was reached and the *baal* fly season began, deaths amongst the camels that had to be kept in the infected zone developed enormously and eventually resulted in the almost complete extinction of our animal transport. In the last stages of boundary demarcation a tsetse belt was encountered, and this caused the deaths of the remaining riding-mules, which had necessarily been converted into baggage animals some time previously, and of the two donkeys which had been bought in an effort to save the situation. The final extraction of the working parties was actually effected by the natives who had been cutting the boundary.

As regards labourers, the greatest difficulty was experienced in inducing any of the Bantu tribes to leave their comfortable well-watered lands and to face the waterless regions of Jubaland and the hostile and aggressive Somali tribes, of which they lived in constant fear. The Somalis themselves, who overran the whole territory, were far too proud to undertake any sort of job entailing manual labour. The first consignment of about twenty-five men was enlisted in Nairobi, chiefly from "corner" boys, as the better class of native preferred the higher wages to be obtained on shooting expeditions. However, a course of regular work combined with good feeding and strict discipline changed a somewhat miserable-looking gang into a cheerful, contented, and well-developed brotherhood of hard workers. After a year of continuous employment this gang was relieved by another, recruited by Mr. Platts, the District Commissioner at Lamu, which served for the remaining six months of the field work. Fresh drafts were added towards the end of operations, thanks again to the kind services of Mr. Platts, assisted by my escort officer, Lieutenant Holmes.

As special police, eight members of the Jubaland Armed Constabulary (Somalis) were retained on disbandment of that corps. This small body proved itself most efficient, well disciplined, and trustworthy. They were used for policing the camp and for making small purchases of livestock for both food and transport.

It was deemed expedient, for many reasons, but largely on account of the doubtful attitude of the local tribes, to clothe the entire native staff in uniform, and to place them under strict military discipline. All N.C.O. syces bore arms.

APPENDIX B. SURVEY INSTRUMENTS

The wireless receiving set was specially arranged by the Marconi Company at the shortest of notice and served its purpose most admirably. The details of the set were as follows: A four-valve long-wave heterodyne receiver of range 10,000–25,000 m. Two transformers were of ratios 1 to 6 and 1 to 7 respectively. Condenser was of 0·001 mfd. value. The set was mounted in a strong teak box, 21 in. × 12 in. × 12 in., of total weight 20 lbs.

The valves used were "Weco" with American type base, manufactured by the Western Electric Co., Ltd., now the Standard Telephones and Cables, Ltd. They were found very satisfactory, and owing to the small consumption of current (0·25 amp.) highly suitable for working off dry cells. They are very robust, and being small are easily packed for transport.

The headphones (Sterling 4000 ohms), supplied by the Marconiphone Co., Ltd., were entirely satisfactory.

Messrs. Siemens Bros. & Co.'s Type No. 53 Inert Cell gave satisfactory results for filament batteries, but did not stand up well to the roughness of camel transport. It was frequently found that the positive element inside the cell was broken.

Smaller cells by the same firm, Type No. 53, were found to be excellent, and were also used for theodolite diaphragm illumination and for azimuth lamps. They are very light and therefore easily transported, even by porter.

Silvertown I.J. Inert Cells, supplied by the India Rubber, Gutta Percha, and Telegraph Works Co., Ltd., were used for high-tension batteries and stood up well to the work and conditions.

The aerial used was 100 feet of 7-strand bare copper wire, with a lead in of 20 feet.

A 20-feet ash mast, in two 10-feet sections, was used during the first six months, but had to be abandoned to relieve the transport.

The earth terminal was connected to a 3-feet copper tube driven into the ground a few feet from the receiver.

The chronometer was by Thomas Mercer, a special type, non-swinging, with a microphone arrangement by means of which the half-second ticks were made audible in an ordinary headphone. Although this timepiece did not exhibit a very good rate, it served its purpose most admirably and was largely responsible for the good results obtained in longitude determinations.

The chief theodolite, which was used almost entirely for astronomical work, was an 8-inch micrometer type, by Troughton & Simms. Mr. A. G. Baker, the Director of Surveys of Kenya, very kindly lent me this instrument, but I am afraid I cannot give it a very good character, as the trunnion supports had spread and caused us much trouble.

The remaining instruments and also the camp equipment were of types to be found on any normal survey expedition, and I do not propose to occupy time in a description of them.

APPENDIX C. SURVEY AND DEMARCATION

The control of the boundary survey was based primarily on determination of position and of azimuth effected astronomically in combination with wireless time signals. These fixations rarely occurred actually on the boundary-line, but were connected thereto either by a traverse or by a small local system of triangulation. Subsidiary control was provided by surface measurements along the boundary-line adjusted between main control points, direction being maintained by means of a tracing theodolite. The value of a control point was much enhanced if its fixation was effected in advance of demarcation.

When the British and Italian Missions co-operated in fixing a point their camps were within reasonable distance of each other, and the comparisons of their results were made by means of short theodolite traverses.

All British latitudes were measured by the circummeridian method, time by east and west stars, and azimuths by altitudes of stars on or near the prime vertical. Longitudes were obtained by the ordinary relative method, *i.e.* the difference between the chronometer errors on local and Greenwich times at the same epoch.

The night's programme was generally so arranged that the results of the time observations when meaned gave the chronometer error exactly at the epoch of wireless comparisons, thus obviating the necessity of considering the rate of the chronometer.

The method of measurement of chronometer times during a time observation was possibly original. The chronometer stood on the booker's table. The observer wore a headphone by means of which the chronometer beats were brought to his ear, and he was thus able to measure the time of the star's passage as well as its altitude, though the responsibility was shared to a certain extent by the booker. The procedure was as follows: Shortly before contact the observer gave the warning "stand by," and, slightly later, "time." The booker then called out the values of three successive second beats as 2, 3, 4, or 9, 10, 1, never calling a higher value than 10. The observer, having picked up the beat value, continued the count himself, recommencing at 1 if he should have occasion to pass 10. Immediately after contact he called his time to the booker to the nearest decimal of a second. It was the job of the booker to watch the chronometer so that he could complete the value called by the observer, with regard to the particular group of 10 seconds in which it fell and also with regard to the correct minute.

Wireless telegraphy was employed primarily for the reception of the long-wave time signals, but also for press, and latterly for the interception of telegrams addressed to the Commission.

The time signals employed throughout were the rhythmic series of Paris Observatory transmitted by Bordeaux (LY). These fitted in very conveniently at about 22 h. 30 L.M.T., in the middle of astronomical observations, while the morning signals provided a most convenient check on the chronometer. These were also the strongest signals emitted from any station.

The series transmitted by Lyon (YN) were tried several times in 1925, but were weaker. They were discontinued in 1926. Those from Nauen (POZ) were also tried, but were inconvenient, as at 14 h. 30 L.M.T. interference from atmospherics was often considerable, and by 2 h. 30 astronomical work was long since completed.

The new procedure introduced by Paris Observatory in 1926 was a marked improvement on the former system. Reception and comparisons were facilitated, while computations were considerably simplified.

In the earlier stages of the work time signals were taken in the operator's tent, but as this involved carrying the chronometer backwards and forwards from the astronomical station in the middle of the observations, a 100-feet headphone lead was later utilized to enable the signals to be received at the booker's table without moving the chronometer.

Atmospherics were less of an obstacle than had been expected. On only one occasion did they prevent the reception of the time signals. They were at their worst about a month prior to the breaking of each rainy season, but once the rains had broken there was no serious interference. From 14 h. to 22 h. L.M.T. was the worst period of the day, after which atmospherics gradually died off until at 2 h. 30 L.M.T. they were almost nil.

Rugby annoyed us excessively by sending out press at 20 h. G.M.T. Until the rhythmic beats of the time signal from Bordeaux started, Rugby was silent, but simultaneously with the start of the beats Rugby opened up, and, owing to its power and the insufficient difference in wave-length, could not be eliminated, tuning out at such a period not being feasible with our receiving set.

As I have already stated, the wireless comparisons were effected by means of the rhythmic series of signals emitted from Paris Observatory via Bordeaux. With the apparatus at our disposal we were able to bring the Paris signals into one ear-piece of a headphone and the local chronometer ticks into the other, thus rendering the recording of synchronizations an easy matter.

As regards the results of our fixing of control points, interest will naturally

focus on the determinations of longitude. Twelve points were fixed, astronomically, on the line (*vide* the map). The mean number of independent British values obtained at a station was 3, and the mean extreme range at any one station was 00·26s. The Italians co-operated in fixing seven of these stations, the greatest discrepancy between their values and ours being 211 feet, the least 5 feet, and the average 54 feet. Each longitude value depended on eight observations for time; four before and four after reception of time signals. Captain Clifford and I shared the observing and booking about equally, but the responsibility for each individual value of the longitude was not divided.

I will now discuss the processes of demarcation and survey simultaneously. The progress of the party responsible for these two duties I have already related in my general narrative. The actual line was driven by theodolite with the greatest care. In view of the fact that the main control points were fixed astronomically, it could not be expected that two demarcation parties approaching each other from opposite directions should exactly meet without some final adjustment of direction. The procedure generally adopted was as follows:

When the two parties were separated by about 8 kilometres, a Verey Light was fired at night from one of the "cut heads" and was observed through a theodolite set over one of the alignment pickets near the other "cut head." Then, on the assumption that both parties had been preserving the correct azimuth, both directions were equally deflected in accordance with the angle observed with the theodolite. This procedure was repeated when the "cut heads" were about 4 kilometres apart. The final adjustments were made in one or more corrections based on observations to a flag on a tall pole.

Measurements along the boundary-line were all surface measurements, effected with an ordinary steel tape. All crossings of tracks were noted in passage, and these served as a control to the topographical work.

The ordinary compass sound and wheel traverses were adopted in the first instance for surveying tracks and other detail. These traverses when plotted were adjusted to fit control points. The British non-commissioned officers, however, soon developed a system which tended to greater speed. They first trained themselves to a uniform rate of walking, and then by experiment established a time scale which automatically absorbed the increased length of each leg due to curves met on the track, and allowed them to plot direct on to the field sheets. It was found that the normal traverses fitted the control work without further correction.

The form lines defining the relief of the country were based on barometric heights, corrections being taken from a table prepared by the non-commissioned officers after careful observation of the diurnal wave.

Plane-tabling could not be adopted except in the hilly country towards the north and on the coastal belt, the flat plains elsewhere rendering it quite inapplicable.

The total length of the boundary is 681 km. Of this 407 km. were demarcated by the British Mission and the remaining 274 km. by the Italian Mission. Each mission made a topographical survey along those portions of the boundary which it demarcated.

The lane which was cut throughout the length of the boundary was approximately 12 feet broad and clear of all loose brushwood, but, in the first instance, was not cleared of stumps. However, since the departure of the Commission from Africa, much of this lane has been adapted to a motor road. In addition to cutting the lane, the demarcation parties distributed pillars and cairns throughout its length. Main pillars were built at both terminals of the boundary, at all pivotal points, and at approximately every intermediate interval of 30 kilometres.

These were numbered consecutively from the north. Each pivotal pillar was furnished with two small pointer pillars, one set in each direction of the boundary. One large cairn was built where the boundary passes the flank of Finno. Small cairns and pillars were built at approximately every 10 kilometres and elsewhere to accentuate the boundary where it crosses tracks of any importance and also where it crosses grassland in which the lane becomes ill defined. The map produced by the Commission shows the particular type of beacon used in each instance.

In the north the pillars were built of rough stone set in cement, but in the south they were rendered more shapely by building them within a wooden mould. In some cases the cores had to be made of tree-trunks and even of bottles owing to the absence of stone.

The spelling of place-names for the Boundary Map presented a problem that was not settled for some time, as the Italians are not familiar with the R.G.S. II. system, and Italian spelling would be meaningless, or even misleading, to most British officials. The problem was rendered more intricate by the fact that five different languages were involved. It was ultimately decided that for the names of places lying in British territory the R.G.S. II. system should be used, and Italian spelling for those in Italian territory; while important localities, such as El Wak, lying astride the boundary, should be given in both methods. This decision, carrying with it the preparation of a gazetteer, entailed an enormous amount of work on the part of Captains Erskine and Clifford.

The following are some examples of divergence between the two systems of spellings:

R.G.S. II.	*Italian.*
BAKAJA OBE	BACCHEG OBBE
BUBUSH	BUBUSC
DHIWA DHAMASHAKA	DIUA DAMASCIACA
GHAIYAG	HAI-IAGH
GHAWL	HOHL
JINJILI	GIÈNGIOLE
KITUNGENI	CHITUNGHENI
NYURA	GNIURA
YAQALI	IACLE

Note by Captain Clifford.

The river name which we have spelled Daua is given in the First List of Names in Abyssinia, published by the P.C.G.N. as Dawa, pronounced Dáwā, with the warning " not Daua." This pronunciation is certainly not correct near the Kenya frontier. The name is pronounced as the first two syllables in "dowager," the second being nearly mute, and should by the P.C.G.N. rules be Daua. It may not be an Abyssinian word.

The present inhabitants of the area between the Juba and the river in question—*i.e.* north of the latter—are Somalis, but they are of course comparatively new-comers, having displaced Galla tribes. However, many of the place-names in that part of the world are Somali, not Galla.

We got our names into shape by means of a Committee, consisting of two officers (one of whom knows a little Somali), cross-examining an assortment of natives selected from varying tribes and sections, and including Somalis from British Somaliland. For pronunciation we went by the local people, provided the various tribes and sections agreed, and then followed a discussion of the language and meaning of the name until all were agreed. In this way we

took advantage of tribal jealousies—agreement would not be reached unless the statements were correct.

"Webi," is certainly Somali, possibly a dialect. But it is a word one frequently meets, *e.g.* Webi Shebelli, the main source of irrigation of Italian Somaliland, which means "the river of the place of leopards." "Daua," as far as I can recollect, was not quite "Look at it," but perhaps rather "Look," or "Behold." This is also perhaps a dialect, but was emphatically stated to be Somali. The Somali language has plenty of dialects.

NOTES ON JUBALAND: *Read in part at the Meeting of 7 May 1928 with the preceding paper, by*

CAPTAIN E. H. M. CLIFFORD, M.C., R.E.

THE outstanding characteristic of the topography of Jubaland is its featureless flatness. At Dolo, where the Juba leaves Abyssinia on latitude 4° 10′ N., the altitude is only just over 200 m., though the mouth of the Juba is on latitude 0° 15′ S. The greater part of the country is covered with thorn bush, on the average about 11 to 12 feet high.

To consider the country in greater detail. At Malka Rie on the Webi Daua the altitude is about 300 m. Proceeding southwards we climb gradually through Gogal until reaching the northern escarpment of the Dirhara plateau, the western edge of which coincides with the boundary, and along which lie the highest points—about 700 m. altitude. We then drop gently until reaching the southern escarpment which takes us down from 500 m. to 300 m. In this zone, just in British territory, lies Bur Wein, probably the highest hill in the country, 825 m. This escarpment is quite rugged, though covered with dense thorn bush.

We now reach the plain of Central Jubaland, very gently undulating. As we progress southwards, we see less and less camel thorn and the bush is generally less dense. About 1° N. we meet a new feature, a "lak" or watercourse—dry, of course, except after heavy rain—in the bed of which the vegetation is denser, but of a sappy nature and mixed with long grass.

The Lak Dera basin runs roughly east and west about 0° 30′ N. through a zone of open spaces. This watercourse is shown on the map quite rightly as an important water feature; but water ran in it in the summer of 1926 for the first time for twenty-two years. Its course is shown entirely incorrectly on hitherto existing maps.

South of the Lak Dera on the British side is Rama Guda, uninhabited and feared by all natives as a veritable " land of thirst."

About 0° 50′ S. we enter another zone of open country, park-like and traversed by a number of "laks," some open, some bush-covered, ending abruptly at a belt of extremely dense sappy forest known as the Bada. In the middle of this is a gap, in which lies the Durnford River of the older maps, actually a well-defined watercourse whose only name is the Lak. The Bada gradually gives place to a forest of "bean trees," which in turn yields to thorn bush on reaching the coastal hills. These rise to about 60 m. and are some 10 km. across.

Annex 82

U.S. Department of State, Bureau of Intelligence and Research, *International Boundary Study No. 134: Kenya-Somalia Boundary* (14 May 1973)

International Boundary Study

No. 134 – May 14, 1973

Kenya – Somalia Boundary

(Country Codes: KE-SO)

The Geographer
Office of the Geographer
Bureau of Intelligence and Research

INTERNATIONAL BOUNDARY STUDY

No. 134

KENYA – SOMALIA BOUNDARY

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The Geographer
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Bureau of Intelligence and Research

KENYA – SOMALIA BOUNDARY

I. BOUNDARY BRIEF

The Kenya - Somalia boundary is about 424 miles long. In the north the tripoint with Ethiopia is located on the thalweg of the Daua, and in the south the boundary extends to the Indian Ocean. It is demarcated by boundary pillars and consists of a series of straight-line segments.

II. HISTORICAL BACKGROUND

Initially the Kenya - Somalia boundary delimited British and Italian spheres of influence in East Africa between the Indian Ocean and the Daua (Daua Parma, Dawa). In 1887 the British East Africa Association was formed for the development of the British sphere of influence, and it obtained a concession from the Sultan of Zanzibar for part of his mainland territories. During the following year the Association was incorporated under a Royal charter as the Imperial British East Africa Company, and it assumed control of a large area now included in the present-day states of Kenya and Uganda.

Also in 1887 the military forces of Italy and Ethiopia clashed at Dogali, which resulted in the treaty of Wichale (Ucciali) the following year. Almost immediately the terms of the treaty were a source of disagreement between the two states. Italy considered Ethiopia to be an Italian protectorate, and that it had the right to administer Ethiopian foreign policy. Ethiopia interpreted the treaty to mean that the Emperor could request Italian advice and help in foreign affairs if he so desired.

Beginning in 1889, through a number of treaties of protection with the Somalis, Italy made various claims to the coast of Somalia along the Indian Ocean. In addition the Imperial British East Africa Company sublet the ports of the southern Benadir Coast north of the Giuba to Italy, ports which it held in lease from the Sultan of Zanzibar. In 1891, Italy, acting in the role of protector of Ethiopia in accordance with its interpretation of the treaty of Wichale (Ucciali), reached an agreement with the United Kingdom on their respective spheres. An Anglo - Italian treaty signed at Rome on March 24 of this year delimited a boundary as follows:

> 1. The line of demarcation in Eastern Africa between the spheres of influence respectively reserved to Great Britain and Italy shall follow from the sea the mid-channel (thalweg) of the River Jube [Giuba] up to latitude 6° north, Kismayn [Chisimayu] with its territory on the right bank of the river thus remaining to England.

In 1892 the Sultan of Zanzibar ceded the ports of Brava, Merca, Mogadiscio, and Uarsciech (Warsheikh) to Italy for 25 years subject to a fixed annual rent; however, 13 years later Italy purchased the ports from the Sultan. During 1895 the administration of Kenya was transferred to the British Crown, and the entity became known as the East

African Protectorate. In 1896, following a second clash between Ethiopia and Italian forces, the two states signed a peace treaty which officially annulled the treaty of Wichale. On June 24, 1897, the Menelik - Nerazzini treaty[1] attempted to draw a definitive boundary between Ethiopia and Italian Somaliland. The boundary was to be determined by a line drawn on a map by Emperor Menelik between British Somaliland and the cataracts of Van der Decken on the Giuba immediately north of Bardera. Shortly thereafter, with both states using different terms of reference for the location of the line, the alignment of the boundary became a source of dispute between Ethiopia and Italy. An Anglo - Ethiopian agreement of December 6, 1907, established a boundary between the East African Protectorate and Ethiopia, which on the east started at the confluence of the Daua and Ganale - Dorya. The following year, on May 16, 1908, an Ethiopian - Italian treaty afforded a new boundary between Ethiopia and Italian Somaliland which extended northeastward from Dolo, located at the confluence of the Daua and Ganale - Dorya, and British Somaliland. In June 1920 the East Africa Protectorate became Kenya colony and the coastal strip leased from the Sultan of Zanzibar became the protectorate of Kenya.[2]

Italian Somaliland was expanded by the Anglo - Italian treaty of July 15, 1924, under which an estimated 36,000 square miles of Kenya territory, commonly called Jubaland or Trans-Juba, was ceded to Italy in 1925 in accordance with an undertaking started in World War I. Jubaland was administered by Italy as a separate colony for one year and then incorporated into Italian Somaliland in 1926. Article 1 of the treaty describes the boundary[3] as follows:

> From the confluence of the rivers Ganale [Ganale - Dorya] and Daua, along the course of the Daua up-stream to the southern point of the small southerly bend of the latter river in the vicinity of Malka Re [Malca Rie]; thence in a south-westerly direction in a straight line to the centre of the pool of Dumasa [Damasa]; thence in a south-westerly direction in a straight line towards Eilla Kalla (which remains in British territory) to such meridian east of Greenwich as shall leave in Italian territory the well of El Beru [El Beru Hagia]; thence along the same meridian southwards until it reaches the boundary between the provinces of Jubaland and Tanaland; thence along the provincial boundary to a point due north of the point on the coast due west of the southernmost of the four islets in the immediate vicinity of Ras Kiambone (Dick's Head); thence due southwards to such point on

[1] The treaty was so-called because it was negotiated by Emperor Menelik of Ethiopia and Major Nerazzini of Italy.

[2] The Kenya protectorate comprised the mainland holdings of the Sultan of Zanzibar, in respect of which an annuity of 16,000 pounds per annum was paid to His Highness for their lease by the British. With an area of slightly less than 2,000 square miles, it consisted of a strip of land extending 10 sea miles inland along the coast of the Indian Ocean between Tanganyika and the northern branch of the Tana river, including the islands of the Lamu archipelago (Lamu, Manda, and Patta). The original concession was made in 1887 to a company later called the Imperial British East Africa Company; however, the administration of the strip was transferred to Her Majesty's Government in 1895. The territory was ceded by the Sultan to Kenya at the time the state became independent in 1963.

[3] The Kenya - Somalia boundary is sometimes referred to as the Milner - Scialoja line. Lord Milner of the United Kingdom and Senatore Scialoja of Italy were the principal negotiators of the boundary in 1920.

the coast, Ras Kiambone [Chiambone] [Dick's Head) and the four islets above mentioned shall fall within the territory to be transferred to Italy.

In the event, however, of it being found by the Commission referred to in article 12 that the well of El Beru does not contain water either sufficient or suitable for the maintenance at that point of an Italian frontier post, then the line, as between El Beru and Eilla Kalla, shall be so drawn by the Commission as to include in Italian territory the neighbouring well of El Shama [El Sciama].

Ratifications of the treaty of July 15, 1924, were exchanged in London on May 1, 1925. An agreement dated December 17, 1927, includes decisions regulating certain questions concerning the alignment of the boundary by the joint demarcation commission appointed under Article 12 of the treaty.

1. The Commission found that immediately up-stream from Malca Rie the Uebi Daua runs due East, and therefore does not form a small southerly bend as mentioned in Article 1 of the Treaty.

A point about 450 metres up-stream from Malca Rie was agreed upon as the northern terminal of the boundary.

2. The pivotal point of the boundary at the pool of Damasa was so chosen by the Commission that equal watering facilities should be afforded to both parties in the deepest portion of the depression without transgression of the boundary by either party.

3. In accordance with the power conferred by Article 1 of the Treaty, the Commission decided that, as there were elements of doubt as to the sufficiency of water for the maintenance of an Italian frontier post at El Beru Hagia in a very dry season and as to the security of the said well against collapse, the well of El Sciama should be included in Italian territory.

To allow access to El Sciama on all sides, the Commission also decided to adopt for the boundary the meridian passing about 300 metres to the west of this well.

4. The Commission took note of the communications of the 16th and 26th June, 1925, between His Britannic Majesty's Ambassador at Rome and the Head of the Government and Ministry of Foreign Affairs of His Majesty the King of Italy, in which the following formula was substituted for the definition given in the Treaty of the southern portion of the boundary:--

"Having regard to the fact that Ras Kiambone (Dick's Head) and the four small islands, which are in its immediate vicinity, form part of the territory to be transferred to Italy, it is understood that, upon reaching the meridian east of Greenwich which leaves in Italian territory the well of El Beru (or such other meridian east of Greenwich as may be recommended by the Commissioners in

accordance with paragraph 3 of Article 1 of the Treaty), the boundary shall follow such meridian southwards to the point of intersection of such meridian with the parallel of South Latitude 0°50'; thence proceeding in a south-easterly direction to a point situated about six kilometres north of the point on the coast due west of the southernmost of the four islets in the immediate vicinity of Ras Kiambone (Dick's Head); thence due southwards to such point on the coast. The coast shall be defined as the line of mean sea level ordinary spring tides."

The Commission declares that the general terms of this formula, since amended in accordance with the decisions recorded in paragraphs 5, 6 and 7 of this Agreement, have been embodied in Appendix I, Description of the Boundary.

5. Ras Chiamboni is a headland about 200 metres in breadth and about 800 metres in length, with its length parallel to the coast. It consists of a series of small coral eminences. The highest of these is approximately central.

Having been empowered to do so by the two Governments, the Commission decided that the summit of this highest eminence should be accepted as the terminal point of the directional line for the boundary towards the interior.

6. Article 1 of the Treaty states that there are 4 islets in the immediate vicinity of Ras Chiamboni.

The Commission found that there are actually 6 islets.

One of these is a prolongation of Ras Chiamboni to the north.

The other 5 form a group about 2 kilometres south-west from the control point of Ras Chiamboni, and are known collectively as Diua Damasciaca.

The most southerly islet of this group is little more than an almost circular coral rock about 50 metres in diameter.

The Commission, having been empowered to do so by the two Governments, decided that the parallel of latitude tangential to the southern extremity of this latter islet should define the position of the point at which the boundary reaches the coast.

7. Having been empowered to do so by the two Governments, the Commission decided that the short portion of the boundary defined in the Treaty by a meridian of longitude in the region of Ras Chiamboni should be moved parallel to itself in a westerly direction so that its southern terminal point should be 15 metres inland from high water mark and on the parallel of latitude mentioned in paragraph 6; the coastal waters being very shallow and high water mark being defined by the crumbling edge of a sand terrace.

The locality is known as Dar es Salam.

Concurrence was reached on additional points connected with the demarcation of the boundary in an Anglo - Italian agreement of August 27, 1930. The present alignment of the boundary is contained in an exchange of notes between the United Kingdom and Italy, which includes the "Agreement of the Boundary Commission, Appendices, and Map."

Following the Italian occupation of Ethiopia in 1935 - 36, Italian Somaliland was administered as part of Italian East Africa until World War II. Between 1941 and 1950, Italian Somaliland was occupied by United Kingdom and other Commonwealth forces. In 1950 the U.N. Trust Territory of Somaliland (Somalia) was organized and placed under Italian administration. An independent Somali Republic was proclaimed with the termination of the Trusteeship of Somaliland on July 1, 1960. At the same time Somalia merged with former British Somaliland (which previously had become independent on June 26, 1960) to form a single state.

Kenya was given internal self-government in May 1963 and became independent the following December. Exactly one year after independence, the constitution was changed to make Kenya a republic.

III. ALIGNMENT

The exchange of notes between Italy and the United Kingdom on November 22, 1933, contains the following alignment of the Kenya - Somalia boundary:

First Part - General Description.

Starting in the north from the Abyssinian frontier at a point in the "thalweg" of the Uebi Daua about 450 metres upstream from Malca Rie, the boundary passes, in a south-westerly direction, in a straight line through the point where the south bank of the Uebi Daua is intersected by the meridian of longitude 41°54'36.43" East of Greenwich to a point in the pool of Damasa so chosen as to afford equal watering facilities to both parties in the deepest portion of the pool without transgression of the frontier;

thence in a straight line and still in a south-westerly direction towards the centre of the well of El Ghala (of the El Wak group), which remains British, until this line is intersected by the meridian of longitude 40°59'44.34" East of Greenwich;

thence due south along this meridian, leaving the well of El Sciama in Italian territory, to its intersection with the parallel of South latitude 0°50'00.00";

thence in a straight line, in a south-easterly direction, towards the highest point of Ras Chiamboni until this line is intersected by the meridian of longitude which

passes through a point at Dar Es Salam 15 metres inland from High Water Mark and due west of the southern extremity of the southernmost of the group of 5 islets known as Diua Damasciaca;

thence due south along this meridian as far as the point at Dar Es Salam defined above;

thence, in a south-easterly direction, to the limit of territorial waters in a straight line at right angles to the general trend of the coastline at Dar Es Salam, leaving the islets of Diua Damasciaca in Italian territory.

Second Part - Detailed Description.

The boundary throughout its length is traced on the ground by a lane approximately 4 metres wide cut through the vegetation, and is indicated in a more permanent manner by primary and secondary beacons at intervals, each of which will be described hereinafter. The primary beacons have been numbered consecutively from the north, and these numbers are marked in ordinary arabic figures on the side of the beacon facing Italian Somaliland and in original arabic figures on the side facing Kenya.

At each angle of the boundary line there is a masonry or cement primary beacon together with a supplementary beacon on each side to indicate the directions of the two boundary lines converging on that point.

For convenience of description the boundary is divided into sections, each section corresponding with one of the straight portions of the boundary line already defined in the "General Description."

In each section, the lane is cut as nearly as possible in a straight line between its terminals; but owing to the errors inherent in the methods of survey adopted, very slight deviations from the straight line have inevitably resulted in certain localities.

All distance quoted hereinafter are reckoned from the northern terminal of the section concerned, and are correct to 100 metres.

The geographical positions of the points in the frontier zone given in Appendix II are those actually determined by astronomical and trigonometrical observations.

Normally the position of a control point, where a beacon was subsequently built, was fixed before the cut lane reached that point; but the positions of Primary Beacons Nos. 12, 24, 25, 26, 27 were dependent on astronomical observations made after the lane had been cut and they are thus slightly displaced from the positions they should occupy.

For two small lengths of a few metres, the boundary is indicated by alignment only. These are: --

a length in the north between Primary Beacon No. 1 and the Abyssinian frontier,

and a length in the south from Primary Beacon No. 29 to the sea.

Section 1.

From Primary Beacon No. 1 (Malca Rie) to Primary Beacon No. 6 (Damasa).[1]

Leaving the cemented masonry Primary Beacon No. 1 on the south bank of the Uebi Daua at its intersection with the meridian of longitude 41°54'36.43" East of Greenwich, the boundary passes in a south-westerly direction:--

through two secondary cairns astride the track leading southwards from Malka Got in Kenya;

through a secondary cairn and the adjacent cemented masonry Primary Beacon No. 2 located astride the road leading from Madera in Kenya to Malca Rie in Italian Somaliland;

through two secondary cairns astride the track leading from Malka Madera Yeri in Kenya to Coriamu in Italian Somaliland;

through two secondary cairns astride the road leading from the British military post of Madera, which lies km. 1.2 from the boundary, Dambala Ghessa in Italian Somaliland;

through the area known as Funa Guba;

through a secondary cairn;

through two secondary cairns astride the track leading from Hunduda in Kenya through the pool of Gebia which lies km. 2.2 in Italian Somaliland to Gal Gali, which is about 12 kilometres from the boundary;

through two secondary cairns astride the track leading from Koromi, which hill lies about 6 kilometres in Kenya, to Gurgura in Italian Somaliland;

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1. Part I of the Appendix to the Agreement contains the coordinates of the primary boundary beacons and the distances between successive beacons.

through the cemented masonry Primary Beacon No. 3;

through two secondary cairns astride the track leading southwards from Hunduda in Kenya;

through two secondary cairns astride a branch of the last-mentioned track north of Bur Gawse, which hill is in Kenya;

through two secondary cairns astride another branch of the same track, immediately south of Bur Gawse;

through two secondary cairns astride the same track where it turns away from the boundary towards Mata Arba in Italian Somaliland;

through a secondary cairn;

through two secondary cairns astride the track leading from Beila Machesa in Kenya to Mata Arba in Italian Somaliland;

though the area known as Hareri Hawseli;

through a secondary cairn;

through the area known as Hara Gulgula;

through a grave;

through the cemented masonry Primary Beacon No. 4, leaving the hill of Mata Arba about 9 kilometres in Italian Somaliland;

through two secondary cairns astride the track leading from Hafura past Ber Hawamadi in Kenya to El Uara, which well lies in Italian Somaliland km. 2.1 from the boundary;

through a secondary cairn;

through two secondary cairns astride the track passing between Finno and Hegali in a south-easterly direction;

through a large Primary Cairn erected on the south-east spur of the hill of Finno, the summit of which lies in Kenya;

through the cemented masonry Primary Beacon No. 5 and the adjacent secondary cairn, located astride the track leading from Hafura in Kenya to Iacle in Italian Somaliland;

through a secondary cairn;

through two secondary cairns astride the track leading from Berti Finno in Kenya to Gubbet Uasasa in Italian Somaliland;

through two secondary cairns astride the track leading from Berti Finno, which shambas lie in Kenya, to Iacle in Italian Somaliland;

through four secondary cairns, two astride each of the two tracks leading from Berti Finno in Kenya to Cuddama, which lies km. 3.0 in Italian Somaliland, leaving Bur Cus about 2 kilometres in Italian Somaliland;

through a secondary cairn;

through two secondary cairns astride the track leading from Manza in Kenya to Cuddama in Italian Somaliland;

touching the east side of a small pool unnamed which remains in Kenya;

along the east slope of Bur Manza, which remains in Kenya;

through two secondary cairns astride the track leading from Hawal Garba Hogi, which lies km. 1.7 in Kenya, to Cuddama in Italian Somaliland;

through a secondary cairn;

through two secondary cairns astride the track leading from Hawal Garba Hogi in Kenya to Damasa;

through a cemented masonry pointer beacon on the north-east edge of the depression of Damasa to the cemented masonry Primary Beacon No. 6 located in the deepest portion of that pool.

Section 2.

From Primary Beacon No. 6 (Damasa) to Primary Beacon No. 8 (angle at El Wak).

Leaving Primary Beacon No. 6, the boundary passes in a south-westerly direction, the alignment being indicated by a cemented masonry pointer beacon on the south-west edge of the depression:--

through two secondary cairns astride the road from Damasa to El Wak;

through a secondary cairn;

through two secondary cairns astride the road from Damasa to El Wak;

through a secondary cairn;

leaving the pool of Avein Nur km. 2.0 in Italian Somaliland;

leaving the pool of Daba km. 0.3 in Italian Somaliland;

through the cemented masonry Primary Beacon No. 7;

through a secondary cairn on the side of the road from Damasa to El Wak at a point where this road touches, but does not cross, the boundary on the Italian Somaliland side;

through a secondary cairn;

through two secondary cairns astride the track leading from Jalanto Lango in Kenya to Uenti Dima km. 1.0 in Italian Somaliland, leaving the pool of Uenti Digo km. 1.9 in Italian Somaliland;

through two secondary cairns astride the track leading from Arda Dadaja km. 1.0 in Kenya to Uenti Dima, in Italian Somaliland;

through a secondary cairn;

through two secondary cairns astride the track leading from Jaba Kurmama km. 0.8 in Kenya to Uarsesa Raghi km. 3.6 in Italian Somaliland;

through two secondary cairns astride the track leading northwards from Golati, which lies km. 3.0 in Italian Somaliland;

through a cemented masonry pointer beacon to the cemented masonry Primary Beacon No. 8, leaving El Golija and El Saqo in Kenya km. 2.4 and km. 4.1, respectively, from this beacon.

Section 3.

From Primary Beacon No. 8

(angle at El Wak) to Primary Beacon No. 23 (Latitude 0°50'00.00" South, Longitude 40°59'44.34" East of Greenwich).

Leaving Primary Beacon No. 8, the boundary passes due south, the alignment being indicated by a cemented masonry pointer beacon:--

through two secondary cairns astride the track leading from El Ghala, which lies km. 2.0 in Kenya to Golati in Italian Somaliland;

through the cemented masonry Primary Beacon No. 9, on the south side of the road leading from El Ghala in Kenya to El Sciama and El Beru Hagia, which wells lie km. 0.3 and km. 2.4, respectively, in Italian Somaliland;

through two secondary cairns astride the junction of the two tracks leading from El Bisq and El Dargula, respectively km. 1.0 and km. 7.0 in Kenya, to Gof in Italian Somaliland;

through two secondary cairns astride the track leading from El Sciama in Italian Somaliland in a direction south-south-west;

through the area known as Rama Gedoli;

through a secondary cairn;

through two secondary cairns astride the track leading from El Ghala through Megag, in Kenya and Rama Gedoli to Meri in Italian Somaliland;

through the area known as Gol Kio;

through a secondary cairn;

through two secondary cairns astride the track leading in a direction north-north-east from Wel Gersi, which lies km. 1.3 in Kenya;

through two secondary cairns astride the track leading from Wel Gersi in Kenya to Meri in Italian Somaliland;

through the cemented masonry Primary Beacon No. 10;

through two secondary cairns astride the track leading from Falama in Kenya to Bilaca in Italian Somaliland;

through two secondary cairns astride the track leading from Daka Laftu in Kenya round the north of the area known as Bute to Bilaca in Italian Somaliland;

through the area known as Bute;

through a secondary cairn;

leaving the hill of Ghedo Sama in Italian Somaliland;

through a secondary cairn;

through two secondary cairns astride the track leading from Ramu in Kenya through Ilalo to Bilaca in Italian Somaliland, leaving the group of wells of Ilalo about a third of a kilometre in Italian Somaliland;

through two secondary cairns astride the track leading from Ali Golo in Kenya to Gorgala, which is km. 2.0 in Italian Somaliland, leaving a small pool unnamed km. 0.2 in Kenya;

through the cemented masonry Primary Beacon No. 11;

through a secondary cairn on the north side of the track leading from El Kura, which is km. 1.8 in Kenya to Hara Cadera in Italian Somaliland;

through two second cairns astride the track leading from Kura Yeri in Kenya to Hara Cadera in Italian Somaliland;

through two secondary cairns astride the track leading from Kura in Kenya in a direction south-south-east;

through a secondary cairn;

through two secondary cairns astride the track leading from Konton in Kenya to Serenli in Italian Somaliland;

through a second cairn and the adjacent cemented masonry Primary Beacon No. 12 located astride the road from Wajer Bor in Kenya to Serenli in Italian Somaliland, leaving the pool of Dadol km. 0.2 in Kenya;

through a secondary cairn;

leaving two small pools unnamed km. 0.2 in Kenya;

through a small pool unnamed;

through a secondary cairn;

leaving the pools of Bactili about 1-1/2 kilometres in Italian Somaliland;

through the cemented masonry Primary Beacon No. 13;

through two secondary cairns astride the road leading from Wel Garas, which is km. 4.4 in Kenya, to Gherille, which is km. 4.9 in Italian Somaliland;

through a secondary cairn;

through a secondary cairn;

through the cement Primary Beacon No. 14;

crossing the track leading from Wel Adi in Kenya to the Gololati - Escudutca track;

crossing the track leading from Gololati in Kenya to Escudutca in Italian Somaliland;

through a secondary cairn;

through a secondary cairn;

through the cement Primary Beacon No. 15;

crossing the track leading from Hambalash to Dif, both of which places are in Kenya;

through a secondary cairn;

crossing Lake Bisq;

crossing the track leading from Hambalash to Dif, both of which places are in Kenya;

through the cement Primary Beacon No. 16 and the adjacent secondary cairn, located astride the motor road from Wajer Dima in Kenya to Afmadu in Italian Somaliland, leaving the group of pools of Dif about 1 kilometre in Kenya;

through a secondary earth gabion;[1]

crossing the track running in a north-westerly direction from Abodili in Italian Somaliland;

through a secondary earth gabion;

through the cement Primary Beacon No. 17;

through a secondary earth gabion;

1. The secondary earth gabions were scheduled to be replaced by cement or masonry beacons (cairns) in accordance with the terms of Paragraph 14 of the Agreement.

through a secondary earth gabion;

through the cement Primary Beacon No. 18 and the adjacent secondary earth gabion located astrice the road from Benani in Kenya to Au in Italian Somaliland;

crossing Lak Ghorqani, in which the "bisq" scrub is particularly dense;

crossing Lak Dera;

through a secondary earth gabion and the adjacent cement Primary Beacon No. 19, located astride the track leading from Liboi in Kenya to Dobli in Italian Somaliland;

through a small pool unnamed;

through a secondary earth gabion;

through a secondary earth gabion;

through a secondary earth gabion;

through a cement Primary Beacon No. 20, approximately on the Equator;

through a secondary earth gabion;

through a secondary earth gabion and the adjacent cement Primary Beacon No. 21, located astride the track leading in a north-westerly direction from Dib Ul Chena in Italian Somaliland;

through a secondary earth gabion;

crossing the road leading from Jara Jila, which lies km. 2.6 in Kenya, to Cormale in Italian Somaliland;

through a secondary earth gabion;

through the area known as Uarrach;

through a secondary earth gabion;

touching the east edge of the pool of Gangesa, which remains entirely in Kenya;

through a secondary earth gabion, leaving the pool of Dubra km. 2.9 in Italian Somaliland;

through the cement Primary Beacon No. 22 on the south side of the road leading from War Dod in Kenya to Cauitti in Italian Somaliland, leaving the pool of Bakaja Obe km. 2.7 in Kenya and that of Corio Cauitti km. 2.3 in Italian Somaliland;

crossing the track leading from Bakaja Obe in Kenya, to Gurara, which pool is km. 2.1 in Italian Somaliland;

through a secondary earth gabion;

between the two pools of Mata Arba, the larger one falling in Kenya, the smaller in Italian Somaliland;

touching the west edge of the pool of Cascia Debin, which remains entirely in Italian Somaliland;

through a secondary earth gabion;

a grave which lies immediately on the east of the boundary;

crossing Lach Sara;

crossing the track leading from Kasha Gurgurda in Kenya to Mug Domaro in Italian Somaliland, leaving the pool of Sara km. 0.5 in Italian Somaliland;

through a cement pointer beacon to the cement Primary Beacon No. 23.

Section 4.

From Primary Beacon No. 23 (Latitude 0°50'00.00" South, Longitude 40°59'44.34" East of Greenwich to Primary Beacon No. 28 (angle near Chiamboni).

Leaving Primary Beacon No. 23, the boundary passes in a south-easterly direction, the alignment being indicated by a cement pointer beacon:--

crossing a "lak" unnamed;

through two cement secondary beacons astride the road leading from Ilkabere in Kenya to Mug Domaro in Italian Somaliland;

through a cement secondary beacon;

crossing the road leading from Odolabambu in Kenya to Ulaul in Italian Somaliland;

crossing the track leading from the group of pools of Dambala in Kenya to Ulaul in Italian Somaliland;

through two cement secondary beacons astride the road leading from Dambala in Kenya to Cussa in Italian Somaliland;

through two cement secondary beacons astride the track leading from Konoghori in Kenya to Dola in Italian Somaliland;

through the cement Primary Beacon No. 24;

through a cement secondary beacon opposite the pool of Juma Korke which lies in Kenya;

through a series of three cement secondary beacons spaced across the scattered tracks leading from Rama Jebia in Kenya to Hola Dugium in Italian Somaliland;

through a series of five cement secondary beacons accentuating the partition of the pools of Kolbio;

through a series of three cement secondary beacons spaced across the scattered tracks on the caravan route leading from Lama Det in Kenya to Uama Idu in Italian Somaliland;

through the cement Primary Beacon No. 25, in the area of Did Sanga;

passing a small pool unnamed which falls in Kenya;

through a cement secondary beacon;

through a belt of forest with dense undergrowth, known as the "bada";

crossing the Lak at Gibitcilaua which remains in Italian Somaliland;

through a cement secondary beacon;

through another belt of the "bada";

leaving the group of pools of Hele Keberye km. 0.4 in Kenya;

through two cement secondary beacons on the edge of the depression of a pool unnamed half-way between the groups of Kon Tuwari in Kenya and Nuidi in Italian Somaliland, the pool lying in Italian Somaliland;

through a cement secondary beacon, leaving the pool of Doria in Kenya and that of Burrada Ier in Italian Somaliland;

through a cement secondary beacon and the adjacent cement Primary Beacon No. 26, which accentuate the division of a pool unnamed lying astride the boundary;

through a cement secondary beacon on the south-east side of the track leading from Mbogo in Kenya to the group of pools of Labchelli which lies about ½ kilometre in Italian Somaliland;

through two cement secondary beacons astride the track leading from Wanyeka in Kenya to Baraca in Italian Somaliland, leaving Kon Malabi in Kenya.

through two cement secondary beacons astride the track leading from Pepechono km. 0.4 in Kenya to Billada km. 2.9 in Italian Somaliland;

through the cemented masonry Primary Beacon No. 27 on top of the most inland ridge of the coastal hills;

through a series of five cemented masonry secondary beacons spaced across a clearing, the last of the series being on the north side of the track leading from Jawasi in Kenya to Comauala which lies km. 1.1 in Italian Somaliland;

through a cemented masonry secondary beacon on the north side of the track leading from Mwangati in Kenya to Meri in Italian Somaliland;

through a series of four cemented masonry secondary beacons spaced across the shambas;

through a cemented masonry pointer beacon to the cemented masonry Primary Beacon No. 28.

Section 5.

From Primary Beacon No. 28 (angle near Chiamboni) to Primary Beacon No. 29 (Dar Es Salam).

Leaving Primary Beacon No. 28, the boundary passes due south, the alignment being indicated by a cemented masonry pointer beacon:--

leaving the pool of Mado km. 0.1 in Kenya;

leaving the pool of Con Sagarada km. 0.1 in Italian Somaliland;

through a series of five secondary cairns of coral spaced across open ground to the coastal road;

through a cemented masonry pointer beacon to the large cemented masonry Primary Beacon No. 29 at Dar Es Salam.

DOCUMENTATION

1. Protocols between the Governments of Her Britannic Majesty and of His Majesty the King of Italy, for the Demaracation of their respective Spheres of Influence in Eastern Africa, March 24 and April 15, 1891. Great Britain Treaty Series, Italy No. 1 (1891), C. 6316.

2. Agreement between the United Kingdom and Ethiopia relative to the Frontiers between British East Africa, Uganda, and Ethiopia, December 6, 1907. Great Britain Treaty Series No. 27 (1908), Cd. 4318.

3. Convention between Italy and Ethiopia for the settlement of the Frontier between the Italian Possessions of Somali and the Provinces of the Ethiopian Empire, May 16, 1908. The Map of Africa by Treaty, 3 vol., 3rd Edition (London: Harrison and Sons, 1909), Vol. 2, pp. 1223 - 4.

4. Treaty between the United Kingdom and Italy regulating Certain Questions concerning the Boundaries of their respective Territories in East Africa, July 15, 1924. Great Britain Treaty Series, Italy, No. 1 (1924), Cmd. 2194 [with maps].

5. Treaty between the United Kingdom and Italy regulating Certain Questions concerning the Boundaries of their respective Territories in East Africa, July 15, 1924. Great Britain Treaty Series No. 29 (1925), Cmd. 2427.

6. Agreement recording the Decisions of the Commission appointed under the Treaty between the United Kingdom and Italy of July 15, 1924 regarding the Boundary between Kenya and Italian Somaliland, December 17, 1927. Great Britain Treaty Series, Italy, No. 1 (1933), Cmd. 4230.

7. Agreement between the Local Commissioners appointed to settle certain points connected with the Demarcation of the Boundary between Kenya and Italian Somaliland as determined by the Commissioners under the Treaty between the United Kingdom and Italy of July 15, 1924; August 27, 1930. Great Britain Treaty Series, Italy No. 2 (1933), Cmd. 4231.

8. Exchange of Notes between His Majesty's Government in the United Kingdom and the Italian Government regarding the Boundary between Kenya and Italian Somaliland with the Agreement of the Boundary Commission, Appendices and Map, November 22, 1933. Great Britain Treaty Series No. 1 (1934), Cmd. 4491.

This International Boundary Study is one of a series of specific boundary papers prepared by The Geographer, Office of the Geographer, Directorate for Functional Research, Bureau of Intelligence and Research, Department of State, in accordance with provisions of the Office of Management and Budget Circular No. A-16.

Government agencies may obtain additional information and copies of the study by calling The Geographer, Room 8744, Department of State, Washington, D.C. 20520 (Telephone: 63-22021 or 63-22022).

Annex 83

United States, Department of State, Bureau of Intelligence and Research, *Limits in the Seas, No. 92, Maritime Boundary: Kenya-Tanzania* (23 June 1981)

U.S. DEPARTMENT OF STATE • BUREAU OF INTELLIGENCE AND RESEARCH • ISSUED BY THE GEOGRAPHER

LIMITS IN THE SEAS

No. 92

MARITIME BOUNDARY:

KENYA-TANZANIA

This paper is one of a series issued by The Geographer, Bureau of Intelligence and Research of the Department of State. The aim of the series is to set forth the basis for national arrangements for the measurement of the territorial sea or the division of the maritime areas of coastal nations.

Intended for background use only, this research document does not represent an official acceptance of the United States Government of the line or lines represented on the charts or, necessarily, of the specific principles involved, if any, in the original drafting of the lines. Principal analyst for this study: Robert W. Smith. Additional copies may be requested by mail from The Geographer, Department of State, Washington, D.C. 20520.

LIMITS IN THE SEAS

No. 92

MARITIME BOUNDARY:

KENYA-TANZANIA

June 23, 1981

Office of The Geographer
Bureau of Intelligence and Research

MARITIME BOUNDARY: KENYA-TANZANIA

On December 17, 1975, the Republic of Kenya sent a note to the United Republic of Tanzania proposing the terms of an agreed delimitation of the boundary between their respective territorial waters and other maritime jurisdictions of the two States. The United Republic of Tanzania replied on July 9, 1976, accepting these terms. The exchange of notes constitutes an agreement on their maritime boundary which entered into force on July 9, 1976. The full text of the agreement is as follows:

EXCHANGE OF NOTES BETWEEN THE UNITED REPUBLIC OF TANZANIA AND KENYA CONCERNING THE DELIMITATION OF THE TERRITORIAL WATERS BOUNDARY BETWEEN THE TWO STATES

I

Kenyan note

December 17th, 1975

Your Excellency,

I have the honour to refer to the meetings held between officials of the United Republic of Tanzania and of the Republic of Kenya on 8th May, 1972 at Mombasa, Kenya and from 6th to 8th August, 1975 at Arusha, Tanzania and on 4th September, 1975 at Dar-es-Salaam, Tanzania, on the delimitation of the territorial waters boundary between our two countries and to state that, as a result of the said meetings, the following points were agreed:

1. Boundary:
   Base Lines:
   (a) Ras Jimbo beacon-Kisite Island (rock)
   (b) Ras Jimbo-Mwamba-wamba beacon
   (c) Mwamba-wamba beacon-Fundo Island beacon (rock)
   (d) Fundo Island beacon (rock)-Ras Kigomasha lighthouse
   (e) Kisite Island (rock)-Mpunguti ya Juu-lighthouse

2. The description of the boundary:
   (a) On the West: The median line between the Ras Jimbo beacon-Kisite Island/Ras Jimbo-Mwamba-wamba beacon base lines to a point 12 nautical miles from Ras Jimbo up to a point hereinafter referred to as 'A', located at 4°49'56"S and 39°20'58"E;

   (b) On the East: The median line derived by the Intersection of two arcs each being 12 nautical miles drawn from Mpunguti ya Juu-lighthouse and Ras Kigomasha lighthouse respectively hereinafter referred to as point 'B', located at 4°53'31"S and 39°28'40"E and point C, located at 4°40'52"S and 39°36'18"E;

(c) On the South: An arc with the center as the Northern Intersection of arcs with radii 6 nautical miles from point 'A' as described in paragraph 2(a) above and point 'B' which is the Southern Intersection of arcs from Ras Kigomasha lighthouse and Mpunguti ya Juu lighthouse.

(d) The eastward boundary from Point C, which is the Northern Intersection of arcs from Ras Kigomasha lighthouse and Mpunguti ya Juu lighthouse as described under paragraph 2 (b) above, shall be the latitude extending eastwards to a point where it intersects the outermost limits of territorial water boundary or areas of national jurisdiction of two states.

(e) The marine charts of 1:250,000 describing the co-ordinates of the above points shall form an integral part of this agreement.

3. Fishing and fisheries:

(a) It was agreed that indigenous fishermen from both countries engaged in fishing for subsistence, be permitted to fish within 12 nautical miles of either side of the territorial sea boundary in accordance with existing regulations.

(b) It was agreed that there be reciprocal recognition of fisheries licenses, regulations and practices of either State applicable to indigenous fishermen aforesaid. The fishing within the area specified in paragraph 3 (a).

After due consideration of the said points of agreement, including the attached map describing the co-ordinates of the boundary as delimited, the Government of the Republic of Kenya hereby confirms that it accepts the above recommendations having been fully convinced that they are for the mutual benefit of our two countries.

If the Government of the United Republic of Tanzania is of the same view, then it is suggested that this Note and your reply thereto in the affirmative shall constitute an Agreement for the territorial waters boundary between our two States and other related matters referred to above and the same shall enter into force on the date of the receipt of your said Note in reply.

Accept, Your Excellency, the assurances of my highest consideration.

Yours

Dr. Munyua Waiyaki
Minister for Foreign Affairs

H.E. Mr. Ibrahim Kaduma, M.P.,
Minister for Foreign Affairs,
United Republic of Tanzania
Dar es Salaam, Tanzania

II

Tanzanian note

9th July, 1976

Your Excellency,

I have the honour to acknowledge receipt of your letter Ref. No. MFA.273/430/001A/120 of 17th December, 1975 which reads as follows:

[See Letter I]

I have the honour to confirm that the foregoing is acceptable to the Government of the United Republic of Tanzania.

Please accept, Your Excellency, the assurances of my highest consideration.

Ibrahim M. Kaduma
Minister for Foreign Affairs

H.E. Dr. Munyua Waiyaki
Minister for Foreign Affairs,
Office of the Minister,
Nairobi, Kenya

Analysis

The Kenya-Tanzania maritime boundary is depicted on the attached illustrative map. The boundary consists of three turning points and an undefined seaward terminus. The turning points are located in the Pemba Channel area and are all within 12 nautical miles of the coast; but, as Article 2 (d) of the agreement states, the boundary shall follow the latitude of point C (4°40'52"S) "…extending eastwards to a point where it intersects the outermost limits of territorial water boundary or areas of national jurisdiction of [the] two States." Kenya currently claims a 12-nautical-mile territorial sea, and Tanzania claims a 50-nautical-mile territorial sea. [1] The intersections of their claimed territorial seas with the boundary are depicted as points 1 and 2, respectively, on the attached map.

With reference to Article 2 (d), point 4 illustrates where Kenya's claimed 200-nautical-mile economic zone intersects the 4°40'52" parallel of south latitude, and point 3 identifies where a potential Tanzanian 200-nautical-mile claim would intersect this parallel of latitude.

[1] The United States does not recognize any State's claim to a territorial sea breadth in excess of 3 nautical miles. In the UN Law of the Sea negotiations, however, the United States has expressed its willingness to accept a maximum territorial sea breadth of 12 nautical miles within the framework of a comprehensive and acceptable Law of the Sea treaty.

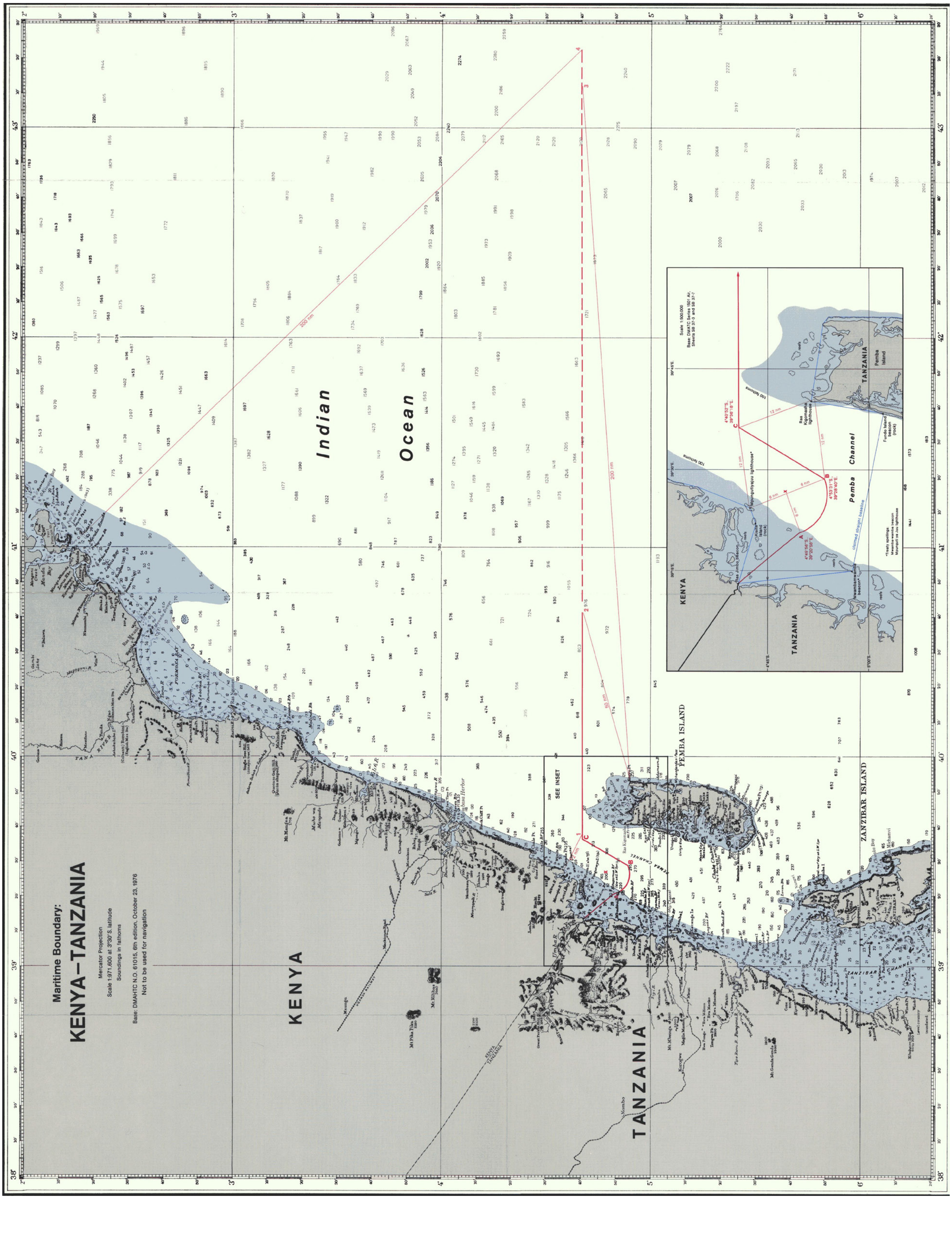
The salient coastal points affecting these outer limits are indicated on the attached map as the bases from which the light-red construction lines are drawn. Both countries are able to extend their maritime zones eastward to a full 200 nautical miles without overlapping an opposite State to the east. For most of its length the boundary traverses waters deeper than 100 fathoms. From the land boundary terminus to point A, the water depths are less than 100 fathoms. Boundary segments A-B and B-C are situated in the Pemba Channel where depths range from 100 to 300 fathoms (600 to 1,800 feet). Seaward from point C the depths range from 250 fathoms to over 2,000 fathoms.

The interesting section of the boundary is situated near shore in the Pemba Channel area (see map insert). Article 1 of the agreement establishes straight baselines for each country in the boundary region, although some of these baselines do not seem to influence the course of the boundary. [2] The first boundary segment extends from the land boundary terminus at Ras Jimbo to point A, which is 12 nautical miles seaward from Ras Jimbo. Point A, however, is only 6.8 nautical miles from Kisite Island and the Tanzanian baseline. This segment is equidistant between the two baselines described in Article 1 (a) and (b): i.e., lines connecting Ras Jimbo to Kisite Island (Kenya) and Ras Jimbo to Mwamba-wamba beacon (Tanzania).

Turning points B and C have been situated in locations where the 12-nautical-mile arcs as drawn from Mpunguti ya Juu lighthouse (Kenya) and Ras Kigomasha lighthouse (Tanzania) intersect. In order to establish boundary segment A-B, point X was created. Point X is the northern intersection of 6-nautical-mile arcs drawn from points A and B. With point X as the center, a 6-nautical-mile arc was drawn between points A and B to form that segment of the boundary. Points B and C are connected by a straight line. The agreement, however, does not state what kind of lines are to be employed, i.e., geodesics, great circles, or rhumb lines. From point C the boundary continues eastward along the parallel of latitude of point C to, as previously noted, an undefined terminal point.

The course of the final boundary combines numerous delimitation methodologies. The first boundary segment is equidistant between the two claimed straight baselines. Segment A-B has been developed by drawing an arc from point X, an artificially established point. Segment B-C is equidistant between selected coastal points one from each country. The seaward extension of the boundary from point C is based on a parallel of latitude. Thus, the boundary represents an agreement which has been established in accordance with equitable principles and which is satisfactory to both countries.

[2] Baselines in international law serve the purpose of defining the limit between internal waters and the territorial sea. Various international law principles are used in determining the baseline. The establishment of baselines by bilateral agreement is not a common practice. The status of the baselines created by this agreement is not clear and, under any interpretation, could not be binding on third States.



Maritime Boundary:
KENYA–TANZANIA
Mercator Projection
Scale 1:971,600 at 3°30' S. latitude
Soundings in fathoms
Base: DMAHTC N.O. 61015, 6th edition, October 23, 1976
Not to be used for navigation
KENYA
TANZANIA
Indian
Ocean
PEMBA ISLAND
ZANZIBAR ISLAND
SEE INSET
200 nm
Pemba Channel

Annex 84

E.M. Mathu and T.C. Davies, "Geology and the environment in Kenya", *Journal of African Earth Sciences*, Vol. 23, No. 4 (Nov. 1996)

Pergamon

PII: S0899-5362(97)00016-X

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Geology and the environment in Kenya

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Abstract—Kenya is in a unique environmental setting by virtue of its geographical location, range of altitudes and perhaps most importantly, the Great Rift System that traverses it. The country displays virtually every facet of environmental geological phenonmena - seismicity, volcanism, mass-movements, the impact of mining, mineral processing and geothermal energy resources development, soil and beach erosion, desertification, air, water and soil pollution, etc. A significant mass of data on these topics already exists, but it lies scattered in various journals and agency reports, some of which are not readily available to environmental researchers and country-planners. The aim of this paper, therefore, is to highlight some features of geology and the environment in Kenya and to set the scene for the subsequent papers in this issue, which examine more deeply various aspects of the subject. The uniqueness of the country's environmental setting is emphasised throughout, since it gives it a special appeal to geomorphologists, geophysicists, hydrologists and land-use planners. A comprehensive list of references is given at the end of this paper in order to aid the search process of those who seek additional information on areas covered in this review.

Résumé—Du point de vue environnemental, le Kenya occupe une place unique par sa situation géographique, ses variations d'altitude et, peut-être plus encore, par le système du Grand Rift qui le recoupe. Le pays présente pratiquement toutes les facettes de phénomènes géologiques en relation avec l'environnement: séismicité, volcanisme, mouvements en masse, impact tant des activités minières que du traitement de matières premières et du développement de ressources en énergie géothermique, érosion du sol et des plages, désertification, pollution de l'air, de l'eau et du sol, etc. Une importante quantité de données existe déjà sur ces sujets mais elle est dispersée dans diverses revues et rapports d'organismes, dont certains ne sont pas facilement accessibles aux chercheurs de l'environnement ainsi qu'aux responsables de la planification nationale. C'est pourquoi le but de cette note est d'insister sur certains aspects géologiques et environnementaux du Kenya en introduisant, par la même occasion, les notes subséquentes de ce volume traitant de façon plus approfondie divers aspects du sujet. La situation unique du pays dans le domaine environnemental est mise en évidence dans cet ouvrage puisqu'elle suscite l'intérêt particulier des géomorphologues, géophysiciens, hydrologues et autres planificateurs de l'utilisation des terres. A la fin de la note, une liste détaillée de références est fournie afin d'aider les recherches de ceux qui souhaitent une information complémentaire dans l'un des domaines couverts par cette synthèse.

(Received 23 February 1995: revised version received 11 March 1996)

INTRODUCTION

Environmental geoscience research carried out in Kenya today focuses on the solutions to problems pertaining to surface- and groundwater pollution, geo-hazards and land-use. Despite a rapid growth in research, institution building, training and investment, an acceleration of environmental degradation in fields such as water pollution, soil erosion, desertification and mining is still witnesed. These phenomena and processes can often be related to the country's unique geography and

geology, which are in turn dominated by the great Rift Valley. This is a 50-70 km wide chasm extending south from Lake Turkana and deepens to 600-900 m below the surrounding land. The formation of this spectacular geological phenomenon, as well as other aspects of the geology of Kenya, is summarised under the section on 'Geology and Mineralisation'.

Kenya is a country of great diversity in the regional sense. The diversity of Kenya's landscape, for instance, is shaped by the relief, the formation of which, together with other pertinent aspects of the country's geography, are outlined in this paper. Almost exactly on the equator, the 5,200 m high glaciated peaks of Mount Kenya overtop the country, rising above sweeping plateaus of Tertiary lavas and towering over grassy plains alive with countless species of flora and fauna. Kenya's relief is of overiding importance for the climate of the country, particularly as regards the amount of precipitation and temperature. These climatic factors in turn condition the ecological endowment and the agrarian capacity, which greatly influence the density and distribution of the peasant and herding populations.

About 83% of the country falls within arid and semi-arid lands (ASAL). These ASALs have undergone long-term degradation that has reduced both their actual and potential productivity, thus increasing unemployment in such areas (Central Bank of Kenya, 1991). Desertification can be attributed in part to drought and in part to the highly variable precipitation, but its effect and extent have been greatly aggravated by unsustainable increases in human and livestock populations. Only 20% of the country's land is suitable for agriculture. The Kenyan approach to these problems through geo-scientific research and community participation are dicussed in this paper.

GEOGRAPHICAL SETTING

Location

The Republic of Kenya is located astride the equator on the eastern side of Africa (Fig. 1). It extends between latitudes 5°30'N and 4°30'S and longitudes 34°00'E and 42°00'E and is bordered by Sudan and Ethiopia to the north, Uganda to the west, Somalia to the east and Tanzania to the south. Kenya has a 500 km long coastline with the Indian ocean and a total area of about 583,000 km^2.

Physiography

Kenya has a varied relief which controls and constrains its drainage system (Fig. 1). The altitude varies from sea level at the coast to over 5,000 m at the top of Mt Kenya, which is located almost exactly on the equator. Like the other volcanoes of East Africa, its origin is linked with the formation of the Rift Valley. From the edge of the steep scarp slopes of the Rift Valley system one discerns a breath-taking scenery comprising savannas, salt lakes, picturesque extinct volcanoès and the well-tended landscapes of large farms providing maize, wheat, milk and meat for the growing urban population.

Relief

Four major relief zones are distinguishable within the country. These are the coastal and eastern plains, the central and western highlands, the Rift Valley Basin and the Lake Victoria Basin.

The coastal and eastern plains

These plains cover approximately one third of the total area of the country.They are roughly enclosed by the Indian Ocean and the Somali border to the east, the 39°E longitude to the west, the Tanzanian border to the south and the 3°N latitude to the north. Their elevation varies from 0 at the coastal belt up to 500 m at the hinterland coastal hill masses.

The Rift Valley Basin

The Rift Valley Basin has an elevation of about 500 m in its lowest and widest sections (the Lake Turkana area in the north and the Lake Magadi area in the south). However, the highest elevation reaches 500 m in its narrowest and middle zone around the equator, where it is enclosed by the Mau Hills to the west and the Aberdares Mountains to the east (Fig. 1). This basin runs approximately north-south along the 36°E longitude and separates both the eastern and western highlands. At its broadest northern part, around Lake Turkana, it is about 300 km wide, but between 50 and 60 km wide at its narrowest section around the Naivasha and Nakuru areas. The Laikipia and Mau Escarpments then mark the eastern and western boundaries, respectively, of this basin at its narrowest zone. Between the two escarpments, the Tungen Hills form a spectacular horst in the middle of this basin.

The eastern and western highlands

The eastern and western highland regions, separated by the Rift Valley Basin, have an altitude varying between 1500 and 5200 m above sea level. East of the Rift Valley Basin, the Ndoto Mountains mark the northern limit of these highlands, while the Aberdares Range (about 4000

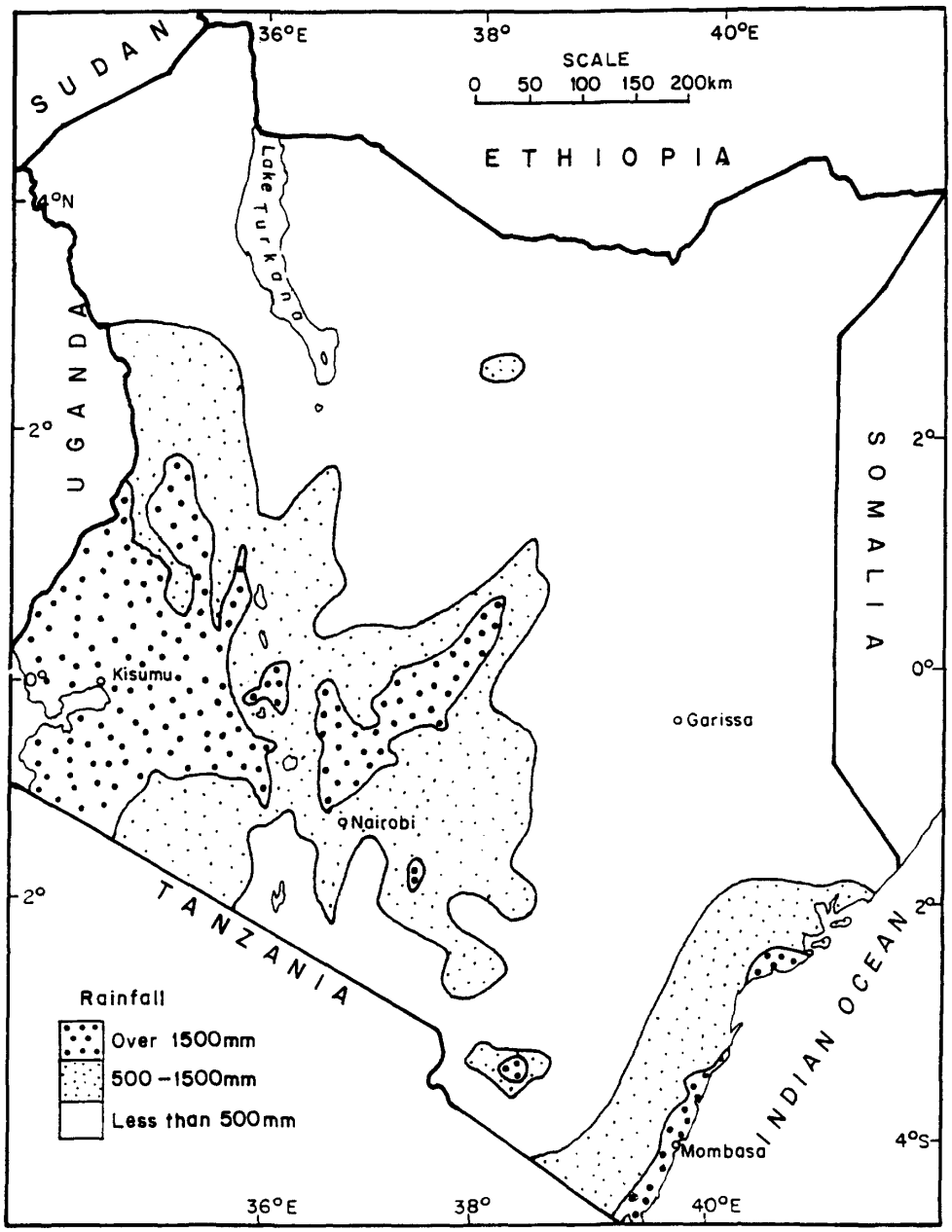

Figure 2. *Generalised annual rainfall map of Kenya (modified from EAEP Limited, 1991)*

m) and Mt Kenya (about 5200 m) mark the highest peaks in the high central area of these eastern highlands. The Nyambene Hills are an immediate northeastern extension of the Mt Kenya highland region. Further southwards these eastern highlands pass into the Athi and Kaputei Plains, which extend southeastwards to form the Chyulu Range. The Chyulu Range thereafter adjoins the Taita Hills.

The western highlands are marked by the Mau Hills (about 3100 m), which occur in the central part of the region and face the Aberdares Range. Further north they are marked by Mt Elgon (about 4300 m) on the Kenyan-Ugandan border, and the Cherangani Hills (about 3400 m). The Nandi, Nyando and Lolgorien Escarpments separate the western highlands from the Lake Victoria Basin in the northern, central and southern sides, respectively.

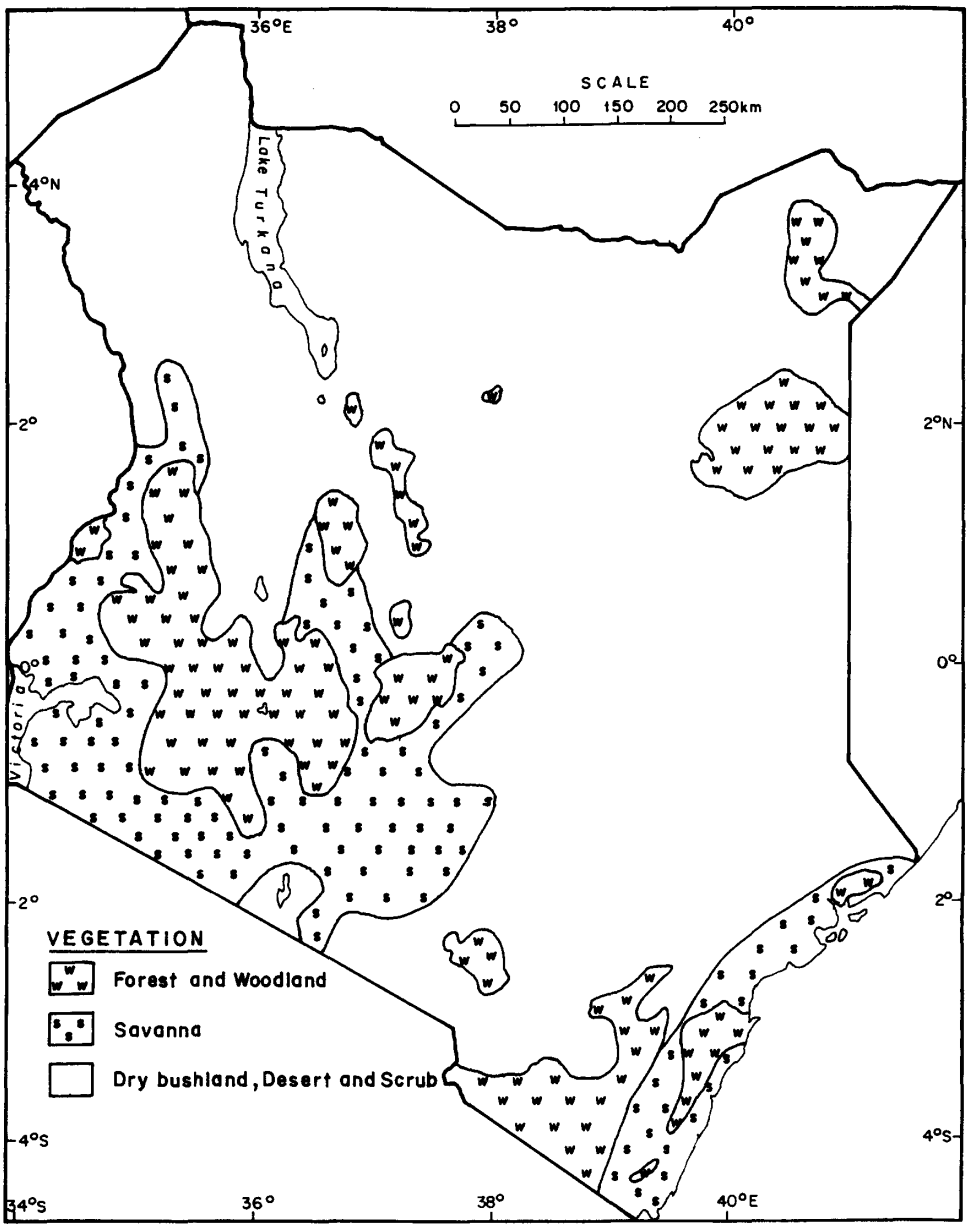

Figure 3. *Generalised vegetation map of Kenya (modified from EAEP Limited, 1991).*

The Lake Victoria Basin

This basin has a general elevation of about 500-1000 m above sea level. It is separated from the western highlands on its eastern side by the three escarpments mentioned in the preceeding section. Semi-circular in shape and enclosing Lake Victoria, this basin is approximately bounded on the eastern side by the 35°E longitude and by the latitudes 1°N and 1°S, respectively.

Drainage

Drainage is controlled by the four major relief zones described earlier. The longest rivers in Kenya are the Tana and the Athi, both over 700 m long. They rise from the eastern highlands and drain southeastwards, finally reaching the Indian Ocean. Most of the other rivers also originate in the precipitation-rich Kenya Highlands and run off radially; in so far as they do not dry out in the

semi-arid areas or end up in swamps, they merge with the Tana and Athi (Fig. 1).

The water level of the rivers varies greatly. Whereas in the dry season they dry up or contract to a narrow channel, in the rainy season they swell enormously and carry large amounts of sediment.

The Rift Valley is basically a long north-south orientated inland drainage catchment with a number of lakes occurring along its entire floor. From the north to the south, they include Lakes Turkana, Baringo, Bogoria, Nakuru, Elmenteita, Naivasha and Magadi. The rest of the Rift Valley lakes in Kenya occur in its middle zone where they are found astride the equator. Both Lakes Turkana and Magadi are terminal basins within the larger Rift Valley catchment.

Two long rivers, the Turkwel and the Kerio, rise from the western highlands and drain northwards into Lake Magadi from the eastern and western sides of the southern Rift Valley scarps. The southern Ewaso Ngiro River drains along the Rift floor into Lake Natron at the Kenyan-Tanzanian border, adjacent to Lake Magadi.

The Rift Valley lakes vary in salinity. Lake Naivasha is a fresh water lake, and Lake Baringo is only weakly saline. The remainder of the lakes are alkaline to hyperalkaline in their chemistry. Lake Victoria, a large fresh water lake, occupies a basin into which the majority of the rivers and streams rising from the western highlands drain. These rivers include the Sio, the Nzoia, the Yala, the Kuja and the Mara.

Climate and vegetation

Lying in the middle of the equatorial belt, Kenya displays a variable climate and vegetation cover consistent with its range of altitudes. Four broad climatic zones are distinguishable within the country and include the lake basin around Lake Victoria to the west, the highlands (western and central highlands including Nairobi), the coastal and the semi-desert (including desert) climates (Fig. 2).

The lake basin climatic zone receives an average annual rainfall of 150 cm to >200 cm with the driest month receiving an average minimum of only 5 cm and the wettest month an average minimum of 20 cm. Temperatures are warm to hot, rarely falling below 20°C and reaching a maximum of about 30°C.

The coastal climatic zone receives an annual rainfall of 100-200 cm. During the hot months temperatures are about 30°C and in the warm months about 25°C. With the exception of January and February, which receive a rainfall of less than 1 cm each, the rest of the months receive an average rainfall of 5-10 cm, except for the wettest months (April and May) which receive over 20 cm of rainfall each.

The highlands receive an average annual rainfall of 50 cm to >200 cm. During the hot months the temperatures are 22-28°C and during the cool months 15-20°C. January, February and July to September are the driest months with an average rainfall of less than 3 cm each. The wettest months are April to May and October to November with an average rainfall of between 10 cm and 20 cm each month.

The semi-desert climate is hot to very hot throughout the year. Temperatures are over 25°C in the cool months and over 30°C during the hot months. The climate is largely dry and during the wet months of March to May and October to December, the rainfall is less than 5 cm each month.

The vegetation varies according to the climate and relief (Fig. 3). In the lake basin, the highlands and the coastal climatic zones, the vegetation varies from predominantly savanna type (grassland) to scattered woodlands and equatorial forest. In their upper reaches the montane forests are fringed by bamboo and heather growth, which gradually give way to grassland and moorland (highland forest and shrub). In the semi-desert climate, which accounts for over three quarters of the total area of the country, the vegetation is mainly desert and shrub. Moorland vegetation is found at the top of the Mt Kenya region. A few scattered areas with swamp vegetation also occur within the country. Their largest development is found slightly north of the equator about 150 km west of the Somali border in the Lorian swamp, where the River Engare Uaso Nyiro disappears through a network of tributaries.

Soils

Over three quarters of the country is covered by loam soils, which are particularly well-developed in the semi-arid and desert regions. These are well drained soils with an adequate amount of soil nutrients and therefore ideal for agriculture. Nevertheless, the lack of adequate rainfall or other forms of water continues to impede agricultural development in these areas. In the lake basin and central highlands regions, clays are the dominant soils. Young, very fertile, volcanic ash soils ideal for agriculture are found in the high mountain areas such as Mt Kenya, Mt Elgon and the Aberdares Range. These soils are known to have a high sorption capacity and are a contributory factor to landslide events in these areas (Davies and Nyambok, 1993). Along the coastal region, a narrow band of coastal sand borders the land adjacent to the Indian Ocean.

Table 1. Population of Kenya according to the 1989 Census

Province	Population
Nairobi	1,324,570
Central	3,116,703
Coast	1,829,191
Eastern	3,768,677
Northeastern	371,391
Nyanza	3,507,162
Rift Valley	4,981,613
Western	2,544,329
Total (Kenya)	21,443,636

Source: Central Bureau of Statistics, Government of Kenya (1994).

Population

The population of Kenya based on the last census (1989) is 21.4 million people, with a projected figure of about 30 million in the year 1996 (Central Bureau of Statistics, 1994). The highest population densities (>3 million people) are found in the Rift Valley, Eastern, North Eastern, Nyanza and Central Provinces, respectively (Table 1).

The capital city, Nairobi, has a population of about 1.5 million people (Central Bureau of Statistics, 1994), while Mombasa and Kisumu are the next major towns, respectively. Other major population centres include Nakuru, Eldoret, Meru, Thika, Nyeri, Kisii, Kericho, Bungoma, Busia, Malindi and Machakos (Fig. 4).

The population density is controlled mainly by agricultural productivity, which is in turn largely determined by rainfall. The high and medium density areas of the central highlands region and the Lake Victoria and coastal regions, receive medium to high rainfalls and have good arable lands. Major towns have high populations because they are either largely administrative and/or commercial and industrial centres. In contrast the low population density areas are either arid or semi-arid.

Land use

A wide variety of crops, depending on their ideal climatic and soil conditions, are grown in the different parts of the country (Fig. 5). However, only the major crops and agricultural activities are described in this section. Along the coastal strip cashew nuts, coconuts and sisal are the main cash crops grown.

In the central highlands coffee, tea, rice, fruit, sisal and pyrethrum are the main cash crops, while in the western Kenya region these are sugar cane, cotton, tea and rice. Some coffee and tobacco are also grown in this region. Maize and wheat are grown both as subsistence as well as cash crops. Cattle rearing, mainly for beef, is practised particularly in the semi-arid areas. Over 70 percent of the country is not arable and arable lands are only found in the central, western and coastal regions. Climatic conditions, vegetation and agriculture are largely controlled by the relief of the country which has already been discussed earlier.

Economics and industry

The economy of Kenya is largely dependent on tourism and agriculture. Since independence in 1963, the economy has undergone an overall structural transformation accompanied by significant changes in the contribution of various sectors to the gross domestic product. Agricultural production, which accounted for 44.2 and 38.4% of the gross domestic product in 1954 and 1963, respectively, declined to about 30% in 1990 (Central Bank of Kenya, 1991). This reflects the growing importance of the other sectors of the economy. Nevertheless, this sector remains the backbone of the economy, supporting the almost 80% of the population that live in rural areas.

The tourism industry has gained increased importance in the Kenyan economy since 1963. With the weak performance in coffee and tea over the last few years, this sector has become the country's leading foreign exchange earner. The phenomenal expansion in this sector reflects not only the diverse tourist attractions that Kenya has, but also the enormous investment that the country has undertaken in infrastructural facilities such as hotels of international standard and roads connecting the national parks and main urban centres.

The contribution of the manufacturing sector to the gross domestic product has also increased significantly since independence. Manufacturing production has been dominated by food, beverages and tobacco, chemical and petroleum products and metal products. The country has several tea processing factories within the tea growing zones in the western and central regions (the Kericho, Murang'a, Nyeri and Kiambu districts). Coffee factories are also common in the coffee growing zones, the majority of which are located in the central region. The tea and coffee industries utilise huge quatities of water and environmental pollution is frequently noted in the nearby rivers and streams into which factory effluents are discharged.

Wood and paper factories are located in Thika, Nairobi and Webuye. The Pan Paper Mill is located in Webuye and discharges its effluent into the River Nzoia (Fig. 1). The level of toxic gas emission into the atmosphere, as well as organic and metal

Annex 85

M.G. Hassan and M.H. Tako, "Current status of marine fisheries in Somalia", in Assessment & Monitoring of Marine System (S. Lokman et al. eds., 1999)

15 ARF

Current status of marine fisheries in Somalia

MUSSE GABOBE HASSAN & MAHAMUD HASSAN TAKO

Maritime & Fishery Institute,

Abdul-Aziz District, Mogadishu, Somalia

Key words: Economic Analysis, Effects, Evaluation, Recommendation, Stock

Abstract

Somalia's fishery is under exploited due primarily to four factors. The first factor is the abundance of livestock, which makes people reluctant to utilize the resources in the sea. The second is the absence of vital and important infrastructure. The third is the division of Somalia into several clan-controlled regions, which are presently functioning as self-governing states. The fourth is the imperceptive of both local and international markets.

No one is responsible for fisheries resources and activities have failed due to inadequate security. Some of the reasons include the following; firstly unrealistic perceptions, particularly primitive attitudes of ignorance, non-competitiveness, and other fallacious attitudes of nomadic agropastroal people; secondly, there are scarcity of professionals who take how realistic approaches would come to being; thirdly, sectarianism with respect of clan based divided territories where the artisanal fisheries are being intimidated; fourtly, isolation organizational structures where lack of communication exists between the fisheries professionals and artisanal fishermen because of unclear policies of the political leaders; fifty, fragmentation of the international donors whose interest is ignition and flaming new fighting as they receive risk allowances and their false approach would not be traced.

Introduction

Geographically, Somalia locates in the East Africa, in the east it is adjacent to Indian Ocean and in the north the Gulf of Aden of Red Sea. The size of the land is estimated 637, 540 km square; with coast line of 3333 km square with population of 9, 639, 541; sovereignty territorial waters up to 200 nautical miles. Its economy mainly depends on agriculture, livestock, forestry and fisheries. Livestock, which is predominant export, an important source of animal products (mostly milk) for internal markets and subsistence. Crop cultivation dominated by rural subsistence sector, which generated sufficient surplus to sustain domestic informal markets and barter economy. Fisheries are mainly engaged in lucrative commerce from enclave along the Red Sea and the Indian Ocean as far south as to the coast of Kismayo.

G.H. Musse & H.T. Mahamud (1999) *In* Assessment & Monitoring of Marine System. S. Lokman, M.S.N. Azhar, M.S. Nasir & M.A. Borowitzka (eds.), Universiti Putra Malaysia Terengganu, Kuala Terengganu, Malaysia (p 255 - 264).

Fish distribution is strongly influenced by environmental factors such as the temperature, salinity, nutrients, upwelling, and the thermocline. Seasonal variations in abundance are considerable with two peaks in the landing i.e. in November and in March with Southwest monsoon landing declines. In the absence of a central government, a few qualified professionals and active private sectors with the help of non-governmental organization have attempted to cover all possible needs up to their extreme capacity. They forward consultancy, private project management; fisheries development, procurement of boats, gears, marketing and all other necessary accessories need by the fishing industry. Since there is chronic shortage private investors and fisheries professionals who would take the realistic steps which could lead how the resources would be utilized. Research initiatives and forwarding recommendations could establish solutions for the shortage output by elevating with establishment rehabilitation and development activities.

Constraints to the Development

Unrealistic Perceptions

Perhaps the most pervasive threatening which halts the consumption of fish is primarily the abundance of livestock. Fishing which is generally considered recent intrusion into otherwise nomadic pastoral economy. Obviously, Somalia maintain the same culture, which it happens based on misconception of Somali descendants who were nomads, and whose life style depended on livestock and cultivating farms. It is rooted in the cultural, social fabric with centuries-old precedents. Somalis are simple, postural economies and highly adaptive to their environment. While some others, parts of the world were engaged actively in fishing. The potential is too high and the fishery is under exploited. The artisanal nature of fishery is often construed as being high level but insufficient, due to non-effective mobilization. Yet, fishery development has fallen drastically since the fall of the late dictatorship Siad Bare. Although fishing has been taken as an opportunity since the environment of employment has faded, with the emphasis on increased number of fishermen with susceptible infrastructures.

Lack of Professionals

Fisheries professionals of Somalia were very few priors to the civil war. Lack of professionalism regarding fish, fishermen, and fisheries, and the run-down degree of sectarian influences, which extends all the way down to the day-to-day operation levels. The small number of fisheries professionals who were positioned at ministry of fisheries and marine resources and the small proportion of maritime and fisheries institute and those of department of fisheries of technical college have scattered almost all over the world. Currently, small companies owned by some remainder of the fisheries professionals and some artisanal fisheries are the sole expert. It is quite complex and has its difficulties to regenerate the existence of fisheries professionals in the region. It is recognized that in the empty environment of fisheries professionals due to presence domination of factional warring territories would not enrich on the sound management and socio-economic information. What is needed is a cadre of multi-discipline, intellectuals willing to communicate to solve the problems, create free atmosphere for fisheries professionals, and aritisanal fisheries, and encourage more production and training. The most communities are lacking skilful participants due to financial and security constraints.

Sectarianism

Somalia suffers division into several clan-controlled territories whose administration is entirely independent apart from political influences. Histories of enmity and divergent economic interests may have divided into conflicting factions. The second problem arises due to unawareness of local and international markets. The previous government did not encourage the implementation of private sectors and inconsequence the toppled factions have worsened the case all the fishing activities were doomed into failure. For example, many co-operatives ran by the government and the entire infrastructure was looted and could not make use because of spare parts. Hopefully, in the near future, Somali people work together by setting up a federal government in collaboration with the present local state governments; co-ordination would greatly facilitate many aspects of fisheries development, training, analysis, exploration, and management. Inter-regional communication would also enhance the professionalism and morale of fisheries personnel in general. A notable example is the Red Sea Fisheries and Marine Services Co. and Somali Marine Resource Development and Conservation Center, which are actively engaged in promoting business opportunities, and luring foreign investment in the absence of central government.

Fragmentation of Organizational Structure

Since there are no institutional organizations almost all the country there are a numerous areas have been identified as constraints private operating companies' entire country. These include firstly; there is no market for their catch. Secondly, there is no permanent program for systematic fishing schedules. Thirdly, the fisheries split with their respective local communities. Fourthly, there is no co-ordination among artisanal fisheries. Fifty no communication facilities for artisanal fisheries rural and urban areas. Sixthly there is a lack of public awareness and no appreciation at all. Seventhly, there is a lack of financial support and no plan for management approaches. Eighthly, there is no plan for data collection and lastly there are severe environmental degradations from developed world.

Artisanal fisheries efforts are currently divided into several units and co-ordination or communication hardly exists between them. There is no room for management programs affecting commercial fisheries development fall. What is needed is a formation of joint-commission management for all companies irrespective of their base, in order to form a single, permanent structure for expertising, recruiting, importing fishing gears, and marketing. The proposed new governments is supposed to move significantly in the proper direction, but many aspects, in particular the co-operation between the local governments would remain unclear.

The division of local governments responsibilities based fisheries is unavoidable consequence of the Somali clan systems. As such, there is little likelihood that this situation will change. However, because of the little of Somalia's productive area comes under the influence of non-stable policies of the warring factions. This must be minimal to create safe channels and should be minimal impedimentation from the point of view of the localities. However, recently there have been a long waited compromises among the local government presidents and would motivate the promotion of fishing industry in Somalia since people realized these policies do not suit for Somalia in general and they have little impact to rely on premature policies.

Fish and Crustaceans Available in Somalia

Countless studies done by EU member countries, Americans, and some UN Agencies have shown Somali marine resources are estimated at an annual catch of 300,000 tones of fish and 10,000 tones of crustacean. The actual annual catches at the present are only about 2000 tones, 450 tones of lobster, 100 tones of shark, and 20 tones of shrimp. The market for all fish is consumed locally and lobster is exported to united Arab Emirate (UAE).

Methods of Production and Consumption

Fish is caught with line and hooks, gill nets, drift nets, purse seine. It is consumed within 24-hours of catch within the same area where it is caught. Negligible quantities of frozen fish fillet form are exported to UAE. The true status is subsistence fishing. The production capacity in Somalia is about 5,000 tones per year. However, because of lack of infrastructure and means to reach export markets the production is about 2,000 tones per year. There are several trawlers owned by Somali Government, operating in Somali waters and landing their catch in foreign ports. It is not known their annual catches so as the illegal fishing with sweeping trawl were observed over there.

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Boats and Fishing Gears

Most fishing boats used in Somalia are wooden outboard motor Boats and rowboats. These boats catch most of fish with gill nets, lines & hooks, trolling lines, short pelagic longlines, and hand lines, drift nets, purse seine. They are owned by individual fishing families. There are about 1,000 in the country. Somalis are proficient in their manufacture and maintenance. These boats are rowed while some are outboard motors. There are also about 400 small fiberglass boats 6-10 meters long. These boats are mechanized; however, the motors and other equipment for these boats are old and debilitated. It is difficult to find spare parts for them. Some of these boats were manufactured in the country by a project funded by FAO, but was its infancy when the civil war broke out. On gear and spare parts, there is very little or almost no place to buy.

The most active fishing in Somalia (excluding illegal fishing from foreign trawls) is being carried out along coastal waters. Over all 866 functional motorized GRP vessels are observed actively engaged in fishing. Similarly, the largest number of traditional fishing boats (i.e. the canoe-like Houris and the larger wind-powered Mashuas and Bedens) were counted in Somalia as shown in Table 1. The numbers of fishermen who are actively engaged in the sector of fishing and make a living out of it are estimated 4500 fishermen, although varying considerably in the coastal regions of the country. However, the greater majority of these unaccounted fishermen are not working in the field either because of they are lacking fishing equipment and/or boats or because local or export markets outlet are not available.

Most of the valuable marine organisms found along the entire coastline of the country are being exploited by local aritisanal fishing community, but the level of utilization is far below the potential sustainable capacity of the territorial waters. The reduced level of the exploitation is also due to lack of functional infrastructure available in the country. At the present, in fact, no demersal and pelagic fish are being exploited in Somalia for the fresh frozen markets. Only small quantities are being fished, most of which are gutted, salted, sun-dried and then exported to Mombassa, Kenya. Very small volumes of fresh fish are being consumed in the country itself and mainly by a small percentage of the inhabitants of some of the larger settlements along the coast (e.g. Berbera, Bossasso, Mogadishu & Kismayo). Due to the absence of the additional infrastructure such as ice plants, adequate transportation means, processing facilities, etc., the industry is at the present limited to the production and marketing of sun-dried and salted products. Shark meat as well as a variety of demersal and pelagic fish species is being utilized. However, although reliable figures are not available, the total quantities of dried products produced and exported in the last few years is likely to have been very low.

Table 1. The total number of motorized fishing vessels imported or manufactured locally with the country of origins.

Country of Origin	LOA (m)	Engine Power (hp)	No. of Units		Material
USSR (Lifeboat type)	8.8	USSR	25	150	Wood

Sweden	6.4	Volvo MD5	8	220	FRP
Sweden	10.0	Volvo MD70	95	6	FRP
Kenya	7.0 & 9.0	Yanmar	8	60	FRP
Kenya	7.8	Yanmar	18	40	FRP
Greece	8.4	Petter	20	25	FRP
Italy	5.0	Slanza	8	10	FRP

Table 1 (Continued)

Country of Origin	LOA (m)	Engine Power (hp)	No. of Units		Material
Italy	9.0	Slanza	20	25	FRP
Sri Lanka	8.7	Yanmar	22	25	Wood
Sri Lanka	8.8	Yanmar	22	100	FRP
Sri Lanka	8.8	Yanmar	28	105	FRP
Somalia (Hamar-type)	8.5	Yanmar	18	85	Wood
Somalia (USSR-type)	8.5	Yanmar	18	15	Wood

Note : Information from Dubad, Omar Haji Ahmed, Ministry of Fisheries and Marine Resources (1990). Data has been slightly modified by the authors. Detailed information on the total number of motorized fishing vessels imported or manufactured locally is not available. It was almost impossible for the authors to determine the number of various field missions as not all localities were visited.

The only fishery, which is presently being exploited in a semi-industrial manner, is the spiny lobster fishery along the Indian Ocean Coast. All the catch in 1995 estimated 140 Mt. of lobster was reportedly exported to United Arab Emirates. This industry is booming and encouraging more entrepreneurs every year to invest in small companies. The reasons for their success (possibly the only one in the entire fishing industry in Somalia) are many and most probably include the political stability of the region.

Artisanal fisheries in Somalia have great developmental potential thanks to the abundance of marine resources in its coastal waters as can be seen in Figure 3. In order to support the growth of this industry, development efforts should be concentrated initially in strengthening the various activities already undertaken by the local fishing community and traders (i.e. the lobster fishery and trade of dry-salted products). At the same time efforts should be made to encourage the consumption of fresh and dried fish among the Somalia even though only an export market can ensure the growth of the sector beyond the artisanal stage.

Table 2. The major commercial marine species, crustacean & other species exploited in Somali coastal waters

English Name	Scientific Name	
Barracuda	*Sphyraena spp.*	(Sphyraenidea)
Cobia	*Rachycentron canadu*	(Rachycentride)
Croaker	*Otolithes ruber*	(Sciaenidae)
Dolphin Fish	*Coryphaena spp.*	(Coryphaenidae)
Emperors	*Lethrinus spp.*	(Lethrinidae)
Frigate Mackerel	*Euthynnus affinis*	(Scombridae)
Goatfish	*Upeneus spp.*	(Mulldae)
Grouper	*Epinephelus spp.*	(Serranidae)
Hammer Shark	*Sphyna zygaena*	(Sphyrnidae)
Mullet	*Liza spp. Valamugil spp.*	(Mugilidae)
Rays	*Numerous species*	(Rajiidae)
Sailfish	*Istiophorus platypterus*	(Istiophoridae)
Sardine	*Sardinella spp.*	(Clupeidae)
Saw Shark	*Pristis pectinata*	(Pristidae)
Skipjack Tuna	*Katsuwonus pelamis*	(Scombridae)
Snapper	*Lutjnus spp.*	(Lutjanidae)
Spanish Mackerel	*Scomberomorus commerson*	(Scombridae)
Spinefeet	*Siganus spp*	(Siganidae)

Swardfish	*Xiphias gladius*	(Xiphiidae)
Tiger Shark	*Galeocerdo cuvieri*	(Elasmobrachchii)
Trevally	*Carangoides spp.*	(Carangidae)
Wolf Herring	*Chirocentrus spp.*	(Chirocentridae)
Wrasse	*Bodianus binulatus*	(Lambridae)
Yellowfin Tuna	*Thunnus albacares*	(Scombridae)

Marine Crustaceans Species		
Spiny Lobster	*Panulirus spp.*	(Palinuridae)
Shrimp	*Penaeus spp.*	(Penaeidae)

Other Species		
Cuttlefish	*Sepia spp.*	(Sepiidae)
Squid	*Loligo spp.*	(Loliginidae)
Octopus	*Octopodidae spp.*	(Octopodidae)

Needed Recommendation Measures

The recent situation in Somalia is disheartening, although some improvements have been made. These need to be continued and solidified. Current new initiatives of compromising political leaders if properly designed and followed through, offer an opportunity for productive changes. The number of rehabilitation and developmental activities that the international donor community can support in the artisinal fishery sector in Somalia are many. However, there have its peculiar needs and problems. Such differences among the zones are due to the different levels of development the industry had achieved prior to the war. Over all, the needs of the fishing sector are considerably high and are not limited simple supply of fishing boats and equipment. The fishing industry in fact achieved relatively high level of development during the '80s some major processing facilities and cold storage were established. To effectuate rapid rehabilitation of artisanal fisheries requires substantial efforts for donation. In fisheries, this requires two. First, board based international benefaction including the development of fisheries projects for procurement of boats, gears, processing plants. Secondly, to initiate instant education for fishermen and other concerned with fisheries (e.g. enforcement personnel, marketers), with the emphasis on particular aspect of technology,

management, regulations, etc. Currently, there are no mandates at all levels. Substantially, there are no funds for all, some offices still exist but they are used for other purposes and no personnel. It is recommendation that local state governments should set an advisory commission, consisting of fisheries experts and fisheries education/information-transfer specialists for these appropriate agencies.

Largest segment of the Somalis have realized, that there is a large natural resources beneath their seas and are intent to exploit it. Almost everyone is waiting formation of a federal government and the availability of financial facilities. We believe the incoming government will concentrate on the development of these natural resources, mainly on agricultural production. It is quite obvious that the government will purchase boats, gear, processing plants, ports training and research equipment. To accomplish these projects the government will need the technical know how of companies to expertise. More importantly, the consensus in Somalia is to develop through private sectors not like the previous government whose policy degraded all the natural resources due to highly favor of individualistic. Fisheries management is prima rily the management of people. It is exceeding difficult to develop effective management if people are not aware the existing problems, their potential consequences, and possible solutions. Without participation and co-ordination of fishermen, management will be difficult at best, and more likely impossible. At the present there are established channels for dialogues among local state governments to set on structure, this takes care for all necessary measures.

The reviewers do claim that there is a room for integrating the development within the marine fisheries of Somalia. However, the areas worthy of attention are not limited. But more or less, appears to be the room for generating among pelagic or demersal resources, notably, sharks, mackerels, tunas, swo rdfish, lobster, squid, etc. Ideally, finding international markets with co-operation, co-ordination, and technical assistance donor countries and/or international non-governmental organizations can increase exploitation. It is recommendation that the government agencies be restructured and they revise the way they interact with the fishermen and serve the public. While the fishermen and professionals be involved in resources management with international organizations to advocate to prevent foreign vessels engaged in fishing in Somalia coastal waters or/and other companies which dispose fatal waste products into Somali waters within its EEZ.

It has been identified four levels in the fishery industry of Somalia which are highly linked to one another. Unquestionably, the industry exists, regardless of its development, it is necessary that the fishing community also exists and which is engaged in fishing activities. This constitutes the first level in the industry, i.e. "Production". The followed by "Conservation and Processing", the third one being "Marketing", while fourth level is "Fisheries Experts" who recommend reliable information about the uniqueness of the follow of the process. Whenever a fishing industry exists all four levels described above are developed to some extent, however the degree of sophistication depends on the development status of the industry itself. All these activities are linked to one an other but become more complex and technically demanding the more developed the fishing sector in this particular region. Reliable achievements and commitments for implementing new approaches to the resources are highly recommendable.

Participatory approaches have increased considerably besides a passive role to the people to benefit. All the previous failures lead to the realization to the best measure of development to exploit the abundance of wealth production. In order to qualify to improve the quality of life of poor coastal residents, the small farmers and fishermen, the urban poor and other marginalized people, but the pervasive constraints recovery paradigms (patterns) are expected recently. At the present time, it is necessary to extend our outcry and appeal internationally to find some type of commitment into action programs, which are more practical and appropriate. There have often been European Union member countries, United States and UN and many non governmental organization which in fact worked hard enough to ease our complexity of destruction and still at out side for re-establishing and reorganizing all the lost efforts. Now the technology transfer domination has attained to the oriental countries so we are looking forward for their technical assistance as well.

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Annex 86

F. Carbone et al., "The Modern Coral Colonization of the Bajuni Barrier Island (Southern Somalia): A Facies Model for Carbonate-Quartzose Sedimentation", *Geologica Romana*, Vol. 35 (1999)

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THE MODERN CORAL COLONIZATION OF THE BAJUNI BARRIER ISLAND (SOUTHERN SOMALIA): A FACIES MODEL FOR CARBONATE-QUARTZOSE SEDIMENTATION

The Somali coast south of Kisimayo has been long investigated and a modern depositional model is proposed. Several evolutive phases have been identified, corresponding to eustatic sea-level variations starting from isotope stage 5e, which led to the present coastal setting, characterized by mixed carbonate-terrigenous sedimentation and conditioned by climatic factors. The sea level fall below the continental shelf edge during the last glacial period caused subaerial exposure, erosion and weathering of the sedimentary substratum. As a consequence a braided fluvial net developed on the coastal belt and coastal dune ridges migrated toward the shelf edge, influencing the distribution pattern of the modern sedimentary and ecological environments. The Holocene inundation of the shelf caused the drowning of the channels, the overflowing of the interdune areas, the formation of the Bajuni barrier island, of wide coastal lagoons and channelized tidal flats. The relation among inherited morphology, supply of terrigenous material and development of coral communities is shown in a series of ecological profiles and sketch maps of facies distribution. The depositional systems of outer shelf, marine passes, coastal sound and braided channels have been investigated in detail in some key areas. The types of coral colonization as well as their interaction with seagrass meadows have been examined. In outer shelf corals grow in form of fringing reefs and coral carpets around the abraded flat of the islands and along some morphological steps corresponding to old sea-level stillstands. In the marine passes crossing the barrier island, the hard substrate is colonized by fringing and pinnacle reefs, coral carpets and knobs and their distribution is controlled by the energy dispersion of the tidal currents. In the coastal sound corals grow to form at places small fringing reefs and carpets along the protected edges of the islands and near the channel mouths, whereas patch and table reefs are found on isolated erosion remnants inside wide *Thalassodendron* meadows. The braided channelized area of the coastal belt is characterized by the development of mangal and salt flat depositional systems where the facies distribution is controlled by the extension of the tidal prism.

PAROLE CHIAVE: *Coral reefs, barrier island, coastal environment, Somali coast, Indian Ocean, Holocene.*

KEY WORDS: *Scogliere coralline, barrier island, ambiente costiero, costa somala, Oceano Indiano, Olocene.*

Introduction

This paper synthesizes data collected during the investigations carried out in the 80's (Angelucci *et al.*, 1982; Angelucci *et al.*1984; Carbone, 1987; Angelucci *et al.* 1987; Carbone and Matteucci, 1990; Carbone *et al.*, 1994) along the coastal belt of southern Somalia, from the Juba river to the Kenyan border (Fig. 1).

Purpose of this research is to define an evolutive model of the modern depositional pattern in a comparatively unknown region characterized by a range of elongate islands parallel to the shore, separated from the mainland by a narrow marine sound.

During the Pleistocene and the Holocene, climate changes and sea-level fluctuations continuously modified the depositional environments by means of the varying interaction of the skeletal carbonate with the quartzose sedimentation. The main factors which control the sedimentary processes along this coastal belt are referable to those involved in the barrier island systems (Hoyt, 1967).

Different depositional systems have been deeply investigated in key areas of the archipelago to define different textural facies characters, types of bottom colonization and of coral associations. Furthermore an extensive survey carried out on the whole archipelago allowed to recognize the general development and the areal distribution of these depositional systems.

The study of the modern coral reefs and of the Pleistocene reef terraces cropping out along the coast allowed to recognize a series of depositional phases which cannot be exactly placed in the stratigraphic record, but certainly connected to the sea-level fluctuations since the last interglacial. These data are synthesized in a series of schematized outlines consisting of some maps of the main depositional environments and of a series of ecological profiles which, besides having local meaning, provide also an example of the sedimentary models developed along the southern Somali coast.

Geographical and geological setting

The Somali continental shelf of the Indian Ocean is for the most part narrow and its edge lies at compara-

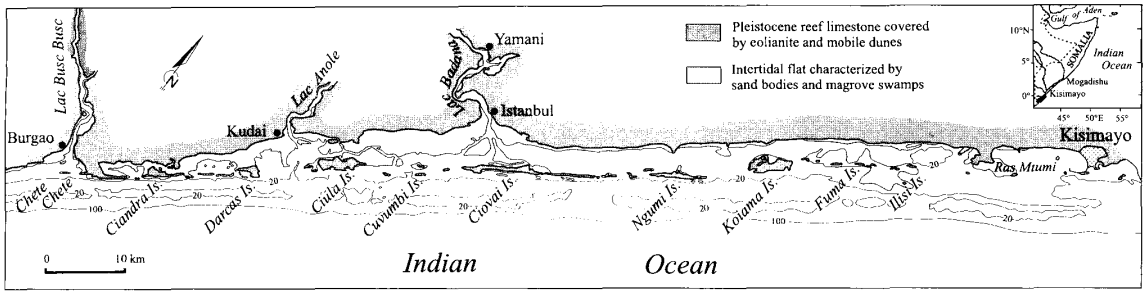

Fig. 1 – Sketch map of the Bajuni Islands.

– Carta schematica delle Isole Bajuni.

tively shallow depths, commonly between 60 m and 100 m, few km off the coast, where it turns into a short steeper slope. In places there appears to be no shelf along straight stretches of the coast, suggesting a fault origin. Southwards, indentations of the coast generally coincide with a widening of the shelf and appearance of insular strings.

The coast extending from Kisimayo to the Kenyan border is characterized by two peculiar morphologic elements: the Bajuni Islands and three channels, connected with the sea through large mouths which are named, from north to south, Lac Badana, Lac Anole, and Lac Busc Busc (Fig. 1). These channels are characterized by the presence of three villages, respectively Istanbul, Kudai and Burgao.

The flat coastal belt of the Kisimayo region shows a marine carbonate substratum covered, near the shoreline, by reddish soils and dune bodies and, inland, by alluvial and marshy deposits. An old dune ridge, made up of poorly cemented, reddish, quartzose sand, separates a narrow coastal belt from the inland plain which is crossed by the three channels; the inner region shows a sub-endorheic regime, with wide areas flooded during the rainy seasons.

The Bajuni archipelago consists of a series of islands, islets and skerries roughly aligned and parallel to the coast. It extends for about 130 km from Kisimayo to Burgao. Southwards, other islands are found along the northern coast of Kenya from Ras Chiambone to Lamu. The islands are separated from the coast by a narrow marine sound up to 10 m deep, ranging in width from 1 to 3 km south to north. Water exchange between this sound and the open sea is allowed by shallow passes.

Seawards of the islands, the continental shelf is limited by an elongated depression, 25-35 m deep, followed by a narrow ridge coinciding with the shelf edge. This ridge, 1.5-3 km wide, at places rises up to less than 10 m below sea level, showing axial depressions which are not corresponding to the passes crossing the barrier island.

Beyond this ridge the sea-floor reaches a depth of 100 m in less than 2 km and with similar gradients is connected to the Somali Basin (Fig. 2).

Along the southern Somali coastal belt, the present-day geological setting has been closely related to the recent, relative sea-level fluctuations. The modern sedimentation takes place over a bedrock forming the coastal abraded shelf and channel and sea cliffs. It consists of the uppermost part of the Plio–Pleistocene sedimentary succession of the Merka Formation made up of sands, shales and skeletal limestone, typical of paralic and shallow marine environments.

For the African coast of the Indian Ocean, there is scarce radiometric age-dating of the uplifted Pleistocene coral reef terraces. Braithwaithe (1984) gave a complete description of the depositional units outcropping along the Kenyan coast, reporting data from different authors (Hori, 1970; Toyah *et al.* 1973; Battistini, 1976) concerning the age-dating of the various terraces cropping out along the coast at different elevations. Radiocarbon dating of the northernmost sector of the Kenyan coast, scarce and poorly reliable, was generally referred to the isotope stage 3 and thus not compatible with the sea-level position about 100 m b.p.s.l. recognized by Colonna *et al.* (1996) on the basis of $^{230}Th/^{234}U$ age-dating of about 34,000 years BP of samples from the Mayotte Reef in the Comoro Islands.

Regarding the Somali coast, age dating is still insufficient and not enough reliable; $^{230}Th/^{234}U$ age-dating performed on *Tridacna* and massive coral samples from the coral reefs 5-6 m a.s.l. outcropping just south of Mogadishu produced conflicting dates of 35,000 ± 1000, 53,000 ± 2,000, 105,000 ± 3,000 and 123,000 ± 5,000 years BP (unpublished data). Dates obtained from the fossil reefs near Lamu are on the contrary all restricted to the isotopic stage 5, ranging between 109,000 ± 4,000 and 131,000 ± 5,000 years BP (unpublished data).

The raised reef, which forms the coastal cliffs in the Bajuni region and into which various quarries in the outskirts of Kisimayo are dug, shows a sequence,

6-7 m thick, of skeletal limestone characterized by well developed, domal-shaped coral colonies, often in growth position, loose in a coarse skeletal sediment. Sheety acroporids as well as crusty – massive and massive types prevail in the coral community (*Favia*, *Favites*, *Goniopora*, *Porites*). The top of the raised reef is generally calichified and shows several cavities filled with reddish sandy sediments. In places, such as the levees of Lac Badana channel near the village of Yamani, the sequence ends with rhodolith facies deposited during a regressive phase linked to an interstadial period of the isotopic stage 5.

Fossil reefal bodies, scattered all along the coastal belt, are well exposed in the runway of the old airport of Kisimayo, where coral colonies in growth position can be seen on the landing surface. This coral facies is replaced by a shallow lagoonal sequence, well exposed in some backshore areas in the outskirts of Kisimayo. At the Beder quarry the most complete sedimentary succession, 9-10 m thick, crops out (Fig. 3). A packstone layer at the bottom is characterized by spherical sandy concretions, 7-11 cm in diameter, strongly calichified, interpreted as internal moulds of coconuts (Carbone, 1987) and by internal moulds of bivalves and gastropods which testify beach environments. The overlying succession is made up of wackestone and packstone with gastropod and bivalve shells and moulds, in places so abundant to form a coquina. The fossil community consists of predominately burrowing bivalves, both suspensivorous and detritus-feeders (*Tellina*, *Mactra*, *Loripes*, *Lucina* and cardiids). Vegetarian and predator gastropods are also abundant (trochids, naticids, conids). This 2 m thick mollusk facies, indicative of a protected lagoonal environment, is gradually replaced, through a sandy layer rich in ostreids, by fine skeletal wackestone, 6-8 m thick, rich in large specimens of the bivalve *Anadara antiquata*, scattered or grouped in patches together with ostreids and red algae with columnar shape. This assemblage is indicative of quiet, shallow water environments in backshore areas. The succession is topped by a thin bioclastic layer of coral debris and mollusks (*Codakia*, *Tellina* and trochids) typical of back-reef vegetated sandy bottoms. In different places south of Kisimayo, the top surface of the Pleistocene sedimentary sequence is topped by thin reddish paleosoils and deeply bioeroded, specially by the boring action of clionids and lithophagous bivalves.

Along the coastal belt eolian sediments are widespread and mostly consisting of reddish, siliciclastic, poorly cemented dunes and carbonate eolianites forming ridges parallel to the coastline. The outermost of these ridges shows fossil wave notches which prove a recent progradation of the coastline. Mobile dune fields of both quartzose and carbonate sand cover the older eolian deposits.

The geology of the Bajuni islands is monotonous, as they all are made up of eolianite reaching an eleva-

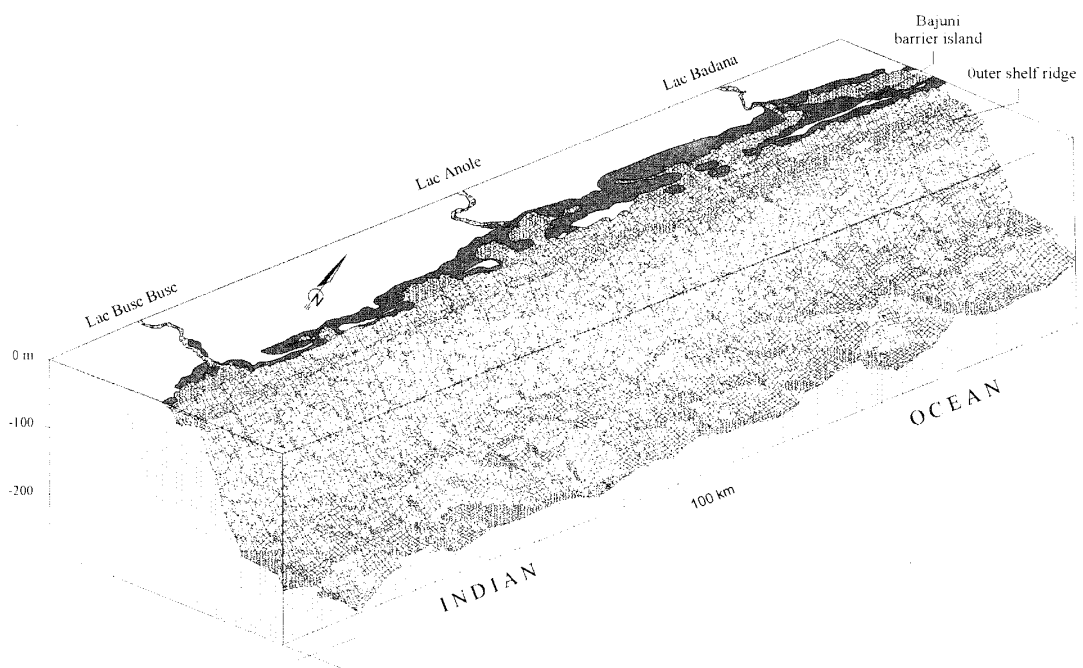

Fig. 2 – Block diagram of the Somali coast south of Kisimayo.

– Bloccodiagramma della costa somala a sud di Kisimayo.

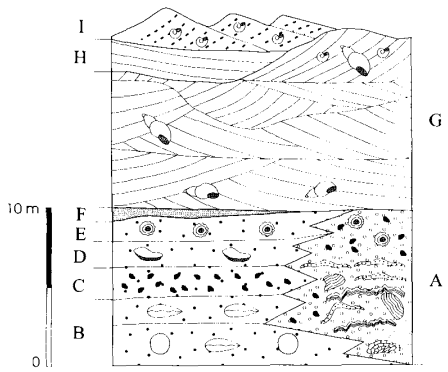

Fig. 3 – Lithofacies of the Pleistocene sequence outcropping along the coast south of Kisimayo: A) reef rudstone, locally bindstone with encrusting corallinaceans and sheety corals; B) calichified wackestone with mollusk and coconut-like moulds; C) skeletal grainstone; D) ostreid wackestone; E) rhodolith rudstone; F) reddish crust with ostreids and encrusting corallinaceans; G) *Achatina* eolianite; H) poorly cemented, quartzose reddish sand; I) carbonate-quartzose mobile dunes with *Achatina* and *Georgia* shells.

– Litofacies della sequenza pleistocenica affiorante lungo la costa a sud di Kisimayo: A) rudstone di scogliera, a luoghi bindstone con corallinacee e coralli incrostanti; B) wackestone fortemente alterato con modelli interni di molluschi e probabili noci di cocco; C) grainstone bioclastico; D) wackestone ad ostreidi; E) rudstone a rodoliti; F) croste arrossate con ostreidi e corallinacee incrostanti; G) eolianite ad *Achatina*; H) sabbia rossastra quarzosa poco cementata; I) dune mobili carbonatico-quarzose ad *Achatina* e *Georgia*.

tion of about 10 m a.s.l., usually covered by grassy and shrubby vegetation. The well cemented eolianite of the islands shows evident cross-bedding episodes separated by irregular erosive surfaces which reflect the discontinuous growth of the dune systems. Processes of calichification and karstification are also evident, especially in the most depressed areas where the rock is topped by thin layers of red soil. Small mobile dunes accumulate on the landward side of the islands.

The boundary between eolianite and underlying skeletal limestone is barely detectable on the islands, and only in rare cases can it be found at the base of the seacliff, coinciding with the nearshore abraded flat. Of paleoenvironmental interest is the finding at the base of the eolianite of a *Nautilus* shell, commonly found also nowadays along the Somali coast, blown by wind even much beyond the seashore.

In conclusion, the Bajuni archipelago is made up of a ridge of eolian sediments accumulated on the abraded shelf surface after the sea-level fall below the shelf edge during the last glacial period.

Environmental parameters

The climate in Somalia is tropical, from arid to semi-arid, with a bimodal rainfall pattern influenced by monsoon winds. The country has an average annual rainfall of about 250 mm with severe droughts being quite common. The mean annual rainfall in the north is less than 250 mm, about 400 mm in the south and 700 mm in the south-west (Fantoli, 1965; NOAA, 1991; FAO, 1995). The rainfall distribution is bimodal, falling in two seasons, the Gu from March to May and the Der from October to November. Occasionally the Gu season extends into June or July because of the Haggai rains which are produced by the onset of the moist onshore winds. The southernmost Somali coastal belt is then characterized by the only rainy season of the Haggai rains, with an average annual rainfall of about 600-700 mm. The Gu and Der rains are caused by the passage of the Inter Tropical Convergence Zone (ITCZ) which follows the apparent movement of the sun's zenith. The ITCZ is where the surface winds of the northern and southern hemispheres meet and then rise in a low pressure zone of considerable atmospheric instability. This instability causes rain to fall in isolated storm cells, the result of which in an extremely irregular distribution both in space and time. The ITCZ also controls the annual pattern of wind direction. From May to September when the ITCZ is 15°N, the wind blows from the south-west and from December to February when the ITCZ is 15°S, the wind blows predominately from the north-east. During the transitional periods (Tangambilis), the wind drops or becomes erratic in direction.

The mean daily temperature is very constant throughout the year, the hottest months, March and April, being only a few degrees warmer than the coolest months, July and August. At Mogadishu the mean daily temperature ranges from 25.5°C to 32.2°C in April and from 22.8°C to 28.3°C in July (NOAA, 1991). However the diurnal temperature fluctuations are much greater and can range from 20°C to 35°C. The mean daily relative humidity pattern is the opposite of the temperature pattern, with high humidity corresponding to low temperatures.

A noteworthy feature of the marine circulation along the Somali coast is the presence of the Somali Current running parallel and close to the coast (Fig. 4). Though frequently strong, this current is actually a narrow flow, so that at more than 100 miles offshore it is often quite weak. To the south at about 2°S, along the east African edge, variations in the coastal currents throughout the year are only slight. To the north of that latitude, on the contrary, the Somali Current reverses in direction during the year, as do the monsoon winds of the area, but it does not necessarily change at the same time.

In the investigated area the coastal currents flowing from south to north are stronger than the reversed ones; as a matter of fact the spit at the mouth of the Juba river is very well developed northwards due to the predominance of the southern coastal currents.

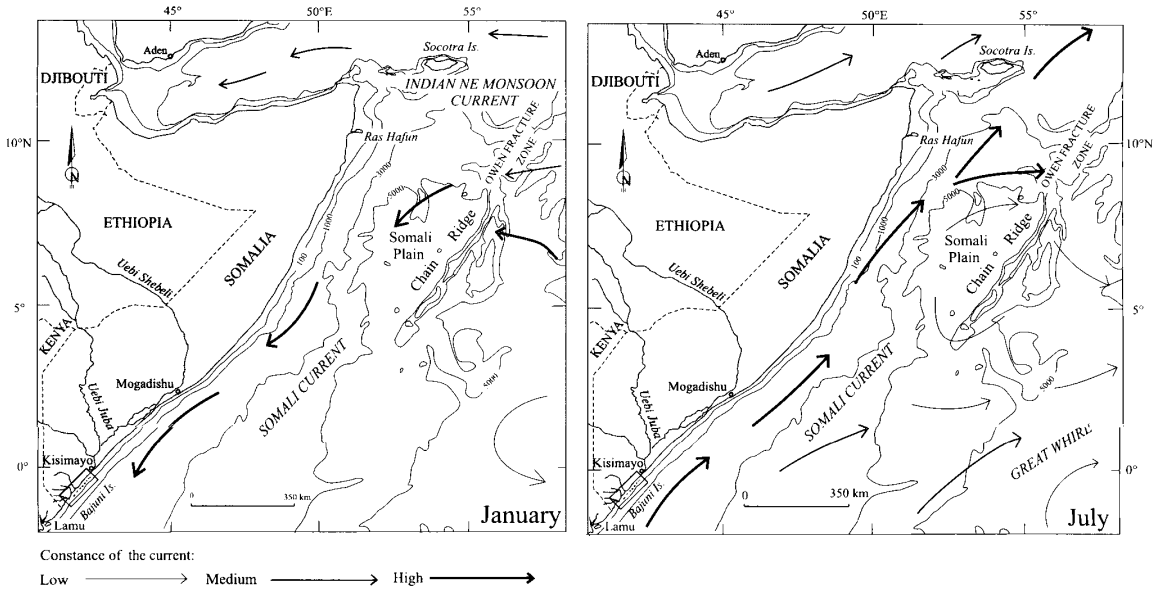

Fig. 4 – Water current patterns along the Somali coast during January and July.

– Flusso delle correnti marine lungo la costa somala in gennaio e luglio.

The sea surface temperature is warmest in April and coldest in August, with a mean annual temperature of 26°C. In August the water temperature is subject to a sudden lowering along the northern coast of Somalia with a minimum of 21°C at Ras Hafun, because of upwelling. High variations from normal values are recorded in shallow water environments, especially in the southernmost part of the Somali coast, where the presence of wide floodable areas during the rainy season causes the drainage of fresh water towards the sea. Thus temporary schizohaline environments develop along the channels and near their mouths, with water temperatures varying several degrees from mean values.

Mixed, semi-diurnal, and diurnal tides occur in the Indian Ocean (Anonymous, 1980). Tidal exchange in coastal waters of the western Indian Ocean is characterized by a mean tidal level of 1.9 m and a tidal range of 4.0 m. These tides cause strong localized currents to flow in breaks around the islands and the reefs that are superimposed onto the overall longshore current. On the east African coast, the tide range increases from South Africa (1.5 - 2 m) to Mozambique (up to 5.5 m), then decreases to 3 - 3.5 m in Kenya, and to 1.5 m in Somalia, at 11°N. The tidal streams are generally weak along the Somali coast, except very close inshore, where the currents are comparatively strong and subject to considerable variation with changing of the wind. The effect of the tidal streams on the resultant water flow is negligible at more than a few miles offshore. South of Kisimayo, in the vicinity of the outlets of the channels, the effect of the tidal streams becomes increasingly important.

Major environmental changes from Late Pleistocene to present-day

The geological setting of the Somali coast is the result of the interaction between tectonics of the passive east African margin and recent sea-level fluctuations. Regarding the southern Somali coast, the depositional event sequence documented by sea-level indicators, such as the height of fossil raised reefs, wave-cut notches and bioeroded surfaces, cannot be definitely placed in the Pleistocene-Holocene stratigraphic record because of insufficient age dating. Nevertheless, some still unpublished $^{230}Th/^{234}U$ dating of massive corals and *Tridacna* shells from Mogadishu and Lamu areas places the older reef cycle cropping out along the coast between 105,000 and 131,000 years BP. Thus, assuming the relative stability of the Somali coast, a connection can be hypothesized between a basal transgressive episode and the depositional event of the last interglacial period of the isotope stage 5. In the investigated area several evolutive phases have been identified, corresponding to eustatic sea-level variations starting from isotope stage 5e (See enclosed chart):

Marine transgression - Sea level rise during isotope stage 5e with landward migration of a fringing reef

complex made up of variously sized buildups, often with bindstone texture. They pass laterally to coarse skeletal grainstone and rudstone, overlying beach ridge facies. The development of protected lagoonal environments during this period is proved by muddy deposits rich in gastropod and bivalve communities (*Anadara antiquata, Lopha cristagalli*) in the outskirts of Kisimayo.

Interstadial forced regression - Sea-level drop with progressive migration of the fringing reef complex towards the shelf edge during the isotope stage 5. This phase is shown by the deposition of muddy sand at the top the coral reef complex and of rubble with abundant rhodoliths forming a marine regressive surface along the banks of Lac Badana.

Sea-level fall below the shelf edge - During the last glacial period the sea level reached a minimum of 145 m b.p.s.l. about 18,500 years BP (Colonna *et al.*, 1996), i.e. far below the shelf edge. As a consequence, a long subaerial exposure of the continental shelf surface occurred, with subsequent erosion and weathering; a braided fluvial net developed, with its base level lower than the present one, and dune ridges migrated towards the shelf edge.

Sea-level bypass of the shelf edge - The rapid submergence of the east African coast during the Holocene rise caused the inundation of the Bajuni shelf, characterized by the presence of a submerged ridge along the shelf edge. Hopley (1994) found a similar morphologic setting in the Great Barrier Reef and according to him this ridge, whose base is located 20 m b.p.s.l., could indicate the foundation site of the modern reef, which probably begun 8,000 years BP. The lowermost part of this submerged ridge could also represent either the outermost dune ridge connected to the previous continental phase or the accumulation of submarine skeletal sand banks (*Halimeda* banks) connected to the first phase of the shelf recolonization (Orme *et al.*, 1978; Marshall and Davies, 1988). In fact the coral growth during the initial phase of the inundation seems to be negligible because of probable high water turbidity deriving from reworking of previously deposited soil and regolith and of upwelling of cool subsurface water reaching the shelf edge. Some morphological steps parallel to the coast in outer shelf areas can be related to stillstands during this phase.

Flooding of the Pleistocene shelf - The complete inundation of the Pleistocene shelf causes the drowning of the channels cut during the lowstand period and the overflowing of the interdune areas. This causes the formation of the Bajuni barrier island, of wide coastal lagoons and channelized tidal flats. About 5000 years BP the sea level reached the height of about 2 m a.p.s.l. (Carbone, 1987) and the deposition of beachrock took place just above the present sea-level; abraded flats and wave notches were cut also in the inner areas of the channels. In places coral knobs, patch reefs and fringing reefs started growing.

Present-day sea-level stillstand - The present facies pattern has been reached in very recent times, following a regressive tendency, marked by accretionary beach ridges, long shore bars and wide tidal bars developed at the outlets of the channels. The presence of partially buried old notches, bordering the mangal flat landward, suggests a prograding tendency of the coastal area. Today, many areas inside the Bajuni sound appear to be shallowing, with increase of the mangrove colonization and decrease of the coral community in favour of *Thalassodendron* meadows.

Sedimentary facies and bottom colonization

Depending on the type of depositional substratum and of corresponding biota, a series of sedimentary facies, shown by ecological profiles, has been defined, forming as a whole the barrier island model. Localization and extension of these facies are different, some of them being ubiquitous and widespread both inside and outside the island ridge, some other being on the contrary indicative of specific morphologic and energetic characters of the substratum. They are connected to different bottom types: sandy bottoms, either mobile or stabilized by marine vegetation; abraded hard bottoms, with poor or lacking sediment cover and finally bottoms colonized by corals forming different types of buildups.

1) *Washed sandy beach* - The side of the islands towards the open sea shows wide high energy beaches alternating with cliffs cut into the Pleistocene well cemented eolianites. The present-day wave notch borders an abraded flat with wide areas emerging during low tide and with variously sized, steep sided pits, whose bottom depth sometimes exceeds the low tide level. The cliffs are steep and the wave notch at their base shows the effects of boring and grazing. The beaches consist of well rounded, variously grained skeletal sand (Pl. 5, Fig. F) and show different profiles of equilibrium due to wave energy and their position respect to the main wind directions.

2) *Millepora and alcyonarian sandy bottom* - In outer shelf areas near the islands, flat or gently dipping sandy bottoms, ranging in depth from 4 to 10 m, are characterized by large, isolated colonies of *Millepora* (*M.* cf. *platyphylla*), showing globular or cylindrical shape and a size range of 2-4 m in diameter and 1-2 m in height; colonies of branching alcyonarians are also frequent with similar sizes. Small thickets of branching *Acropora*, poorly developed in height and patch

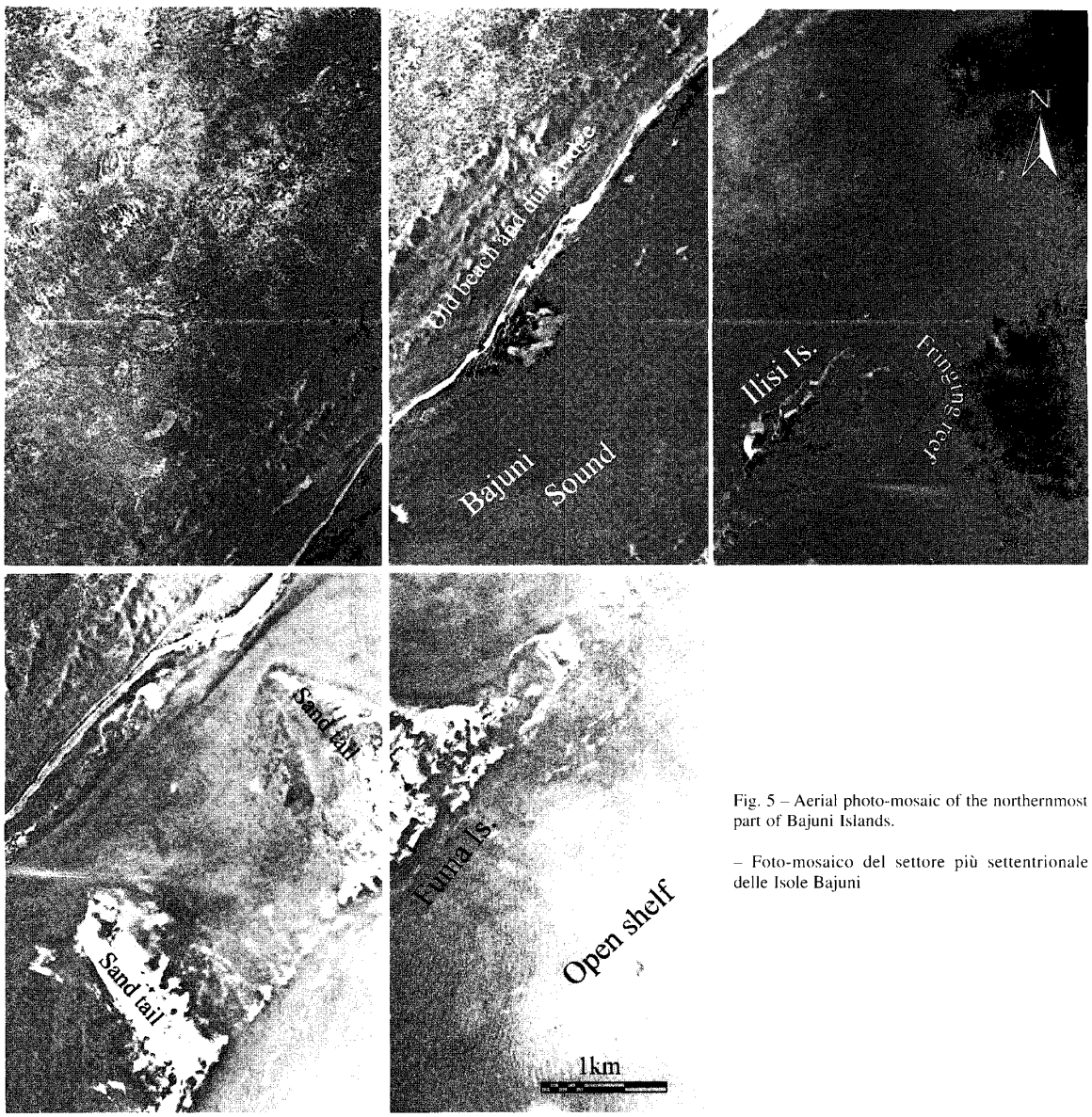

Fig. 5 – Aerial photo-mosaic of the northernmost part of Bajuni Islands.

– Foto-mosaico del settore più settentrionale delle Isole Bajuni

reefs are sporadic, of small size and made up of various species of poritids, faviids and crustose coralinaceans.

These sandy bottoms, where phanerogam vegetation is absent or very scarce, either pass gradually to shallower vegetated areas, or border the outer slope of the fringing reefs off the islands, as at Ilisi (Fig. 7C). Furthermore they alternate at places with raised, flat hard bottoms, some hundreds of meters wide, which can reach the sea surface and are surrounded by steep walls. An encrusting community of corallinaceans characterizes these hard surfaces, whereas the walls are colonized by a flourishing coral community of massive and crustose forms (poritids, faviids, hydnophorids) and by colonies with short and stout branches, mainly pocilloporids. Rich fungiid communities thrive on bottoms covered with dead coral.

3) *Rippled skeletal sandy bottom* - In correspondence of the inlets crossing the island ridge, where the substrate deepens to 5-7 m assuming a channel morphology with a flat bottom, washed and coarse sandy sediments are deposited to form lunate megaripples perpendicular to the flow direction. Some wider

and shallower reaches of these inlets are covered with *Thalassodendron* seagrass beds crossed by small-scale braided sandy channels characterized by ripple systems.

4) *Sandy tail* - Wide tidal flats close to the islands are built by sandy bodies crossing the sound, characterized by deposition of both mud and skeletal grains. The proportions of the two components evidence a cyclic deposition connected with tidal currents or seasonal trends, but usually this character is hidden by intense bioturbation by infauna, shown by abundant mounds on the surface (Pl. 2, Fig. A).

5) *Bryozoan sandy bottom* - The bottoms of the sound facing the channel mouths and ranging 8-10 m in depth are generally characterized by bioclastic washed sands rich in bryozoans, mostly of reteporid type. The grains are rounded, polished and often stained by oxides. Part of this sediment originates from productive surrounding areas and hosts epibiontic organisms such as bryozoans, polychaetes, encrusting foraminifers and red algae. The bryozoan colonies are frequently broken, but well preserved colonies of reteporid forms are also found, showing the typical foliate, at times convolute, morphology of the zoaria. The textural characters of these sediments are typical of environments subject to tractive currents generated by tides through the channel mouths.

6) *Tidal delta* -Where the channels flow in the sound, wide and shallow mobile sandy bodies are built by a mixture of carbonate and quartz grains to form accretionary tidal bars and shoals widely emerged at low tide (Fig. 6). The surface of these shoal deltas shows the typical sedimentary pattern described by Evans et al. (1973) in the Persian Gulf and by Davies (1970) in western Australia. Seawards sandy deposits form swash bars and linear tidal shoals, often associated with sets of both symmetrical and asymmetrical megaripples.

7) *Channel bank* - The channel levees are generally characterized by medium to fine grained sandy deposits (Pl. 5, Fig. E). The sediment grain size and composition are very variable, depending on water energy degree and on *in situ* production of carbonate biogenic grains. The muddy flats of the mangals are replaced by wide sandy bodies towards the channels' mouths, where production of skeletal sediment is high and tidal currents are strong. Here the channel banks are covered with swash bars alternating with shoals highly burrowed by small crabs and with asymmetric ripples orientated according to the tidal flow. Small washover fans built by skeletal sand and muddy deposits characterize the protected areas at the back of the bars, where small sheltered schizoaline ponds colonized by *Terebralia* and small gastropods are found. Towards the outlets, in areas of scarce sand accumulation, the abraded bedrock is colonized by encrusting red algae, thin algal mats trapping fine sediment, and small scattered coral colonies; the cliffs bordering the abraded flat are colonized by *Saccostrea cucullata*, barnacles and boring bivalves (*Lithophaga* and *Gastrochaena*).

8) *Channel bottom* - Two different sedimentary patterns characterize the subtidal channel environments: in the high subtidal zone, sedimentation is dominated by sand showing different sorting, while in the deepest zone of the channels, where maximum flow speed on the water/sediment interface is reached, washed coarse sand is deposited. The sediment grain size and composition are very variable, depending on water energy degree and *in situ* production of carbonate biogenic grains (Fig. 14). The carbonate/quartz grain ratio normally increases towards the mouth of the channels (See enclosed chart). The coarser grain fraction is mainly made up of thin shell bivalves, bryozoans (Pl. 5, Fig. C) and at places abundant *Halimeda* remains. The foraminiferal assemblage gradually increases seawards, including miliolids, textulariids, soritids, *Amphistegina*, *Heterostegina*, *Ammonia* and the epiphytes *Rosalina* and *Planorbulina*; their tests are often abraded and black stained.

9) *Salt flat* - High intertidal-supratidal areas with sabkha characters are found in some areas of the old beach ridge along the coastal sound, as well as in areas connecting the mangal flat of the channel with the inland, showing at places a wide areal development (Pl. 3, Fig. A). In these areas processes of evaporative pumping, deflation and adhesion of eolian sediment are common. Arid and semi-arid conditions cause a sedimentry pattern to develop, characterized by different types of algal mats and sedimentary structures already described for the Persian Gulf (Purser, 1973), western Australia (Davies, 1970) and Andros Island (Hardie, 1977).

10) *Thalassodendron meadow with scattered coral knobs and heads* - Seagrass beds are widespread in shallow water areas of both outer shelf and coastal sound, where the genus *Thalassodendron* is common on flat bottoms lying at shallow depths of 1-6 m, with medium to high water energy. These phanerogams, typical of sandy-gravely bottoms, but able to colonize hard bottoms as well (Fig. 7B), are usually very thick and resistant to high water energy and to partial subaerial exposure at low tide. The substrate of the meadow is more elevated than the surrounding, unvegetated sea floor, which is either covered by rubble and coarse skeletal sediment or shows the rocky bottom. These depressed areas are at places colonized by coral patches and knobs of varying sizes which at times reach the sea surface; The top surfaces assume a microatoll-

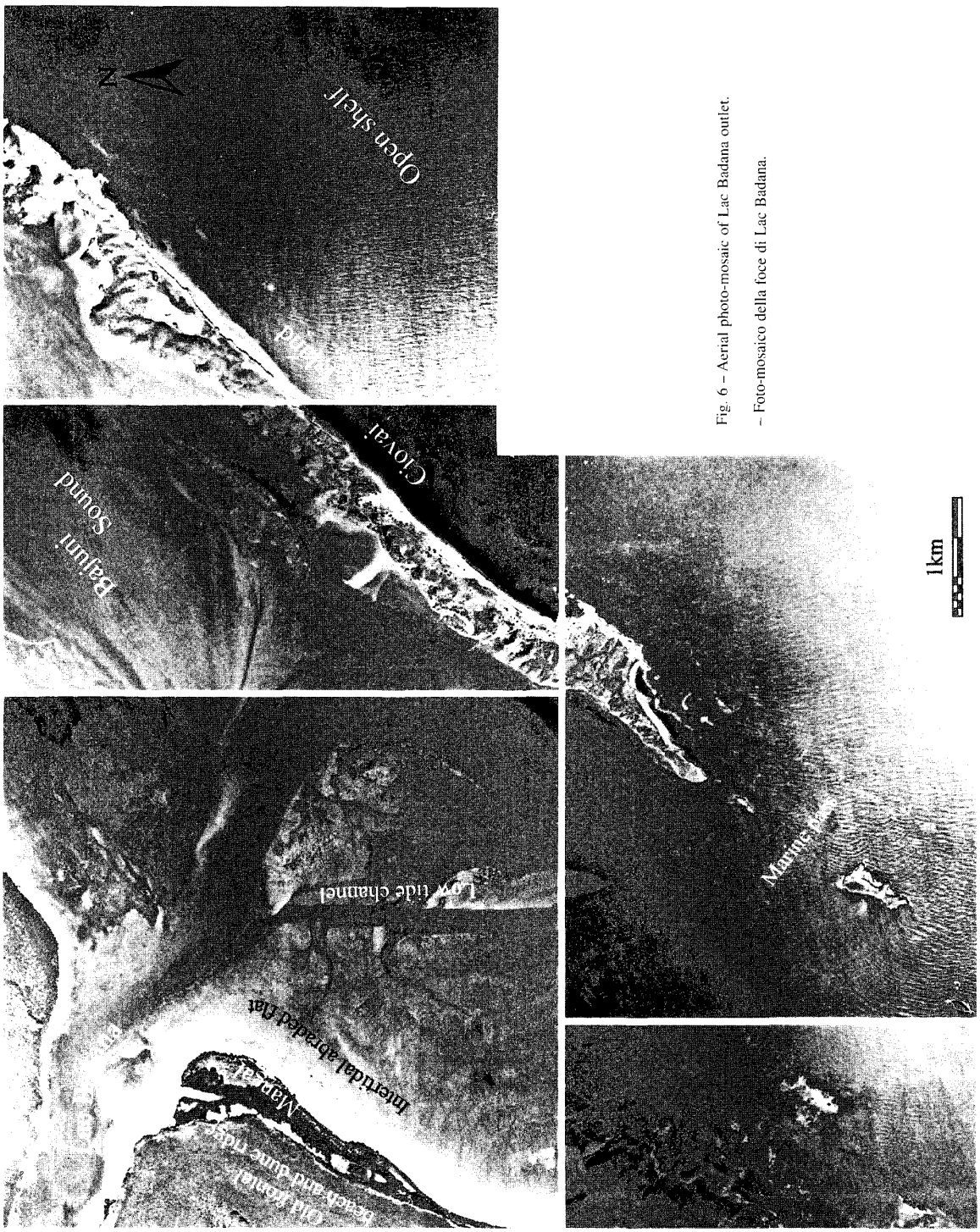

Fig. 6 – Aerial photo-mosaic of Lac Badana outlet.

– Foto-mosaico della foce di Lac Badana.

like morphology, clearly depressed in the middle and colonized along the peripheric ridge. The coral association consists of crusty, plate-like and massive forms and alternates with abundant encrusting red algae. Dead corals are intensely bioeroded by lithophagous bivalves, clionid sponges and polychaetes. Coral colo-

nization inside the meadows is on the contrary very scarce except for some heads of *Galaxea fascicularis* and isolated colonies of *Millepora* (Pl. 1, fig. A, B). In high subtidal zones, where seagrass is thin, free-living corals, mostly *Goniopora stokesi*, are subject to shifting by waves. The competition between phanerogams and corals for the bottom colonization is mostly controlled by the hydrodynamism occurring inside the meadow (Angelucci et al., 1982). The speed of the water flow crossing the seagrass beds decreases due to the resistance offered by plant blades, with subsequent decrease of suspended load and deposition of sediment which is trapped by thick vegetation.

11) *Mangal flat* - Low energy intertidal environments, located in the most protected areas of the sound and along the channel banks (Pl. 4, fig. A), are subject to widespread colonization by mangroves. They thrive both in protected areas of some islands and along the coast of the mainland, especially in coves and beach ridges, where high accumulation rates of the sediment causes the rapid progradation of the coastline and subsequent set-up of marshy environments in the backshore. Also the intertidal abraded flats facing the channels are widely colonized by red mangroves (*Avicennia* and *Rhizophora*) and are bordered inland by old wave notches, passing to the wind scoured bedrock surface where acacia and baobab grow. At places mangals are backed landward by narrow belts with salt flat characters. The development of a complicated aerial root system further favours the energy decrease, allowing the deposition of muddy sediment. The substrate is generally rich in organic substances due to large accumulation especially of underground portions of roots; the mud is dark and its disturbance produces a strong smell of hydrogen sulphide, indicating the anaerobic environment. Mangrove roots emerging at low tide are encrusted by *Saccostrea cucullata* (Pl. 4, fig. C), barnacles, tubicolous polychaetes and bored by clionid sponges, whereas *Littorina* cf. *scabra* lives on trunks and leaves, even when completely emerged. *Saccostrea* flourishes in the low and middle intertidal zone in front of the channels and suddenly decreases towards inner areas. In sheltered muddy bottoms of mangrove thickets, where semi-permanent pools persist during low tides, the infauna is dominated by the fiddler crab *Uca* (Pl. 4, fig. E), while the gastropod *Nerita* occupies the peripheral part of the mangal flat. The inter-mangrove pools are highly populated by potamiid *Terebralia palustris*, *Cerithidea decollata* and by an infauna of polychaetes and crabs (Pl. 4, Fig. B).

12) *Encrusted hard bottom* - Wide areas ranging in depth from 0 to 3 m show a hard abraded bottom lacking sedimentary cover at all. Such a type of bottom is mainly found along the barrier island, in intertidal, open marine areas (Fig. 8B). Sedimentation is inhibited by wave action and tidal currents, whereas crustose coralline algae, vermetids and scarce crustose corals, mainly poritids and faviids grow on the flat and rough surface. In the most protected areas they form small reefs in association with small colonies of pocilloporids and acroporids. The colonization is furthermore achieved by scattered tufts of *Halimeda* and *Sargassum* and veneers of crustose corallinaceans. Small depressed zones, characterized by decrease in water energy, are covered with coarse deposits of coral fragments and rounded lithoclasts encrusted by red algae, vermetids and foraminifers; bioerosion is intense, mostly by clionids and polychaetes. The largest pebbles show a rough surface hosting dense aggregates of the foraminifer *Haddonia* cf. *torresiensis*. Where water energy is particularly high, only boulders and rhodoliths 5-7 cm large accumulate (Fig. 8A). Their shape is subsphaerical or slightly flattened, the surface is smooth or globular and the nucleus usually consists of a coral fragment.

13) *Fringing reef* - Well developed coral buildups, showing a typical fringing reef zonation, are set up in shallow water in coincidence with morphologic steps marking the outer edge of the abraded flat of some islands (Fig. 7C). A reef wall, usually very steep, separates the back reef - reef flat zones, 20-100 m wide, from the fore reef sandy bottom, 5-12 m deep. The short distance between reef and shore and the scarce lateral extension of the coral fringes inhibits the development of real lagoonal environments which are replaced by very shallow back reef flat areas. Here the coral community gradually decreases on behalf of phanerogams and algae which characterize the bottom closer to the shore.

14) *Coral fringe and carpet* - Along the edges of the widest passes and inside the sound, on the edges of the abraded flat surrounding the islands, along some stretches of the mainland shelf, where morphology and water energy degree are favourable, a coral community thrives, forming coral carpets, small fringing reefs and patch reefs (Fig. 8C) of varying size. On the submerged shelf separating the island coast from the passes, two depositional environments are set up: an inner one, characterized by a discontinuous veneer of muddy-sandy sediment at places stabilized by *Syringodium* seagrass; an outer one, where a discontinuous coral colonization is performed by small-sized Pocilloporids, Poritids, Hydnophorids, Faviids and Milleporids. Small colonies of soft corals are also frequent, together with corallinaceans, codiaceans and *Halimeda*. Where conditions are particularly favourable, real fringing reefs develop on the edge of these flats, consisting of successive coral generations and showing a clear zonation from the reef front to the reef flat. Growth and diversification of corals are variable according to water energy and

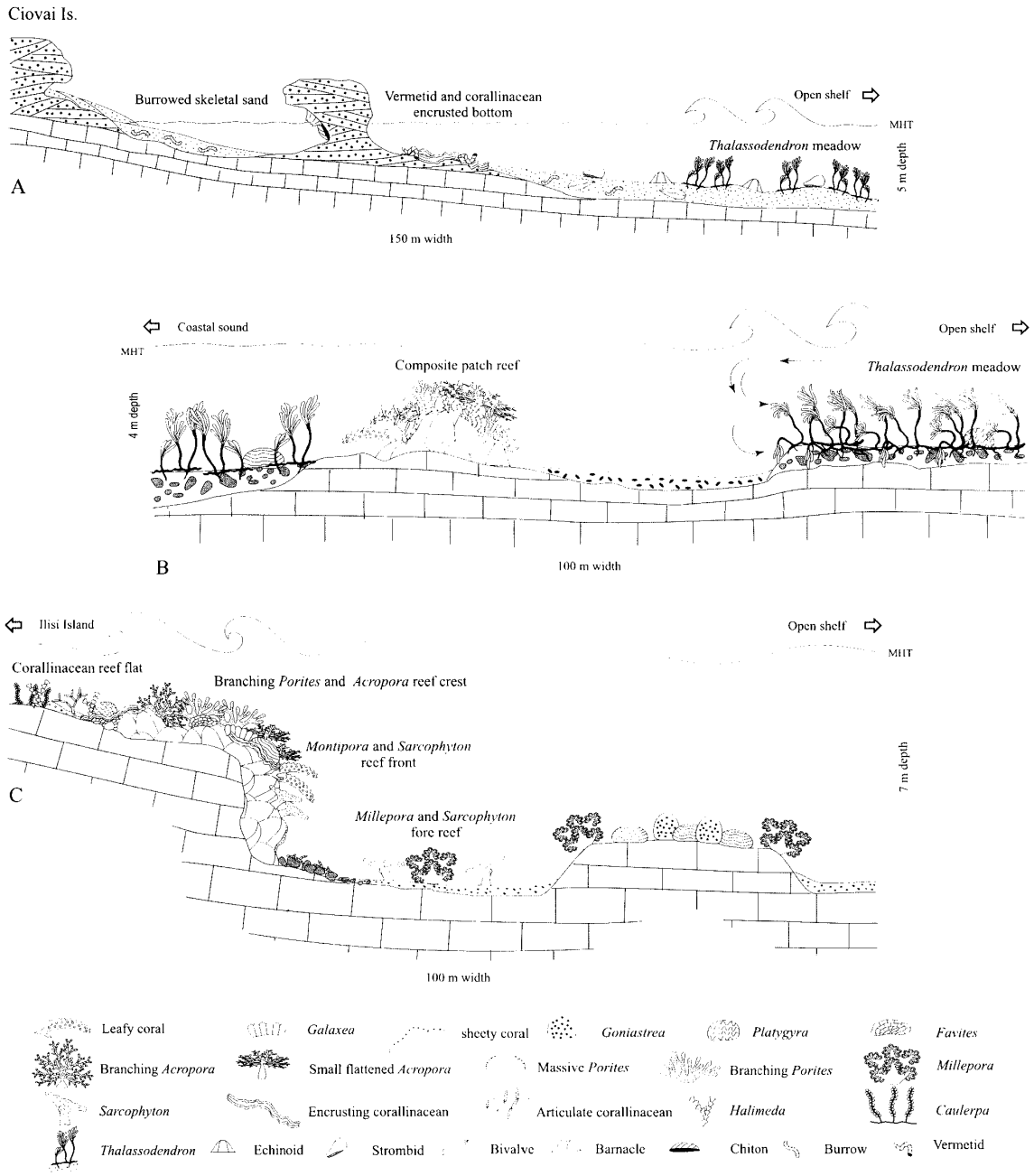

Fig. 7 – Schematic cross sections showing the relationships between substratum and living community: A) washed sandy beach on the seaward side of Ciovai; B) flat bottom colonized by *Thalassodendron* seagrass, scattered composite patch reefs and coral knobs; C) Ilisi fringing reef showing the highest coral diversification observed in the archipelago.

– Profili schematici mostranti le relazioni tra substrato e comunità vivente: A) spiaggia sabbiosa ad alta energia sul lato verso mare dell'isola di Ciovai; B) fondale pianeggiante colonizzato da una prateria a *Thalassodendron* e da patch reef e knob corallini; C) scogliera a frangia di Ilisi mostrante la più alta diversificazione corallina osservata nell'arcipelago.

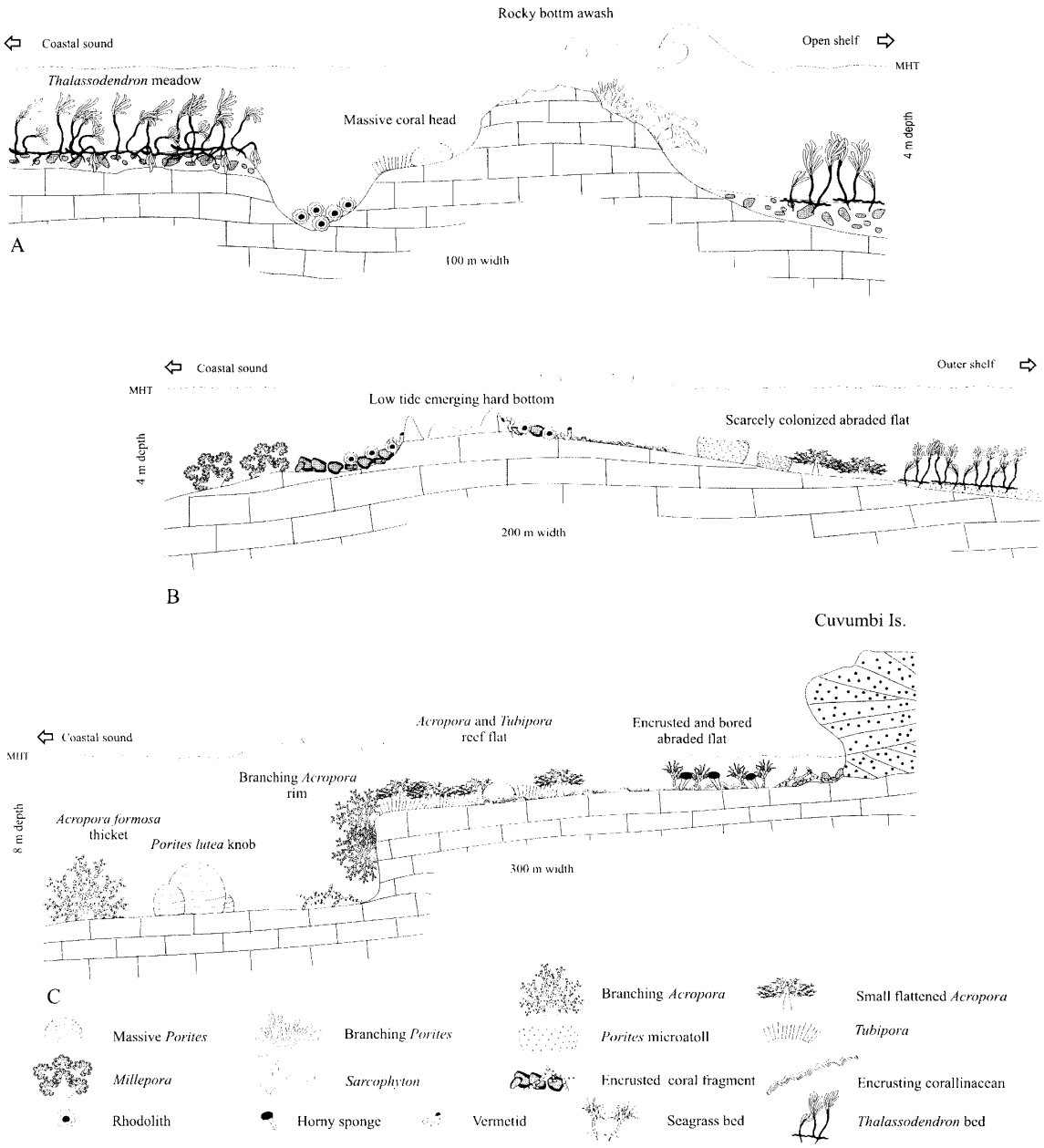

Fig. 8 – Schematic cross sections showing the relationships between substratum and living community: A) rock emerging at low tide on the seaward side of Fuma Island. The continuous wave shifting on the sea-floor is responsible for the scarce coral cover and the growth of rhodoliths; B) unprotected rough sea-floor, partially emerging at low tide, near a marine pass of Cuvumbi Island. The bottom is scarcely colonized by small coral colonies, encrusting corallinaceans and vermetids; C) small fringing reef on the western side of Cuvumbi Island, facing the pass. Different types of branching *Acropora* characterize the reef crest and reef flat.

– Profili schematici mostranti le relazioni tra substrato e comunità vivente: A) scoglio a fior d'acqua sul lato esterno dell'Isola di Fuma. La continua agitazione del fondo ad opera delle onde è causa della scarsa copertura corallina e della crescita di rodoliti; B) fondale non protetto accidentato, affiorante in bassa marea, in prossimità di un canale di marea dell'Isola di Cuvumbi. Il fondo è scarsamente colonizzato da piccole colonie di corallo, da corallinacee incrostanti e vermetidi; C) piccola scogliera a frangia sul lato occidentale dell'Isola di Cuvumbi prospiciente il canale di marea. Diverse specie di *Acropora* ramificata caratterizzano il reef crest ed il reef flat.

turbidity which is often responsible for the development of oligotypic associations of the most adaptable species. Some coral fringes, especially those on the protected side of the islands, show a clear coral zonation. Along the mainland coast, in the areas subject to the currents flowing from the channels, the coral cover is on the contrary scarce and restricted to the high intertidal narrow belt.

15) *Acropora pinnacle reef* - Some rocks, reaching the width of some tens of metres, rise from the bottom of the deepest (about 10 m) passes. When the top surface of these rocks does not exceed the low tide level, it is covered with a flourishing coral community (Fig. 10). Where tidal currents allow water exchange without strong energy increases, very large colonies of *Acropora hyacinthus* grow on the top surface in wide umbrellas leaning out of the edges. The walls of the rocks are colonized by mighty colonies of *Acropora* sp. with stout branches reaching 30 cm in diameter, forming large colonies which expand outside in search of light, as their growth is hampered by the overlying *Acropora hyacinthus*. These two species are predominant and only few left spaces are occupied by other branched (*Acropora* spp., *Pocillopora* spp.) and crustose (Poritids, *Hydnophora*) coral colonies.

16) *Composite patch reef and table reef* - In many places inside the coastal sound, usually in correspondence of the largest passes, patch reefs grow, showing different coral assemblages.The maximum coral blooming is reached only in the upper part of the walls, whereas it decreases rapidly downward and inward. Sheltered, elevated flat sea floors, originated by inherited morphological highs, show a typical feature of table reefs (Fig. 9C), schematized for the Bermuda platform (James, 1983). Different coral communities develop along the walls, 5-6 m high: branching *Acropora* assemblages prevail on the landward side, whereas leafy and plate-like communities are common on the seaward side (Pl. 1, Fig. E).

17) *Saccostrea reef* - Scattered small buildups with domal shape, up to 1 m high, of successive generations of *Saccostrea cucullata* (Pl. 4, fig. D) are found where mangrove trees thin out, on a wide intertidal flat separating the channel from the land. This flat consists of the Pleistocene bedrock and is locally blanketed by sandy sediment. The *Saccostrea* buildups are often arranged in strings parallel to the levee on the channel bank; the shells adapt themselves to the substrate without a preferential orientation and are locally associated with *Nerita*, barnacles and polychaetes. This facies is particularly widespread at Lac Busc Busc, just north of Ras Bobo, in the belt between the channel and the mangal. Here the *Saccostrea* reefs are bordered towards the channel by a subtidal zone covered with sand stabilized by seagrass, whereas they are backed by quartzose-carbonate sand which in turn passes landward to mud with *Terebralia palustris* (Pl. 4, fig. B).

Depositional environments derived from selected type areas

South of Kisimayo, the modern sedimentary pattern developed both on the coastal belt and the continental shelf is highly controlled by the presence of the Bajuni island ridge, aligned parallel to the coast. The depositional systems developed seaward of the archipelago show the characters of a shallow water open platform, where sedimentation is mostly controlled by the interaction of the depositional interface with the fair weather wave base (FWWB) and the storm wave base (SWB). The landward zone shows more complex characters, as it includes both a depositional system typical of a coastal sound (Fig. 5) and another one of channelized tidal flat developed beyond the coastline (Fig. 6). The present-day morphology, partially inherited from the Pleistocene modelling of the shelf, plays a basic role in the facies distribution. In the areas close to the islands and inside the sound, the facies distribution is influenced by the presence of inlets crossing the island ridge which allow water exchange even in the inner zones of the sound during the tide flows.

In the outer shelf, off the step corresponding to the low tide level, other steps occur parallel to the islands, probably suggesting past sea-level stillstands and influencing both biota and sediment distribution. The mainland is bordered by a wide abraded flat, running both along the coast and the channel levees, characterized by the development of mangal and salt flat systems, specially along the channels.

Our investigation mainly concerned shallow water environments of the innermost zone of the continental shelf, such as the channelized coastal belt, the coastal sound and the barrier island, whereas in the outer shelf they were limited to the bottoms near the islands up to the depth of 10 m. For a better knowledge of the main depositional systems, a series of key areas was chosen whose sedimentological and ecological characters are representative for the whole archipelago.

The outer shelf

The part of the shelf seawards of the islands starts with a flat bottom extending for a width of less than 1 km. It is bordered by a straight edge at the depth of 10 m and has a gently dipping topography characterized by low morphologic steps parallel to the coast and small channels perpendicular to the coast, frequently corresponding with the tidal inlets crossing the island ridge. A wide depressed area follows, reaching the depth of 25-35 m and a variable width of 0.5-3 km.

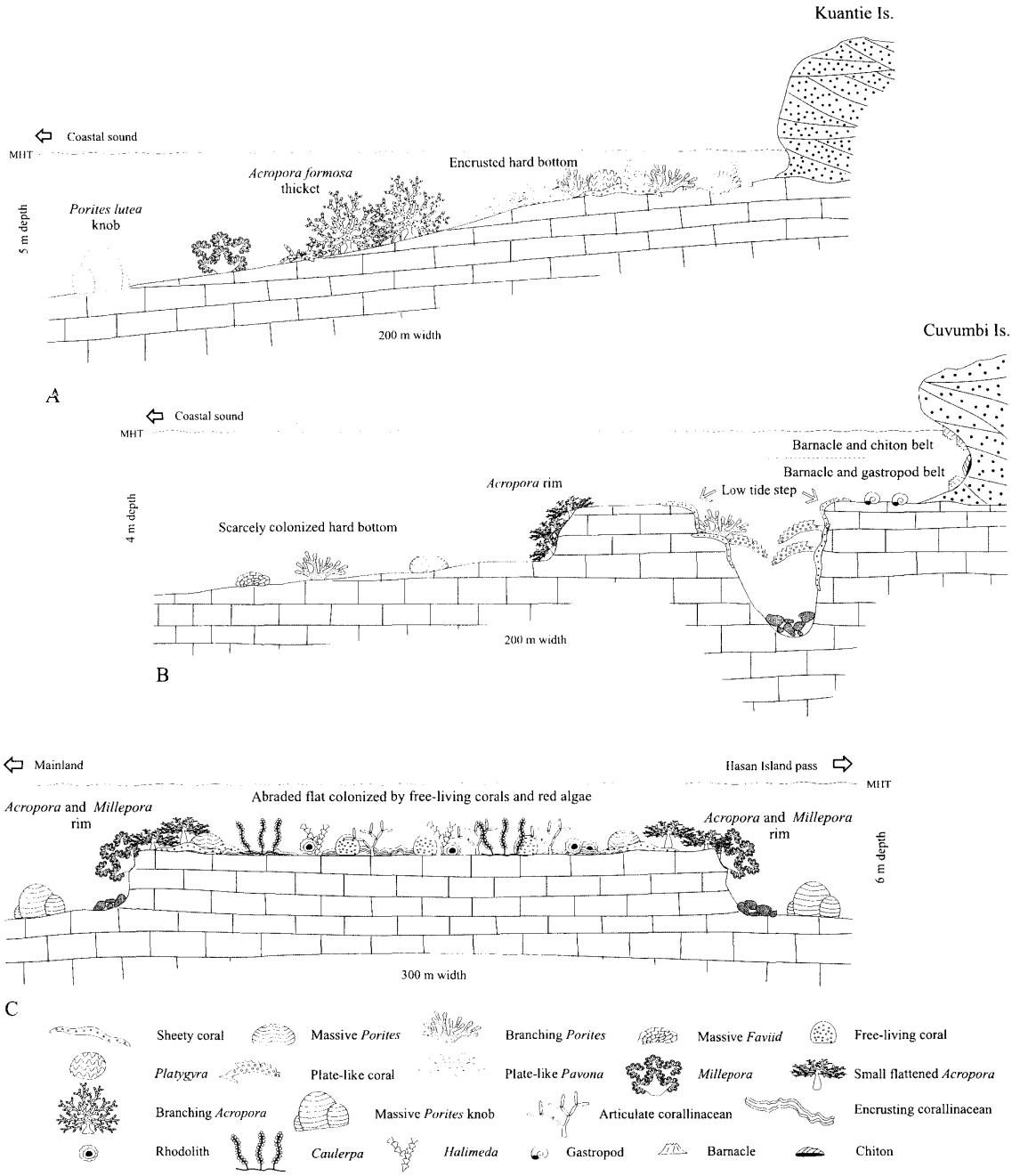

Fig. 9 – Schematic cross sections showing the relationships between substratum and living community: A) ecologic profile of the shallow shelf on the landward side of Kuantie Island. The relatively quiet water environment favours the growth of flourishing thickets of branching *Acropora*; B) sea-floor morphology and colonization of a high water energy marine pass on the northern side of Cuvumbi Island; C) table reef in the coastal sound near Hasan Island. *Acropora* and *Millepora* rim a wide flat area where algae and free-living corals grow.

– Profili schematici mostranti le relazioni tra substrato e comunità vivente: A) fondale di acque basse sul lato protetto dell'isola di Kuantie. L'ambiente relativamente tranquillo consente lo sviluppo di rigogliosi boschetti di *Acropora* ramificata; B) morfologia del fondo e colonizzazione di un canale di marea ad alta energia lungo la costa settentrionale di Cuvumbi; C) table reef sviluppato nel braccio di mare costiero presso l'isola di Hasan. *Acropora* e *Millepora* bordano un'ampia zona piatta occupata da alghe e coralli «free-living».

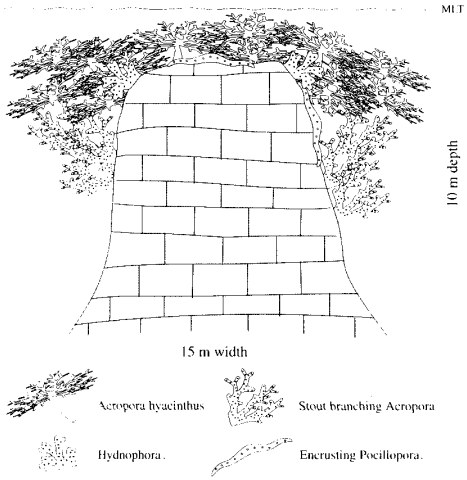

Fig. 10 – Pinnacle reef extensively topped by large umbrellas of *Acropora hyacinthus* overgrowing on stout branched *Acropora* sp. colonizing the steep walls.

– Scogliera a pinnacolo coperta da grandi colonie ad ombrello di *Acropora hyacinthus* ricoprente verso l'esterno colonie di *Acropora* sp. dai rami tozzi che colonizza le pareti subverticali.

Further out the bottom is shallowing again up to less than 10 m, forming a ridge coinciding with the edge of the continental shelf.

The facies distribution around the islands is subject to the competition of *Thalassodendron* meadows vs. coral colonization. The former covers wide areas of the flat substratum close to the islands, the latter develops in form of small fringing reefs and knobs especially on morphologic steps and along the passes. The areal distribution of these communities is closely controlled by the way in which wave energy is dissipated and therefore by the distance of the breaker zone from the coastline. In the belt ranging in depth from 0 to 12 m, five main depositional facies can be distinguished: washed sandy beach (F1); *Millepora* and alcyonarian sandy bottom (F2); *Thalassodendron* meadow with scattered coral knobs and heads (F10); encrusted hard bottom (F12); fringing reef (F13). The following two type-sites of Ciovai and Ilisi are representative respectively of a high water energy beach (F1), and of a well developed fringing reef (F13).

The Ciovai Island beach. This is one of the longest islands of the archipelago and its eastern side shows a wide beach whose sandy sediments (F1) cover part of an abraded flat extending for a width of about 600 m up to the breaker zone (Fig. 7A). Isolate erosion remnants occur along the coastline, showing at their seaward base a trottoir of corallinaceans and vermetids, emerged at low tide. The highly asymmetric profile of these remnants is marked, on the side facing the island, by a pronounced wave notch showing several cavities bioeroded by chitons, whereas encrusting organisms, such as ostreids and balanids, are rare. The wide intertidal sandy share of the beach is connected landward to accumulations of skeletal, sometimes coarse sediment at places stabilized by shrubby vegetation. This sediment can extend up to the fossil notch of the island. The share of the beach which is always submerged is separated by the previous one by a narrow channel, about 1 m wide, covered with skeletal sandy sediment washed, well rounded and rippled. The loose sediment is gradually stabilized seawards by *Thalassodendron* seagrass.

The Ilisi Island fringing reef. Located some km south of Ras Mtuni, Ilisi is the northernmost of the small islands forming the Bajuni archipelago (Fig. 7C). Seaward it is bordered by a shelf 500-600 m wide, with a large intertidal belt and connected through a steep reef wall to a sandy floor 8-12 m deep. The following facies belts were recognized along a cross section from the sea to the coast (See enclosed chart):

Fore reef - It ranges in depth from 8 to 12 m and is made up of a flat sandy floor, characterized by *Millepora* and alcyonarian facies. The bioclastic sediment shows a significant percent of aragonite spicules of alcyonarians and a very little percent of non carbonate material.

Reef front - The wall is very steep, at places almost vertical and shows high coral cover mainly in the middle-upper portion. The lower portion is covered with carpets of soft corals, mainly *Sarcophyton*, with single colonies, very short and crustose, forming a complete cover of the substratum even for several square metres. Empty spaces are occupied by crustose-foliaceous corals (*Montipora*, *Hydnophora*, *Echinopora*), small tufts of acroporids with short and stout branches, small emispherical massive corals (*Favia*, *Favites*, *Porites*) and heads of *Galaxea fascicularis*. The abundance of soft coral carpets is not only due to their ability to colonize or recolonize empty spaces, but also to the lack of active competitors and to the scarce action of predators. In the middle-upper portion of the reef wall soft corals are gradually replaced by colonies of branching *Porites*.

Reef crest - It widens out for about 30 m and is densely covered with a coral carpet of mainly monospecific branched *Porites* colonies reaching a width of some tens of square metres. The most common species is *Porites somaliensis*, characterized by short and stout branches with rounded tips, sometimes club-shaped. Large colonies of *Millepora platyphylla* and rare tufts of small flattened *Acropora* cf. *hyacinthus* and *Favites* (Pl. 1, fig. F) are found together. Crusto-

se-foliaceous (*Montipora*, *Montastraea*) and crustose or crustose-massive (*Hydnophora*, faviids) corals thrive in cavities, whereas small clumps of *Acropora palifera* gradually replace colonies towards the reef flat. The reef crest and the slope are repeatedly cut by shallow channels perpendicular to the edge and widening towards the fore reef. Their bottom is covered with coarse bioclastic material, whereas nearby zones are covered with broken coral branches encrusted by corallinaceans.

Reef flat - The sea-floor of this zone shows a progressive decrease of the coral cover, consisting of small colonies of massive forms of *Favia*, *Goniopora*, *Porites*, *Platygyra*, small scattered heads of *Galaxea fascicularis*, *Lobophyllia* and *Tubipora*, tufts of *Acropora* and crustose-massive forms, among which *Hydnophora* is frequent,. Empty spaces are encrusted by corallinaceans or covered with coarse bioclastic sediment of coral remains and mollusk shells encrusted by corallinaceans and polychaetes and densely bored by clionids, siphunculids, etc. Very abundant ophiuroids live in cavities of the rough substratum.

Back reef - Most of the flat surface facing the island shore is covered with a dense *Thalassodendron* meadow; the stalks of the plants are encrusted with muffs of crustose red algae (Pl. 2, fig. B) and tufts of the articulate corallinacean *Jania* (Pl. 2, fig. D). Further towards the shore, phanerogams are replaced or alternate with different types of vegetation. These meadows are often interrupted by depressed, unvegetated areas covered by rubble or coarse sediment originating from skeletal material produced *in situ* by corallinaceans, *Halimeda*, corals, mollusks and echinoids; soritids and amphisteginids are the most common among foraminifers. Coral colonies are scattered and mainly located in poorly vegetated areas or in the sandy depressions where *Porites* and faviid knobs and soft corals (Pl. 1, fig. D) grow.

The marine passes

The communication between outer shelf and coastal sound is allowed by a series of passes of varying shape and size, which sometimes play the role of real tidal inlets crossing the barrier island and characterized by a winnowed hard substrate. On the contrary, where the islands become rare and are frequently evolved into rocks rising from the abraded platform, the water exchange into the sound is ensured by tidal currents flowing on wide shares of abraded shelf emerging or reaching the sea surface at low tide. Rarely, in the areas facing the mouths of the large coastal channels, some passes are found, deeper than 10 m. The interaction between the undulating floors forming ridges and grooves of varying size and the water energy produced by tidal currents and waves crossing the barrier island causes the set up of different facies, among which common are: rippled skeletal sandy bottom (F3); encrusted hard bottom (F12); coral fringe and carpet (F14); *Acropora* pinnacle reef (F15). Cuvumbi island and Chete Chete rocks type-sites are representative of various features of coral colonization (F14).

The Cuvumbi island coral fringe. Cuvumbi is part of a group of islets and ledges located south of Ciovai (Fig. 8C). After the pass separating the islands of Bagadini and Kinene, the archipelago bifurcates to form two alignments of which Cuvumbi is the outer one. The sea-floor near the islands shows a widespread, recent coral colonization, mainly developed in sheltered areas far from the wave action but connected with the passes which provide water exchange with the open sea (See enclosed chart). The coral distribution is then subject both to the sea-floor morphology and to water energy. Between the wave protected coast of Cuvumbi and the awash substratum encompassing the islets of Hasan and Kuantie, a shallow water area shows highly diversified coral facies (Fig. 9A; Pl. 1, fig. C). The areal distribution of corals is mainly conditioned by the presence of two passes cut into both the sides of the Cuvumbi shelf. Along the channel edge and on part of the abraded flat between the west side of the island and the sandy beach, a small fringing reef thrives, showing a well diversified coral zonation.

Reef edge – It consists of a small steep wall with vertical zonation of the coral community: the bottom of the wall, 5-6 m deep, is colonized by tabular forms of *Acropora hyacinthus* and bushes of *Acropora gemmifera* and *A. danai*, whereas in the upper part branched *Acropora formosa* and *Porites nigrescens* are common. Outside the coral fringe, the sandy bottom of the fore reef zone is covered with scattered colonies of *Porites somaliensis*, *P. lutea* and *Platygyra lamellina* (Fig. 11).

Reef flat – It is characterized by a rich community of small flattened branching *Acropora* and *Tubipora musica* (Fig. 12). They gradually decrease shoreward, being replaced by microatolls of *Favia stelligera* and small colonies of *Acropora abrotanoides*, *Favites flexuosa*, *F. abdita* and *Porites nigrescens*.

Back reef – In sheltered areas close to the coast of Cuvumbi, abundant muddy-sandy sediments accumulate, intensely bioturbated and in places stabilized by algal mats and seagrass beds (Fig. 13). Where the abraded platform is narrower and the channels are cut very close to the island, the present-day cliff is subject to clear bioerosive processes. In the first 4 m above the abraded platform three belts show different faunal associations (Fig. 9B): the first with barnacles and chitons coincides with the higher part of the notch, where

the effects of bioerosive processes are clearly shown; the second reaches the low tide step and shows an outstanding increase of barnacles together with rare gastropods (trochids); the third, coinciding with the stretch of the cliff which is always submerged and subject to wave action and tidal currents, shows a scattered coral colonization extending also on the abraded flat. Corals consist of small massive forms (*Porites somaliensis*, *Platygyra lamellina* and *Favites* spp.) and flat, stout branching colonies of *Acropora*, associated with encrusting forms of *Echinopora gemmacea* and *Hydnophora exesa*.

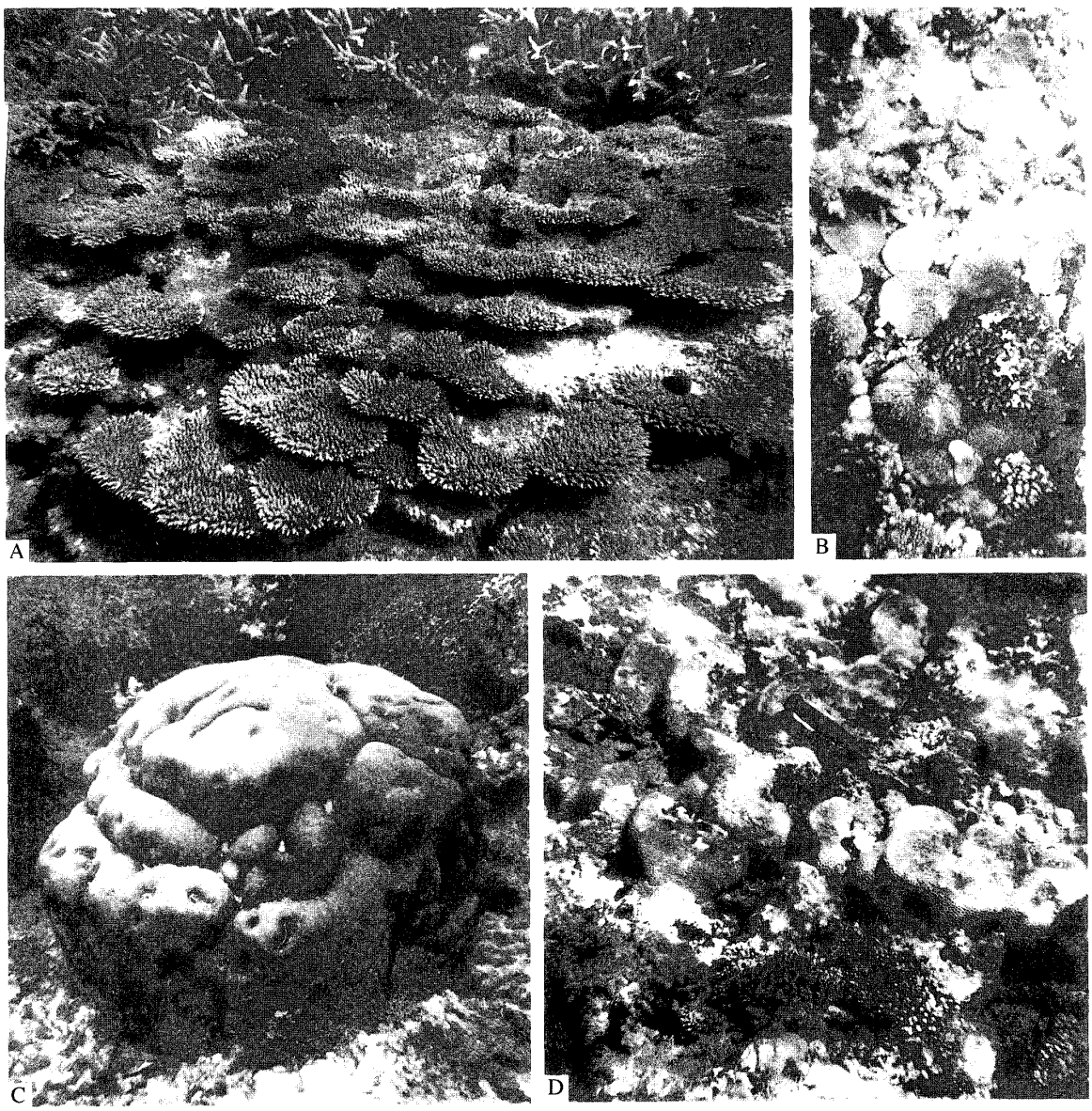

Fig. 11 – Some features of the reef front of the Cuvumbi Island coral fringe: A) *Acropora hyacinthus* colony growing along the reef crest; B) dense *Fungia* clump localized in reef crest areas where the coral is dead and encrusted by corallinaceans; C) huge single colony of *Porites lutea* grown at the foot of the reef wall, about 8 m deep; D) large colony of *Porites* on the reef crest showing the abraded top surface due to subaerial exposure at low tide.

– Alcuni aspetti del reef front della scogliera a frangia di Cuvumbi: A) colonia di *Acropora hyacinthus* caratteristica del reef crest; B) addensamento di *Fungia* in zone del reef crest dove il corallo è morto ed incrostato da corallinacee; C) grossa colonia di *Porites lutea* cresciuta ai piedi del reef ad una profondità di circa 8 m; D) colonia di *Porites* cresciuta al tetto della scogliera, mostrante la superficie superiore abrasa a causa dell'esposizione subaerea durante la bassa marea.

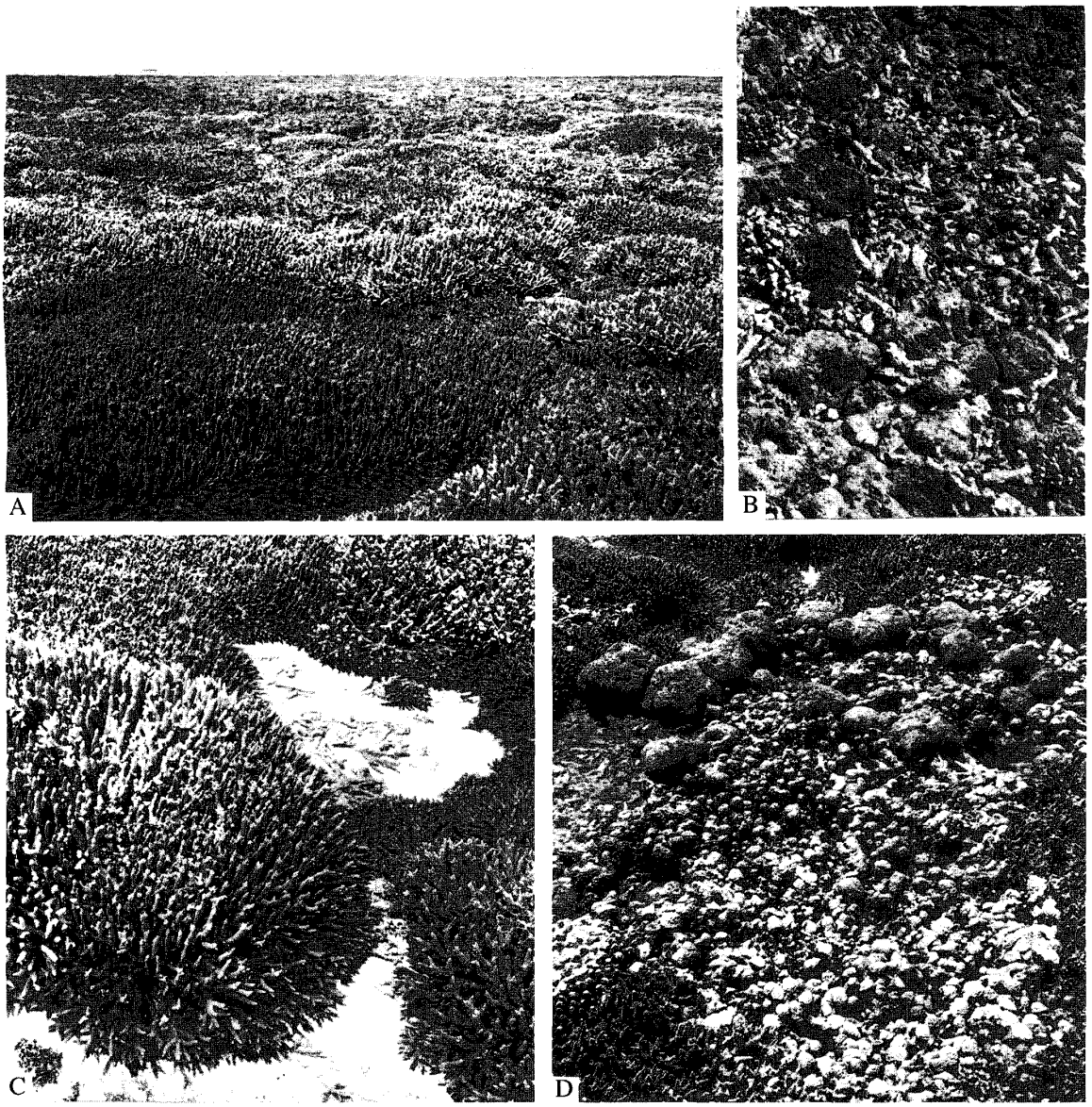

Fig. 12 – Some features of the reef flat of the Cuvumbi Island coral fringe: A) panoramic view of the reef flat exposed during low tide, extensively colonized by branching *Acropora*; B) close-up view of the inner part of the reef flat showing the abraded surface of the coral carpet partially covered by *Acropora* detritus; C) close-up view of the small branching *Acropora* forming the extensive cover of the reef flat; D) close-up view of the reef flat surface showing scattered small domal colonies of *Tubipora musica* and small branching *Acropora* on a substrate partially encrusted by corallinaceans.

– Alcuni aspetti del reef flat della scogliera a frangia di Cuvumbi: A) veduta panoramica del reef flat emerso in bassa marea, estesamente colonizzato da *Acropora* ramificata; B) dettaglio della zona interna del reef flat mostrante la superficie abrasa del tappeto corallino parzialmente coperto da frammenti di *Acropora*; C) dettaglio delle piccole colonie di *Acropora* ramificata che forma l'estesa copertura del reef flat; D) dettaglio della superficie del reef flat mostrante piccole colonie domiformi di *Tubipora musica* e di *Acropora* ramificata su di un substrato incrostato da corallinacee.

Chete Chete rocks coral carpet. Facing the mouth of Lac Busc Busc, they are the remnants of the old Pleistocene dune ridge (See enclosed chart). On their seaward side a subvertical cliff without notch faces the abraded platform which is encrusted by red algae and vermetids, whereas corals consist of small scattered tufts of pocilloprids, hosted in cavities of the hard substrate. The coral cover increases gradually through the passes towards protected, high subtidal zones, colonizing the bottoms up to the depth of 4 m. The

community lacks a clear zonation and consists of Acroporids, Pocilloporids, Hydnophorids and Faviids, and shows a sharp transition to surrounding *Thalassodendron* meadows.

The coastal sound

The waterway between the mainland and the islands is very shallow, such as to make difficult in low tide the sailing even of small boats. Low water energy environments characterized by fine sediment deposition are widespread; the prevailing skeletal sediment is frequently enriched in detrital quartz transported both by wind and by the three channels. A striking sedimentologic character of the sound is the high production and accumulation rate of skeletal sediment, which is partly produced *in situ* and partly originating from the channels and distributed longshore. Wide and flat tidal deltas develop at the mouth of the channels and sandy bodies accumulate along stretches of the coast protected by the insular ridge. Longshore currents are furthermore responsible for sediment transport, causing the progradation of wide beach ridges.

The action of monsoon winds combines with that of tidal currents and causes tails and sandy bars to develop perpendicular to the sound, isolating areas with low water energy conditions. Where water exchange with open sea is active, coral reefs develop with varying prosperity and specific diversification. Therefore also the habitat of the coastal sound is subject to diversification in different depositional facies: sandy tail (F4); bryozoan sandy bottom (F5); *Thalassodendron* meadow with scattered coral knobs and heads (F10); mangal flat (F11); coral fringe and carpet (F14); composite patch reef and table reef (F16). The following type-sites concern the sandy tail sedimentation developed at Fuma island (F4), the coral colonization of the protected shelves of Ciovai island and Istanbul (F14) and the table reef near Hasan island (F16).

The Fuma Island tail. On the landward side of Fuma Nangue island, the combination of a flat sedimentary substratum with the wave and tide energy dissipation causes the accretion of a wide sandy body perpendicular to coast (See enclosed chart). A narrow channel, about 10 m deep, separates this sedimentary tail from the mainland. The intertidal zone is characterized by different facies belts, nearly perpendicular to the coast, whose distribution is mainly controlled by time of subaerial exposure and energy produced by tidal flows.

Sandy beach - In small protected coves along the north-western coast of the island some beaches are built by accumulation of poorly sorted skeletal sand characterized by an alveolar structure due to air bubbling. The faunal assemblage mainly consists of small endobiontic bivalves. Beach rocks crop out on the beach near the high tide limit and mainly consist of coarse remains of gastropods, bivalves and corals.

Mounded sandy bottom - This facies borders the coast of the island and extends also perpendicular to the channel axis towards the mainland; it consists of fine sand densely burrowed by crabs and polychaetes worms. Seagrass beds of *Thalassodendron* and *Syringodium*, partially buried by fine sediment (Pl. 2, fig. A), realize at places, just below the depositional interface, reducing conditions. Small gastropods such as strombids and cipreids characterize this facies, whereas in outer areas facing the channel they join with abundant holoturians which produce typical faeces heaps, usually dispersed by the tidal flow.

Rippled and burrowed sandy bottom - It develops in the high intertidal zone perpendicular to the coast, characterized by widespread asymmetric ripples formed by tidal currents. The muddy-sandy sediment is intensely pelleted by crabs. Bioturbation gradually increases towards the channel, produced by bottom dweller bivalves such as *Solen* which build mounds of faecal origin.

Thalassodendron meadow - The transition to subtidal environments along the channel edge is characterized by a rapid development of *Thalassodendron* seagrass which thrive on the deepest skeletal sandy bottom of the coastal sound.

The Ciovai Island protected shelf. Ciovai is one of the biggest islands of the archipelago and is located just in front of Lac Badana mouth. Thus it interferes with water flow from the channel causing a sharp water energy decrease and a subsequent quick accumulation of the sediments both in areas often emerging at low tide and on channel bottoms not deeper than 10 m. A flourishing and well diversified coral community thrives on the south-western tip of the abraded shelf of Ciovai facing one of the largest tidal channels. This shelf ranges from 100 to 200 m in width and is gently dipping toward the sound, to which is connected by a slope 30-50 m wide. In this area four facies belts can be distinguished from the coast towards the sound (See enclosed map):

Rocky shore - It includes the notch, which is colonized by a typical association of *Saccostrea cucullata* and balanids, and the intertidal belt of the abraded flat encrusted by red algae, at places passing to sandy beaches or seagrass meadows.

Acropora formosa thicket - This species grows in well developed colonies forming large thickets. Living coral is normally found only in the uppermost part of

Ciò ha prodotto la formazione e migrazione verso mare dei campi di dune costiere, in parte oggi formanti il cordone insulare e forse il ridge sommerso limitante il bordo esterno della piattaforma continentale. Di uguale importanza per la fascia costiera è stato lo sviluppo del reticolo anastomizzato dei canali originato dalla combinazione dell'abbassamento del livello di base con il probabile sviluppo di una fase climatica più umida dell'attuale.

Altri fattori hanno agito a media scala, non determinando il tipo di modello deposizionale ma influenzando le caratteristiche dei singoli sistemi deposizionali. Nella piattaforna esterna le interazioni tra substrato deposizionale e base dell'onda normale e di tempesta determinano la distribuzione dei sedimenti e le caratteristiche della comunità bentonica. La presenza del rilievo sommerso lungo il bordo esterno dello shelf, attribuibile ad un cordone sommerso pleistocenico di dune o a vecchi banchi di sabbia organogena (banchi ad *Halimeda*), condiziona senza dubbio la distribuzione delle facies nella retrostante depressione della piattaforma.

Nel braccio di mare costiero, oltre a fattori morfologici quali rapporto ampiezza - lunghezza dell'area protetta dalle isole, numero e dimensione dei canali di marea che interrompono il cordone insulare, determinante è la presenza dei tre grossi canali a cui sono legati in gran parte la mobilizzazione e il trasporto del quarzo relitto.

Flussi tidali e correnti lungo costa generate dai venti monsonici sono responsabili dell'attuale quadro di distribuzione del sedimento tra le isole e la costa e del suo mutamento durante i cambiamenti stagionali del clima.

Un esubero nella produzione e accumulo di sedimenti rispetto allo sviluppo del tasso di accomodamento ha generato una chiara fase di progradazione della linea di costa e del contemporaneo insabbiamento di zone marine di acque basse.

Il settore occupato dal barrier island risulta ampiamente condizionato dalla presenza della fascia continua di bassi fondali abrasi dalla quale si ergono le isole, le isolette e gli scogli che formano l'arcipelago. In questa zona la dissipazione dell'energia prodotta dal moto ondoso e dalla costante azione dei flussi tidali sui fondi a pelo d'acqua e attraverso i canali di marea è il fattore determinante nella distribuzione delle facies ed in particolare nel tipo di colonizzazione di organismi sessili quali le alghe rosse e i coralli. In queste condizioni zone a bassa energia sono presenti solo lungo il versante delle isole rivolto verso terra, dove l'accrescimento di barre e tomboli sabbiosi permette lo sviluppo di ambienti intertidali protetti dove è possibile la deposizione di sedimento fino.

Il reticolo di canali sviluppato lungo costa mostra nella distribuzione degli ambienti attuali un forte condizionamento esercitato dalla paleomorfologia e dal volume del ricambio d'acqua operato dai flussi tidali. Le ampie superfici pianeggianti intagliate nei calcari pleistocenici che bordano i canali, spesso limitate verso terra da solchi di battigia fossili, formano oggi ampie fascie intertidali dove si sviluppano fiorenti mangrovieti.

Anche a piccola scala la distribuzione delle facies si presenta influenzata dall'adattamento delle comunità bentoniche al substrato modellato da processi erosivi e deposizionali sviluppatisi in tempi molto recenti. Costruzioni coralline e praterie a *Thalassodendron* si contendono l'habitat marino di acque basse, mentre le mangrovie (*Avicennia* e *Rhizophora*) colonizzano le piane interitidali protette dei canali e di alcune isole. Lo sviluppo della comunità corallina segue l'andamento irregolare dei bordi della piana d'abrasione che circonda le isole formando scogliere a frangia di varia estensione, colonizzando con radi tappeti fondi duri pianeggianti, spesso emergenti in bassa marea e formando scogliere isolate di varie dimensioni e forma in aree protette del braccio di mare costiero. Nello shelf esterno bordi recifali sono localizzati in corrispondenza dei gradini morfologici corrispondenti agli antichi livelli di stazionamento del mare, mentre costruzioni coralline discontinue più estese sono segnalate lungo il margine esterno della piattaforma.

Le praterie a *Thalassodendron*, pur occupando substrati di diversa natura sia lungo costa che in aree esterne della piattaforma, rappresentano spesso il risultato finale di un processo sedimentario che porta alla stabilizzazione di coperture di sedimento, formate in prevalenza da frammenti grossolani di corallo, spesso incrostato da corallinacee, ai quali si somma il materiale più fino prodotto e intrappolato dalla prateria via via che si sviluppa.

I rapporti tra comunità corallina e vegetazione a fanerogame sono fortemente influenzati da fattori locali, infatti l'espansione areale delle due comunità è condizionata sia da fattori energetici locali che di carattere più generale, coinvolgenti l'intero ecosistema. Numerosi fattori contribuiscono ad indurre mutamenti areali nella distribuzione delle singole comunità che definiscono ambienti e subambienti sedimentari, tra cui i più importanti sono: lo smantellamento progressivo dei corpi insulari ad opera del moto ondoso e della bioerosione; l'accrescimento o lo spostamento di corpi sabbiosi che variano la geometria delle isole; il cambiamento di intensità e verso delle correnti lungo costa e dei venti dominanti stagionali; le modificazioni nell'upwelling lungo la scarpata somala dovute alle variazioni della circolazione oceanica; i fenomeni di bleaching indotti, oltre che da fattori climatici globali, anche dalle variazioni nelle quantità di apporto torbido e di acqua dolce drenata durante le stagioni piovose.

Il modello deposizionale attuale risulta applicabile solo per un breve intervallo di tempo, essendo il frutto della ricolonizzazione recente della piattaforma continentale cominciata in varie parti del mondo circa 8000 anni fa (Hopley, 1994), quando il mare ne ha superato il bordo esterno durante la risalita olocenica. Il quadro attuale di distribuzione delle facies sulla piattaforma delle isole Bajuni si è sviluppato su un tratto di costa africana tettonicamente stabile durante l'Olocene, dove l'accumulo di sedimenti quarzosi rimaneggiati e di sabbia organogena prodotta *in situ* non trova un analogo incremento nelle variazioni relative del livello del mare. Da ciò deriva uno scarso accumulo verticale di sedimento che porta ad una marcata migrazione laterale dei corpi sabbiosi lungo la linea di costa e intorno alle isole e al concomitante smantellamento progressivo dei corpi insulari, dove l'energia elevata e la scarsa profondità dell'acqua impediscono la sedimentazione. Il risultato finale è quindi quello di avere un modello di sedimentazione di barrier island effimero, destinato a subire nel corso del tempo marcate modificazioni che porteranno ad un inglobamento dell'arcipelago delle Bajuni in un nuovo profilo di costa spostato verso mare e allo sviluppo sull'antistante piattaforma di un ambiente marino aperto simile a quello già presente lungo molti tratti della costa somala dell'Oceano Indiano.

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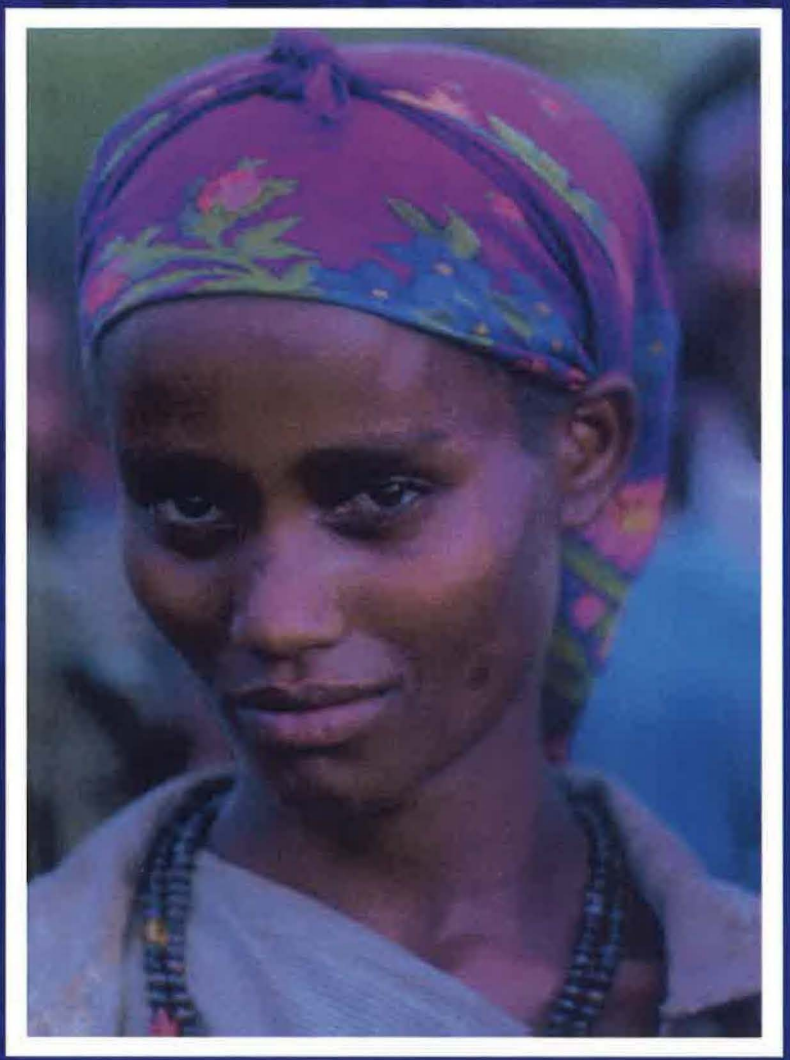
Annex 87

Mohamad D. Abdullahi, CULTURE AND CUSTOMS OF SOMALIA (2001)

CULTURE AND CUSTOMS OF AFRICA

CULTURE AND CUSTOMS OF SOMALIA



MOHAMED DIRIYE ABDULLAHI

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Mohamed Diriye Abdullahi

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1

Introduction

GEOGRAPHY

IN THE BEGINNING was the land, which has been called many things: Punt, Land of the Barbaroi, Terra Aromatica (Land of Aromatic Plants), Regio Cinnamafore (Land of the Cinnamon), Land of Milk and Myrrh, Land of the Somalis. The northern coasts on the Red Sea and the Gulf of Aden and the adjacent mountains are the ancestral home of the Somalis. This area was known as Punt (The Land of the Gods) to the ancient Egyptians, as the land of the Barbaroi to the Greeks, and as Regio Cinnamafore to the Romans who thought the Somali coasts produced cinnamon.[1]

Later in the nineteenth century, the whole peninsular section of northeast Africa, the projecting region that gave rise to the name of the "Horn of Africa" would be known as the Somali Peninsula. The Somali Republic, formed in 1960 from the former British Somaliland (the North) and the former Italian Somalia (the South), is situated in the Somali Peninsula. It is the Somali Republic, now in disarray, which is popularly known as Somalia.

TOPOGRAPHY

In the northern regions, facing the Gulf of Aden, the topography of the land consists of three zones. These are the coastal *Guban*, the mountainous *Golis*, and the high plateau *Haud*.

The Guban is a low-lying stretch of country about twenty to thirty-five miles in length that is crossed by numerous dry riverbeds, known as *tog*, that

become swift torrents when they carry the runoff water of the Golis mountains. It also has ridges and knolls in some places. Its name means "the burnt," in allusion to its desert environment, searing heat, and sandstorms. However, even if it is generally dry and has sand dunes in some places, it has grass and shrubs in other areas, which afford excellent grazing to sheep and goats, especially when it rains.

During the hot season (June–September), Guban temperatures are high during the day and are accompanied by hot winds; traveling on foot is not advised therefore in daytime. The local people move to higher ground when that is possible to the extent that the population of the coastal towns is sometimes at half the usual during that time of the year. In hot weather, the locals say that snakes never come out during the day and hunt only under the rays of the moon.

Traditionally, nomads used to move their stock from the Guban to the slopes of the Golis in a familiar pattern of transhumance. But this is being modified by permanent settlements on higher grounds, leaving less land for transhumance between coast and mountain. The Guban is not just a slice of desert terrain below the mountains; it has the most ancient towns and places of habitation in the entire region. Zeilah, Berbera, Bulahar, and Bosaso are just some of the ancient ports that dot the Guban coastline and that had been visited by sailors, travelers, and merchants as far back as the time of ancient Egypt. Guban beaches, practically unknown to international tourism, are also fabulous, and with their hot sands they are said to cure one of rheumatism in just one day.

As one travels inward from the coastal Guban, the land steeply rises as one scales the mountains. Modern roads follow the caravan routes of old along the mountain passes. Because of the abrupt ascent, the road to the mountains can be at places precipitous. The most spectacular pass is the Sheikh pass, a serpentine route sometimes hewn straight out of the mountain flank. The Sheikh pass lies on the Berbera-Burao tarmac road and proceeds through the mountain town of Sheikh. The northern mountains top at places at altitudes of almost 8,000 feet above sea level. The highest peak is Mount Surat. The width of this zone varies; its widest parts are in the west and far east, and with the center having the shortest width. Borame, Hargeisa, Erigabo, and Sheikh are the only major towns situated in the mountains.

The *Oogo* is a small strip with varying lengths that forms the first southern descent of the mountains and at places the table top of the mountains. However, it is ecologically a part of the mountain region. It means "the top" in Somali.

The Haud plateau is the zone that slowly descends in a north to south

direction; it extends from below the city of Hargeisa in the west to as far south as the plains of central Somalia and the Somali region of Ethiopia. Haud is the Somali word meaning "a country of thickets and grassy plains." This zone forms the best rangelands for the pastoralists and supports the largest number of livestock; it is livestock from this region that forms the bulk of Somali livestock exports to Arabian markets on the other side of the sea.

South of the northern regions, the landscape consists of mostly flat plains, as the Ethiopian high plateau slowly smooths to sea level. However, there are outcrops that occasionally break the monotony of the land, such as the Bur Hakabo rock, which resembles the famous Ayers rock of Australia. This zone has Somalia's only two permanent rivers, the Juba and the Shebelle, both rising in the Ethiopian highlands. The Juba reaches the sea near the city of Kismayu, while the Shebelle finishes its course in sand dunes, a few miles away from the Indian Ocean.

CLIMATE

The southern tip of the land of the Somalis straddles the equator. But the Somalis do not live in a lush tropical country but in a dry land where humidity is not a factor except along the southern coastal areas.

In the interior depending on the elevation, day and night temperatures can vary considerably, and the unwary traveler might be exposed to uncomfortably cool nights in the mountains or to cool drafts blowing over the prairies and scrublands. On the higher summits of the Golis, such as where the city of Hargeisa is situated, sometimes rain with hailstones, known as *dhagahyaale* (rain with stones), falls, injuring people and destroying crops such as corn. In July 1999, for example, one such hail storm hit the small town of Arabsiyo to the west of Hargeisa, damaging homes and crops, and leaving in its wake large blocks of ice on the ground that took two days to melt.

Somalis divide the weather into four main seasons: *gu, haggaa, dayr,* and *jiilaal.* Gu and dayr are the wet seasons while haggaa and jiilaal are the dry seasons, although coastal areas might get some light showers during the haggaa, known exactly as *haggaayo* (haggaa rains).

The gu season might be called "the long rains"; it starts in March or April and tapers off in June, and in a good year in July. It is the season that both the land and the people await and pray for; if missed, the consequences are disastrous for both agriculturist and pastoralist, that is for the majority of the population. If the long rains come in plenty, the gray scrublands and yellow

prairies become lush green; water is plentiful again for both man and beast; the voice of the frog is heard again and the people rejoice—it is a *barwaaqo* (prosperous year). The word barwaaqo itself is deeply rooted in the ancient culture and religion of the Cushitic people of northeastern Africa, of whom Somalis form part. It is composed of *bar* (raindrop) and *waaqo* (the ancient Cushitic god) whose abode is the sky. The rains are therefore *Waaqo's* raindrops and Somalis wish each other *bashbash iyo barwaaqo* (plenty of prosperity and splashing) from *bashbash*, an onomatopoeia for the sound made while splashing in water, and barwaaqo (god's raindrops). This shows the close relationship between water and human life in a dry country where water graphically equates with life.

The gu rains are usually accompanied by thunderstorms and strong gusts that precede rainfall. During this time unpaved country roads can become unsuitable for motor vehicles, especially in areas where the soil is prone to water-logging such as in riverine regions. The numerous dry rivers also become torrents at this time of year, and, depending on the width of the river, some have a current swift enough to upturn a six-ton vehicle. Large-scale flooding might also occur in riverine areas, especially if it rains a lot in the Ethiopian plateau, which feeds the Somali river systems.

The haggaa (short dry season) runs through July, August, and September. This is the hottest time of the year anywhere. Temperatures can vary from 80°F (43°C) on the southern coastal areas to around 100°F (48°C) along the northern maritime zone. This is the time of the southwest monsoon; it brings slight showers to the southern coastal areas; however, in other areas, it is a dry wind that blows sand. The Guban zone is hot and windy at this time of year, when the *Kharif* wind drives sandstorms during the day that have the strength to loosen the tethers of a tent.

The dayr (short rains) season runs from October through December. The dayr rains are usually heaviest in the immediate vicinity of the Golis mountains. If the dayr rains fall heavily and are widespread, pastoralists look forward to the dry season without apprehension.

The long dry season, jiilaal, runs from around the middle of December to March or April. This is the season that both pastoralists and cultivators fear. It corresponds to the dry winds of the northwest monsoon. However, the sun being away in the Southern Hemisphere, temperatures are not high. In fact, they are at their lowest. This is the cool season in the northern highlands. Everywhere water levels drop dangerously low, and vegetation, except in areas of permanent water, is reduced to a drab gray scenery. The Guban receives light showers knowns as *hays*. If the rains do not come in May or April, the country is said in the grip of an *abaar*, the dreaded drought. Livestock prices

are low at this time of year, as the herds become gaunt. People start praying for rain, sometimes holding public praying ceremonies—*roobdoon* (supplication for rain)—especially if the jiilaal seems to persist.

In time, the jiilaal is followed by the long rains again; just before the onset of the rains, there is a short period of intense heat lasting about a month known as *kaliil*. Thus ends the cycle of seasons in the lands of the Somalis.

Rainfall varies from zone to zone. The Guban might be said to receive less than ten inches; generally, the Golis receives the most rain. However, rainfall can differ from year to year; for example, 1998, due to the El Niño weather phenomenon, a warming of the Pacific waters, there were unusually high levels of rainfall and vast areas of the south riverine were flooded. The two rivers, Juba and Shebelle, overflowed their banks and temporarily formed an inland lake where there had been human habitation and fields. Crocodiles, hippopotamuses, and snakes were reported to be vying with humans for the little ground still above water in some places. A year later, 1999 was mostly a drought year with dire consequences in the South, while rain storms inflicted heavy damages to some areas in the Golis in August and October, especially around the northern capital, Hargeisa.

VEGETATION

The land of the Somalis is usually portrayed as a desert. True, there are desert patches with rolling sand dunes and little vegetation. But such places are usually confined to the coastal areas. Inland, the vegetation is that of a dry land but not that of a true desert. The coastal areas have little vegetation, although because of the togs that carry rainwater from higher ground, thickets are sometimes found near the sea. In the lower ranges, and especially at their western and eastern extremities, there is little or no vegetation on the mountains. However, at around 4,000 feet in elevation, the mountains have a good cover of short grasses, acacia woodlands, and flowering aloes. Sometimes the lower banks of mountain togs and gorges have dense thickets of trees, grass, and climbing plants.

On the highest peaks in the central Golis, there is still a remnant of the ancient cedar forests (the cedar of Lebanon); the best standing forest of this type is the one at Daalo mountain, near the town of Erigabo. It is a reserve now. The cedar tree itself is known as *dayib* in Somali.

The mountains, after rains, are a sight not to be missed; everywhere small rivulets and cascades of water are to be seen and all the plants and trees bring forth flowers. The African violet is one of the many small flowering shrubs that dot the higher slopes of the mountains at such times of the year.

The Haud zone has undulating grasses in its plains (*ban*) and clumps of acacia trees in thicket country (*gaaroodi*). This can be said to be savanna or veld country. In the old days, the gaaroodi country used to have a lot of tall acacia trees—so much so that a saying developed: *gaaroodow geel maaragtey?* (oh thicket country, have you seen my camels?), which the Somali say when something is indistinguishable from its surroundings. This saying alludes to the fact that from a distance the legs of grazing camels in gaaroodi country look like tree trunks; it is the equivalent of the English saying "not to see the wood for the trees."

In the areas between the two rivers, *jiq* (thick bush), an impenetrable country of thorn bushes and tall grass is found, in addition to open plains and spaces devoid of vegetation. Clumps of trees and bushes, known as *gosha*, also occur on the banks of the Juba and the Shebelle Rivers, and is especially true of the banks of the Juba. There are also seasonal swamps in the river areas that dry up during periods of prolonged droughts. The gosha country is infested with tsetse flies and other biting insects such as mosquitoes so nomads avoid encampment near rivers. Somalis have known for a long time that mosquitoes carry a feverish disease, a fact that Richard Burton, an English traveler arriving in the land of Somalis in the nineteenth century attributed to a superstition, the link between malaria and the mosquitoes being then unknown in Europe.[2]

No discussion of the vegetation of the Somali peninsula can be complete without a mention of the shrubs that produce frankincense and myrrh, products that brought fame and wealth to the northern coasts of the Somali peninsula for thousands of years. The trees, two species of the boswellia tree (*Boswellia frereanna* and *Boswellia carteri*) and one of the commiphora (*Commiphora myrrha*), grow in the eastern and central mountains of the Golis. The trees also occur, although to a considerably less extent, on the Arabian side of the Gulf of Aden.[3] The aromatic trees grow on high mountain slopes out of the rocky ground. The young trees supply the most valuable gum, while the older ones produce a clear, glutinous fluid that resembles coral varnish.

Frankincense and myrrh were very important and expensive products in the ancient world. They were the perfumes of the ancient civilizations and religions. They also had important medicinal uses, as part of the pharmacology of the ancient peoples; myrrh, especially, had a status of being a panacea for many illnesses. The medicinal values of myrrh are not unfounded, and a recent study showed that Somali myrrh as used in Somali traditional medicine has antibacterial as well as antidiarrheal effects.[4] Today's

use is, however, largely limited to making incense, used a lot in the Muslim world, and to manufacturing pastilles.

In the fifteenth century B.C. Queen Hatshepsut of Egypt sent a commercial expedition to Punt to fetch the precious substances. The Greeks and Romans in turn were much interested in getting these resinous products. Herodotus, the Greek author known as the Father of History, states in his *Histories* that frankincense was important in both ancient Egypt as well as in ancient Persia and Assyria. He says that an amount of two and one-half tons was offered every year to Bel, the Babylonian god, on the great altar of Bel's temple in Babylon.[5] He also points out that the frankincense producing region was about two month's journey in a southerly direction from Egypt, an indication that corresponds to the northern Somali coasts. We also learn from Herodotus that incense was called *ledanon* by the Arabians—the Greeks thought all incense came from Arabia—incidentally, that name is still recognizable in Somali as *luubaan*, a generic name for incense.

To obtain incense sap, a deep, longitudinal incision is made in the trunk of the tree with a sharp instrument called a *mangaf*. When the milk-like sap comes out, it is left on the trunk and is exposed to the air for a few days until it hardens into yellowish "tears." The workers return several days later to collect the now clear globules and to make new incisions. The harvest season runs from May to about the middle of the short rains. Working in the hillside aromatic groves is not an easy task, yet laborers usually are without ladders or climbing equipment, thus, accidents that happen on the slopes are often fatal. The groves themselves belong to hereditary owners, members of the clans in the area who pass them from father to son.

The People

The population figures for the Somali Republic have never been uniform. However, a figure of about ten million at the present time is reasonable. Too often, the people have been represented as homogeneous—the ideal nation-state. The central government actively promoted the idea that the Somali Republic was the most homogeneous nation in Africa and one of the few in the world. That view was further spread by scholars both Somali and non-Somali.[6] It is true that Somalia in terms of ethnic or linguistic diversity was far from being like the Congo, the Soviet Union, and even neighboring Ethiopia. However, behind Somalia's shroud of homogeneity are a number of ethnic groups and cultures different from those of the majority Somalis, after whom the country took its name.

The word *Somali* itself today refers to any inhabitant of Somalia; it also refers to any person of ethnic Somali origin in the Horn or elsewhere. But "it seems that the ethnic name Somali has been extended . . . in much the same way as the various inhabitants of the British Isles are known to foreigners as 'English.' "[7] No agreed-upon etymology exists for the word itself. One possible source is the mythical father, Samale, whose supposed descendants form the majority of the population. Other popular unscientific etymologies include *soo maal*, which means "go and milk," heard, as the story says, by some foreigners who were visiting the land. Hence, the people became known by that name. However, the source might as well have been *salama*, which means "became a Muslim," since Somali identity is intertwined with Islam.

The Somalis

The Somalis are a people of a predominantly pastoralist culture, even if their ancient cities have maritime traditions spanning several millennia. The original Somali homeland was along the coasts of the Gulf of Aden and the Red Sea areas; it is there among the hot coasts and the cool mountains that oral history places the ancestral homes of the clans. This is true even for clans such as the Abgal, whose members are found today residing in southern Somalia, around Mogadishu, and in the Benadir hinterland. According to legend, the founder of the Abgal clan, itself a subclan of the larger Hawiye clan, lies buried at Abdal, near the northern port of Berbera. The northern regions therefore hold a significant spiritual and cultural significance for all Somalis.

Somalis speak one language, Somali, and are not confined to Somalia or Somaliland alone but also inhabit parts of Djibouti, Ethiopia, and Kenya. They are culturally homogenous with few variations. However, Somalis divide themselves into numerous clans and clan confederations. The largest clan confederations are the Hawiye, the Darod, the Isaaq, and the Dir. The Isaaq predominate in the northern regions, the Darod, the eastern parts of the north and the central regions, and the Hawiye, parts of the central regions and parts of the Benadir farther south; the Dir are found in the extreme north and in parts of the south.

Clan confederations are historically the result of political groupings, several minor clans banding into a large clan for a pragmatic reason. However, over time, Somali clan historiographies, much like the noble lineages of Europe, have become convoluted, as the genealogies were embellished with saints and noble ancestors. At the same time, the clan became associated with notions

of common ancestry, perhaps as a result of Islam; later, the colonial practice of giving salaries to chiefs also helped to institutionalize what was a minimal associative system into a more reified one. The result is that rivalries between the clans, which in the old days used to involve minor vendettas between close neighbors in the countryside, in the fashion of the legendary Hatfields and McCoys of U.S. lore, have become politicized under the hands of political leaders who are jockeying for positions of defending their own interests.

The Sab (Maay, Tunni, Dabare, Garre, and Jiido)

The largest minority in Somalia is the related group of peoples referred to as the Sab, who live in southwestern Somalia in the riverine area. "Strictly, the word 'Somali' does not apply to the Sab, who say themselves that they are 'Sab,' and are so described and distinguished by the 'Somali.' . . . The Sab stand opposed to the Somali."[8] Sometimes the Sab are called the Digil and the Mirifle, after their (political) clan confederations, and sometimes they are simply called the Rahanwein.[9] The Sab are thought to be descended from an admixture of migrating Somalis, Oromo substrate populations who had preceded the arrival of Somalis in the area and pre-Cushitic Bantu villagers, and even more ancient hunter-gatherers of the area. The Oromo, also known in the literature as the Galla, are a group of people who belong, like the Somalis, to the Cushitic-speaking peoples of northeast Africa.[10] They live mostly in neighboring Ethiopia.

The origins of the word Sab are obscure. It has been, however, linked to Sabo, an Oromo clan, the Boran, which contributed strongly to the ancestry of the Sab in Somalia.[11] Linguistically, the Sab groups consist of five linguistico-ethnic groups; the Maay (or Maay-Maay), the largest and dominant group, while the other smaller groups are comprised of the Jiido, the Dabare, the Tunni, and the Garre. It is in the language more than anything else that the Oromo connection is evident among the Sab groups. Their languages lack, just like the Oromo dialects, the sounds from the pharynx, which are characteristic of Somali.

The Maay number about a million while the four other groups are much smaller; perhaps each of the groups Jiido, Dabare, Tunni, and Garre, do not have a population of more than 50,000. Under the traditional clan politics these smaller groups formed a political confederation, the Digil, to counterweight the Maay-speaking clans of the Mirifle confederation. The Sab practice agriculture, especially of the rain-fed type, more than the Somalis proper.

The Benadiri

Benadiri inhabit the southern coastal region of Benadir, which historically corresponds to Mogadishu, and then southward down the coast. The Benadiri were part of the coastal Swahili peoples and city-states that stretched along the East African coast before the Portuguese and later the British modified the commercial relations between the Indian Ocean and Gulf basin countries. Their ethnic origins are eclectic and include coastal Bantus, Persian and Arab immigrants, and without doubt people of Cushitic origin such as Somalis. The Benadiri speak a Somali dialect known as coastal Somali or Benadiri, born out of the situation of contact between Somali and Maay speakers on one hand and Swahili speakers on the other.

The Bantu Groups

The Bantu groups, also known variously as *Wagosha* or as the *Gosha* (the people of marshes) in reference to the location of their villages near the lush river banks, are rather scattered groups in southern Somalia. Their farming communities and villages are strung along the Juba and Shebelle Rivers upward to the sources of these two rivers in Ethiopia. Before the invasion of the nomadic Somali and Oromo, their oral traditions told of a legendary kingdom known as Shungwaya that had control of the riverine areas and the adjacent coastal zones. In some areas, they are known by the name of *Baarfuul* (the palm people) as they are the only people that know how to plant and care for the palm trees in Somalia. Some of them have migrated to urban towns in the Benadir and to other southern towns where they tend to reside in one quarter. Thus in Mogadishu, the Waaberi quarter is associated with them, even if other groups reside in it. In urban centers, they tend to work as carpenters, mechanics, plumbers, electricians, or masons. They speak either the Somali dialect of the Benadiris or the Maay language of the Rahanwein, depending on the location of their community.

Only one small community, Mushunguli, still speaks a Bantu language that is not a Swahili dialect. The Mushunguli are mostly rural folk and tend to be very close-knit and reserved probably because of the language barrier.

The Eyle, the Hunter-Gatherers

In ancient times, hunter-gatherer societies held sway over much of southern Somalia. Things changed when the Bantu peoples migrating northward

reached southern Somalia.[12] Later, the Cushitic Oromo and Somali, migrating southward, would overrun everyone else. As a result most of the hunter-gatherer societies disappeared by absorption. Today's little known Eyle are remnants of that bushman population.

Eyle in Somali means "dog owners." The Eyle use dogs in their hunting forays; by contrast, the Somali and Sab nomads neither hunt nor own dogs—they despise hunters and consider dogs as dirty creatures whose contact the Muslim must avoid at any price. Physically, the Eyle have a slightly yellowish complexion and slightly slanted eyes. In the 1960s and 1970s, they inhabited some hunting and farming communities in the plains to the south of Baidoa. However, their communities have been constantly in decline since the 1960s due to assimilation with the Sab and Bantu agricultural communities or through migration to large towns such as Mogadishu where they found employment as butchers. Moreover, the civil war has scattered those few communities they had, and it would be difficult to reconstitute their former settlements.

The Swahili-Speakers

There are two small ethnic groups that still speak Swahili (Bantu) dialects in the Benadir region. These are the Barawani, also known as the Amarani, and the Bajuni. Their origins like those of the Benadiri are from diverse groups such as coastal Bantu, the hunter-gatherer societies of southern Somalia such as the Eyle, and later additions such as Arab, Persian, and Cushitic immigrants. The Barawani live chiefly in the city of Barawe or Brava.

The Bajuni are perhaps the smallest minority, numbering around 10,000 in the 1970s. Some authors have thought they have some resemblances to Indonesians because of their physical features.[13] Instead of an outside factor, however, whatever Asiatic resemblances they may exhibit are probably due to the absorption of large numbers of the bushmanoid hunter-gatherers of the region than anything else. By tradition, they are seafarers and fishers. Their habitat is the tiny Bajuni islands off Kismayu and, on the coast, the town of Kismayu and the villages around it. In recent years, some migrated to Kenya, where they have joined the Bajunis of Kenya in Mombasa and other coastal towns.

History

Early theories mostly speculated on a view called the Hamitic myth under which the Somalis were characterized, by virtue of not closely corresponding

to a standardized image of the African, as being relatively newcomers to Africa whose ancestors crossed over from Asia and mixed with the former inhabitants. This was a view that was based on the nineteenth-century European view of inhabitants of African as a monolithic group; any variation between African groups was then to be explained in terms of external migrations. By the same token, the great Egyptian civilization was to be lopped off from African history and African contributions by virtue of some early Egyptians not corresponding closely to the standardized image of the African. Today serious scholars recognize the wider cultural unity of the peoples of Africa as well as the localized variations in its populations from north to south, all as part of the African mosaic.

One of the more recent theories about Somali history is provided by Herbert Lewis, an anthropologist, and E.R. Turton, a historian.[14] They base their theories solely on the strength of the "theory of migration" postulated by the linguist Isidore Dyen, which might be summarized as: if a certain region has more dialects than another region where similar dialects are spoken then the first region is the original homeland of the group that speaks related dialects.[15] Lewis and Turton, noticing more linguistic variety in southern Somalia, therefore theorized that early ancestors of the Somalis lived around Lake Turkana in northern Kenya and southern Ethiopia where they were supposedly living until well into the beginning of the first millennium.

However, Dyen's theory is not a physical law, and when applied to linguistic diversity in Italy, for example, it would wrongly predict that the Romans originated from the border area between Italy and France, since there is much more linguistic diversity in that zone, and then spread out toward Rome and central Italy, whereas in fact the opposite is true and is known from recorded history. Additionally, as far as linguistic diversity in southern Somalia is concerned, Lewis and Turton were laboring under the assumption that Maay, Jiido, Garre, Tunni, and Dabare are all dialects of the Somali language. In fact, they are not Somali dialects but are separate though related languages, whose main characteristics, moreover, in sound and syntax show them to have much in common with the Oromo language; this is not surprising since it is well known that Oromo speakers were in the southern areas well before the Somalis arrived. Despite such serious limitations, Lewis's and Turton's theories have caught on and have been subsequently well quoted in recent works. As for the relative lack of diversity of the Somali language proper, it is due to the intermingling of pastoralists, to constant trade, to itinerant clergy and their students, and to history, such as epochal times when Somalis had to unify their ranks in the face of Christian groups such as the

Amhara-Tigreans or in the face of the Galla (the Oromo), who had in the old days mostly ancestral faiths.[16]

Even if Herbert Lewis presents no other evidence, except Dyen's theory, itself an intuitive postulation incapable of explaining all forms of linguistic diversity, he affirms, "At the moment we have no written evidence nor oral traditions to support this view, but neither, I submit, have we any evidence seriously to question it."[17] To the contrary, Somali oral history as well as that of related groups such as those of the Oromo and even of the Bantu groups in Kenya provide abundant material about the general direction of Somali movements. The version of southbound migration sketched by another scholar is more accurate in that it is corroborated by both Somali oral history and accounts from early travelers.[18]

The Somalis were still migrating southward in search of greener pastures when the British arrived in Kenya and put a stop to the Somali advance on what became British East Africa. One historian tells us that "the British government in Kenya halted the Somali migrations at the Tana River in 1910, and the point beyond which Somalis could not pass came to be known as the 'Somali line.' "[19] Without that edict, Somalis would have been today probably south of Kilimanjaro and in Tanzania.

Ancient visitors to the Red Sea areas and to the Gulf of Aden systematically give descriptions of peoples whose modes of livelihood, government, culture, and even physical appearance agree with those of coastal Cushites such as Somalis and Afars. Medieval Arabs knew today's Somalis as the Berbers, a name still borne by the port city of Berbera in the north. Medieval Arabs also traded with peoples farther south than Somalis in what became the Swahili city-states, but they knew the inhabitants of these areas as the Zenj. The word Berber is itself related to the older word Barbaroi, which is used in the document *Periplus Maris Erythraie* (The Periplus of the Red Sea), a document written in Greek in the middle of the first century A.D.[20] This document indicates that the Barbaroi, meaning the inhabitants of northern Somali coasts, were trading with the inhabitants of Arabia before Islam; they were also trading with Egypt, then under the Romans. The document then lists some articles of commerce in the land of the Barbaroi such as frankincense; it also gives the names of some of the ports of the Barbaroi such as Avalites, doubtless today's Zeilah.

Other than the fact that the Barbaroi were able sailors and traversed the Red Sea and the Gulf of Aden themselves for commercial purposes, what is more interesting is the comment on their mode of government. The author of the *Periplus* wrote that the Barbaroi were without a central government,

with each port city an independent political entity; they were, he wrote, an unruly people. From that description, it is certain that the author was writing about the ancestors of today's Somalis and other coastal Cushites. In fact, the mostly nomadic peoples of northeast Africa have been for most of their history without a king or feudal lord. The Englishman and explorer Richard Burton, arriving some 1,900 years on the same coasts after the *Periplus* was written, found, in 1854, the same organizational mode among the Somalis and described them as "a fierce and turbulent race of republicans."[21]

However, more ancient glimpses of these "republican" inhabitants of the coasts than those recorded by the *Periplus* exist. For example, Herodotus wrote that the Ethiopians, meaning the peoples immediately south of Egypt, on the Red Sea coasts ate a lot of meat and drank a lot of milk; we learn also that they had little esteem for those who ate the fruits of the soil.[22] These cultural traits are still mostly applicable even today to Somalis and their Afar neighbors. In contrast, their cousins, the Oromo, have adopted, for the most part, an agriculture-based mode of life after having mixed with non-Cushite agriculturists in the southwest of today's Ethiopia and in the south of today's Somalia.

However, we can go further than the Greco-Roman times for information about the early inhabitants of the northern coasts. In the fifteenth century B.C. Egyptian Queen Hatshepsut sent a commercial expedition to Punt to get supplies of the precious myrrh and frankincense, so indispensable to their religion.[23] The expedition arrived in what is today's northern coast, where the best frankincense in the world grows not far from the sea. Ancient Egyptians knew the difference between true frankincense and the varieties found much nearer their home in certain parts of the Sudan. After the return of the expedition, the queen had engraved the account of the event on murals at Deir el-Bahri near Luxor in the Valley of the Kings. What can be learned from the history of that voyage is that the Egyptians depicted themselves as arriving in the land of another brotherly people and that, during the course of their stay, they lived in the homes of the Puntites. We also learn from the murals that the people depicted, whether they were Egyptians or Puntites, looked alike, as far as physical appearance, clothing styles, pigmentation, and hairstyles were concerned.[24] We can say those depicted resemble the Cushites such as Somalis still living on the same coasts.

What is more, whether it is by reason of a common linguistic origin or by reason of cultural influence, the Somali language has many terms that have an equivalent term in the religion of ancient Egyptians, which the Lewis–Turton hypotheses would not be able to explain since, according to their theories, Somalis were around Lake Turkana and far away from the

Red Sea and the Gulf of Aden as recently as the dawn of the second millennium. An example of these words is the word *neter* for diverse divinities in Egyptian religion; the Somali equivalent is *nidar*, the righter of wrongs. Somalis say: *Nibar baa ku heli* (The Nidar will find and punish you). The Egyptian word of spirit (*ba*) has the Somali equivalent of *bah* (soul, courage). Somalis say: *bahdii baa laga saaray* (His essence and soul have been taken out from him; he has no more courage). There is also an equivalent for the Egyptian moon diety *ayah* in the Somali *dayah* (moon). Additionally, the *huur* bird (the marabou, a large black stork), the herald of death in Somali mythology, is akin to the Egyptian bird, *Horus*, depicted as the divinity of death.

The facts as we know them, either from historico-cultural sources or from the accounts of ancient, classical, or medieval travelers, tell us that the ancestors of today's Somalis were in fairly stable existence for millennia in their northern homeland, following their herds of sheep and goats back and forth between mountain and coast in a pattern that still continues today.

In the end, increasing population and the need to find pasture for their livestock were the initial causes for the southward migration of Cushites; it might be said the direction of the migration was dictated by the sea barrier in the northern direction. Also, in the case of Somalis, their adoption of Islam incited them to propagate the faith. The mode of migration of Somalis was not a hapzard one, in fact Somali nomads sent exploratory expeditions (*sahan*) before breaking camp so that the *maato* (women and children) as well as *hoolo* (livestock) would not be exposed to danger from lack of water, pasture, or peace. Only when the sahan were back and brought news of desirable pastures would the camp be broken. If therefore, Somalis were in northern Kenya any time before the nineteenth century, then they would have headed straight for the verdant lands of Kenya and Tanzania. It is highly improbable that they would have migrated northward in the direction of drier land.

Briefly the period from 1000 to 1900 witnessed a continual expansion of Somalis from their original coastal homeland downward to Kenya. In the west, Somali expansion was hindered by the Christian kingdoms, which themselves were expanding east, west, and south and constantly jostling with the Somalis, as the proponents of another missionary religion in the region.

As the Somalis advanced from their northern homeland, they clashed with the Oromo who had preceded them in that direction. In the riverine areas of southern Somalia, they found diverse populations consisting of Galla pastoralists and agropastoralists, agricultural Bantu populations who had stayed behind after the Oromo advance, leftovers from still older populations such

as the hunter-gatherer Eyle, and, in the coastal areas, the Swahili peoples of the Benadir, all living by then in a fairly stable accommodation long after the Oromo attacks had ceased in the region. By the fourteenth century, the Ajuuraan Somali clan had moved into the riverine areas and had established a hereditary dynasty, thereby controlling the flow of trade between the coastal cities of the Benadir and the southwestern hinterland.[25]

Meanwhile, in the southwestern direction Somalis clashed with the Christian Amhara-Tigreans and the largely pagan Gallas. From the twelfth to the sixteenth centuries wars tinged with religious fervor raged between Muslim Somalis and the Christian Amhara-Tigreans. The period between the tenth and the sixteenth centuries brought the development of important Muslim sultanates such as Ifat, later called Adal, based in the port city of Zeilah. In 1331, Ibn Battuta, the Arab traveler, visited the port cities of Zeilah in the north and Mogadishu in the south.

If the era between the tenth and sixteenth centuries was an era of development for coastal cities and city-states, it was also an era of turbulence and religious antagonisms. Information from the Crusades—the series of wars fought from the late eleventh through the thirteenth centuries, in which European kings and warriors set out to gain control of the land in which Jesus had lived, the Holy Land, from the hands of Muslims—were filtering down to the Horn of Africa and feeding local conflicts between Muslims and Christians. To the Somalis, the crusaders would be known as the Faranji (the Franks), a word which to this day denotes a European.

The War of 128 Years (1415–1543)

The increasing populations and prosperity of Muslim sultanates, especially of Ifat, led to renewed confrontations with the highland Christian Amhara-Tigreans. The history of the most tumultuous confrontations roughly corresponds with the start of the depredations of Negus Yeshaq, king of the Christians, and ends with the death of Imam Ahmed Guray, the leader of the Somalis; that era was a period of rampaging armies and continuous wars between the Christian highlanders and Muslim lowlanders. In 1415, Negus (King) Yeshaq, qualifying the Muslims as "enemies of the Lord," invaded Ifat, defeated the Muslim armies, sacked Zeilah, burnt its mosques, and killed its ruler Sa'ad ad-Din on the island off Zeilah that would ever after bear his name. Yeshaq compelled the Muslims to pay a tribute and had a victory song composed for him in which we find the first written record of the word Somali. But the story would not end there; Sa'ad ad-Din's sons would reorganize Muslim forces and one of his sons, Jamal ad-Din, would chase Yeshaq into the confines of the Blue Nile, burning in revenge Christian

churches and cities.[26] However, the war was inconclusive for either group and it would only be in the 1530s when the next major battles would take place.

In the 1530s, the Somalis, who were fragmented in their political organization as they had always been, rallied under the Imam Ahmed Gurey (the left-hand), known as Gragne to the Amhara-Tigreans. He unified the Muslims, obtained some muskets from Turkish sources, which were the most advanced weapons at the time, and conquered the Christian highlands. He practically took possession of their land "save a few hill forts."[27] But the Portuguese—who like other Europeans held the legend of the kingdom of the Prester John, a Christian kingdom, which, if only it could be contacted, would come to the aid of the Christian Europe against the Muslim Turks—came around the Cape of Good Hope in southern Africa, sailed up to the Red Sea, and arrived just in time to shore up the defeated forces of the Christian king. Imam Ahmed Gurey would die from a battle wound received from the Portuguese-Coptic forces, and the Somalis who were yearning to go back to their lowland homes fell back. The history of this turbulent period has been captured in writing by the Somali chronicler of the time, Shihad Ad-Din, in his *Futuh Al-Habash*, which is one of the important documents of the history of the Horn.

The Christian-Muslim wars eased after the middle of the sixteenth century, largely because of the devastation that both groups had wrought upon each other. However, another religio-ethnic group, worshiping mostly an ancestral divinity or the *Waaqo*, the Gallas (Oromos) moved against both Muslim and Christian. Galla depredations of the time were described as a "scourge" that afflicted both the Christian Amhara-Tigreans and the Muslim Somalis. Somalis were pushed back toward the sea on the northern front, with the Galla penetrating sometimes as far as the sea. These far-flung Galla attacks were possible because of the use of the horse, which the Galla had earlier acquired from the Somalis.[28] However, the Somalis would recover from the Galla invasions and the Portuguese attacks on their coastal cities in the mid-seventeenth century to attempt to drive out the Galla from their northern territories and consolidate their southern possessions.

In the south, because of the increasing migrations of Somalis, the area became Somalized and coastal cities such as Mogadishu, Merca, and Barawa, which were traditionally part of the Swahili world, became more and more Somali in dialect and culture. In the interior to the west of the Benadir coastal strip, the populations that remained from the Galla, for all of them had not been pushed out by the southward driving Somalis, and Somali migrants, incorporated into their tribes through the traditional method of adoption of new arrivals, gave rise to the present Digil and Mirifle confederations—the

Sab.[29] Toward the end the nineteenth century, the Somalis crossed the Tana River in what is now northern Kenya.

The Decline of the City-States

As soon as they came into the Indian Ocean and the Red Sea, the Portuguese started harassing the coastal cities. Unable to take the cities by force, they would then content themselves with bombarding them from their ships and making brief sallies for loot; thus in 1499 Mogadishu was bombarded by Vasco Da Gama; in 1507, Barawe (Brava) was sacked by Trista da Cuita; Zeilah was burned in 1517, and Berbera sacked in 1518. By the eighteenth century the glory of the city-states was mostly gone. Both Zeilah in the north and Mogadishu in the south were a pale shadow of themselves; the effect of Portuguese plunder and new trade patterns, set by the arrival of the Europeans in the East and in the Indian Ocean, had caused a downward spiral in growth and trade.

The former glories of Zeilah and Mogadishu have been handed to us by travelers through the centuries. In the sixteenth century (circa 1517–18) Duarte Barbosa, a Portuguese, said of Mogadishu: "It has a king over it, and is a place of great trade in merchandise. Ships come there from the kingdom of Cambay [India] and from Aden with stuffs of all kinds, and with spices. And they carry away from there much gold, ivory, beeswax, and other things upon which they make a profit. In this town there is plenty of meat, wheat, barley, and horses, and much fruit; it is a very rich place."[30]

The Arab traveler Ibn Battuta visited in 1331 both Zeilah and Mogadishu. He described Zeilah as "a large town with an important market," where a lot of fish are landed and many camels slaughtered for meat, evidently to feed a large urban population.[31] After a sea voyage of fifteen days, Ibn Battuta arrived in Mogadishu where he found the inhabitants also slaughtered many camels for meat. He also mentioned that its merchants were wealthy and exported locally manufactured clothing to Egypt and other places.

The decline of Mogadishu was such that the Omanis of Zanzibar started exercising a nominal suzerainty over the Benadir in the nineteenth century. As for Zeilah, when Richard Burton, arriving aboard a Somali sailboat from Aden, visited it in 1854, he found it barely able to assert any control beyond its walls; its governor, Sharmarke Mohamed, nominally tied to the Ottoman Empire, through their Mukha representative, was still dreaming, according to him, despite his advanced age, of carving out a new state by conquering the rebellious Somalis. It was never to be and in 1875, the Egyptians, under the then khedive (viceroy), Ismail Pasha, who was having his own dreams of

creating an empire of his own in northeast Africa, occupied, with British encouragement, both Zeilah and Berbera and then went inland to colonize the independent city-state of Harar.

The Egyptians evacuated their Somali possessions in 1885, unable to sustain their occupation financially. Emperor Menelik, the founder of modern Ethiopia, then attacked Harar in 1887, defeated its Muslim inhabitants, and placed Ras Makonen, the father of would-be emperor, Haile Selassie, as governor of Harar. Realizing the significance of his victory over Harar, seat of Iman Ahmed Guray, the conqueror of the Christian highlands in the sixteenth century, Menelik was to declare: "This is not a Muslim country, as everyone knows."[32]

The Partition of the Somali Lands

The last two decades of the nineteenth century were ones of uncertainty for Somalis; Europeans were actively reconnoitering their areas—explorers such as Richard Burton and G. Revoil had visited their lands; rumors of the Faranji (the Franks) coming to Christianize them and to take their lands were rife. Their traditional political and religious rivals, the Amhara-Tigreans, freshly armed by the Europeans, their coreligionists, were venturing out of their mountain redoubts for the first time since the sixteenth century and expanding their control to traditional Muslim areas.

In the end, the Somali populations would be partitioned in the late nineteenth century between three European countries and the Amhara-Tigrean kingdom of Menelik. The three European countries were Great Britain, which got the northern regions; Italy, which got the southern regions; and France, which got a portion of the extreme north, subsequently known as French Somali Coast, and which would become part of the present state of Djibouti.

British interests on the northern Somali coast as well as the Yemeni coast were motivated by their strategic plan for their more valuable colony of India, especially after the opening of the Suez Canal in 1869. Aden in Yemen was to be a coaling station for ships en route to India and a garrison city for the troops guarding it. In turn, the Somali coast was to be the feeder of the troops in mutton, and so it had to be added to the British dominions, in order, as the British Lord Curzon stated, "to safeguard the food supply of Aden, just as the Roman Protectorate was extended over Egypt to safeguard the corn-supply of Rome."[33] Aden, of course, had prior commercial relations with the northern coast before the arrival of the British. But the British sought to strengthen these ties as both their garrison and the population of

Aden were totally dependent on shipments from the northern coasts for meat.[34]

To secure the northern coast from its European competitors, which were scouring the area after the opening of the Suez, Britain signed treaties of protection with the northern clans between 1884 and 1888. This was the beginning of the British Protectorate of Somaliland. However, in the early years, the British presence was a nominal one consisting of political residents in the main ports such as Zeilah, Berbera, and Bulahar whose responsibility was limited to ensuring the flow of maritime shipments. At that time, the protectorate was actually governed through the British colonial government in India. The Indian connection continued for fourteen years after which Britain became more involved in Somaliland due to the war in the Sudan.

The British administration in the north has been characterized as one of indirect administration, since the Somali traditional system of politics was included in the ways the country was run; the *qadi* judicial system as well as the functions of clan chiefs, the *akils*, were recognized and even strengthened. The British rule was not therefore felt in the north as too harsh or too alien. However, the reason for British magnanimity in the north might be dismissed as benign noninvolvement in the affairs of a country that had neither gold mines nor verdant lands suitable for European settlement such as the green lands of East Africa or Southern Africa.

While the British were establishing themselves on the northern coast, modern Ethiopia was taking shape under the guns of the *naftanya* (Menelik's riflemen). The Europeans gave supplies of modern weapons to Menelik, while denying them to the Somalis; more important, Menelik, recognized as a head of a Christian state, could buy weapons from European merchants whereas the Somalis could not.[35] The Somalis saw the whole affair as Christians helping other Christians. Be that as it may, Menelik's hordes, without pay or provisions, were now well armed and raiding Somali pastoralists and expropriating livestock far away from their mountainous country.

With increasing European maneuvers on their shores and Amhara plunder in the rear, Somalis were caught in a spiral over which they had no control. The Europeans stood to profit from the Amhara menace they had created in their quest for protectorate agreements. No doubt the Somalis were utterly confused, bewildered, and powerless. Somali sentiments of the time had been caught admirably well by the poet Farah Nur:

> The British, the Amhara and the Italians are conniving
> The country is snatched, divided by whosoever is strong
> The country is sold without our knowledge!

Somali reactions to these events included both defiance and a call for a *jihad* (struggle) as well as acceptance of European hegemony, and even Amhara hegemony; in 1891, Col. Swayne, a British officer, for example, found members of the Somali Bartire clan acting as "cat's paw" for the Amharas; armed by the Amhara with rifles, they were requisitioning cattle from other Somali clans such as the Habar Awal and the Ogaden for the Amhara garrison at Jigjiga.[36] The Somalis among whom Swayne traveled pleaded with him by saying: "We are not allowed to import firearms, the only effective weapons against the Abyssinians [Amharas]; and we ask the British, who have occupied our ports, either to protect us, or to allow us to import guns with which we can protect ourselves."[37] As a result of Amhara depredations, Swayne found everywhere he traveled Somalis pleading to be placed under British protection; even the riverine cultivators at Imey, now in Ethiopia, of non-Somali origin but of Muslim faith, were pleading to be placed under British protection, and when Swayne did not sign the paper of allegiance, one of the councillors of chief Gabba Oboho cried, "Ah, it is as we feared, you English have sold us to Amhara."[38]

Among those who called for a jihad was notably a man by the name of Mohamed Abdulle Hassan (the Mad Mullah). His appeals got him in the beginning a large number of followers from the Somali clans. However, despite his rhetoric of pushing the invaders to the sea, his massacres of thousands of innocent Somalis, including women and children, and his camel-rustling activities spoke louder than his words, and he was in the end abandoned by the seaward clans. He was still, however, for many years able to keep a band of coerced followers from the more hinterland clans, notably members from his father's clan, the Ogaden, and from his mother's, the Dhulbahante. His activities paralyzed movement and trade in the hinterland and brought his followers head to head with British forces. In fact, the British, who as long as trade kept going had no interest in venturing much into the hinterland, were obliged to mount expeditionary forces far into the interior to capture the sanguinary *mullah*, who by then had acquired a mythical fame of being invincible—legend had it that he had sold his soul to the *'aasho badhi*, a desert lizard believed to be the abode of the devil, in exchange for invincibility.

Mohamed Abdulle Hassan was also a poet of keen finesse and did not spare any words to exhort his followers with poetry while at the time painting his Somali adversaries as "infidels" whose massacre would earn paradise for his followers. His contemporary and fellow poet, Ali Jama Haabiil, engaging him in poetic duel answered him in the now the famous line: *Nimaan muumunimo kugu dhaqayn muslinimo khaas ah, gaal maxasta kuu dhowra ood*

magansataa dhaama (An infidel who will not hurt your weak and will protect you is better than someone who will not govern in a just and Muslim way). He would be routed in 1921 when the British organized a force among the Somalis who were fed up with his banditry and massacres; but once more the elusive mullah got away to die in exile among the Oromo.

Ironically, instead of defending the Muslim faith, his massacres left so many children orphans that priests from a Catholic mission were picking up roving and dying kids from the desert. By the succor afforded them, they became the first Christian Somalis in several centuries. The Mad Mullah's orphans would give rise to several Christian Somali families, some of whom would become household names; they include the Mariano family of the Habar Jelo Issaq, and the Siyad of the Dhulbahante Darod.

Other British colonial possessions in Somali areas included the most southerly Somali habitation, which became part of British East Africa and later part of Kenya. That territory was labeled NFD (the Northern Frontier District) and placed under a special administration with the aim of checking Somali advances in the area. The British organized a referendum in 1962 to ascertain the wishes of Somalis in that region before Kenya gained its independence; 83 percent of Somalis expressed a wish to join the Somali Republic rather than stay in Kenya. However, higher imperatives of the British, who were threatened with an expulsion of their farmers from an independent Kenya by the leaders of Kenyan independence, meant that the wishes of the Somalis of the NFD were conveniently disregarded.[39] After independence, Kenya renamed the Somali area the Northern Province and fought Somali independence guerrillas for a decade after the departure of the British. Today, NFD, as the Somalis still call it, endures as the least developed of Somali territories, as the containment of Islam and Somalis undertaken by the British has been succeeded by neglect and outright discrimination in independent Kenya.

France and the French Somali Coast

In 1862, France got the port of Obock in Afar country, then it extended its protectorate over a spit of a country inhabited by Somalis on the coast, after Britain cheated it out of the main city and port, Zeilah. This small coastal colony was first mistakenly called French Somali Coast, since, at the time, it contained mostly Afars; but Afars are not Somalis, although they share with the Somalis common ethnic origins and a common religion in Islam, as well as a common history of feuding with the Christian highlanders.

Today, the Republic of Djibouti resulting from that French colonization is about half Somali in population.

Romanente: In the Manner of the Romans

Romanente (in the manner of the Romans) read the milestones on the first main road built by the Italians in their Somali colony. The Italians were latecomers to the game of colony making in Africa, as Italy itself was constituted as an independent entity in 1861, but they invoked ancient Roman glories to inspire them. The Italians went looking for their "place in the sun" (as if the heat of southern Italy was not enough), as was the fashion of the times among European powers. Unlike the British, who in the early years made no tangible attempt at administering the land and whose residents on the coast let the Somalis go about their business without hindrance, the Italians were more aggressive and soon got involved in the local commerce.

These direct contacts increased the number of incidents between the Italians and the local populations. On October 11, 1893, the Italian flag was hoisted in Merca for the first time. A Somali attacked and killed an Italian soldier, who in turn was shot by the Italians.[40] In 1895, an Ethiopian force reached the vicinity of Lugh, increasing Somali suspicions of an Ethiopian takeover of the area. In 1895, the Italians established an outpost at Lugh in the far southwest, under the guise of protecting the Somalis from the ever-expanding Amhara-Tigrean empire of Ethiopia. In 1895, Captain Cecchi, a proponent of Italian assertiveness in the Somali peninsula, set out from the coast, in an attempt to increase Italian influence, toward the interior, but his forces were defeated by the warriors of the Biyomaal clan at a place called Lafole "the place of bones" in the vicinity of Afgoye. The captain, thirteen Italians, and their *askaris* (locally recruited troops) perished.[41] This event set back active Italian penetration for a while in the south.[42] In 1907, two thousand Somalis attacked an Italian regiment at Turunley; the attackers, from the Biyomaal clan, were defeated and sustained high casualties—several hundred died.[43] In 1908, with calls for a forceful occupation mounting, Italian troops were sent to the hinterland. The town of Mererey, which had attracted resistors from the coastal towns, was destroyed and more than seventy fighters of the local Hintire clan perished.[44]

In a more northern direction, the Italians had placed in 1899 a protectorate under the sultan of the Majeerteen clan, and also over Ali Yusuf, warlord, adventurer, and sailor, who had established himself in Obbia; an Italian consul general based in Aden had responsibility over those northern areas.

In 1908, the southern coastal area of the Benadir and the northern Italian protectorates were unified. In the more northern regions, Italian penetration was even more nominal than that of the southern areas, and Italian expeditionary forces had to be sent in several times. However, Somalis were disorganized, unlike the highland Christians who had been united by the strongman tactics of Menelik; therefore, despite their spirited resistance and calls for a jihad, Italian administration was firmly established by 1927 in all regions, with Mogadishu as the capital.

Italian colonial endeavors were also helped by the British, who were afraid of competition from the Germans, whom the British considered more potent contenders. As one Somali said, the British were practicing the Somali proverb that says "give your stick to someone from whom you can repossess."[45] The British facilitated Italian occupation of the central regions. In addition, in 1924, Britain ceded the Jubaland province, in the extreme south, to Italy.

The Rise of Modern Somali Nationalism

While Somalis had always been aware of being part of one ethnic group unified notably by one language and one religion, historically, they had rallied more on the basis of religious identity rather than nationalist identity. In their brief moments of great cohesion, Somalis had come together as Muslims instead of as Somalis. City-states, sultanates, and independent clans were the normal mode of Somali government since time immemorial. The advent of modern Somali nationalism and its centralist state are therefore a tributary of the nationalist ideals and the concept of the nation-state that started to take shape in nineteenth-century Europe. Somalis had always been seafarers and travelers, and with the opening of the Suez, they were working and traveling in Europe and even as far as Australia. They came back with the feelings of a need for a state for their nation. Colonial experience also, even if it divided up Somali territories, brought together the disorganized clans, sultanates, and city-states under a single administration and indirectly helped foster Somali nationalism.

Some writers start the Somali struggle for nationhood with the so-called Dervish disturbances, instigated by Mohamed Abdulle Hassan (the Mad Mullah). However, Mohamed Abdulle Hassan had no grasp of the wider implications of Somali nationhood in the order of nations; his movement and rhetoric as well as his many bloody battles were parochial in nature and involved large-scale looting of camels, exacerbation of clan antagonism, and massacres of innocent Somalis in unprecedented numbers; in fact, the one other Somali who equals him in wanton destruction and massacres is General

Siad Barre. Mohamed Abdulle Hassan's other endeavors were also about local events such as the competition between *sufi* (religious) orders or expressions of some historical antipathies between Muslims and Christians.

Conscious and thoughtful Somali nationalist movements started in the 1930s in urban settings. No single person can be called the father or mother of Somali nationalism. There certainly had been a number of individuals in the movement, such as Farah Omar (1864–1948), a man who, like Mahatma Gandhi of India, sought change in a peaceful way by writing and petitioning British authorities.[46] The Somali poets and composers who produced a large repertoire of nationalist literature in the 1940s and 1950s had indisputably the largest role in Somali nationalist consciousness.

Early Somali discussions coalesced, as is only natural, into the formation of political and social groups. We witness the first such organizations in the north, where the British colonial regime was politically more tolerant than the fascist Italian regime in the south, which was advocating separation of the races and had no tolerance for the political emancipation movements of the colonized. Somali nationalist sentiments crystallized particularly after the end of World War II, as happened in many nations under colonial regimes. Somalis had fought and died in Africa, Asia, and Europe for the Allies. They had also fought on the losing side with the Italians in Ethiopia. These events brought them even more in contact with the outside world and the other peoples aspiring for liberty from colonialism.

In the north, the Somali National Society was formed in 1935. This organization later evolved into the SNL (Somali National League).[47] This would be the main northern political organization until independence from Britain. In the south, after the defeat of fascist Italy, its colony was placed under British military administration. It was during this period that the SYC (Somali Youth Club) was formed in 1943 under the encouragement of British officers who did not like the powerful pro-Italian lobby in Mogadishu. There was a sizable number of Italians and pro-Italian locals in urban southern centers at that time who were clamoring for a return to an Italian colonial status. The SYC changed its name to SYL (Somali Youth League) in 1947. The SYL dominated southern politics until independence from the Italian trusteeship period and it continued its hegemony after the amalgamation of north and south into the Somali Republic.

While the Somalis had no history of a single central administration, they had territorial contiguity, a widely diffused language, one religion, and of course a single ethnic origin, for the most part. The various minorities in the south were also warm to nationalist aspirations since the word Somali was acquiring wider meaning than the people to whom it referred in the

past. The unification of the Somali territories naturally became a burning question—the Somalis wanted one administration over their heads. In particular, the return of Somali-speaking territories such as NFD that went to Kenya and the Somali areas that fell to Menelik's Ethiopian empire were sought in a movement that would be known as "Somali irredentism," which would lead to disputes with both Kenya and Ethiopia. The sentiment of restitution applied also to the French colony of Somaliland, only partially Somali in ethnic composition.

In 1946, British foreign secretary Ernest Bevin pleaded for the unification of all Somali lands under one administration. He was vetoed by the three other members of the Four Power Commission, comprising the victors of World War II (United States, Great Britain, France, and Russia), and charged to decide the future of former Italian possessions in Africa after the war. Russia suspected Britain of expanding its colonial possessions in northeast Africa. The commission traveled to the south in 1948 and had audiences with the populations of the region. The pro-Italian lobby did an intense campaign for thirty years of trusteeship under Italy; however, the commission granted only ten years of trusteeship.

In the north, nationalist sentiments focused on the transfer of the Haud and Reserved Areas in 1954 to Emperor Haile Selassie's Ethiopia. This Somali-inhabited area served as the main grazing land for the clans in British Somaliland. The Somalis of the north felt a sense of immense betrayal and hastened to send the British home. With poets rallying them at every point, northern Somalis went through paroxysms of nationalism that took them to independence and to a hasty amalgamation with their fellow Somalis in the south in 1960. On June 26, 1960, the SNL, the majority party, headed by Mohamed Ibrahim Egal, led British Somaliland to independence. But the resulting State of Somaliland was short-lived; on July 1, it combined with Somalia, on the same day the Italian colony gained its independence. In the British paper, the *Herald*, it was called "The Colony That Rejected Freedom"[48] and the name stuck.

The Formation of the Somali Republic

The amalgamation of the north and the south was the result of a nationalist fever in the north; the southerners were not much interested in a union; this was specially true of the southern leadership who were afraid to lose their prominence. The northerners flew to Mogadishu, the southern capital, a few days before the "precipitate union," and were housed in a hotel.[49] The southerners deliberated alone for a day about what their conditions would be for

the union with the north. Finally they summoned the northerners in the middle of the night and presented them with a set of options that all started with the word *hal*, a word which means "one" in southern Somali dialect but which meant a "she-camel" in the northern dialect and had to be explained to some of the northern delegates. The southerners rattled off five conditions: "The president is one, and it is going to be ours; the prime minister is one, and it is going to be ours; the capital is one, and it is going to be ours; the currency is one, and it is going to be ours; the flag is one, and it is going to be ours."[50] The southerners thought they had raised the stakes so unpalatably high that the northerners would not be able be to swallow their conditions. But the northerners knowing the nationalist fervor in the north duly accepted the southern proposition.

"The unification effort, however, fell short of the legal requirements mandated by domestic and international law."[51] The new state, the Somali Republic, would have "nothing more than the recognition of other states to testify to the existence of Somalia as a unified state."[52] Despite the union, the new country was functioning in all reality as two countries under one flag: there were two administrative systems, two monetary systems, two customs and taxation systems, two official languages, and two educational systems. With faraway Mogadishu calling the shots and Italian the language of the government, the northern population soon felt a sentiment of "marry in haste and repent in leisure." Within a year, in June 1961, the north voted, in a referendum, against the constitution of the new republic. The main northern party called for a boycott of the referendum; voting did take place but the result was still a negative vote in the north. The south voted overwhelmingly for the constitution. In an effort to declare a massive yes vote, southerners not only reported a yes vote higher than the estimated population for their region but also declared a small village called Wanla Weyn in the vicinity of Mogadishu to have registered a yes vote higher than the 100,000 ballots cast in the entire north![53] This not only gave northerners a new term for southerners—Wanla Weyn—but it also made them suspicious of the political culture of southerners.[54] No other referendum was held for the constitution even if it was not approved by the north.

The Chaotic Democratic Years

In the first years of the Somali Republic, northerners had no influence on the government and felt politically marginalized. In the newly formed National Army, things were no better; under the Italian Trusteeship administration, the south had only police contingents but no standing army.

However, just before the union, the police officers of the south, themselves products of the semiliterate colonial force, gave themselves, with the full knowledge of their political bosses, generous promotions in rank with the express aim of "outranking" the northerners. In the north, the British had a territorial army of 2,000 men whose junior officers were graduates of distinguished British military academies such as Sandhurst and Mons. These young officers now fell under the command of the old *carabinieri* (police) officers such as Siad Barre. The northern officers were outraged and staged a coup to sever ties with the south. However, the coup, poorly organized, failed as noncommissioned officers did not follow their orders. The officers were arrested but could not be sentenced in a court. The judge decided to acquit them "on the basis that, in the absence of an Act of Union, the court had no jurisdiction over Somaliland."[55] Relations between the north and south continued to simmer.

In May 1962, Egal, the man who took the north into union despite his personal misgivings, allied himself with some southern opposition leaders in a new political formation, the SNC (Somali National Congress). Egal, unlike many of his northern countrymen, understood the workings of southern politics, which were articulated around clan politics and clan balancing mainly between the Hawiye president, Aden Abdulle Osman, and his Majeerteen-Darod prime minister. The challenge was to wrest power from the SYL and its alliance of clans through a more diverse grouping. When the first national postindependence elections were held in 1964, the SNC coalition of northerners and southerners did not win the election, but it narrowed the SYL seats to 54 out of 123; the SNC won 22 seats, the Digil-Mirifle party (the HDMS) won nine seats, and the SDU 15 seats. More than anything else, the election proved that the SYL, the governing party, could be beaten. But instead of preparing for the next elections, Egal shrewdly realized the significance of the American adage: If you cannot beat them, join them. He joined the SYL and was instrumental in getting Abdirashid Ali Sharmarke elected in 1967 as the second president of the Republic by corralling the northern deputies against the incumbent Aden Abdulle Osman, the man who had presented the five conditions of the union to the northerners. As a result, Egal, now in the SYL, was invited by President Sharmarke to form the next government. The Republic had thus its first northern premier.

Gradually, the integration of the two regions improved and northerners felt less alienated in the union mainly for three reasons: (1) the crossed political alliances such as the SNC or Egal's entry into the SYL inner circle; (2) the increasing use of English in the south as a result of the internationalization

of that language; and (3) increased commerce between north and south and investments in the south by northern businesspeople who built the highest buildings in Mogadishu.

While fears of north-south breakup evaporated, Somali politics became a game of clan parties, as politicians sought to mobilize members of their clan instead of seeking election solely on a debated platform. Party formation was a front to getting elected, and it did not reflect any ideological convictions or any specific visions. The number of registered parties thus arose phenomenally. The small one-man parties were meant to dissolve as soon as the election was over by joining the SYL. In the last free elections held in the country in 1969, 68 parties and more than 1,000 candidates representing the intricate set of clans and subclans of the Somali clan mosaic contested the elections. The SYL again won the elections, amid sharp accusations of electoral improprieties, through the use of public resources and slush funds.

Inevitably, the general public became disillusioned with the machinations of the politicians, who while electioneering would promise to bring in development projects to their districts but who would be seen soon after catering first to their personal needs. Little surprise then that one politician was dubbed *bad-maʿaaneeye* (he who sweetens the sea), as he was fond of hyperbole while fishing for votes. Perhaps more than ever before, the legislative elections of 1969 were a mess of disorder and irregularities that only widened the gulf between the political class and the ordinary people.

After the election was over and the new parliament duly sworn in, President Sharmarke was assassinated by one of his bodyguards, apparently for a grudge tied to the elections in his own district. This incident added a new unsettling element to the country's already volatile political situation. Suddenly, the highest political office in the country was vacant, and a mad backstage marathon started to fill the new position. There could have been no better political situation for the army brass and its Soviet advisers to hatch a coup d'état.

The history of the plotting that led to the fall of the civilian government has never been written down. One fact that is well known is that Premier Egal had antagonized the commander of the army General Siad Barre by allusions to his inadequate education in military science and wanted him to retire. According to one version of the plot, a junior northern officer Captain Khaawe, with the support of General Barre, side-stepped the higher-ranked but militarily less-educated southern officers and went about organizing the coup in a methodical manner. He did this by recruiting some of his former classmates and fellow officers, such as Ismail Ali Abokar, Mohamed Ali Shire, and Ahmed Suleiman Abdalle.[56] Then Siad Barre and the young officers

co-opted a few of the senior officers. The plotters had not given any information as to whom was going to be in their junta council a whole week after the coup.[57] Apparently ardent discussions were going on between the young junior officers and the old guard who had the benefit of better-known names. Thus, on the first press conference, Siad Barre and General Ainanshe, both of the old Italian police force, were present.[58] The young officers saw in Siad Barre a transitional compromise figure, an old rustic of no particular keenness of mind, to be conveniently replaced later on. Unluckily, what the promoters of the coup did not know was that behind the rustic figure of Siad Barre was a mind endowed with enough talent to sow suspicion among strong friends and hatred between brothers.

After the soldiers had staged their coup without any bloodshed, they arrested members of the government and parliament and suspended the parliament and the constitution. Then, taking a leaf from a trend that was common in the Third World, they constituted the SRC (Supreme Revolutionary Council) and started governing by simple decree without consulting anyone except themselves. Barre, the chair of the SRC, was named the president of the Republic, renamed appropriately in the same military-leftist style of the era, the Somali Democratic Republic. Unfortunately, the population tired of the inefficiency and corruption of the civilian regime, and, seduced by the propaganda of the military leaders who promised a new era of justice, discipline, efficiency, and development, poured out into the streets tacitly endorsing the coup.

The Years of the Dictatorship and Civil Wars

In the first two years, the military regime had genuine popular support. Basing their speeches on populist socialism and nationalist ideals, the junta leaders exhorted the population to reach self-reliance. Popular slogans such as *Hadal yar iyo hawl badan baa horumar lagu gaadhaa* (Less speech and more work is the way to progress) festooned all public places. The Somali urban elites, schoolteachers, civil servants, and students were caught in the populist movement as the military leaders promised justice and advancement through merit and hard work. On the first day of the anniversary, Somalia was officially declared to be a socialist country; nationalizations of the banks, insurance companies, fuel distribution companies, newspapers, the sugar refinery, and any enterprise of importance were carried out. State companies were set up to import and export items. Unemployed youth were rounded up and organized into agricultural teams known as crash programs to increase food production and decrease urban unemployment. Multiplying egalitarian steps

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Typical propaganda poster of the Barre regime.

in a country where egalitarianism was a reality by the near absence of a significant bourgeois or a landed gentry class, the regime, in the fashion of the Paris Commune, declared that from that time on everyone should be addressed as *jaalle* (comrade) without distinction to rank, age, or sex.

The propaganda machinery through the state-owned media (private media being forbidden) was relentless in inculcating upon the people the arrival of a new era and the banishment of corruption, *afmiisharnimo* (rumor-mongering, literally having a serrated mouth), and tribalism. Public ceremonies were held in which effigies of tribalism were burned and then publicly buried. All the while, however, Barre was consolidating power into a clique of his own making; his first scheme was to divide the SRC by winning to his side those who shared clan roots with him. Soon, a joke was circulated that when the effigy of tribalism was buried, Barre sneaked out in the middle of the night, dug out its skeleton, and placed it in his cupboard.

At the same time, repressive measures were put into place: the right of habeas corpus, the freedoms of political association, public expression, and the right to form labor unions and to strike were suspended and made an offense punishable by death in some cases. Advised by the security services from the Soviet bloc countries such as the Soviet Union itself, East Germany, and Romania, a new security service, the National Security Service (NSS) was created. Its followers would show, in the coming years, that they were

the equals of Hitler's Gestapo in sheer brutality and cold-blooded murder—the very mention of the NSS became enough to make someone break into a cold sweat. Next, a popular militia, the *Guulwadayaal* (Pioneers of the Revolution), was created with chapters in almost every village of the country. The Guulwadayaal, recruited from among the members of the illiterate urban youth and from common criminals, were trained in rudimentary military techniques and uniformed in green fatigues, a dress which earned them the derogatory name of Green Dog, whose utterance was punishable by a harsh sentence. Their task was to spy on the members of every household and on ordinary people, freeing the NSS to pursue the more educated enemies of the regime. One of the common pretexts that the NSS or the Guulwadayaal used to arrest someone was to state they heard that person utter the word *Af-weyne* (big mouth), Barre's sobriquet. This was the childhood nickname given to him by his fellow camel boys in Shilaabo in eastern Ethiopia where Barre was born.[59] Farah Galooley, the wit of Mogadishu, a man whose pungent political satire was couched in fables and aphorisms, summed up the repressive atmosphere in these words: *Ama Af-weyne amaan, ama Afgooye aad, ama afkaaga hayso* (Either sing Big Mouth's praises, or go to the Afgoye prison [literally the mouth cutter] or shut your own mouth).

By 1974, barely five years after the coup, Barre had firmly established the basis of his system, Siadism if it could be called a system.[60] The keystone of the system was put in place in 1976 by the creation of the SRSP (Somali Revolutionary Socialist Party). The central members of the SRSP were chosen in a by-invitation-only meeting attended by members handpicked from the Guulwadayaal and government-controlled organizations such as the Workers' Union and various groups previously established by the propaganda office of the junta for women and youth. The criteria for inclusion into the party membership was an obedient temperament or blood links to Barre.

The army, on whose strength Barre's power ultimately rested, was given a special consideration. Officers judged to have a mind of their own and those not related to the inner circle of Barre's power base were dismissed, retired, or assassinated. The cadets who applied for admission to the military academy were henceforth to be from loyal clans, which meant the Marehan, the president's paternal clan, the Ogaden, his maternal clan, or the Dhulbahante, his son-in-law's clan; the alliance of those clans became known as MOD. The National Army was restructured in essence as an instrument for internal oppression; gone was the professionalism of the army whom the people of Somalia used to be immensely proud of and rely on in moments of disaster; in its place was a ragtag army headed by hastily trained semi-illiterate cadets who did not hesitate to destroy whole towns and villages.

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Over the years, Barre would create a class of semiliterate apparatchiks who owed their food, homes, and luxury to Barre. His circle of family members and hangers-on had one aim in mind—to stay in power and endure. Nothing was too sacred to profane, no massacre too heinous to ponder to ensure the interests of the "family." The circle that ran the country had become a mafia, a *cosa nostra*. Gone were the ideals and the legacy of *somalinimo* "somalism," bequeathed by the Somali patriots from the colonial era. One by one, Barre and his inner circle cut all the bonds that held Somalis together as a nation: solidarity, compassion, decency, humanity, and sacredness of life and property. In short, the values of the Somali society were turned upside down. The Somali nation-state was in shambles, burnt by the idiosyncracies of a crazed old man and his greedy relatives, who let go only when flames from the burning *aqal* (house) fell on them.

But many who knew Barre from his boyhood and during his stint in the colonial police under the Italians were not that surprised. Barre was not a normal person; he was a psychopath whose mercurial spirit vacillated between raving hatred in one moment and words of praise and reconciliation the next moment. He was said to have witnessed the murder of his own father when he was only ten years old during the turbulent year of 1921, when the clan conflicts instigated by Mohamed Abdulle Hassan were raging across the land (Hassan was also an orphan of clan wars). Barre was reportedly forever after deeply marked by the murder of his father. He became sadistic, and as a member of the fascist colonial police, he had the ear of his Italian commanders. He was subsequently trained in interrogation and intelligence methods as a "special branch" police in the colonial era.[61] As a commander of a police station, he was said to practice torture, especially on nationalist Somalis. He had a particular liking for deriding and intimidating his colleagues, even his most ardent followers. He rewarded the corrupt and the embezzlers; it was publicly said that if a particular minister was not corrupt, he would soon dismiss him for fear that the honest minister would witness against him one day.

It seems that, early in his life, Barre took to heart the lesson that craftiness and guile were more rewarding than honesty and hard work. He was fond of retelling how he "craftily earned" his first promotion in the colonial police and how a "clever man," possibly an allusion to himself, stole another recruit's hat and ended with two hats while the guileless recruit went without one.[62] To the end of his life, he ostensibly thought he could remain the "clever man" and would outsmart everyone else. The personality cult he developed around him was much to his liking; he was called among other eloquent names "the father of the nation," and "the father of knowledge." His portrait

was mandatory in all public and private establishments; every public institution had an illuminated concrete and glass structure in its front yard where an immense portrait of the *macallinka* (the teacher) was displayed, and this in a country where most people were poor and without electricity. Instead of being the redeemer the people were dreaming of in 1969, he became the monster child born to the woman of the African legend who had incessantly bothered God for the gift of a son.

In 1977, with Barre's popularity waning, he sent the army into Ethiopia to lend a hand to the guerrillas of the Somali region in Ethiopia. The Ethiopian army was quickly pushed back. Uniting Somali-speaking territories had always been popular with Somali masses, and with a victory to show, Barre improved his popularity overnight. But the victory would be a short-lived one. The Soviets, who had been the country's ally and major arms-supplier since the 1960s, switched their friendship to Ethiopia, now ruled by the Marxist regime of Colonel Mengistu. The Soviets saw Barre's socialism as a facade for his clan dictatorship; in contrast, they saw in Colonel Mengistu a younger and more knowledgeable leader, more committed to communism, than the colonial policeman that Barre was. Additionally, Ethiopia was the bigger country and, therefore, the bigger catch, and the more so since it was being stolen from the Western camp. What happened next was a replay of a scenario right out of the sixteenth century—a foreign ally was coming to the help of the defeated of the Amhara-Tigreans, now of course ruling a larger country, Ethiopia, with many nationalities including Somalis. The Soviets mounted their largest military campaign since World War II and airlifted a huge arsenal of weapons and thousands of troops, mostly from Cuba and South Yemen, into Ethiopia. With veteran Soviet generals in the war room, the operation "was almost over before it started."[63]

In 1988, the Somali army and irregulars returned to Somalia after having incurred many losses. The Somali state was bankrupt. Additionally, as an aftershock of the war, thousands of refugees of Somali or Oromo origin, afraid of ethnic reprisals in Ethiopia, flooded Somalia. Barre's newfound popularity vanished overnight, and Somalis wanted him to leave. But he would find a new cold war patron in the name of the United States. For the United States, this was a time perceived as an expansionist period for the Soviet influence. With the Shah of Iran overthrown and Soviet troops in Afghanistan, Washington felt the Soviets were getting too close to the oil fields of the Middle East. An agreement was therefore reached with Barre providing his regime with arms and other aid in 1980 in exchange for use of Somali ports and airports, especially Berbera, the former Soviet naval and

air base in the north. For Barre, this was a godsend; once again, he had pulled an ace out of his sleeve. He felt more confident than ever and saw no compulsion to listen to his internal critics. He brazenly jailed seven members of his regime in 1982, including the popular former foreign minister Omar Arteh. The group included the most senior member of his regime from the north, Vice President Ismail Ali Abokar. The surprise move was designed also as a way of crushing Isaaq critics, whom he felt were becoming more daring in their opposition to him. Among those arrested were two members from his Marehan subclan, which was a Machiavellian maneuver intended to camouflage his objective of crushing the northern Isaaqs who had just set up a guerrilla movement across the border in Ethiopia.[64] Barre was a keen bluffer as a gambler—he had learned European card game techniques in his days as a colonial policeman.[65]

Barre's tactics and methods of rule deeply divided the Somalis. To those who opposed him, no punishment was harsh enough; to those who obeyed and served him, no reward was too high. By 1980, the Somalis were deeply divided; the clan, a minimalist association for pasture and conflict management in the countryside, had under Barre become transformed into social and political identities no different from the classical ethnic identities where language, religion, or physical appearance are the differentiating factors.

The year of 1981 is important in Somali history. It corresponds to the foundation of the Somali National Movement (SNM) by members of the Isaaq clan. For sure, the SNM was not the first front to oppose Barre. The SSDF (Somali Salvation Democratic Front), a front set up by members of the Majeerteen subclan of the Darod, was in operation since 1978. But Barre, by playing his clan cards well, which meant calling for Darod solidarity against the other clan families, lured its fighters back into Somalia and sent them up north to fight the northern Isaaq insurgents who were becoming more and more troublesome. The northern Isaaqs are ethnically no different from the Darods, Barre's clan family, or the Hawiye, the major southern clan family, or any other clan for that matter. However, as the majority population of the north, they had joined the south in 1960. In the early 1960s they were fearful of southern domination; but those fears subsided in the late 1960s as the northerners became more integrated economically with the south. Now a combination of factors, all emanating from Barre's administration, alienated the Isaaq population. First the most important causal factor was political alienation. Northerners, who came from a different political culture than that of the south, where fascist Italian rule had rendered ordinary

people to be less questioning of those in power, were less willing to accept Barre's clan rule.

Second, the northerners have historically been more of a trading society than the more hinterland Somalis as participants in the historical trade between sea ports and the Ethiopian highland. Barre's state-run enterprises and bureaucracy crippled their commerce. Third, the northerners were not blind to the fact that they produced the mass of Somalia's wealth in the form of livestock exports and workers' remittances from the Gulf countries but received in return an insignificant amount of government investment—invariably, major socioeconomic projects in the form of factories, hospitals, and institutions of higher learning would go to the south.[66] Schools and roads built by the departing British were deteriorating in the north. The worsening socioeconomic infrastructures led in 1981 to the formation of a self-help group in Hargeisa, the main northern city, by a group of doctors and teachers with the aim of improving conditions in the main hospital. They were tried for insurgency and sentenced to stiff prison sentences. But instead of silencing opposition in the north, schoolchildren held demonstrations and were met with bullets, leading to the death of several schoolchildren.

Fourth, the number of refugees from Ethiopia settled in the north was disproportionate in comparison to those resettled in the south. Nevertheless, the northern population had welcomed the refugees, many of whom were ethnic Somalis, and collected pots and pans for them. What happened next was mind-boggling and objectionable to the northerners: the refugees were recruited into the Somali army and stationed to interrogate and harass the local populations.

Finally Barre's viceroys in the north, first General Ganni and then General Mohamed Said Hersi (alias General Morgan), who were iron-fisted individuals with no compassion for their fellow citizens, used outright killings and exposition of the corpses of presumed guerrillas, who were nothing more than unlucky Isaaq nomads collected from the countryside, as the preferred methods of silencing the population. The two tyrants would both earn the names of "butcher of Hargeisa."

The irony was that ethnic cleansing was a reality in a country that had prided itself, to a xenophobic level, on the homogeneity of its people, and the enemy was now officially the country's northern citizens. But with no changes emanating from the regime, a largely unreported war was fought from 1981 to 1990. The regime's answer to popular challenge in the north would be scorched-earth tactics, and by all means the regime was by now a fascist one. As one British scholar wrote in a most revealing way, "the North began to look and feel like a colony under a foreign military tyranny."[67]

But events took a tragic turn in 1988. In that year, with the army increasingly bogged down with fighting the SNM, Barre made a volte-face and signed a peace agreement with Colonel Mengistu of Ethiopia; the deal suited both dictators, as each saw in it a chance to eliminate insurgency movements: the Northern rebellion for Barre and the Somali, Oromo Eritrean insurgency for Mengistu. Both agreed to cut off assistance to their respective client insurgents. This basically meant stopping assistance in arms and munitions, shutting propaganda broadcasts by rebel radios, and evicting the guerrillas from the safe bases in each other's territory. The Ethiopian groups had few safe bases in Somalia to speak of, so the latter point was aimed at evicting the SNM from their sanctuaries in the Somali region of Ethiopia. Before the unknown, the leaders of the SNM decided to take the initiative and risk all in their home territory instead of being reduced to a toothless tiger in Colonel Mengistu's lap. On May 27, 1988, the SNM seized Burao, the third-largest city in the country, and freed political prisoners including schoolchildren from the main jail. On June 1, they attacked Hargeisa, the northern capital, and captured it except for the airport in its outskirts. The regime was caught completely off guard.

The regime's response was swift and brutal; the plan followed was nothing less than a genocide. Earlier in 1986, Barre's viceroy in the north, General Said Hersi, who was the dictator's bodyguard before he married a presidential daughter, told some nomads at a waterhole, who were not even capable of distinguishing between government soldiers in camouflage from rebels also in camouflage, "if you Isaaqs resist, we will destroy your towns, and you will inherit only ashes." This same man in a policy letter written to his father-in-law, which came to be known as "the letter of death," proposed the foundations for a scorched-earth policy to get rid of "anti-Somali germs."[68] Those morbid words became a reality in the north, as the army directed its fire power against the civilian populations. Jet fighters would take off from Hargeisa airport and drop their deadly cargo a few miles away in downtown Hargeisa. Artillery units positioned on the ridges that surround the city would train their sights on the residential quarters of the city and fire round after round of shells. Then soldiers would go door to door to physically eliminate any remaining residents and to loot homes. In one month, Hargeisa and Burao were reduced to rubble and became ghost towns.

By then any surviving urban Isaaqs had fled across the border into Ethiopia, pursued along the way by fighter-bombers piloted by mercenary South African and ex-Rhodesian pilots paid $2,000 per sortie. About 50,000 to 100,000 were killed in the first two months of the conflict. But this was a war fought in obscurity, the regime not allowing any reporters into the re-

gion. Even the Red Cross was denied access to bring food and medicines to the civilian population. The survivors of that attempted genocide claim today that only the bravery of the SNM fighters saved them from an outright annihilation; but in reality, it was more than that. Every man and woman became a fighter with nothing to lose but everything to gain.

These events happened long before the word "ethnic cleansing" gained currency, long before "humanitarian intervention" was thought to override the prerogatives of sovereign states. This tragedy happened at a time when the cold war was still in effect, when a patron superpower would look the other way to keep the privilege of having a regime in its camp, even one that was massacring its own citizens. That is why at the height of the fighting, the United States delivered weapons "of obvious and urgent value to the Barre government, and no one in the United States doubted that they would be used to kill people."[69] The weapons were distributed to Barre's forces in the north.

Toward the end of 1988, the regime's forces, at the cost of total depopulation, recaptured the main towns from the SNM guerrillas; however, the SNM fighters, now no longer fighting a dictator for the sake of a better government in Somalia but a veritable liberation war to retake their homes, farms, towns, and land from a brutal occupying force, retreated to the mountains and to the countryside. This was the beginning of the end for the Barre regime; and the end would have happened sooner were it not for the external aid principally from the United States, Italy, and Saudi Arabia that kept flowing to the regime. Barre thought he had played his cards well and found a solution to the Isaaq problem, but he underestimated the resolve of a people pushed to the wall.

The war in the north was becoming an insatiable juggernaut in human and financial terms for the regime. Batches of fresh young conscripts would be sent up north while their wounded comrades would be brought to the capital. Soon the hospitals of Mogadishu ran out of beds and blood supplies. Inevitably open resistance spread to the south. The southern Somalis, in particular the Hawiye, on whose land Mogadishu lies, joined openly the rebellion in large numbers especially after the setting of the USC (United Somali Congress). Another important blow to the regime came from Colonel Omar Jess's defection to the SNM; later, he would set up his own front, the SPM (Somali Patriotic Movement). Suddenly, Barre's clan alliance centered largely on the Darod clan family, whose inner circle had been dubbed MOD (after the acronym for the subclans of the Darod: the Marehan, the Ogaden, and the Dhulbahante), which was falling apart as Colonel Jess, an Ogaden by his father's side but Isaaq by his mother's side, parted ways with Barre. By the end of 1990, the rebellion was reaching Mogadishu as USC forces ap-

proached the red sand dunes that mark Mogadishu's northern periphery. The legend of Barre's decreasing magic map was becoming more and more a reality. According to legend, in the early years of his rule, Barre paused in front of a map of Somalia in one of the rooms of his palace. While he was gazing at the map, the devil spoke to him and said: "Behold, President. This is a magic map; it will grant you any wish you may ask; but after every answer, it will shrink accordingly."[70] Barre's map of authority, after so much ill-use, had by now shrunk so much that he was dubbed the "mayor of Mogadishu."

As the guerrillas of the USC closed on him, Barre adopted the same methods of destruction. Artillery pieces from his hilltop palace-barracks shelled downtown Mogadishu. Civilians were tied together in batches and shot summarily by the members of his feared Red Berets presidential brigade, who were drawn to the man from a small Marehan subclan. To a group of Hawiye elders who asked him to step down, Barre stormed: "When I came to Mogadishu . . . [t]here was one road built by the Italians. If you try to force me to stand down, I will leave the city as I found it. I came to power with a gun; only the gun can make me go."[71]

On January 27, 1991, on a Friday to a Saturday night, the people of Mogadishu, who had been exposed to two months of artillery bombardment from loyalist barracks in the city, gave the final assault to the presidential palace in a popular revolt that eerily looked like the taking of the Bastille by the people of Paris. Before dawn, instead of facing the showdown, Barre fled in a tank. In the end, as his own prophecy would have it, Barre, who came with the gun in front of him, left with the gun in his back.

Unluckily the dawn that came to Mogadishu on January 28, 1991, did not lead to peace. The following day, without consulting either the northern SNM or the southern SPM or even with the central committee of the largely Hawiye USC, Ali Mahdi, a politically hitherto obscure man but reputedly a rich hotelier and a member of the Abgal subclan of the Hawiye, in a preemptive move that left the Hawiye insurgency movement utterly divided, self-proclaimed himself president of Somalia. To the northerners, who saw things rather in regional terms, this felt like an insult added to their grievous injury from Barre's depredations. In the USC itself, the main rift happened when General Aidid, who had coordinated the fight against the regime for the USC, felt himself cheated by a man who had been drinking *spremuta* (orange juice in Italian, as it is called in Mogadishu) while he had been fighting in the bushes and in the desert. With each man now drawing support from his own subclan militia and independent marauders lavishly armed with the spoils of the army—the Somali army's main arms depots have always been in and around Mogadishu—the two equally obstinate men crossed

swords in 1991 in a bloody urban war that would destroy the remaining infrastructure of Mogadishu.

Meanwhile, the leaders of the northern SNM, taking note of the southern audacity, convened an assembly of the populations of the north, including those that openly fought on the side of the regime. The northern convention was attended by members of all the northern clans including the Gadaboursi, the Issa, the Dhulbahante, and the Warsangali. The assembly, composed of traditional and eminent leaders of northern communities, after having deliberated first in Berbera and then later in Burao, judged that the region was stepping back from the unconstitutional union it had in 1960 with Somalia. Accordingly, the region was declared on May 18, 1991, as an independent state to be known as Somaliland within the confines of the ex-British Protectorate of Somaliland and the State of Somaliland of 1960. Although no country has yet to recognize Somaliland, the existence of its administration has spared it the civil wars that continue to plague the south to this day. Reconstruction, fueled by livestock exports and workers' remittances, has started in the north, creating a boom economy that has attracted migrant workers not only from the south but from Ethiopia, Kenya, and Djibouti as well.

In the south, while the enemy Hawiye brothers, Ali Mahdi and General Aidid, were dueling in Mogadishu, Barre and his loyalist troops were attempting a comeback. When Barre fled Mogadishu, he set up shop, with the remains of his army, at Baidoa, the granary of the south and capital of the Maay. There, "General Morgan," in a manner reminiscent of his genocidal program in the north, hatched a plan for eliminating the Maay and other agricultural peoples from the fertile interriverine area.[72] A top-secret document carrying his signature said implicitly "to pursue a military campaign between the two rivers (Shebelle and Juba) in the south so that it will be safe for our people."[73] However, months before the planned ethnic cleansing was put down on paper, Barre's remnant army was already massacring and raping across the region with the wrath of a defeated army and the rapacity of unpaid soldiers. The Maay and other riverine leaders asked for Aidid's help; the Hawiye general credited with having thrown Barre out of Mogadishu, who, out of his own self-interest and fearing that Siad Barre would fight his way back to Mogadishu as long as he was in Baidoa, joined the fight. The *Economist* noted: "Mr. Aidid's forces were drawn from the Hawiye; Mr. Barre's from the Darod clan. Each side, in the course of advances and retreats across the farmland that feeds Somalia, looted without restraint. This was partly because the armies received no rations. The land they fought across belonged to farming clans that traditionally occupy the lower rungs of Somali society.

They were stripped of their crops and livestock. Today's awful famine is the result."[74]

Most of the actual looting was done by Barre's forces, but Aidid's militia, allies to the weak Rahanwein militia, SDM, contributed to the depletion of resources. In the end, after several pitched battles, Aidid and a coalition of the peasant communities, including the Maay and other riverine groups, chased Barre and his remnant army under Morgan out of the riverine region and into Kenya in April 1992. In October 1992, four months later, Morgan, rearmed by Kenya's Daniel arap Moi, a good friend of Barre's (since the day he was saved from a certain coup by a Kenyan general who happens to belong to the same Somali clan as Barre), was back in the region with a vengeance.[75] Soon he recaptured Bardera, massacred its population, and was on his way to Baidoa when the marines landed at Mogadishu in December 1992, bringing a temporary halt to his advance on Maay lands.

Throughout the fighting, four planting seasons, two per year, were missed in the Baidoa area as the farmers abandoned the villages, which were the first places where Barre's soldiers would forage for food. With underground grain silos, *bakaar*, empty, the young and the old journeyed on foot to Baidoa, which was secure from the attacks of Morgan. The problem was that there was no food in Baidoa; death was waiting for them at the end of the trek. As the dying peasants flooded in, the town became the epicenter of the famine and was dubbed the City of Death by the Western media.

As for Barre himself, after a brief stay in Kenya, he went into exile in Nigeria where he would die in January 1995. There ended the life of a man who had begun it, like most Somalis, as a nomad. His first break from a typical nomad's life came when he enlisted in the Italian colonial police by craftily hiding his birthplace in the Somali region of Ethiopia lest he be disqualified for not being a subject of the Italian colonial regime; he would then rise through the ranks of the colonial police by stoically obeying his superiors even if he had to harass and torture Somalis agitating for freedom. He would be promoted to chief of staff of the Somali army after independence, only to emerge as the strongman of the junta that seized power in 1969. He claimed to be a socialist but was known for his limited understanding of social theories, never having had the benefit of any formal schooling. In Somali history, only one man, who was a model to him, ranks close to him in brutality. That man is Mohamed Abdulle Hassan, known as the Mad Mullah. Both were orphans at an early age and were thus exposed to a harsh reality in their formative years—it is known Barre had witnessed his father's assassination by a fellow clansman. Both had a gift for rhetoric, Barre in prose and Mohamed Abdulle Hassan in both prose and poetry. Both were short

in stature, obese, and had raspy voices. Both were short-tempered but otherwise, both had pleasing personas that could be taken for sincerity. Both cultivated personality cults: Barre dubbed himself *macalinka* (the teacher) and *aabaha aqoonta* (the father of knowledge); Hassan had his followers and anyone else address him only as *sayidka* (the master) in a land of "fierce republicans" where no one was a subject or a master. Incidentally, both stuck around in power, although Hassan's was only above his followers and cowered subclans in the far hinterland, for twenty-one years after which both were defeated and chose to turn tail instead of fighting to the bitter end. Both died in exile far from Somali inhabited areas.

Barre spent a lot of money glorifying Mohamed Abdulle Hassan, the Mad Mullah; he commissioned an expensive towering equestrian statue set on a marble pedestal as a tribute to him, while a campaign of revisionist history was launched to wash away the Mad Mullah's massacres. School manuals were written to teach that Hassan was a "hero of Somali nationalism" while Barre was the "father of the revolution." Perhaps one day, some deranged dictator would also restore Barre's image as another "hero of Somali nationalism." One thing is sure: Barre will always figure prominently in Somali history. "History is no more than the portrayal of crimes and misfortunes,"[76] at least in large measure. Within living memory, Barre compares only to Pol Pot of Cambodia or to Hitler in sheer madness and desolation visited upon a people. Somalis have already called him "Black Hitler" and no more fitting epitaph can be found.

By 1992, as a result of the fighting between Barre loyalist forces and those led by Aidid, the famine in the southwestern region between the rivers populated by Maay-speaking groups and other minority groups reached a climax and was viewed around the world. The emaciated faces of the interriverine peasants shown on Western television screens prompted humanitarian nongovernmental organizations and media crews to pour into southern Somalia. A change occurred at the UN, which under Perez de Cuellar, a man with little interest in Africa, had been largely indifferent to the plight of Somalis. The Egyptian Boutros Boutros-Ghali became the first African to head the world body; with his characteristic but undiplomatic candor, he accused the West of preoccupying itself solely with "the rich man's war" in the Balkans to the detriment of other troubled spots in the world. Suddenly, Somalia, was on the agenda in every Western capital and numerous parliamentarians and celebrities went to visit.

By the end of 1992 the famine in the southwest region had been largely contained by efforts of nongovernmental organizations both Somali and foreign; however, U.S. President Bush, then a departing president, offered to

send the marines to Somalia under the auspices of the UN, initially with the objective of securing ports, airports, and highways to allow smooth deliveries of food to the famine victims. Earlier, on April 24, 1992, the Bush administration had opposed the idea of sending 500 armed UN troops to Somalia at a cost of $20 million, "arguing that Congress would not support another costly peacekeeping mission in an election [year]."[77] President Bush's sudden change of mind came, therefore, as a surprise to Somalia watchers and many motives had been advanced for his sudden decision; but on the whole it seems that American foreign policy, which has always fluctuated between isolationism and interventionism, was particularly conducive to interventionism at that moment, as a result of the Gulf War victory against Iraq.

On December 3, 1992, the UN Security Council unanimously adopted resolution 794(1992), welcoming the United States's offer to lead humanitarian intervention in Somalia and authorized, under Chapter VII of the Charter, the use of "all necessary means." Some Somalis had misgivings about the idea of sending foreign troops to Somalia, especially given the haste in which the operation was launched.[78] However, in general Somalis were about evenly divided on the issue.

The U.S.-led operation was code-named "Restore Hope." The marines landed on the beaches of Mogadishu on the cool night of December 9. They were welcomed by hordes of journalists and television crews in what was the first televised marine landing of all time, the warring factions of Mogadishu having decided in advance not to oppose them.

The international forces were militarily well equipped, but the politicians who sent them had not given much thought to the possible problems ahead. Were the factions going to be disarmed? Was an international tribunal going to be set up, as in the case of the former Yugoslavia? How were the revolt leaders and Barre's men, like Morgan, the butcher of Hargeisa, or Barre himself going to be dealt with by the UN forces? If the aim of the operation was the delivery of food to the famine-stricken southwestern region, why not create a "secure zone" in that area as suggested by Frederic Cuny, a consultant to the U.S. Agency for International Development?[79] How were the international forces going to react to the deaths of their soldiers? Answers to these questions probably were not explored beforehand. In short, the simplicity with which the operation started was worthy of the adventures of Tintin, the French cartoon character.

Unfortunately, this was not a cartoon expedition to Africa and mistakes borne out of expediency soon piled up. In the belief that Somalis obey only a superior force, the international troops were told to "shoot first, and talk later." "Somalis admire military strength and power. Ill-timed diplomatic

gestures can be interpreted as a sign of weakness," the marine booklet instructed.[80] The guide book, on the other hand, glossed over in a half sentence how Washington and Moscow, armed to the tune of hundreds of millions of dollars, propped up the abominable Barre regime in the pursuit of their cold war objectives, frustrated Somalia's democratic forces, and helped create the conditions that led to the armed insurgency.[81]

The supporters of Aidid of the USC and his ally, Jess, became suspicious of the actions of Unitaf (Unified Task Force), as the operation was renamed later, soon after the forces of Morgan took Kismayu with the tacit approval of Unitaf, shortly after Jess's own forces had been ordered out of the town by a Unitaf commander. Demonstrations were held with banners stating "This is not [Operation] Restore Hope, this is Restore Morgan."[82] That the operation could be referred to as "Operation Restore Morgan" even in jest should have been a serious cause for concern to the international community—Gen. Morgan, as Barre's right-hand man and as his viceroy in the north, is second only to Barre for having led Somalia into the very violence from which the world was trying to rescue it. Suspicions of unfair conduct were also aroused by the uncoordinated disarmament efforts that happened to target the forces of the Aidid-Jess alliance in Mogadishu and in Kismayu.

On the other hand, some progress was made in the first few months to reconcile the factions of Aidid and Ali Mahdi in Mogadishu through the good offices of Ambassador Robert Oakley, the U.S. representative in Mogadishu, and the "green line" dividing the city was erased. The situation, however, deteriorated after the command of the operation, now officially a UN operation under the name of UNOSOM (United Nations Somalia Mission), was passed, in May 1993, to Admiral Jonathan Howe, a U.S. retired navy general, who had practically no experience in Somali politics or any civilian diplomacy at all.

With the supporters of Aidid already suspicious of the true objectives of the mission and feeling targeted, the shots that would set the whole mission on the slippery path of war with Aidid's faction were fired on June 5, 1993. On that day Howe sent a group of Pakistani soldiers to Radio Mogadishu, which the mission had accused of spewing anti-UN propaganda. Word soon spread that the Pakistanis had come to shut down the radio. Officially, the UN would claim that it had dispatched its troops to inspect a nearby arms cache. A crowd of Somalis gathered informally from all around to watch the operation. Tensions were running high. No one knows who fired the first shot but shooting started. One version of the events says that the Pakistanis fired the first shots and killed some Somalis, which only infuriated the Somalis and encouraged them to take on the Pakistanis before and after the inspec-

tion.[83] In the ensuing battle between Somali irregulars and the Pakistani troops, the Pakistanis sustained twenty-four deaths; but the Somalis being just armed civilians sustained a far greater amount of fatal casualties. The whole event was just an accident; it had not been planned in advance, as some claimed in the rush to condemn Aidid. If it were General Aidid would have sent his veteran fighters and the deaths among the lightly armed UN troops would have been much higher. However, on June 6, less than twenty-four hours later, the Security Council hurriedly passed resolution 837 putting the blame squarely on the Aidid camp, without even so much as starting an investigation.[84] A military solution was to be privileged in Somalia and the Somali gnat was to be stricken with a sledgehammer.[85]

On June 11, the UN forces launched a coordinated attack on what was perceived to be Aidid targets. Shells and missiles fired from Cobra helicopter gunships hit densely populated areas. Radio Mogadishu, housing a hallowed site of Somali culture, the audio-visual tape library, was destroyed. Many Somalis died. The war was now officially on between the UN and the Aidid camp—the UN had just become another faction in the Somali civil war, albeit a better armed one. The hunt for Aidid was officially launched and Howe, whom the nickname-loving Somalis soon dubbed "Animal Howe," added a Wild West dimension to the manhunt when he threw in a bounty worth $25,000 and had "wanted" posters plastered all over Mogadishu.

The Pakistani soldiers would get their chance to have another encounter with the Somalis; on June 13, 1993, they simply fired volley after volley into an unarmed crowd of protesters consisting mostly of women and children. The Pakistani commander, Brigadier General Ikram ul-Hassan, would claim that his troops were provoked by shots fired at their bunkered positions, but Paul Watson, a reporter from the *Toronto Sun*, who certainly was not a Somali, and who happened to be in the unarmed crowd of demonstrators, gave an eyewitness report of a Pakistani contingent simply avenging their fallen comrades from June 5.[86] It was clear that the UN forces were not acting in coordination at all but rather that each contingent was acting independently in many ways and sometimes engaging in vengeful shootings with Somalis.

Unluckily, more bloody operations would follow; one of the worst, called a massacre by the Vatican paper, the *Catholic Register*, happened on July 12 when U.S.-UN forces, acting on mistaken information, showered missile and cannon rounds from Cobra helicopters on a meeting of elders, religious men, and intellectuals in a "conference center."[87] The death toll among conferees, who ironically were trying to come up with ways to reduce tensions with the UN, was high with 100 dead.[88] Aidid was not even at the conference center.

By that time, Howe had alienated all of the people he needed to help him work with the Somalis; earlier, the Italians had to recall their ambassador, the only Western ambassador who had stayed in Mogadishu since the downfall of Barre, to "avoid a head-on confrontation with Admiral Howe."[89] Howe next hounded the Italian commander, General Bruno Loi, out of Somalia, accusing him of complicity and leniency toward the Somalis.[90] Loi's mistake seems to have been walking among Somali crowds, microphone in hand, while Howe was staying longer and longer in his bunker, which was said to remind him of his submarine headquarters.

It seemed the Italian call for moderation was forcefully put down by Howe and U.S. officials, who were pursuing "Rambo" policies and had no patience for the Italian "Machiavellian" diplomatic approach.[91] Howe also won support for his "hardline approach" from the UN Secretary General Boutros-Ghali,[92] who had an "animus against Aidid" and was equally obsessed with his capture.[93] The secretary general had suffered humiliation at the hands of Aidid supporters on January 3, 1993, the day when his historic visit, capping his activities in favor of Somalia, was rudely disrupted by Aidid supporters, who threw stones at his car.[94]

The French defense minister Alain Juppé reminded Howe that several French soldiers had been killed in the Balkans, but that they were willing to implement a peace agreement.[95] Howe seemed to have no ears for calls for moderation; he was said to be obsessed with Aidid and to have adopted him as his "great white whale."[96] Howe was a key man in the capture of Noriega in Panama and might have thought that he was in familiar terrain again.[97]

However, Somalia was more akin to Afghanistan or to Vietnam in terms of locals with fighting experience or tenacious guerrillas than the Panama enclave, historically under close U.S. guard. Nothing, in the end, succeeded in swaying Howe's hardline approach in Mogadishu. Yet warnings of an impending crisis were abundant. As early as July 1993, *Newsweek* had written, "The mess in Mogadishu is the result of a team effort at mismanagement that would be comical if lives weren't at stake."[98] Two journalists called for a change of approach and head of mission at about the same time, in an article aptly titled "Talk, Don't Shoot in Somalia," writing: "The only way to restore UN credibility is to drop Howe's militaristic approach. A trusted outsider must be appointed to restart political and disarmament talks."[99]

Neither the manhunt for Aidid nor the punitive measures that brought death to so many civilians and more damage to a battered city eased until the final fatal encounter of October 3, 1993, when a terrible firefight erupted between a group of American soldiers dispatched to grab the elusive Aidid

and Somali militiamen. Among the resulting casualties on the American side were 18 dead and 70 wounded. The Somali casualties, mostly civilians as the battle happened in an urban setting, were in the hundreds—the estimates vary from 500 to 3,000 dead. The sad events have been explored by a Philadelphia *Inquirer* reporter in "Blackhawk Down: An American War Story."[100] It tells a story of young soldiers, unsure of what to do, who, being shot at, blasted away in turn every living target in sight including men, women, children, and animals.

Four days later, President Clinton announced that he was ordering U.S. troops out of Somalia by March 31, 1994. With the pullout of American forces, who were the linchpin of the international intervention, the UN operation collapsed. The U.S. forces pulled out in March 1994 after their worst losses in battle since Vietnam. The rest of the UN peacekeepers left in 1995. The final death toll on the UN side was 135 dead, with several hundred wounded.[101] The Somali casualties were much higher at around 6,000 killed.[102]

After the departure of UN forces, it was thought that fighting would erupt all over again; but that did not happen, although sporadic fighting had been reported, major flare-ups of violence have not happened. But still no central government has been formed. For the moment, the old Somali state does not exist anymore; in its place are two lands corresponding to the old colonial borders. One, the north, calls itself Somaliland and is a de facto state with a government, a parliament, a constitution, a fledgling economy, and two newly opened universities. Its people, who created their own peace without international help and started reconstruction on their own, resent being routinely lumped together with Somalia by the UN and other international organizations. The Southern Somalia still has no peace nor governance and is fragmented into several faction-held territories.

The UN has held several conferences with the aim of helping the Somalis to set up a government; at the same time, several countries such as Ethiopia, Kenya, Djibouti, and Egypt have also held conferences with that objective. So far nothing has come of all those endeavors. The main reason is that the conferences were trying to set up a government without having closure on the past; in short, Somalis were being asked to make peace among themselves without justice for war crimes. Heinous atrocities had taken place in Somalia and Somalis needed some kind of a healing act to bury the past. In particular, Somalis needed a war crimes tribunal like the one set up for Yugoslavia or Rwanda and even a "Nuremberg." It did not happen. In the absence of peace with justice, another centuries-honored alternative of the Horn, time, a greater healer but a slow one, has been left to take care of wounds. With

enough time, the rancor of war has always disappeared among Somalis, and this time, it seems the process might even be faster due to a new breed of Somalis—businesspeople.

Unfettered by bureaucracy and guided only by the bottom line, Somali businesspeople are cutting across all communal divides; they have set telecommunications, fishing, trading, and transport companies including the largest private airline companies in the Horn of Africa. They have introduced wireless telephone and the Internet to Somalis. Lured by the new prospects, the Somalis in the diaspora have in return started drifting back, often to invest and prosper. Therein lies the Somali hope and perhaps the only thing Somalis need from others the most is to be left to themselves. Over millennia, Somalis have endured and adapted; they will surely overcome their present disorganization.

Notes

1. However, it appears northern Somali ports were only half-way depots for much of the cinnamon that found its way to the Roman world and to Europe; no cinnamon has been known to grow off Somali coasts, unlike frankincense and myrrh, which are indigenous to the region. See Lionel Casson (1989). *The Periplus Maris Erythraie.* Princeton: Princeton University Press.

2. Richard Burton (1987, 1856). *First Footsteps in East Africa.* New York: Dover Publications, 17.

3. Thomas J. Abercrombie, "Arabia's Frankincense Trail," *National Geographic,* 168, no. 4 (October 1985): 474–513.

4. Per Claeson, "Pharmacognostic Studies on Scented Myrrh with Emphasis on the Biological Activities of the Isolated Sesquiterpene T-cadinol." Fildr Degree Dissertation: Uppsala Universitet (Sweden), 1990.

5. Aubrey De Sélincourt (1972). *Herodotus: The Histories.* London: Penguin Books, 114.

6. Samatar and Laitin compare, for example, the "homogeneity" of Somalis with the "plethora of tribes" in other African countries. Said S. Samatar and David Laitin (1987). *Somalia: A Nation in Search of a State.* Boulder, Colo.: Westview Press, 21.

7. I.M. Lewis (1961). *Pastoral Democracy.* London: Oxford University Press, 12.

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9. Some writers spell Sab as Saab, to avoid, it is said, confusion with Sab, a word which refers to low-caste groups among Somalis.

10. The Cushitic languages are a group of languages spoken in the Horn of Africa; as part of the Afroasiatic superfamily of languages, they are related to ancient

Egyptian, Semitic languages (Arabic, Amharic, etc.), Chadic languages (Hausa, etc.), and Berber group of languages.

11. Cerruli, cited by Lewis. See I.M. Lewis (1955), 32.

12. George Peter Murdock (1959). *Africa: Its Peoples and Their Culture History.* New York: McGraw-Hill, 302.

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17. Herbert S. Lewis (1966), 41.

18. I.M. Lewis (1960). "The Somali Conquest of the Horn of Africa." *Journal of African History* 1, no. 2: 213–29.

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20. Casson (1989), 7.

21. Burton (1987), 122.

22. De Sélincourt (1972), 212.

23. A. Hersi (1977). *The Arab Factor in Somali History.* Unpublished dissertation, University of Los Angeles.

24. Ibid., 52.

25. Castagno (1975), 103–4.

26. M.R. Basset, trans. (1897). *Histoire de la conquête de l'Abyssinie (XVI siècle) par Chihab Eddin Ahmad Ben 'Abd El Qader.* Paris: Ernest Leroux.

27. R.W. Whiteway, trans. and ed. (1902). *The Portuguese Expedition to Abyssinia in 1541–1543 as Narrated by Castanhaso with Some Contemporary Letters; the Short Account of Bermudes, and Certain Extracts from Correa.* London: The Hakluyt Society.

28. Hersi (1977), 229.

29. I.M. Lewis (1955), 46.

30. Cited by Hersi (1977), 196.

31. G.S.P. Freeman-Grenville (1962). *The East African Coast: Select Documents from the First to the Earlier Nineteenth Century.* Oxford: Clarendon Press.

32. Samatar and Laitin (1987), 12.

33. Lord Curzon (1907). *Frontiers.* Oxford: Oxford University Press, 41.

34. Dileef Patwardhan (1981). "Imperialism by Proxy: Aden and Somaliland." *Indica* 18, no. 2: 105–120.

35. Samatar and Laitin (1987), 52.

36. H.G.C. Swayne (1895). *Seventeen Trips through Somaliland.* London, Rowland Ward, Ltd.

37. Ibid., 121.

38. Ibid., 226–27.

39. Conversation with a former Somali diplomat, Ismail Mohamed Diriye. Montreal, 1999.

40. Lee V. Cassanelli (1982). *The Shaping of Somali Society: Reconstructing the History of a Pastoral People, 1600–1900.* Philadelphia: Pennsylvania University Press, 202.

41. Touval (1963), 45.

42. Cassanelli (1982), 204.

43. Ibid., 227.

44. Ibid., 202.

45. Conversation with a former Somali diplomat, Ismail Mohamed Diriye, Montreal, 1999.

46. Castagno (1975), 71.

47. Ibid., 147.

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50. Farah Hersi, October 25, 1999. Somaliland Forum (somaliland@yoyo.cc.monash.edu.au). No records of course exist, as written documents in several areas of Somali history do not exist; but according to Farah Hersi that is what Colonel Musse Rabile Goud, a northerner who was present at that midnight meeting, said was exchanged between the two parties. In particular, the colonel was the one who asked the head of the northern delegation, Egal, what the word *hal* meant.

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The State of the Environment in

Somalia

A Desk Study

United Nations Environment Programme

UNEP

December 2005

Graphics by: Global Resource Information Database (GRID) Arendal/Viktor Novikov
Layout by: N. Meith
Cover photo: Jean-Marc Bouju/AFP/Getty Images)

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Country Context

Geographical features

Location

Somalia is Africa's easternmost country, and is bordered by Kenya to the south, Ethiopia to the west, Djibouti to the north-west, the gulf of Aden to the north, and the Indian Ocean to the east. It has a land area of 637,540 km^2, and a coastline of 3,300 km, the longest of any African country, 1,300 km of which is on the Gulf of Aden and the other 2,000 km on the Indian Ocean. The country stretches for almost 1,550 km from north to south between latitudes 12°00'N and 1°37'S, and 1,095 km from west to east between longitudes 41°00' and 51°21'E (see Somalia: General map).

Physical features

Somalia is underlain by rocks dating from pre-Cambrian to recent times. The north is severely affected by faults and fractures. Pre-Cambrian rock and sandy limestone from the Cretaceous and Jurassic periods constitute the main sources of sandy soil that occur widely throughout Somalia (Herlocker et al, 1997). In the north, a maritime plain (the *guban*) parallels the Gulf coast, varying in width from about 12 km in the west to as little as 2 km in the east. The *guban* is scrub-covered and crossed by broad shallow watercourses that flow only in the wet season, when the vegetation is quickly renewed and provides important grazing for nomad livestock.

A young Somalian girl takes care of her family's sheep, Jowhar, North of Mogadishu. © Simon Maina/AFP/Getty Images

Source: UNHCR Somalia Atlas 2005, UNDP Somalia

THE MAP DOES NOT IMPLY THE EXPRESSION OF ANY OPINION ON THE PART OF UNEP CONCERNING THE LEGAL STATUS OF ANY

Somalia is for the most part a flat country, but there is rugged country in the southern and central regions and inland from the *guban* are the precipitous north-facing cliffs of the Karkaar range, which extends from the north-western border with Ethiopia to the tip of the Horn. These are the highest mountains in Somalia, up to 2,000 m high and peaking at 2,407 m with Shimer Berris in Sanaag region (EC/IUCN, 1993). To the south, they descend to an elevated plateau devoid of perennial rivers. This region of broken terrain, shallow valleys and usually dry watercourses is known as the *Ogo*. The eastern part of the *Ogo* gently slopes towards the Indian Ocean and, in Central Somalia, constitutes the Mudug plain. An important feature of this region is the Nugaal valley which has an extensive network of seasonal watercourses. The western part of the same plateau is crossed by numerous valleys and dry watercourses. This plateau again slopes gently southwards and merges with the *Haud*, a broad undulating area that is some of the best grazing land for nomads, despite a lack of rainfall for more than half the year. Enhancing the value of the *Haud* are natural depressions which become temporary lakes and ponds during the rains. South-western Somalia is dominated by the country's two permanent rivers, the Shabeelle and the Jubba, and favourable rainfall and soil conditions make this riverine area a fertile agricultural zone and the centre of the country's largest sedentary population.

The coastline consists of a series of sandy beaches interrupted at intervals by rocky cliffs, some of which protrude into the ocean. With a total area of 35,000-40,000 km^2 (UNEP, 1984), the continental shelf is generally narrow, rarely exceeding 15 km in breadth, but drops off sharply into deep water. Only between Ras Asir and Ras Hafun on the north-east coast does the shelf extend to almost 80 km in some places.

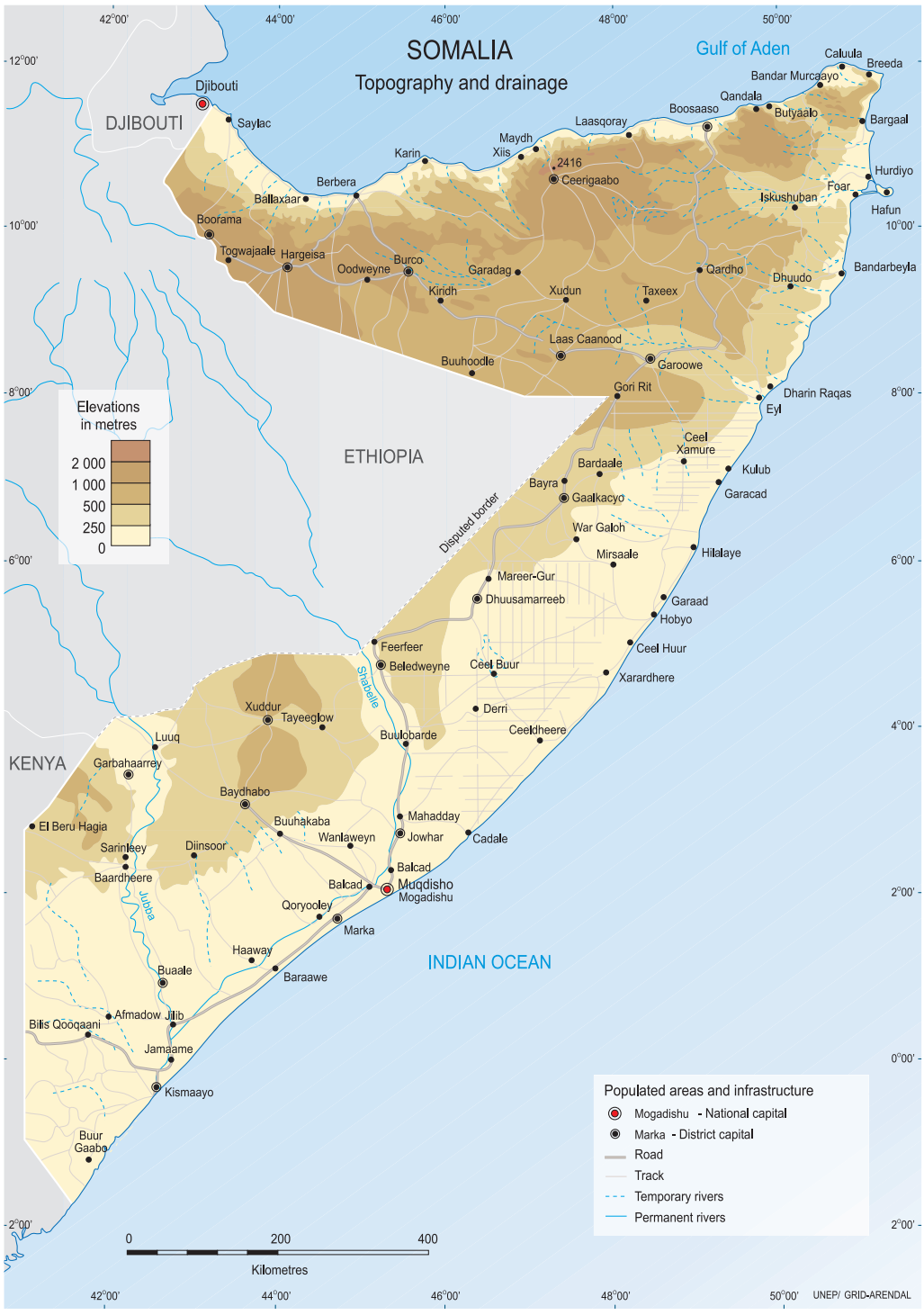
Climate

The climate varies among locations between tropical and sub-tropical, and between arid and semi-arid. Temperatures inland average 28°C, but may be as low as 0°C in the mountain areas and as high as 47°C along the coast. The average annual rainfall is about 280 mm, although this can reach 500 mm in some areas, such as the western *Ogo* highlands (Hughes and Hughes, 1992), and precipitation in generally both negligible and erratic, with seasonal totals being highly variable. Droughts occur every 2-3 years and are often followed by devastating floods, particularly in the south where the Shabeelle and Jubba are vulnerable to heavy rains in the Ethiopian highlands. Between 1961 and 2004, 18 floods were recorded in Somalia, killing 2,671 people and directly affecting the lives of almost 1.8 million. In the same period, there were 12 droughts that killed 19,671 people and affected almost four million (Columbia University, 2005).

Erratic and unreliable as they are, there are seasonal patterns of rainfall that are strongly influenced by the Inter-Tropical Convergence Zone (ITCZ), the north-south movement of which results in two dry seasons and two wet seasons each year. The *Jilaal*, from January to March, is the harshest dry season and results from dry north-easterly winds sweeping down from the Arabian Peninsula. This is followed by the *Gu* rainy season from April to June, then the *Hagaa* dry season from July to September, during which sea breezes from the Indian Ocean help cool at least the southern parts of the country. The cycle is completed by the *Deyr*, a short and unreliable wet season in October and November. The coastal region in the south around Mogadishu and Kismayo has an additional rainy season, the *Xagaaye*, in July and August, during which there may be isolated showers. Livestock husbandry and farming are adapted to this climatic regime, with herds being concentrated around water sources in the *Jilaal*, but driven to pastures deep in the interior during the *Gu*, when rain-fed agriculture also becomes briefly possible (see map Somalia: Topography and drainage).

Cultural features

The Cushitic peoples of the Somali coast in the Horn of Africa have an ancient history. Archaeological evidence indicates their presence in this region by 100 A.D, and possibly earlier. By the 7th century A.D., they began to mingle with Arab and Persian traders who had settled along the coast. Interactions of this nature over the following centuries led to the emergence of a Somali people bound by common traditions, a single language, the Islamic faith, and a clan-based social and political system.



Source: UNHCR Somalia Atlas 2005

THE MAP DOES NOT IMPLY THE EXPRESSION OFANY OPINION ON THE PART OF UNEP CONCERNING THE LEGAL STATUS OF ANY

Somali elders at a ceremony. Credit: G. Farmer

A strict, and respected, lineage underpins Somali society with divisions defined along clan and sub-clan lines (UNDP, 2001; see Box 1). Within each clan, there are many sub-clans and sub-subclans. There are six major clan-families. Four of these are predominantly pastoral – the Dir, Daarood, Isaaq and Hawiye – together representing about 70 per cent of the population, while the remaining two (the Digil and Rahanwayn) are agricultural and comprise about 20 per cent of the population. Other Somalis include castes such as the Tumal, Yibr, Yahar, Midgan and Eyle. The non-ethnic Somali population includes the urban and coastal people, the Reer Hamar/Banadir and Barwanese people of mixed Arab, Persian, Pakistani, Portuguese and Somali heritage, the Bantu riverine agriculturalists, Swahili-speaking Bajuni fishing communities, and Arabs of Yemen, Oman and Zanzibar descent.

Today, about 60 per cent of all Somalis are nomadic or semi-nomadic pastoralists who raise cattle, camels, sheep and goats. Less than one-quarter of the population are settled farmers, most of who live in the fertile agricultural zone sandwiched between the country's two main rivers in the south. The remainder of the population is urban based, the main centres being Mogadishu, Hargeisa, Burco, Berbera, Bosasso, Garowe, Galkaiyo, Kismayo and Baidoa (see Boxes 1 and 2, and map Somalia: Traditional deegan (ecological) classification).

Political history

Colonialism in the eastern Horn of Africa did not penetrate Somalia as deeply as it did other parts of Africa but did have the effect of imposing an alien political structure, the central state, on a society with a highly decentralized, stateless political tradition (UNDP, 1998). The Somali Republic (1960-1991) gained its independence on 1 July 1960 through a merger of the Somaliland Protectorate, which had been under British rule from

Box 1. The Somali clan-based social system

Lineage identity or clannism is a central organising force in Somali society and is more significant in contemporary stateless Somalia than in previous decades. In the period of state collapse, clannism has proved to be both divisive and a destructive tool in the hands of political leaders as well as a vital source of group protection, social security and customary law in the absence of the state. Clan identity in Somalia is very fluid. Each Somali can trace their genealogy over 30 generations, giving Somalis membership in many sub-clans. Which level in one's lineage is mobilized as one's 'clan' depends entirely on the issue at hand.

Clannism exists with a range of other cross-cutting affiliations – professional associations as well as regional, class, factional, gender and religious movements (including the Islamist *Al-Ittihad* organization), some of which are described below.

The ***council of clan elders***, for example, is the dominant institution in most locales expected to provide wisdom and build consensus among clan ranks in matters of clan interest especially in times of crisis. In Somali society all married men can claim to be elders and speak in clan assemblies (*shir*) earning Somalia a reputation as a 'pastoral democracy'. Elders' councils are not institutionalized and often they react more than they act

The main ***religion*** is Islam with almost the entire population being Sunni Muslims. Islamic values provide hope and solidarity to cope with the harsh conditions prevalent in the country. They have also been used to build trusted institutions, both commercial and juridical. The most visible sign of the latter are the Islamic courts based on *shari'a* law. They are widely appreciated by local communities and dispense justice in zones where customary law fails to maintain law and order. Radical Islam, organized as *Al-Ittihad* in Somalia, is a growing trend, with a presence throughout the country. However, even within the *Al-Ittihad* movement, there are numerous splits along clan lines.

Networks of functional ***professional associations*** (made up of non-governmental organizations (NGOs), professionals in education, health and other fields) serve as bridges across clan and factional conflicts promoting human development, reconciliation and good governance. On several occasions women's groups have successfully managed to place pressure on militia to release kidnapping victims or cease fighting. But they have also been at the forefront of mobilization of clannism for armed conflict.

Source: UNDP, 1998

February 1884 until 26 June 1960, and Italian Somaliland where the colonial administration relinquished control on 1 July 1960. The northern area previously known as Italian Somaliland was therefore independent as "Somaliland" for five days before being integrated within the Somali Republic. This fact later served as the principal legal justification for the right to secede that was claimed by "Somaliland" in May 1991.

Territorial skirmishes with Kenya, Djibouti and Ethiopia occurred during the 1970s in particular, but these were eclipsed in intensity by fighting amongst the various groups within Somalia which began in the late 1980s. President Mohamed Siyad Barre came to power in 1969 and ruled Somalia until January 1991, when clan-based warlords overthrew the government before turning on each other. Since that time, much of the country has been under the control of various warlords and armed gangs, with many areas both urban and rural experiencing fierce fighting (EU/IUCN, 1993). The situation in the capital and largest city, Mogadishu, remains chaotic. It has been heavily bombarded and thousands of civilians were killed in an outbreak of violence in November 1991. With the destruction of the country's infrastructure millions of people have faced famine. Annex 1 provides a summary chronology of major events in Somalia from 1869 to 20005.

A two-year reconciliation process resulted in October 2004 in the formation of a transitional parliament known as the Transitional Federal Assembly. A Transitional President, Mr Abdullah Yusuf Ahmed, was elected by the Assembly and a Transitional Federal Government (TFG) was formed shortly thereafter. In December 2004, Mr Ali Mohamed Gedi was approved by the Transitional Federal Assembly as Prime Minister. Continuing insecurity prevented the full scale establishment of government in Somalia itself, and until June 2005 all Somali officials

Box 2. The Somali Traditional ecological classification system, *deegaan*

The Somali people, especially the nomads, who live in close contact with the environment have an extended knowledge of plant-animal-fundamentals (Barkhadle, 1993). Most plants and animals have a local name and their phenology, distribution and ecological zones are known: the use of virtually every plant within the grazing zone – the *deegaan*, which might range from 200 km^2 to 2,000 km^2 – is known. Under the traditional system of ecological classification, 16 categories are recognized, as follows (Barkhadle, 1993):

Guban – "burnt area" in Somalia language – land (*Dhulka Guban*)

Buraha – mountain – land (*Dhulka Buuraleyo*)

Howd – bush or thicket – land (*Dhulka Howd*)

Daror – large plain – land (*Dhulka Dharoor*)

Sol – a highland area – land (*Dhulka Sool)*

Nugal – a specific valley – land (*Dhulka Nugaal*)

Mudug – much of central Somalia – land (*Dhulka Mudug*)

Iid – named after the yicib plant – land (*Dhulka Ciid*)

Deh – without high shrubs or trees – land (*Dhulka Deexda*)

Doboy – clay – land (*Dhulka Dhobooy*)

Bakol – an area where *Commiphora* trees dominate – land (*Dhulka Bakool*)

Gedo – land only suitable for animal (especially camel) grazing) – land (*Dhulka Gedo*)

Bay – the area which receives the highest rainfall – land (*Dhulka Baay*)

Adable –flat area with small mountains – land (*Dhulka Adableh*)

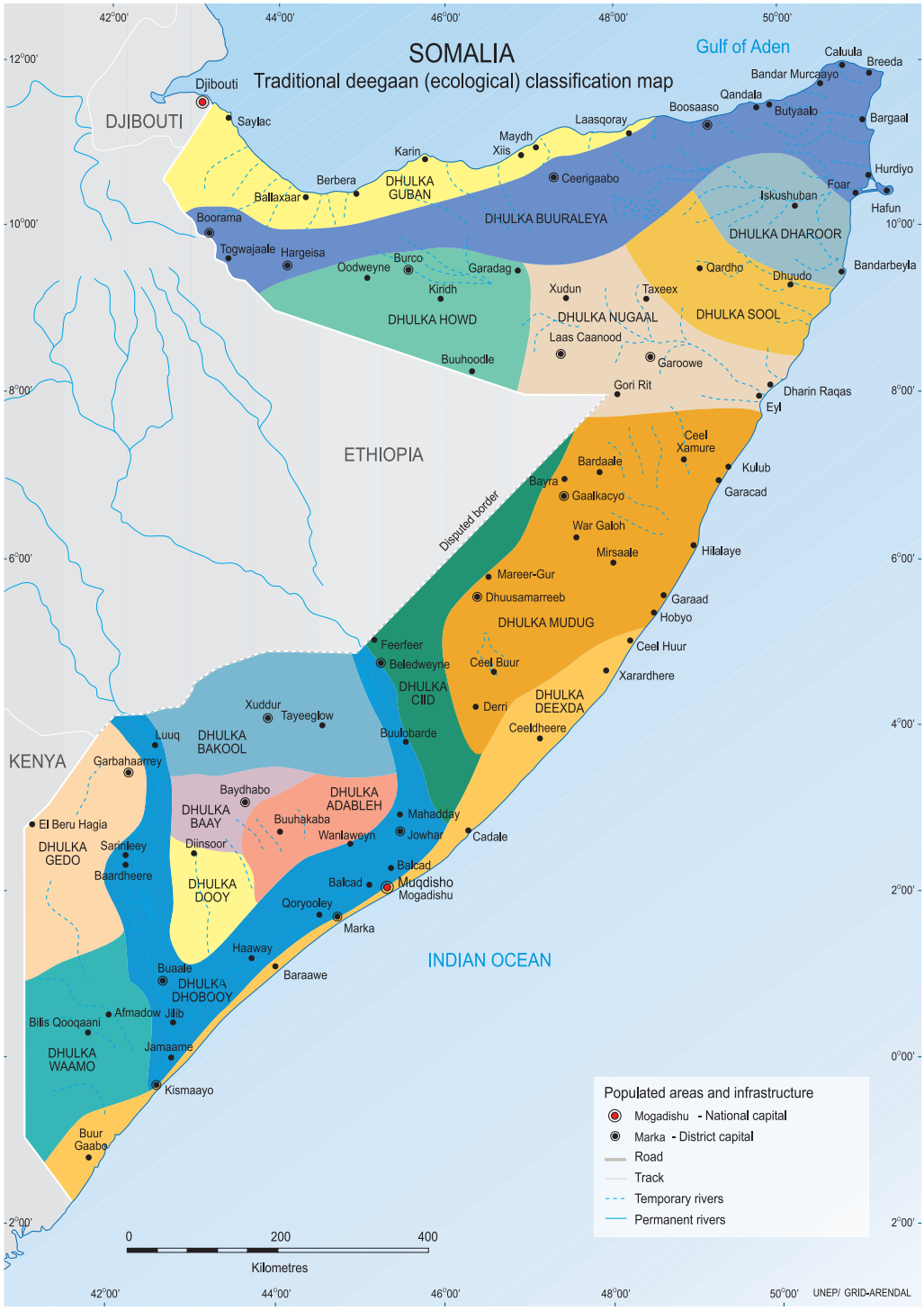
Doy – between the two banks of the Jubba and Shabeelle rivers – land (*Dhulka Dooy*)

Wamo – land lying between Badhaadhe and Kismayo and from Kismayo to the Kenyan border – land (*Dhulka Waamo*)

based in Nairobi, Kenya. The full cabinet returned to Somalia in June 2005 to begin the difficult process of national reconciliation and reconstruction.

Three teams were established, of which the first comprised 30 members of government led by the Prime Minister and left for Mogadishu in February 2005. Smaller groups from this team were then deployed to other regions in the south and central Somalia with the intention of establishing the TFG's presence there and to start dialogue with the people. A second group of ministers was tasked with the physical relocation of the members of parliament and the delegates who participated in the peace process, while a third team, which remained in Nairobi, assessed the challenges and obstacles to the relocation process and prepared the agenda, strategies and an action plan for the installation of the government inside Somalia. For administrative purposes, Somalia is divided into the 18 regions or *gobollada* (singular *gobolka*) of Awdal, Bakool, Banaadir, Bari, Bay, Galguduud, Gedo, Hiran, Jubbada Dhexe, Jubbada Hoose, Mudug, Nugaal, Sanaag, Shabeellaha Dhexe, Shabeellaha Hoose, Sool, Togdheer, and Woqooyi Galbeed.

Despite the existence of a new government, a proliferation of competing administrations, factions and militias remain, all of which strive to assert their own authority (UNHCR, 2005a). Hence there is the self-declared state calling itself "Somaliland" in the north-west, the self-declared autonomous region calling itself "Puntland" in the north-east, and the continuing warlordism in "Jubbaland" in and around Mogadishu in the south. Neither "Somaliland" nor "Puntland" has been recognized by the international community, but it is only in these two



Source: Barkhadle A.M.I 1993

Not drawn to scale

THE MAP DOES NOT IMPLY THE EXPRESSION OF ANY OPINION ON THE PART OF UNEP CONCERNING THE LEGAL STATUS OF ANY

areas that fighting has been more or less brought under control, and where there is any indication that the economy and peoples' livelihoods have started to pick up.

Population and economy

The last official census of Somalia was in 1975, when 3.2 million people were counted, and this number was estimated to have grown to 9.5 million by 2002 (UN, 2002). With an average population density of about 15 people per square kilometre, this is a sparsely populated country in which 75 per cent of the people have lived historically in rural areas. Population growth was estimated at 4.1 per cent per year for 1975-1980 and 3.1 per cent per year for 1995-2000, while some urban centres such as Mogadishu showed growth at a rate of 10 per cent a year (UN, 1998). As a result of this urbanization process, it is possible that a majority of Somalis now live in towns, albeit often in squalid and dangerous conditions. There is also a substantial diaspora of Somalis living abroad, and their remittance payments are an important source of funds for many Somalis inside the country.

The collapse of the government in 1991 led to one of the fastest and largest population displacements ever recorded on the African continent. At the peak of this crisis, more than 800,000 Somalis were thought to have fled to neighbouring countries (UNHCR, 2003). The number of refugees has since declined and continues to do so, as more and more people are undergoing voluntary repatriation, particularly to "Somaliland" and "Puntland". Sizeable numbers of Somali refugees, however, remain in several neighbouring countries: at the end of 2004, the UN High Commissioner for Refugees noted that there were almost 390,000 Somali refugees (UNHCR, 2005b), many still in exile in Kenya, Yemen, Ethiopia and Djibouti, with a sizeable number also living further a field.

The enduring conflict also resulted in an estimated 370,000 internally displaced people, who remain a serious humanitarian concern (UNHCR, 2005a). Inadequate protection and meagre levels of humanitarian assistance place a severe strain on the coping mechanisms of these people, the hosting communities and local authorities. Somalia also has a large number of destitute people, including nomads who lost their livestock as a result of drought and who now live in camps, relying on food aid. Widespread famine in 1992-1993, caused by war and drought, resulted in one of the largest UN humanitarian and peacekeeping operation in history.

As the economy has virtually collapsed, many people have turned to natural resource exploitation as a means of survival. Somalia has a higher proportion of pastoralists than any other country in Africa, and nomadic pastoralism is the traditional basis for the rural economy. An almost overwhelming dependence on livestock can have its risks, however, as has become obvious during times of drought or when export markets are closed and large herds of livestock can also cause serious environmental damage. Agriculture remains the most important economic sector (see Table 1 for numbers of people involved), with livestock accounting for about 40 per cent of gross domestic product and about 65 per cent of export earnings. Nomads and semi-nomads, who are dependent upon livestock for their livelihood, make up a large portion of the population (see Table 1).

Table 1. Number of people involved in main economic activities in Somalia

Economic Activity	1987	1997 (estimate)
Agriculture	2,085,000	2,486,000
Industry	277,000	430,000
Services	534,000	847,000

Source: UN, 1998

Box 3. Vulnerability of the economy to environmental change

Somalia has always been vulnerable to frequent external and internal shocks, including changes in foreign markets and recurrent droughts. The two most important merchandise exports, livestock and bananas – are dependent on single markets – Saudi Arabia and Italy. Similarly, one internal shock that often disrupts economic activities is recurrent drought. Recurrent droughts in Somalia are symptoms of complex trends and inter-linkages that are related to population growth, dwindling capacity of a fragile ecological system, environmental degradation, weather cycles and the absence of agricultural and non-agricultural rural development. Droughts may still be far more consequential to society and development aspirations that external shocks.

Source: UNDOS, 1999

Somalia's small industrial sector, based on the processing of agricultural products, has been extensively damaged, with much of its equipment being sold as scrap metal. Livestock, hides, charcoal, and bananas are Somalia's principal exports, while sugar, sorghum, corn, fish, *qaat* (*Catha edulis*, Celastraceae, a plant with mild narcotic properties grown in the highlands of Ethiopia and Kenya), and machined goods are the chief imports. Reliable economic data, however, are scarce (see Box 3).

The overwhelming dependence on livestock became a national crisis in 2000 when Saudi Arabia placed a sudden and complete ban on all livestock imports from Somalia over concern for Rift Valley Fever, a mosquito-borne disease which can infect and kill livestock and humans. According to a joint report from the Food Security Assessment Unit and the USAID Famine Early Warning System, the ban caused substantial loss of income at the macro and household levels which in turn limited the purchase of many goods, including medicines, and accelerated the depletion of assets for many households in Somalia (UN OCHA, 2001).

Despite the conflict in many areas, Somalia's service sector has somehow managed to survive and grow. Telecommunication firms provide wireless services in most major cities and offer the lowest international call rates on the continent. In the absence of a formal banking sector, money exchange services have sprouted throughout the country, handling between US$500 million and US$1 billion in remittances annually (CIA, 2005). Mogadishu's main market offers a variety of goods from food to the latest electronic gadgets.

Role of natural resources

Somalia's natural resources fall into three broad categories: marine resources such as fish and salt; surface resources which include forests and forest products such as the aromatic extracts of frankincense (from *Boswellia* spp.) and myrrh (from *Commiphora* spp., both Burseraceae), as well as surface water; and subsurface resources such as rocks and minerals, fossil fuels, and groundwater. Many of them have been directly or indirectly impacted by the extended civil conflict, but competition for access to some resources has also been, and continues to be, a source of conflict in itself.

In the absence of a government, many traditional forms of natural resource management and control systems have been abandoned or are now ignored. In several instances, this has resulted in clearly unsustainable exploitation, a trend which may prove difficult to reverse. For example, parts of the north-west, and the Kismayo area, are showing signs of environmental degradation as a result of overgrazing and the uncontrolled harvesting of trees for charcoal making (UNDP, 1998).

Despite the country's long coasts, Somalis are not traditionally a fishing or fish-eating people, although some small coastal communities have in the past been engaged in subsistence fishing. Somalia has one of the world's lowest fish consumption rates in the world (Van der Elst, 1997), with just 2 per cent of protein intake coming from fish (WRI, 2003). Fishing was however strongly promoted by the government during the 1970s,

partly in response to the drought of 1973-1975, when the Coastal Development Project resettled 14,000 nomadic people from inland regions to the coast (Nur, 1998). In 1984, it was estimated that a million people lived on the Somali coast, of whom almost 10 per cent were directly or indirectly involved in artisanal fishing (Bihi, 1984). Training and equipment were provided, and numerous fisheries co-operatives established, but the fate of this initiative is now largely unknown.

Although recent data are sparse, one source reports that Somalia exported almost US$2.5 million-worth of fish and fish products in 2000, a 464 per cent increase from 20 years earlier (WRI, 2003). Near-shore fisheries now target just a few key species, lobster and shark in particular, with much of the catch being exported. Recent observations (FAO, 2005a) suggest that better arrangements for control and processing are urgently needed since stocks of target species are being over-fished, and there is much wastage in both catching and processing. In the fisheries sector, the absence of effective policy, access arrangements, management procedures and biological reference points for monitoring has resulted in serious overexploitation of certain species (Van der Elst, 1998), and this is likely to be continuing to date.

Hundreds of fishing vessels from a variety of nations ply the waters off Somalia, most operating without any licensing agreement. Some of these vessels have even attacked local Somali fishermen and destroyed their boats and equipment (UN, 2005). Illegal fishing by foreign interests represents a loss of much-needed revenue for the new Transitional Federal Government (TFG) and the regional authorities of "Puntland" and "Somaliland" (UN, 2005).

There has been a rapid expansion in the production of charcoal in recent years, with much of it being exported to meet demand in Saudi Arabia, Yemen and the United Arab Emirates, where local forests are more strictly protected. Charcoal may today represent one of Somalia's most valuable exports: a bag of charcoal in Somalia might fetch US$3-4, but the same bag could be sold for US$10 in the Gulf States (EDC News, 2001). This same trade, however, has also caused open conflict between clans in Somalia, involving shoot-outs and mine laying, as well as environmental damage.

The transient rights to use resources that are so critical to nomadic pastoralism were ignored when the national land tenure regime – which favoured crop cultivation – was being developed (Unruh, 1995). Among the direct results of this action has been land degradation, resource use conflicts, a decline in pastoral production and impacts on Somali clan alliances, which in many cases serve to regulate rational natural resource access and use.

The lack of any effective government has meant that many people, both local and foreign, have engaged in many kinds of illegal and damaging activities. Despite a number of international investigations, rumours have persisted for many years concerning hazardous pollutants being dumped in Somali waters and on beaches by foreign vessels. The rampant trade in charcoal as well as unregulated off-shore fisheries are also widely reported as having a damaging impact on the country's natural assets, which can be expected to limit and restrict options for national recovery and sustainable development.

Legal and institutional framework for environmental management

Until the establishment of the Ministry of Environment and Disaster Management in 2005, Somalia lacked any central body responsible for these matters. Instead, a National Environmental Committee, with representatives from 13 Ministries/Agencies, served as the co-ordination body for environmental governance (Gudel and Mwanza, 1979). Most environmental issues, however, were referred to two organizations within the Ministry of Livestock, Forestry and Range, these being the National Range Agency and the Central Rangelands Development Project.

A key concern relating to sound environmental management relates to the adoption and effective enforcement of a suite of international, regional and national agreements which define the country's own responsibilities

Somalia's Environment Minister Mohamed Osman Maye at a press conference in Nairobi. © Tony Karumba/AFP/Getty Images

as well as those of the international community. The regulatory framework for most of Somalia is poorly developed, although the country has signed a number of important international conventions (UNEP, 1996) relating to natural resource use and management, including:

- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES);
- Convention on the Conservation of Migratory Species of Wild Animals;
- Regional Convention for the Conservation of the Red Sea and the Gulf of Aden Environment;
- Protocol concerning Regional Co-operation in Combating Pollution by Oil and other Harmful Substance in Cases of Emergency;
- UN Convention on the Law of the Sea;
- Protocol concerning Protected Areas and Wild Fauna and Flora in the Eastern Africa region;
- Protocol concerning Co-operation on Combating Marine Pollution in cases of Emergency in the Eastern African region; and
- Convention for the protection, Management and Development of the Marine and Coastal Environment of the Eastern Africa Region (Nairobi Convention).

At the same time, however, Somalia has also signed a number of other major international and regional agreements but has so far failed to ratify these:

- Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water;
- Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space including the Moon and other Celestial Bodies;
- African Convention on the Conservation of Nature and Natural Resources;
- Bamako Convention on the Ban of the Import into Africa and the Control of Transboundary Movement and Management of Hazardous Wastes within Africa; and
- Treaty Establishing the African Economic Community.

While there is a clear need for a thorough revision of the country's national legislation on management of natural resources, this will require considerable effort and co-operation from all interested parties. A number of gaps in the legal system also need to be addressed, for example the lack of any reference to a national water act or adhesion to the Contracting Parties to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972 (the London Convention), the latter being especially relevant to the alleged dumping of toxic and hazardous materials in Somalia during 2004 and 2005.

Other opportunities to benefit natural resource management could be based on improved regional co-operation and co-ordination. The establishment of an Indian Ocean Sanctuary for the conservation of whales, for example, and the Protocol Concerning Protected Areas and Wild Flora and Fauna in the Eastern African Region, both provide a framework for collaboration in the development of marine protected areas and species conservation programmes. Other possible legal instruments which could serve a similar purpose (but to which Somalia may not currently be a Party) include:

- the Convention on Biological Diversity;
- the Ramsar Convention;
- FAO Code of Conduct (which relates to the sustainable management of fisheries resources);
- UN Agreement on Straddling Fish Stocks and Highly Migratory Fish Stocks;
- the Indian Ocean Tuna Commission; and
- the Marine Turtle Conservation Strategy and Action Plan for the Western Indian Ocean.

The role of non-governmental organizations

The establishment of a new government and the growth of stability in "Somaliland" and "Puntland" are not the only signs of hope in the current situation in Somalia. Boxes 4 and 5 summarize certain non-governmental initiatives exist which are proving effective in environmental resource management.

Future prospects

Somalia currently has an historic opportunity to choose a new and better path. A transitional government is becoming established and is seeking popular recognition throughout Somalia, despite the country's fragmentation with two breakaway regions and a third still plagued by conflict.

Peace and stability are absolute prerequisites for any future rebuilding and development of Somalia, and continued access to natural resources is essential to the livelihoods of the vast majority of its people. Urgent

Box 4. Local institutions take the lead in environmental management

With funding from Novib (Oxfam-Netherlands), the Resource Management Somali Network (RMSN) was founded in 1996. Its mission relates to avoiding land degradation and desertification, protecting and ensuring more sustainable use of forests, effective management and protection of biodiversity, efficient water management, and dealing with pollution problems and population pressure on natural resources. Among the actions undertaken by its members have been to:

- challenge the charcoal making industry, which included mounting a campaign aimed at raising awareness of the degradation, its causes and why it needs to be controlled;
- checking the illegal trade of wildlife;
- denouncing the ruthless exploitation of marine resources by international trawlers;
- promoting the conservation of threatened marine species and promoting sustainable use of fisheries; and
- establishing linkages with external actors.

Members of the RMSN include:

- RMSN Lower Shabeelle region
- RMSN Middle Shabeelle region
- Gedo Resource Management Organisation
- RMSN Mudug region
- Environment Education Team
- Sool Resources Management Organisation
- ASAL – ex Bari Team
- RMSN Western Sanaag region
- RMSN Golis Area
- RMSN Candlelight (Somaliland)
- RMCO (Costal areas)
- Horn Relief (Sool and Sanag)
- RMSN Buran Team
- HARDO (Hiran region)

Source: Novib, Presented at a Round Table Discussion on the Environment Situation in Somalia, UNEP Headquaters, Nairobi (June, 2005)

actions need to be taken on a number of fronts, however, including legislation, regulation, co-ordination, empowerment and wise management of natural resources. Many of the environmental issues, concerns and urgent needs highlighted in this study can be addressed through land-use planning and management, taking account of issues such as legislation and rights, forestry, water management, livelihood security and biological diversity. These are a minimum of necessary actions to be taken before more specific and focused responses can be developed and properly institutionalized.

Somalia's natural assets – its grazing and agricultural lands as well as its rich marine fisheries – are a platform on which the peoples' livelihoods might be rebuilt. Taking control of these assets and managing them productively, sustainably and equitably will, however, remain a considerable challenge for the decision-makers and population of the country. Somalia will not be able to reverse the current situation overnight. One complicating issue is the fact that a number of other countries already have vested interests in exploiting Somalia's resources, including fisheries, charcoal and livestock. Finding a solution to the current levels of over-exploitation will therefore not only depend on reaching acceptable solutions between stakeholders within the country, but also hinges on the co-operation and assistance from neighbouring states.

Box 5. Simple methods prove effective

Simple, but appropriate, methods are often the most effective means of conserving and managing natural resources – something which local non-governmental organizations or community structures are well suited to carry out, as demonstrated in the two examples highlighted below.

Simple rock dam at Awsane built in March 2005 (left) before the rains and two months later after rain (right)

Founded in 1991, Horn Relief, a Somali NGO was established to help build the capacity of up-coming grassroots groups in Somalia. It works in four main areas to form a holistic approach to community development: natural resource management, human health, animal health, and leadership development. Among its environment-related activities are:

- water conservation through the construction of water barriers such as rock walls or rock dams to slow the water flow;
- water retention through blocking water from entering the sinkholes through soil bunds;
- improving the fertility of the surrounding areas to ready them for planting trees, shrubs and grasses; and
- improving selected rangelands by diverting water from roads onto them.

Founded in 1998, the Regional Marine Conservation Organisation (RMCO) works with local communities and encourages natural resource management practices that help conserve land and marine resources. Among its activities are the following:

- public environmental awareness raising and advocacy through training, meetings and media events;
- establishment of an environmental database, keeping record of environmental hazardous wastes incidents;
- providing support to communities in resolving resource-based conflicts;
- monitoring and documenting environmental change; and
- mangrove forest conservation.

Mangrove recovery following awareness raising programmes

Source: Novib, Presented at a Round Table Discussion on the Environment Situation in Somalia, UNEP Headquaters, Nairobi (June, 2005)

HUMAN AND URBAN ENVIRONMENT

Introduction

Land ownership and land disputes are central to much of the conflict in contemporary Somalia. During the rule of the last regime (1969-1991), government tended to increase its control over land previously owned collectively by rural communities. This was accomplished through shifting land-ownership from communal to state levels through the pursuit of revenues. Sections of the 1973 Unified Civil Code abolished traditional clan and lineage rights of use and access over land and water resources (Hooglund, 1993). The 1975 Land Law nationalized all land in Somalia. This required mandatory land registration which traditional landholders resisted or were unable to fulfil, for example, by not having enough money to travel to Mogadishu to register their claims and pay the required fees (official and non-official). This has progressively limited local rights rather than encourage or support them.

As the state authorities lacked capacity to manage and control the nationalized land, however, it effectively became "no-man's land", with open access to its use or misuse. The effect of this law is therefore highly relevant to the ongoing scene of land and natural resource degradation. An epidemic of land grabbing began in the 1980s with well placed civilians, civil servants and government officials registering large tracts of land in their names, even though such land might have been under the management of local communities for generations (UNDP, 1998). Many of Somalia's smallholders were quickly transformed from subsistence farmers to landless or semi-landless sharecroppers and rural wage earners.

This situation persists today, made even worse in some situations by militia groups demanding substantial parts of any crop or potential income, often not even in return for protection from other militia groups. New arrivals have also staked claim to abandoned state farms, while clans which might be more powerful than others have also taken advantage of the chaos to extend the boundaries of their own grazing lands.

Land disputes in urban areas are also a major problem. Houses abandoned by people who fled the turmoil have been occupied by squatters who will only relinquish them when paid a fee for "guarding and improving" the property (UNDP, 1998). The same applies to many institutional buildings such as schools and government offices.

Human Settlements

Prior to the 1980s, some 75 per cent of the population were thought to live in rural areas. Now, however, it is estimated that no fewer that 60 per cent of the people live in urban areas, many of them without adequate shelter (Qasim Hersi Farah, 2005). Information is sadly lacking on living conditions – education, health and sanitation, for example – in almost all urban centres, but the same report states that 85 per cent of the population live in slums or partially destroyed homes.

This shift is largely due to internal displacements on account of the civil war, but the result has been that parts of many cities and towns have become seriously overcrowded, while other areas remain unpopulated. In the absence of regulations and controls, building takes place without proper planning and consideration for any essential services, including sanitation and waste disposal. In response to the growing needs identified, the Somali Urban Development Programme, an initiative supported by the European Commission and UN-HABITAT, was launched on 5 January 2005, targeting all major cities and towns through the implementation of projects and capacity building activities in the urban development sector.

According to the UN Population Fund (UNFPA, 2004), only 24 per cent of the houses in Somalia can be considered permanent. The majority of all other buildings are constructed from wooden sticks with a mud infill. These suffer widely from termite attacks, requiring people to rebuild on a regular basis, an activity which has direct implications for the country's wood resources.

Traditional and modern building in one compound in Hargeisa. Credit: UNDP Somalia

Settled by Arab colonists around 900 A.D., Mogadishu had become an important trade centre for the east coast of Africa by the 12th century. During the 16th century, Mogadishu was controlled by Portugal. In 1871, the city was occupied by the sultan of Zanzibar, who leased it to the Italians in 1892. In 1905, Italy purchased the city and made it the capital of its colony of Italian Somaliland. By 1914 Mogadishu's population was estimated to be approximately 12,000 people. The city was captured and occupied during World War II by British forces operating from Kenya.

Rebel forces entered the city in 1990 during Somalia's long civil war. Intense battling between clan-based rebel factions damaged many parts of Mogadishu in 1991 and 1992, and the city was again the scene of fighting after the international peace-keeping forces of UNOSOM II, which had arrived in 1992, left in 1995. Today the city lacks any form of central government and control remains in the hands of competing militias. Key services such as the airport and port facilities likewise remain under the control of vying factions. Mogadishu's population is currently estimated to comprise around 2,450,000 people (http://www.shimbir.demon.co.uk/; http://en.wikipedia.org/wiki/Mogadishu)

Kismayo, also located on the Indian Ocean coast in south-western Somalia, is the principal town and port of the Jubbada Hoose region. It was founded in 1872 by the sultan of Zanzibar, passed to Great Britain in 1887, and was held until 1924, when it was transferred to Italian control. Kismayo is today the main port for charcoal exports to the Gulf States.

Hargeisa, in north-western Somalia, is an important commercial centre and watering place for nomadic stock herders. The town is a transportation hub and has an international airport. It was taken in 1870 by Egyptian forces, then under Ottoman Turkish control, who withdrew in 1884 to fight the rebellion in the Sudan led by

Muhammad Ahmad or the Mahdi, whose forces captured Khartoum in 1885. The British later took control of Hargeisa and, in 1941, made it the capital of British Somaliland. The city is the capital of the faction which declared northern Somalia independent as "Somaliland".


A make-shift kitchen of a nomadic family. Credit: FAO/D. Signa

Although predominantly a rurally-based population and culture, there are strong patterns of rural-urban migration in Somalia (Gundel, 2002). For a time during the war, this process was reversed as people fled the main towns and moved to areas where their clans originated. Consequently the population of previously small regional towns such as Belet Weyne, Galkaiyo, Baidoa, and Bossassoo rose dramatically as people fled fighting in Mogadishu, the Lower Jubba and the inter-riverine areas.

Rapid urban migration has since become a particular issue in Hargeisa where the majority of returning Somali refugees from Ethiopia have chosen to settle. The concentration of businesses and aid programmes in the administrative capitals has also served to attract people from rural areas (Gundel, 2002). The same applies to Somalis returning from the diaspora – mainly an urban community primarily formed on a family and clan basis – as well as economic migrants from Bay and Bakool regions. The relative stability afforded by areas such as "Puntland" has encouraged a large influx of people who migrated from the southern areas affected by the civil unrest. This has contributed to reduce the availability of water in this dry region, where the inhospitable climate makes water a vital resource (EU, Undated).

Water and Sanitation

Water resources vary by location. In much of the north and north-east, sub-surface water is generally saline and often the only permanent source of water can be found in deep boreholes. In the south, however, water is obtained from rivers as well as shallow wells. In the tsunami-impacted part of the country, many wells in coastal areas have been clogged, or buried by sand washed in by the waves, resulting in brackish and polluted water (UNEP, 2005). Seawater may have also invaded the porous rocks contaminating the underground water with salt.

The Human Development Report for Somalia (UNDP, 2001) estimates that Somalia's annual renewable freshwater fell from 2,500 m^3 per person per year in 1950, to 980 m3 in 1990, with a prediction of 363 m^3 by 2025. It is generally accepted that when this value falls below 1,000 m^3 per year, water scarcity begins to hamper health, economic development, and human well-being; below 500 m^3 per year it becomes life threatening.


Somali women collecting water from a deep well. Credit: UNDP Somalia

Recent data on access to water are not available for much of the country, but it is thought that fewer than 5 per cent of the total population may have secure access to water throughout the year (UNDP, 1998). An estimated 31 per cent of the population has access to safe drinking water in the north-west, while comparable figures for the north-east

and southern part of the country are 19 per cent and 20 per cent respectively. In Mogadishu, the figure is not more than 35 per cent in the urban area and 10 per cent in rural Benadir (UNDP, 1998).

In many parts of Somalia, such as the Galgudud region and the middle regions, the nearest water source may be 70 km or further from settlement areas. Elsewhere, the water table may be very deep and not easily accessible; one may have to drill to a depth of 170-240 m before reaching water (Mardi, 2000). Accessing safe and reliable water sources is therefore a major concern in most areas, for people as well as for livestock and agriculture. During the late dry season many wells become more saline and foul, and hence cause diarrhoea and other water-related diseases.

The level of sanitation services was limited before the civil war and the coverage has certainly not increased since the early 1990s. At present, only 48 per cent of the overall population has access to improved sanitation, whereas only 20 per cent of the rural and nomadic population has access to the same service (EU, Undated).

Waste Management

With little industry, a weak economy and marginal consumerism, Somalia does not have the problem of excessive waste collection, treatment and disposal that some other countries in the region face. Some industrial sources, however, have the potential to pollute the marine environment in particular, such as the oil refinery south of Mogadishu, slaughter houses at major ports, and tanning factories at Brava and Kismayo (UNCTAD, 1998). Other forms of pollution include sewage discharge and industrial waste, silting and fertilizers.

Solid waste on the banks of river Shabelle. Credit: FAO/D.Signa

Since less that half of the population live in households without adequate sanitation or waste management systems, the risks to human health from poor sanitation are real (UNEP, 2005). Human and household waste disposal sites are generally close to dwellings and water sources. There is lack of garbage collection and proliferation of plastics bags (UNEP, 2005). Seepage from waste dumping sites is also a potential contaminant of ground and surface water resources. Near human habitations, especially in Bossassoo, Berbera and Sailac, solid waste is dumped onto the shore and into the sea, causing damage to coastal and marine life (World Bank, Undated).

Another possible health hazard stems directly from on-site processing of fish on the beaches where catches are landed (FAO, 2005a). Domestic waste and discarded fish are left to rot on the beaches in the heat, often in close proximity to villages. Not only does this represent a serious health hazard, it is also a considerable waste of otherwise valuable materials which might be consumed or transformed into useful products such as fertilizers. Hygiene levels when cleaning and storing fish are also a concern (see Box 6).

Energy

Charcoal plays an important role in the energy sectors and the economies of most African countries, and Somalia is no exception. Southern Somalia is the centre of most charcoal production today, this being exported to markets in the gulf through the port of Kismayo in particular.

Somalia has long relied principally on domestic wood and charcoal as well as on imported petroleum to meet its energy needs. Electrical utilities had been state owned since 1970, when foreign-owned enterprises were

Box 6. Abandoned pesticides

An abandoned pesticide storage depot formerly belonging to the Desert Locust Control Organization for Eastern Africa is located on the escarpment above Hargeisa in north-west Somalia. Pesticides stored at the depot include Dieldrin, Heptachlor, BHC, DDT, Malathion, Fenitrothion, Mevinphos, Diazinon and Tetrachlorvinphos. The depot was damaged during an air raid in 1988 which may have resulted in some pesticides leaking into the environment (WHO, 2005). Local inhabitants are believed to have emptied large quantities of pesticides into the ground in order to re-use the storage drums. Contaminated soil was also excavated by local people for use in pest control and for resale in Hargeisa's market. In 1993, FAO commissioned an environmental assessment of the situation as there was concern that the pesticides might enter water supplies as a result of surface run-off during seasonal rains. The assessment, however, concluded that there was no hazard.

The subject was aired again in 2003 when concern was expressed over possible contamination of ground water resources, and a possibility to use the affected area for housing. A subsequent WHO investigation showed low levels of organochlorine and organophosphate exposure in all those sampled, compared with data available from the UK and USA. As emergency measures, the WHO report recommended, among other actions, reduction of the release of the chemicals from the depot through technical measures such as roofing and sealing of contaminated areas; an environmental study to determine the fate of the pesticides released from the depot; prohibition of access by site security measures such as fencing and guarding the area; and awareness raising through the development of a risk communication strategy for vulnerable groups.

The site has since been fenced, roofed and access restricted. However, nothing has been done to contain the pesticides in the face of an increasing population residing in close proximity to the depot.

Sources: WHO, 2005; IRIN, 13 May 2005, UNDP Somalia

nationalized. Throughout the country, about 80 different oil-fired thermal and diesel power plants were established, each relying on imported petroleum. With aid from Finland, new plants were constructed in the Kismayo and Baidoa areas in the mid-1980s. Attempts to harness the power of the Jubba River at the proposed Baardheere Dam had not come to fruition by early 1992.

Somalia relied on foreign donors (first the Soviet Union and then Saudi Arabia) to meet its petroleum needs. In the late 1970s, Iraq helped Somalia build a refinery at Jasiira, north-east of Baraawe, which had a capacity of 10,000 barrels a day. When the Iran-Iraq War broke out in 1980, however, deliveries were suspended, and Somalia once again required refined oil imports. As of mid-1989, Somalia's domestic requirements were again being met by this refinery, but deliveries of Iraqi crude oil were erratic. In May 1989, Somalia signed an agreement with the Industrial Export, Import and Foreign Trade Company of Romania by which the company was to construct an oil refinery in the outskirts of Mogadishu. The project was to cost US$500 million and result in a refining capacity of 200,000 barrels per day. Given the political upheaval which followed, however, this project never materialized.

Throughout the 1980s, various international oil companies explored for oil and natural gas deposits in Somalia. In October 1991, the World Bank and the UN Development Programme announced the results of their hydrocarbon study in the countries bordering the Red Sea and the Gulf of Aden. Offshore oil explorations were conducted during the 1980s, the results showing that Somalia's continental shelf may have oil and gas reserves. Several international oil companies applied for concessions, some of which were awarded in the eastern and central parts of the Gulf of Aden coast. No reserves of economic importance were detected, and neither oil nor gas is currently being exploited (World Bank, Undated).

One apparently successful innovation was the completion of a wind energy project. Four wind turbines, each rated at 50 kilowatts, were embedded in the Mogadishu electrical grid. In 1988 these turbines produced

699,420 kilowatt hours of energy. Total electric energy produced in 1988, the latest year for which figures were available in early 1992, was 257 million kilowatt hours. Five self-contained wind energy conversion systems in rural centres were also planned, but as of May 1992 there was no information that these had been built (US Library of Congress, 1993).

A herd of camels. Credit: UNDP Somalia

Livestock and Agriculture

Pastoralism is the dominant mode of life for a large number of Somalis – both nomadic and sedentary herding of cattle, sheep, goats, and camels are carried out. Livestock production has been the backbone of the Somali economy for centuries. It is also the most important source of cash income for the predominantly rural population, and meat, together with milk, assures 55 per cent of the calorific intake of the entire population (EU, Undated). Most recent projections estimate livestock numbers to include around 5.2 million cattle, 13.5 million sheep, 12.5 million goats and 6.2 million camels, with cattle being concentrated mainly in the south and camels in the northern part of the country.

The predominance of the nomadic rearing system – with herds moving even across borders into Kenya and Ethiopia in search of forage and water – and the almost complete absence of fixed assets, has meant that livestock production has not been as heavily impacted by the civil war as other production systems. This has also been a precautionary move against unreliable precipitation, allowing pastoralists access to different parts of the country containing quality forage and water sources, thus minimising risk in order to provide some degree of security for the household.

Compared with other nomadic livestock systems, that of Somalia is very much market-oriented. Approximately 2.5 million animals are exported each year with livestock exports (including raw hides and skins) representing about 40 per cent of gross domestic product (GDP) and 80 per cent of foreign currency earnings (World Bank, 2003). Perturbed by the export bans placed on Somalia by countries like Saudi Arabia (see above), the export of live and slaughtered animals is also hampered by the collapse of the public veterinary system and the absence of an animal health surveillance system in particular. The lack of a regulatory framework for livestock exports may also be a weakening factor in this trade, as much is controlled by individuals (see Table 2).

Overstocking, overgrazing, declining fertility of pastures, disease outbreaks and unpredictable rainfall are among the perils and risks that livestock owners have to face. Southern Somalia's environment has suffered less from the livestock pressure of nomadic pastoralists that the northern parts of the country, but agricultural development and southward expansion of the cattle industry are now placing severe pressure on many of the region's remaining wild habitats (Simonetta, 1988) (see Box 7).

Migration of pastoralists and their herds from eastern Ethiopia (especially the Shinnile zone) to north-western Somalia (Adwal) since late 2002 has exerted pressure on grazing land in these areas (USAID/FEWS, 2003). The numbers of livestock are reported to be exceeding the carrying capacity, and could cause overgrazing and outbreaks of disease.

Livestock exports – especially for sheep – normally increase sharply during January and February, coinciding with the Haj (USAID/FEWS, 2003). This, however, also places stress on localized grazing and watering points near main ports, as well as fuelling conflict over access rights.

Table 2. Number of livestock

	1988	1997 (estimate)
Camels	6,841,000	6,100,000
Cattle	4,983,000	5,200,000
Goats	20,550,000	12,500,000
Sheep	14,304,000	13,500,000
Horses/Mules/Donkeys	49,000	46,000

Source: UN, 1998

The 1973 Land Reform Act was formulated to give advantage to state enterprises and mechanized agricultural schemes. Arable land had to be leased from government; pastoralists no longer had claim to land they previously depended on (Gunn, 1990). Obtaining leases to land was cumbersome and beyond the scope of most small farmers. Large estates were established – often enclosed and guarded – and pastoralists charged a fee for access to, for example, water. A 1974 law on co-operative development, originally intended to promote the vegetative recovery of grazing lands, initially established 14 co-operatives 200-300 ha in size (Unruh, 1995). More ambitious range co-operatives followed in the late 1970s, with assistance from the Northern Rangelands Development Project, all of which were further to the detriment of smaller herd owners.

Agriculture today remains the second most important production system in Somalia. In the past, agriculture contributed up to 19 per cent of GDP and accounted for some 20 per cent of employment (IUCN, 1997), but current values are not known. Crop production, however, is limited primarily by irregular and unpredictable rainfall but also to some degree by soil conditions and traditional practices. Southern Somalia's alluvial plains are the country's most fertile soils and, together with the inter-riverine area of Bay, used to account for almost 90 per cent of agricultural production.

Rainfed and irrigation cropping are practised in parts of southern Somalia, especially the Jubba and Shabeelle river valleys, while Bay and the lower Jubba and lower Shabeelle regions rainfed cropping is combined with camel and cattle keeping (IUCN, 1997). Rainfed cropping also occurs on the sandy soils of the coastal hinterland north-east of Mogadishu while only very limited crop production is possible in the northern part of the country. Rice, maize and sesame are the main irrigated crops in the Shabeelle and Jubba riverine areas although irrigated farming has suffered from lack of irrigation management, deteriorating infrastructure and susceptibility to flooding (see Box 8).

Maize and sorghum are the main rainfed crops grown in areas with rainfall above 450 mm per year, and cow peas are the main rainfed crop elsewhere. This farming practise, always at risk on account of erratic and generally low rainfall levels, depends on soils being allowed to return to fallow for a number of years in order to recover, and is no longer practised as widely as it once was on account of increasing population pressure and

Box 7. Livestock movements and food security

For nomadic pastoralists – who comprise 60 per cent of the Somali population – the January to March (Jilaal) dry season is considered the most difficult. During this period, herds are moved longer distances from homesteads which, in turn, reduces the supply of milk to the remaining members of the household. Heightened food stress is likely to be experienced at such time.

Box 8. Causes of food insecurity in Somalia

There has been a steady decline in per person food production for years. Food aid constituted 20 per cent of all food imports from 1970 to 1974 and 5 per cent from 1980 to 1984. The difference between food produced and total food consumption (the 'food gap') changed from a surplus of 5 per cent in the former period to a deficit exceeding 30 per cent in the latter. This decline in food self-sufficiency occurred between 1960 and 1990 despite massive international investments in the rural sector and despite considerable untapped potential in the agricultural areas. Among the reasons for this decline are:

- rapid population growth, which outstripped increases in food production in the 1980s;
- rapid urbanization, which places a growing percentage of the population out of pastoral or agricultural food production;
- changes in food consumption habits among urbanized Somalis who prefer wheat, rice and pasta over locally grown maize and sorghum;
- inappropriate government policies such as price controls in the 1970s which created disincentive for farmers to produce grain crops;
- unintended impact of large-scale annual and often poorly timed delivery of food aid, which depresses prices and drives farmers out of agriculture; and
- alienation of portions of the country's most fertile irrigable land for cash cropping of bananas for export rather than grain.

The food security situation has been worsened by the civil war and statelessness. Without a government, farmers have lost access to agricultural inputs and services formerly provided by the state. The private sector has responded to a degree, but the unregulated sector has led to misuse of resources and inputs, poor quality control and the spread of drug-resistant diseases.

Source: UNDP, 1998

demand for land (IUCN, 1997). Poor management practices on rainfed cropped and fallowed land is leading to lower levels of soil fertility and soil erosion which, in turn, translates into lower productivity and increased hardship for people living is such areas.

The major cash crop is bananas whose annual exports exceeded 120,000 tonnes before the war. However, production and exports collapsed during the war and have not yet recovered. Despite some recovery in the mid-1990s, commercial farming was hard hit by the El Niño rains of 1997-1998 which destroyed an estimated 80% of the country's banana plantations, causing about 100,000 families to lose their primary source of income (EU, Undated).

Other important crops include sugar cane in rain fed and irrigated areas, sorghum in drier zones as well as corn, mangoes, sesame seeds, beans, rice and cotton. About 400,000 ha are cropped in the main season and 230,000 ha in the secondary one. The planted area changes significantly from one season to another, depending on the rainfall pattern. From 1994 to 2000, an average of 300,000 tonnes of cereals were harvested each year; a significant reduction compared to the pre-war production of 480,000 tonnes, mainly due to the reduced area under agriculture (EU, Undated).

The prolonged civil war has had some marked impacts on the manner of natural resource use and management systems, with more negative consequences being recorded in the agriculture sector compared with livestock production or fisheries. Farming communities in the south have been displaced taking with them their knowledge of fruit tree management and harvesting systems. New arrivals commonly lack experience of tree management which has resulted in considerable tracts of vegetation being cleared for charcoal or transformed into pasture. Deteriorating infrastructure such as irrigation systems, as well as reduced agricultural

inputs and disrupted technical support services, and a collapse of processing and marketing facilities, have all contributed to agricultural decline and subsequent loss of income and security for many communities. As young men have been drawn into the civil war there is also insufficient labour, with many farming households now being headed by women. Ownership of land has also become an evident issue which will need to be addressed if this sector is to recover.

Industry

The industrial sector in Somalia was never well developed, largely perhaps on account of their being no fossil fuels or minerals ready for extraction. Agricultural processing once constituted the bulk of the Somalian industry sector but even this has been seriously restricted in scale and scope. Meat exportation and processing as well as fish – primarily tuna – canning were and remain the two main industrial activities, supplemented by sugar refining, oilseed processing, leather tanning and the production of cotton textiles.

Minerals only ever made a small contribution to Somalia's exports and the economy in general. Small amounts of gemstones, gypsum, salt and sepiolite (meerschaum) were still being produced in 2004.

In the informal sector, charcoal production has become a significant industry in many parts of the country, with charcoal leaving by sea as well as by land. Lobster and shark processing are also important activities for certain fishing communities, with processing and shipment being done largely by individuals who construct freezing and storage facilities and then arrange onward freight. These industries are generally not co-ordinated and operate primarily under individual interests.

Transport and Telecommunications

Somalia's transportation system is poorly developed and often in poor state of repair. At independence, Somalia inherited only a few paved roads in the more populated areas in the south and north-west, four undeveloped ports equipped only with lighterage facilities, and a handful of usable airstrips. During the next three decades, some improvement was made with the help of substantial foreign aid. By 1990 all-weather roads connected most of the important towns and linked the northern and southern parts of the country. Three ports had been substantially improved, eight airports had paved runways, and a regular domestic air service was also available. The deteriorating security situation in the early 1990s, however, put an end to further investments and necessary maintenance.

In 1988, the total expenditure for transportation and communications was US$57.8 million. Nearly 55 per cent of this amount was for new infrastructure; 28 per cent was for rehabilitation and maintenance of existing infrastructure. This activity must be understood in the context of the ongoing civil war in Somalia; much of the infrastructure particularly bridges in the north, had either deteriorated or been destroyed as a result of the fighting. There has been no systematic study of the infrastructural costs of the civil war.

In 1990, Somalia had more than 21,000 km of roads, of which about 2,600 km were paved all weather roads, 2,900 km were gravel, and the remainder were improved earth. The country's principal highway was a 1,200 km two-lane paved road that ran from Kismayo in the south through Mogadishu to Hargeisa in the north. North of Mogadishu, this route ran inland, roughly paralleling the border with Ethiopia; a 100 km spur extended to the Gulf of Aden at Berbera. By early 1992 much of this road, especially the northern part between Hargeisa and Berbera, was unsafe due to land mines. Somalia's 1988 plan provided for another connection from this main route to Bossassoo on the Gulf of Aden. Somalia had only one paved road that extended from north of Mogadishu to Ethiopia; all other links to neighbouring countries were dirt trails impassable in rainy weather (US Library of Congress, 1993).

Mogadishu International Airport was the nation's principal airfield, but this facility has remained closed since the departure of UNOSOM II in 1995.

Shipping

Maritime transport has long played an important role in Somalia, with most exports and imports being made via the sea. Four ports handled almost all of Somalia's foreign trade: Berbera and Bossassoo on the Gulf of Aden, and Mogadishu and Kismayo being deepwater ports protected by breakwaters on the Indian Ocean.

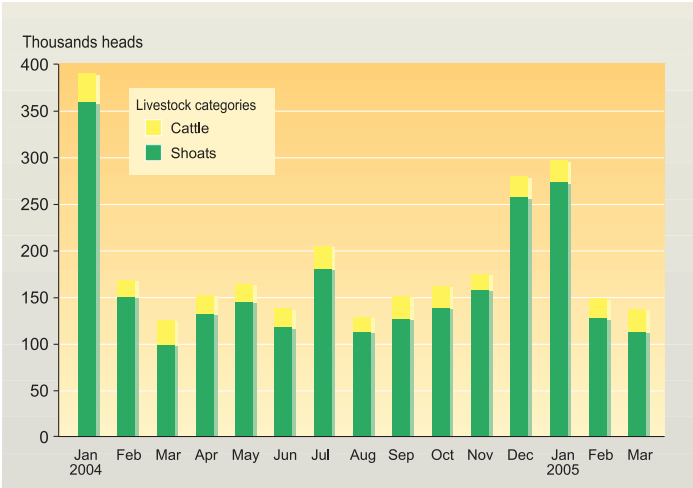
Mogadishu has traditionally been the principal port of entry for most general cargo but the port is now rarely used as different factions continue to struggle for management of the facility. The port is also in need of dredging to be able to accommodate the larger vessels which once docked there. Berbera has tended to receive general cargo for the northern part of the country and handles much of the nation's livestock exports. It is also an important seaport access point for Ethiopia. Bossassoo is also used for livestock export as well as fisheries products and incense. Kismayo's main function was the export of bananas and meat, the latter being processed and packed at the port.

The world's main transport route for hydrocarbons passes through the Gulf of Aden – 590 million tons of oil a year (UNEP, 1987) – and the frequency of tanker movements poses a constant threat of oil spillages. Somalia has no national capacity to deal with an oil pollution incident of any magnitude, which is a concern given the ecological importance of marine and coastal ecosystems in the region (World Bank, Undated) (see Figure 1).

The closest clean-up equipment is located at the IMO Regional Response Centre in Djibouti for the Gulf of Aden region (UNCTAD, 1998). This facility, however, is awaiting re-activation (World Bank, Undated).

Boats in the port of Bossassoo. Credit: G. Farmer

Figure 1. Livestock exports from Somalia, Ports Berbera and Bossaso.



Source: FAO Food Security Analysis Unit Somalia 2005

The absence of surveillance means that tankers routinely discharge oily ballast off the Somali coastline: annual discharges were once estimated at 33,000 tonnes (UNEP, 1982). Tar balls are regularly found on certain sections of the Somali coastline, above all high-energy beaches in the western sector (World Bank, undated). Sewage and solid waste discharge from marine vessels is another unregulated activity (see Box 9).

Natural Disasters

Drought has been the single most devastating and recurrent natural disaster to affect this country in recent decades. Severe droughts interrupted by devastating floods occur frequently resulting in large-scale starvation and the death of thousands of people and their livestock. As recent as March 2004, an estimated 200,000

Box 9. Alleged dumping of hazardous waste

Since the early 1990s, reports have been circulating in Somalia and the international media regarding the dumping of hazardous waste along the coastline of Somalia, including regular sightings of suspected containers. Assessment missions were undertaken by international organizations in 1992 as well as in 1997 but no hazardous waste was found.

Following an increase of reported sightings after the December 2004 tsunami, UNEP, through its Joint UNEP/OCHA Environment Unit, and in co-operation with the International Maritime Organization (IMO), International Atomic Energy Association (IAEA), the Un Development Programme (UNDP) and World Health Organization (WHO), has been investigating these reports with no results to support the presence of hazardous waste.

A UN technical fact-finding mission visited the "Puntland" region of Somalia from 25-29 May 2005, to investigate allegations of toxic waste hazards uncovered by the tsunami. The mission visited three key populated coastal locations at Hafun, Bandarbeyla and Eyl, a region stretching over 500m in length. No traces of toxic waste were found, but the UN added that "the urgent need remained for a more comprehensive assessment of the natural environment of Somalia, which would include further investigations of alleged toxic waste sites on land, and dumping of toxic waste at sea".

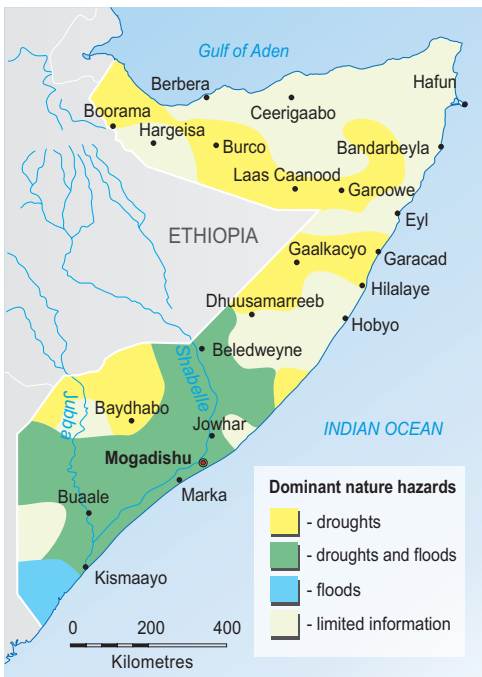
Main source: UN Press release 7 October 2005 (UN Mission to "Puntland" on Toxic Waste in the Coastal Areas of Somalia)

pastoralists in the northern and central regions were threatened by drought considered to be the worst in 30 years (UN OCHA, 2004). By mid-2005, the UN reported that 500,000 people remain in a state of humanitarian emergency or livelihood crisis in drought-affected areas (UN, 2005). Despite the good *Deyr* rains of 2004-2005, which improved water availability and pasture, recovery is slow as pastoralists have been unable to fully benefit from the improved conditions due to significantly reduced herd sizes, excessive debts and widespread destitution. Recovery is also hampered by recurrent instability which limits access to markets, grazing and other resources (see Figure 2).

Recent flooding in the Jubba and Shabeelle regions has caused cereal production to fall to its lowest post-war level. Flooding has continued in the *Gu* rainy season in the Hiran and Middle Shabeelle regions where the situation was described as "precarious", with several thousand households being forced to flee their riverine villages (UN, 2005).

Coastal areas of Somalia, particularly in "Puntland", suffered damage and the loss of several hundred lives as a result of the December 2004 Indian Ocean tsunami. The tsunami came at a time when many parts of the country were beginning to recover from four years of consecutive drought and periodic flooding (UNEP, 2005). Apart from loss of life, the livelihoods of some 44,000 people are thought to have been affected, through loss of housing, loss of fishing materials (and associated revenues) and the need for relocation in some instances following salinization of coastal fresh water sources. Coastal infrastructure such as roads was also damaged (see map Somalia: Impacts of the 26 December 2004 tsunami).

Figure 2. Natural disaster risk distribution in Somalia.



Source: Center For Hazards and Risk Research at the Columbia University 2005 (http://www.ldeo.columbia.edu/chrr)

A Somali child rescues a kitten who was stuck on the roof of a flooded house in Fagan in the lower Juba river area, southwest of Mogadishu. © JEAN-MARC BOUJU/AFP/Getty Images

The desert locust plagues of 1986-1989 and 1996-1998 serve as examples of how agricultural pests and diseases can easily spread across borders and cause emergencies. Although Somalia has been spared from this experience in recent years, there is still a threat of outbreaks in the region, with attention focussing on the Chad/Sudan border and the Eritrean Red Sea coast (FAO, 2005b).

Environmental vulnerability is likely to intensify in Somalia with repeated droughts and flooding, in particular. Changing climatic conditions, combined with growing pressure on the land and for specific coastal resources, will only worsen this situation, in a country which currently lacks the capacity to prepare for, prevent and ultimately deal with disaster-related events (see Table 3).

Displaced people

Migration is at the heart of Somali nomadic culture, a culture characterized by a subsistence economy, a trading mentality and nomadism, a traditional and well-established form of livestock keeping attuned to the region's climate.

During the period of British colonialism, an early Somali diaspora emerged as seamen from British Somaliland worked in the Merchant Navy and settled in ports such as Cardiff and London, UK (Gundel, 2002). This was followed during the 1970s when Somalia became a major labour exporter to the oil producing countries and once again after independence, by others who had lost their assets. Several hundreds of thousands of people left seeking better employment than they could find in Somalia.

Not all population movements, however, were so voluntary in nature. The Ogaden war of 1977-1978 provoked a massive refugee movement, forcing thousands of ethnic Somalis from the Ethiopian Ogaden region into Somalia. By 1981, these refugees constituted perhaps as much as 40 per cent of the population of Somalia.

Source: UNHCR Somalia Atlas 2005, UNDP Somalia, Tsunami Interagency Assessment Mission 2005, Tsunami Research Centre of the University of Southern California 2005

THE MAP DOES NOT IMPLY THE EXPRESSION OF ANY OPINION ON THE PART OF UNEP CONCERNING THE LEGAL STATUS OF ANY

Table 3. Recent natural disasters in Somalia

Disaster	Date	Number of people killed	Number of people affected
Drought	December 1964		700,000
	1974	19,000	230,000
	1987	600	500,000
	January 2000		650,000
	June 2001		1,100,000
	December 2001		500,000
	2004		200,000
Flood	November 1961	200	
	October 1997	2,311	1,230,000
	July 2000		220,000
Epidemic	March 1985	1,262	
	October 1997	500	
	January 1986	1,307	
	February 1998	248	
	April 2000	390	
Wave/Surge (tsunami)	December 2004	298	44,000
Famine	March 1999		375,000

Source: EM-DAT: The OFDA/CRED International Disaster Database, www.em-dat.net. Université catholique de Louvain, Brussels, Belgium. May 2005.

Additional Ogaden refugees as well as Ethiopian Oromos joined this group of refugees from 1984 to 1991. By 1987, one in six persons in Somalia was registered as a refugee (Gundel, 2002).

The eruption of the civil war in 1988 was another period of mass population movement, when more than 600,000 people fled from Somalia to Ethiopia. Further escalation of the conflict produced a refugee flow of more than one million people from southern Somalia to neighbouring and distant countries. Refugees continued to leave southern Somalia in large numbers until 1995. Since then there has been a decline in refugee flows from Somalia and a gradual process of repatriation and re-integration has been taking place, with people resettling in "Somaliland" and "Puntland" in particular. By 2004, UNHCR had recorded the voluntary repatriation of some 476,000 refugees (UNHCR, 2005a). At the same time, however, a quarter of a million Somalian refugees remain in camps in Kenya, Ethiopia, Djibouti, Yemen and other neighbouring countries. Hundreds of thousands of other Somali refugees are scattered across the globe.

In addition to this massive human upheaval to neighbouring countries, there is also a significant population of internally displaced people in Somalia. The largest war-related internal displacements from central and southern Somalia took place between 1991 and 1993, initially on account of the war, but also because of drought and food scarcity. In September 1992 there were estimated to be between 556,000 and 636,000 'visible' displaced people in camps of which 50 per cent were in Mogadishu (Gundel, 2002). The overall trend since 1993 has been one of diminishing internal displacement as the war subsided and people either returned to their homes or resettled in different regions. But the vagaries of climate and economic hardship are now the main causes of population movement. In 2000, there were estimated to be 300,000 internally displaced including 40,000-50,000 newly displaced in 1999. Internally displaced persons constitute more than 60 per cent of those Somalis considered to be 'food insecure' (Gundel, 2002).

NATURAL RESOURCES

Introduction

On land and offshore, Somalia possesses important and some unusual biological resources within its varied biogeographic zones. At the same time, however, it is not well-endowed with an abundance of natural resources which means that particular care needs to be taken in their management. This, unfortunately, has not always been the case and there is a dismal history of resource over-exploitation for personal or clan-based gains. Massive hunting in the early part of the 1990s depleted virtually all of the once great herds of wild animals: today, similar activities are destroying much of the country's forest resources and seriously impacting several different components of Somalia's rich marine fisheries.

The country's infrastructure was poorly developed at independence and it has had little time of stability, security and directed assistance to establish a favourable framework for natural resource management. This seems all the more important in this country where the vast majority of the people – at least directly in rural areas – depend upon the environment for their livelihoods. The legacy of exploitation only worsened during the country's civil war, as communities and clans vied with one another for access to grazing lands, watering holes and access to lucrative fisheries.

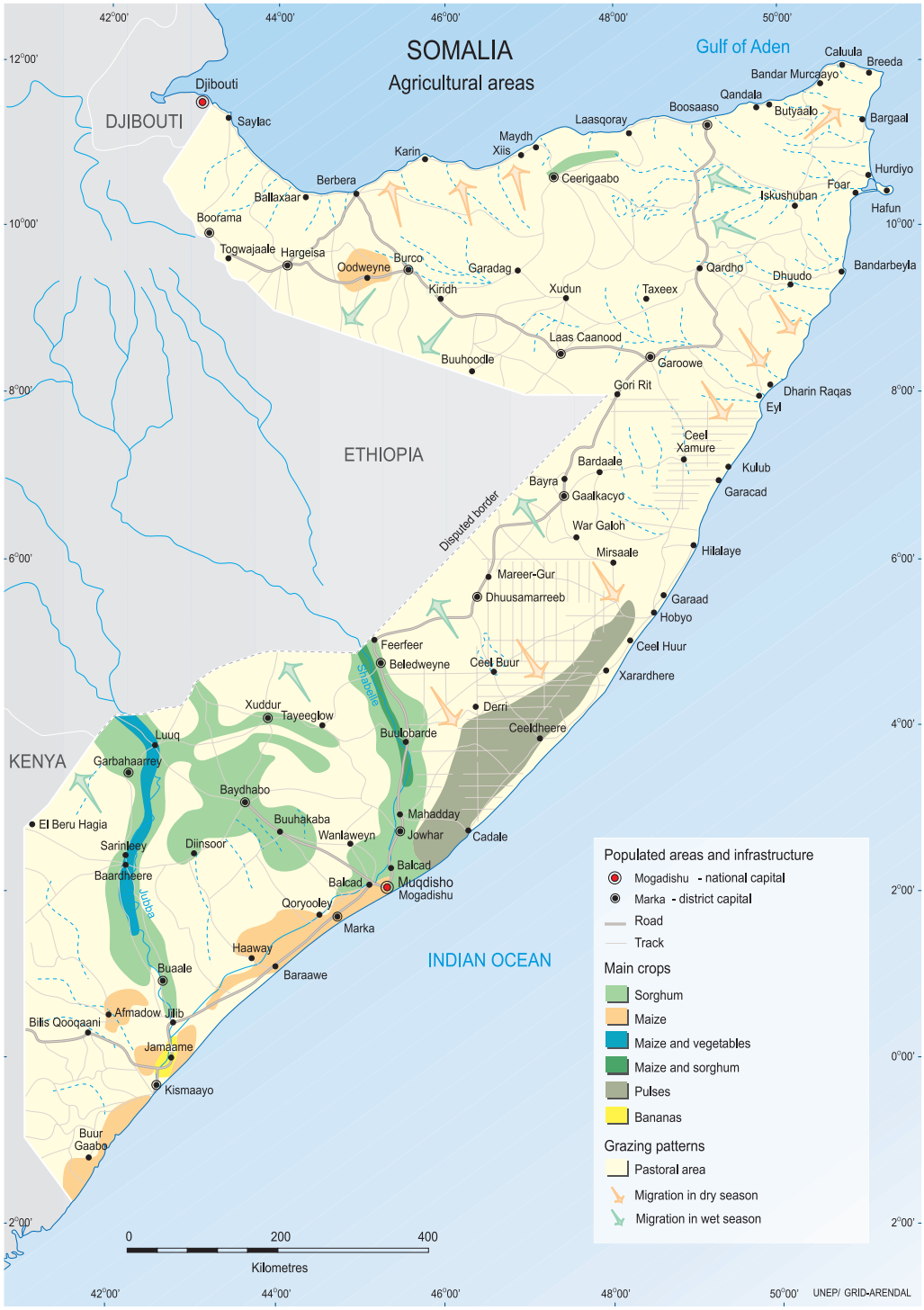
Known issues of particular concern are an almost complete breakdown of legislative and traditional controls governing use and access to natural resources; deforestation near, but no longer exclusive to, populated areas; overfishing of selectively targeted offshore and nearshore marine species; desertification and soil erosion; inadequate water supplies and periodic drought; an inadequate and dysfunctional system of protected areas; an urban environment in disarray; and the effects of political and economic mismanagement of land tenure (EC/IUCN, 1993). Many of these problems actually stem from or have been aggravated by the prolonged civil strife which Somalia continues to experience on some of its territory.

Environmental management issues featured in some of the country's earlier development plans but the first targeted initiative was launched in 1996 when the World Conservation Union (IUCN) began the Somali Natural Resources Management Programme. This was designed to promote sustainable use of natural resources use, and through it the country began to address specific environmental issues, including fuel-wood conservation, fisheries management, marine conservation and land-use planning. Physical coverage of all of the country was incomplete due to security concerns, but by the time the programme ended in 2000 a number of key management issues had been identified which may allow the core of a comprehensive and integrated management system to be formulated. The future of any such system, however, must fully address the needs of the people in Somalia whose current livelihoods are so heavily dependent on a diminishing and deteriorating natural resource base.

Land

Having access to land is a concern of a sizeable part of the population in this country where pastoralism is an established way of life. Estimates vary, but from 46-56 per cent of Somalia's land area can be considered permanent pasture. About 14 per cent of the country is classified as forest, while another 13 per cent is thought to be suitable for cultivation, arid, semi-desert conditions making much of the country relatively unproductive. In most areas, the barren coastal lowland strip – which is widest in the south — is abruptly succeeded by a rise to the interior plateau which averages around 900 metres in height and stretches toward the northern and western highlands. Only two main rivers – the Jubba and Shabeelle – occur, both of which are in the south.

Relatively high rainfall in the highlands around Hargeisa has raised the organic content in the sandy calcareous soils characteristic of the northern plains, allowing some dry farming to be practised. South of Hargeisa



Source: UNHCR Somalia Atlas 2005, Food Security Analisis Unit FAO 2004

THE MAP DOES NOT IMPLY THE EXPRESSION OF ANY OPINION ON THE PART OF UNEP CONCERNING THE LEGAL STATUS OF ANY

begins the *Haud*, whose red calcareous soils continue into the Ethiopian Ogaden. This soil supports vegetation ideal for camel grazing. To the east of the *Haud* is the Mudug plain, leading to the Indian Ocean coast; this region, too, supports a pastoral economy. The area between the Jubba and Shabeelle rivers has soils varying from reddish to dark clays, with some alluvial deposits and fine black soil. This is the area of plantation agriculture and subsistence agropastoralism (www.somalinet.com/library).

Practices concerning land rights vary from rural to urban areas and even within the latter in some parts of the country. In precolonial times, traditional claims and interclan bargaining were used to establish land rights. A small market for land, especially in the plantation areas of the south, developed in the colonial period and into the first decade of independence. However, the socialist regime which took control of the country from 1969-1991 sought to block land sales and tried to lease all privately owned land to co-operatives as concessions. Despite the government's efforts, a *de facto* land market developed in urban areas, while in the rural areas, the traditional rights of clans were maintained.

The Siyad Barre regime also took action regarding the water system. In northern Somalia from 1988-1991, the government destroyed almost all pumping systems in municipal areas controlled by the Somali National Movement (SNM). Failing that, equipment was either stolen or vandalized. In rural areas, the government poisoned the wells by either inserting animal carcasses or engine blocks and car batteries that leaked oil and acid. As a result, northern Somalis had to rely on older gravity water systems, use poor quality water, or buy water. Following the declaration of independence by "Somaliland" in the north in May 1991, the secessionist government began ongoing efforts to reconstruct the water system.

In the south, from the late 1980s onward, the water situation in the towns tended to resemble that of the north, largely as a result of war damage and chaos. Few pumping systems were operational in early 1992. Conditions in rural areas varied. Many villages had at least one borehole from which poor quality water could be obtained in buckets; pumps generally were non-functioning. Somalis who lived near the Jubba or Shabeelle rivers obtained their water directly from the river (www.somalinet.com) (see Box 10).

Forests and Woodlands

The vegetation in Somalia is predominantly dry deciduous bushland and thicket dominated by species of *Acacia* and *Commiphora*, with semi-desert grasslands and deciduous shrubland in the north and along much of the coast. In general, the vegetation becomes more dense towards the south – much of the north-eastern part of the country is devoid of trees (see Box 11).

Forest growth in general is limited due to poor soils and low rainfall. Closed forest cover occupies only about 2.4 per cent of the country (IUCN, 1992) but, if the *Juniperus* forests and evergreen tracts in the mountains in the north are included, the total forest coverage would probably amount to around 14 per cent (90,000 km^2) of the land (see Box 12).

Virtually all of the tropical floodplain forest that once existed along the Shabeelle River has been cleared for smallholder agriculture together with sugar and banana plantations, except for a small patch set aside as a reserve at Balcad by the Somali Ecological Society. Aerial photographs in 1960, 1983-1984 and 1987 reveal a drastic acceleration of forest clearance in the Jubba valley as well, likely encouraged by irrigation and drainage schemes. Only the poorly accessible Middle Jubba, with its predominantly saline, alkaline, impermeable soils, has retained significant areas of relict floodplain forest. Compared with the surrounding woodland and bush, these floodplain forests are floristically rich and are notable for their diversity of specialized birds and animals (Madgwick, 1989).

A number of mangrove stands have been reported, the best areas being between Saada Din Island and Saba Wanak, in the estuaries of three watercourses which reach the sea west of Bossassoo, and in the three estuaries just north of the Kenyan border (Hughes and Hughes, 1992). These and other stands, however, have been

Box 10. Land ownership and land disputes in Somalia

Land ownership and land disputes are central to much of the conflict in contemporary Somalia. The pastoral lands have always been a common good – pasture is claimed by clans and not individuals so land conflicts in the pastoral setting are usually matters of power struggles between two clans. In cases where one clan gains an upper hand, neighbouring clans can be pushed out of prime pasture land and lose access to their own wells. Agricultural land has traditionally been allocated to households by village elders. Although not technically 'owned', this land is passed from one generation to the next and could be rented or sold.

In the 1970s, a modern land tenure law was passed decreeing that land titles be acquired from the state which 'owned' all the land in order to claim usufructuary rights. At the same time riverine farmland which had been held by Bantu and other farming communities for over a century was rapidly rising in value, thanks to major irrigation projects and the revival of the banana export business in the 1980s. Consequently, an epidemic of land grabbing began in the 1980s. Civil servants, well-connected businessmen and other Somalis with access to the Ministry of Agriculture began to register large tracts of land in their name, even though the land had been historically farmed by villages. Few smallholder farmers could afford to register their land as that required expensive trips to Mogadishu and bribes to civil servants. Even then, individuals that were more powerful could obtain titles to the same tract of land and pay for the backing of police to ensure that their title was seen as the legitimate one. At the same time, the state expropriated tens of thousands of hectares of prime riverine land from farming communities, offering them no compensation (since technically the unregistered land was unclaimed) for the establishment of internationally financed state farms. Within a decade many of Somali's smallholders were transformed from subsistence farmers to landless or semi-landless sharecroppers and rural wage labourers. This episode of land grabbing by both the state and private speculators sowed the seeds for endemic land conflicts in later years and depressed many of the riverine agricultural communities.

The civil war and state collapse accelerated this struggle for land, replacing title deeds with semi-automatic weapons as the instrument of choice for appropriating land from weaker groups. As during the 1980s, land grabbing in the 1990s did not involve militia and their kinsmen taking up agriculture themselves, which is seen as a low-status occupation. Instead it involved laying claims to the fruits of the harvest of the farmers. In parts of the riverine zones, smallholder farmers were subjected to coerced sharecropping by militia overlords who may or may not have provided security in return for 50 per cent of the harvest. In other instances militias have been used by powerful landowners to force villages to supply labour to their farms or plantations, with or without pay. On abandoned state farms, newcomers have staked claims to plots without regard to the fact that the land had been expropriated from the villagers. Clans that were more powerful also pushed their herds into pasture land of weaker groups, grazing their livestock on villagers' ripening crops.

Not all relations between militia and local communities were so hostile. In some instances armed newcomers agreed to settle land disputes in order to secure better relations with residents. There is evidence that some militia settled and married into local communities suggesting the possibility, in some areas, of gradual normalization. In other cases, individuals who have lost valuable land or houses have had to request relatives in other clans to look after property, sharing their rent or harvest profits in the process.

Unravelling the thousands of land and property disputes emanating from the collapse of the State has been at or near the centre of nearly every peace process since 1991 and will be a major hurdle in reconciliation efforts.

Source: UNDP, 1998

seriously ravaged for firewood and construction timber. Some have been completely denuded and are now salt marsh ecosystems. Overall the regenerative capacity of the mangrove ecosystems may have declined in recent decades – a state which will almost certainly affect the capacity of these areas to function as breeding and nursery sites for near and offshore fish, crustaceans and molluscs, but one which also now affords less protection to the coastline. An assessment should be carried out of the extent of damage to mangroves and other coastal vegetation (UNEP, 2005) so that responsible actions can be undertaken.

Much of the country – around 60 per cent – is covered by sparse savannah woodlands. Forests and woodlands are important resources on account of the fact that wood is the main source of household energy and construction materials for the bulk of the population, but charcoal – and certain other wood products – are also important for the revenue they provide. Important native forest exports include frankincense from *Boswellia* species growing in the north-east, *Commiphora*, which produces myrrh, in the south-west, gum Arabic from *Acacia* spp, and *Cordeauxia edulis* (now thought to be endangered) which produces *yicib* nuts in the central regions (UNEP, 1984). In 1985 Somalia was the world's largest source of incense, and produced over 2,000 tonnes. Forestry has usually accounted for about 2.5 per cent of GDP. Frankincense used to be Somalia's 4th largest foreign currency export earner with an annual production of 12,000 tonnes. Due to their value, *Boswellia* are highly prized trees with tree tenure systems. Although not cut for charcoal or other uses, their natural regeneration is threatened by over-grazing (EC/IUCN, 1997).

On the basis of a study made on wood-based energy dynamics in Somalia, the charcoal output of north-east Somalia in 1996 alone was estimated to be in the order of 4.8 million sacks, each weighing 25-30kg, 80 per cent of which were exported. Producing such a volume required cutting about 2.1 million *Acacia nilotica* trees. At an average density of 60 trees per hectare, this translates into a deforestation rate of 35,000 hectares of land a year. Such a rate of deforestation would have cleared 170,000 hectares of land during the last five years of the 1990s alone, when the area witnessed a massive outflow of charcoal for export (WSP, 2001) (see Box 13).

Somali women carrying wood. Credit: UNDP Somalia

Box 11. Degrading lands

Rangeland degradation and the formation of sand dunes now affects considerable parts of the country. Dregne (1982) concludes that all rangelands are degraded while a World Bank (1987) survey found Somalia's northern ranges to be the most seriously (as much as 50 per cent) degraded owing to their steep topography, large numbers of livestock and proximity to ports for livestock export. Over much of the country, areas around water holes or wells are all degraded.

Box 12. Mist forests of northern Somalia

The mist forests of the Goolis mountains of "Somaliland" are the only true forest areas of Somalia and are important centres of biological diversity and species endemism. On account of their biological richness, mist forests – so called because of their ability to remove moisture from the air as it blows in from the coast and rises above the plateaux – are also important resources for pastoralists during dry seasons and periods of drought.

Gacaan Libax, a highland area reaching 1,719 m asl in north-western Somalia, hosts one of the largest and most intact mist forest areas in Somalia. Local people are well aware of the importance of these forests to their livelihoods, especially for the grazing and water resources they provide. The loss of traditional grazing lands to private livestock exclosures, as well as an increased number of livestock and the lack of law enforcement combine to now force people to demand more and more from these forests.

As a result, soil erosion is becoming more evident as over-grazing and deforestation take place. To avoid conflicts from developing, opportunities like this provide an ideal setting for the development of community-based land management plans.

The lucrative charcoal trade raises many concerns for the country's remaining forests. Yusuf (1997) estimated that 30,000 tonnes of charcoal were being exported by ship to the Arabian Peninsula, particularly the United Arab Emirates. Many species are felled to produce charcoal but *Acacia bussei*, a slow-growing hardwood is the preferred species. Usually a scattered species, it was formerly found growing in high densities in the plateau areas of Sanaag, Sool, Bari, Togdheer, Woqooyi Galbeed, Bay and Bakool – all regions where charcoal production was very high at one stage (EC/IUCN, 1997). Reports from north-western Somalia reveal that Somali charcoal producers now produce charcoal in Ethiopia, both for internal consumption as well as for export (EC/IUCN, 1997).

Vegetation cover is also important in this country and region in terms of stabilising soils, preventing erosion and encouraging ground water absorption. This is especially important in areas which endure high levels of grazing since apart from direct grazing pressure, movement of livestock over barren or fragile soils easily leads to erosion or compaction of the surface soils.

Box 13. Trade in black gold

Charcoal plays an important role in both the energy sectors and economies of many African countries, and Somalia is no exception. Charcoal making provides a considerable amount of employment in rural areas but the scale of this operation has escalated to such an extent that environmental degradation has now been reported from most parts of the country.

Most charcoal is today made in southern Somalia – more than 80 per cent of trees used are *Acacia* species. The growth rates of these trees – even if some reforestation was taking place, which is not the case – is not fast enough to replace felled trees, so there is a constant net loss of vegetation cover. The destruction of trees for charcoal production is also leading to conflict over these resources as many trees provide dry season forage for camels, cattle, sheep and goats, but heavy grazing pressure itself is also a reason for lack of regeneration.

While fuelwood and charcoal are the main energy sources for most rural and urban dwellers, respectively, it is the foreign demand which primarily drives the scale of charcoal production today in Somalia. A prohibition was passed in 1969 preventing the export of charcoal and firewood, in order to protect trees. In 1993, however, export oriented charcoal production was restarted in the Bari and Sarang regions (at least) for export to the United Arab Emirates.

In the period 1980-1984 charcoal consumption in Mogadishu alone was thought to range from 32,000 to 45,000 tonnes per annum, while consumption for the remainder of the country was estimated at 30,000 to 35,000 tonnes. Estimated annual inflow of charcoal to Hargeisa was 65,000 tonnes in 1999, with per capita charcoal consumption estimated at 206kg, with a mean daily household consumption rate of 4.2kg. All charcoal consumed in Mogadishu and other main urban centres comes from sources several hundreds of kilometres away, all former nearer sources having been long depleted.

The relations between charcoal producers and local communities are complex. In many cases, producers are actual members of the community, but in some cases outsiders have taken control of forest resources, production and sale of charcoal. Many conflicts have arisen and casualties recorded over this business. Although producers may be aware of traditional rules and regulations governing harvesting of whole trees, branches or dead wood, violations of such rules are now widespread – many people having no alternative option as a source of livelihood.

Most charcoal is produced in kilns, of which two kinds are used in Somalia: a pit/trench type which is used mainly in Middle Shabellee and a vertical mound type, most commonly seen in the Bari and Sarang areas. A 1997 report concluded that "charcoal production in Somalia is inefficient", with recovery rates from these kilns only at around 10-15 per cent (IUCN, 1997b). Higher recovery rates – 25-30 per cent – were recorded from skilled charcoal producers using kilns in "Somaliland" in another review (IUCN, 1999b). Even the tree harvesting practices have been noted as wasteful, with as much as 15 per cent of tree materials being lost.

Traditionally the supply of charcoal to main towns in Somalia was managed by Charcoal Co-operatives and the market structure for charcoal was reportedly well managed.

Based on: Agrosphere (2004), Bird and Shepherd (1989), IUCN (1997b, 1999a,b)

At least 151 plants in Somalia have known medicinal values (IUCN, 1997a), but the limited data available is insufficient to describe the status of these resources or the degree to which rural communities, in particular, rely on these or manage them in some way or another (see Box 14).

Box 14. Frankincense

Frankincense was traditionally a major export activity, especially from the northern part of the country, but today this sector is in a state of neglect. Under the Barre government, state support to frankincense producers facilitated certain aspects of production and export trade but this same state control destroyed private trading networks leaving behind a vacuum when the government collapsed. Now, since production and export is no longer regulated, there are concerns over the scale at which trees are being "milked".

Source: Somaliland Centre for Peace and Development, 1999

Freshwater Resources

Somalia is to a large degree an arid or semi-arid country where rainfall is periodic and irregular. Water scarcity has been one of the main traditional sources of social conflict in Somalia. Traditionally such conflicts arise when local supplies are diminishing, particularly during dry periods of the year or during a drought. Nomads are commonly embroiled in water access negotiations at such times. Another source of tension, however, occurs when a new group of consumers moves into a new area – perhaps following displacement of agriculturalists by pastoralists who may lack the experience of former management systems and practices (see Box 15).

Extensive, permanent swamps and floodplains occur on the Shabellee river, while additional swamps abut the Jubba river, the two large perennial rivers which rise across the border in Ethiopia and flow across the southern part of Somalia to reach the Indian Ocean. These two rivers are important sources of water for people and livestock, as well as irrigation – the area lying between the two rivers being the country's main agricultural zone. Temporary watercourses, known as lachs or laks, drain the south-east sloping plateau of north-eastern Kenya into southern Somalia, the main ones being Lach Awaro, Lach Bogal and Lach Dheere (Hughes and Hughes, 1992). Cisterns (*Berkads*) are another source of surface water for at least a few months of the year, these being pans or dams whose bottoms and sides are cemented and covered to ensure that water is not lost to evaporation and seepage (Amuyunzu, 1997). Underground aquifers are also widely exploited, either through boreholes, shallow wells or at natural springs.

Box 15. Repairing damage – securing the future

On 7 June 2005 a newly rehabilitated Duduble (China) canal was inaugurated in Jowhar, Middle Shabellee Region. This project is expected to benefit 50,000 people by allowing them access and control over the River Shabellee for irrigation purposes, to avoid perennial flooding and to boost revenue potential. The canal was first constructed in the early 1980s but had fallen into serious disrepair during the time of the civil war, through silting and physical destruction of infrastructure and equipment. As a result, with heavy rains falling in the Ethiopian highlands, large tracts of the Middle Shabellee would flood, displacing thousands of people, destroying their homes and crops.

Source: UNDP/WFP, 2005

In 1987 – the latest figures available – agriculture accounted for 97 per cent of all freshwater withdrawals, primarily the irrigation programmes of southern Somalia (WRI, 2003). At the same time, however, this figure corresponded with a withdrawal rate of only 8 per cent of the country's actual renewable water resources. Neglect and abandonment of many of these schemes, however, has likely meant a significant decline in the amount of freshwater being extracted for agriculture. Data from 1999 suggest that less than 19 per cent of cropland in Somalia was irrigated at this time (WRI, 2003).

A National Conservation Strategy for Somalia (Government of Somalia/IUCN, 1990) states that the country has adequate water resources to supply the population and sustain its major activities, but the difficulty is its distribution. Currently there are no dams on the Shabellee river although an off-stream storage exists at Jowhar (200 million m^3). A future reservoir has been

proposed upstream as well as a hydropower dam on the Jubba river. In a country with a high dependency on water, the control of the dams could be a likely source of conflict. In addition, large dams can be associated with a number of negative social, economic and environmental effects (UNEP, 2003).

Freshwater fisheries are primarily a subsistence activity practised by Bantu people along the rivers in southern Somalia. Freshwater fish catches were estimated at 400 tonnes in 1990 (EC/IUCN, 1993), but more recent figures suggest that this catch had halved by 2000 (WRI, 2003). There is some potential for commercial fishing which was carried out by at least one fishing co-operative prior to the civil war. With the breakdown of irrigation infrastructure and persistent water logging, it can be assumed that fish stocks are at high levels and thus offer renewed economic potential. However economic sustainability will be dependant on continued ecological sustainability of the fishery.

Marine and Coastal Environment

The Somali maritime zone is one of the largest in the western Indian Ocean and has one of the most important large marine ecosystems – the Somali Current Marine Ecosystem – in the Indian Ocean (Fielding and Mann, 1999). A prominent feature of this ecosystem is a seasonal upwelling which gives rise to high levels of biological productivity which in turn sustains rich fishing grounds, most notably in the northern area between Ras Asir and Ras Mabber (TRAFFIC, 1997).

Somalia has both fringing reefs and patches of coral reefs along the Gulf of Aden coast as well as in the south near the Kenyan border. Few studies have been conducted on these reefs but one off the northern coast east of Berbera highlighted extensive coral bleaching, with some reefs suffering almost total mortality (Schleyer and Baldwin, 1999). The Red Sea coral reefs off the coasts of Djibouti, Eritrea and Somalia, however, are reportedly in good, often pristine condition with 30-50 per cent live coral cover and the richest diversity of coral and other reef species in the entire Indian Ocean (Pilcher and Alsuhaibany, 2000).

Southern Somalia also has numerous small islands north of the Kenyan border. The Banjuni islands and the mainland southern coast are home to the only two ethnic groups – Bajuni and Rermanyo – who have a tradition of fishing in Somalia (Lovatelli, 1996).

Surveys carried out in the 1970s estimated that the potential yield of marine fishery resources could range between 380,000 tonnes and 500,000 tonnes per annum (Haaksonsen, 1983). More conservative estimates, however, suggest that the annual catch potential is likely to lie between 180,000 tonnes and 200,000 tonnes per annum (Van der Elst, 1997). Small pelagic species such as sardine, anchovy and scad likely make up much of the catch but tuna, shark and other species are also actively sought.

Overfishing has been noted in a number of sectors, primarily offshore – where trawlers from many nations ply the waters untroubled by any national maritime force – but also inshore, particularly with regards the shark and lobster fisheries, both of which are of considerable importance in terms of the revenue they provide. While commercial fishing in the past focused primarily on crustaceans and fish (Stromme, 1987), artisanal fishing of shark species now centres mainly on the production of dried shark meat and fins for export, and local use of shark liver oil for maintenance of *dhows* – traditional fishing craft (TRAFFIC, 1997). In addition to uncontrolled exploitation of marine resources, the sea bottom is also being damaged by heavy trawls (World Bank, Undated). According to one report (FAO, 1995), there is no knowledge of the extent to which illegal fishing – much of which takes place at night – is having off the Somali coastline. A more recent report from FAO (FAO, 2005b) noted that this practise continues to date.

Artisanal fishing has a long tradition with some coastal communities, although historically this has been carried out at a relatively low level and focused on a relatively narrow band of species. Following the drought of 1973-1974 the government resettled large numbers of nomadic herdsmen along the coast and trained them as fishermen. The Somali National Development Plan attached high priority to the fishery sector, aiming for an

annual growth of 23 per cent per annum (Nur, 1998). Twenty-one fishing co-operatives were established and a large number of vessels purchased or donated through foreign assistance: an estimated US$100 million was spent from 1987-1990 to assist with the development of the artisanal fishery (Van der Elst, 1997). Other development assistance followed with an associated increase in both the number of fishermen as well as improved catch methods, all of which have combined today – in the complete absence of any regulatory mechanisms – to place a number of species under threat.

Fishing waste on shore. Credit: FAO/D. Signa

The lobster fishery is one such fishery showing undisputable signs of overexploitation, driven by strong markets in several Middle Eastern countries, Dubai in particular. A variety of lobsters of the genus *Panulirus* are found along the coastline as well as two deep water lobsters of the genus *Puerulus* which are fished at depths of 150-400 m by trawlers. Some reports mention a deepwater crustacean fishery of 1,000-2,000 tonnes per annum (Everett and Kelleher, 1998) but there is no information on the species composition of this catch mainly as deep water trawling has always been carried out by foreign vessels which submit no catch and effort data (Fielding and Mann, 1999).

Since 1990 the lobster fishery has become the single most important fishery along Somalia's east coast. A significant increase has been reported on the number of people engaged in this activity while associated investments have also been made by traders, supplying freezer trucks, boats, outboard engines, fuel and fishing gear. Fielding and Mann (1999) report an increasing trend to fish lobster throughout the year, in contrast with former practices which resulted in a seven month closed season during the monsoons. No control is currently exercised on the amount, size or reproductive condition of lobsters caught – every lobster caught is retained.

Crabs eating finless shark abandoned on shore.
Credit: FAO/D. Signa

Drying shark fins on the shore of Somalia.
Credit: FAO/D. Signa

Sharks and rays also represent an important part of Somalia's artisanal fishery (TRAFFIC, 1997), with highest catches being reported from the north coast and the southern portions of the east coast. It has been estimated that sharks comprise 40 per cent of the artisanal landings in the south-eastern coastal area (TRAFFIC, 1997). The main species landed include the hammerhead (*Sphyrna* spp.) and mako (*Isurus* spp.) sharks (Stromme, 1987). At least 10 other species occur in the nearshore waters (Remmerswaal, 1996 cited in TRAFFIC, 1997).

Trade in shark products is dominated by the trade in fins and to a much lesser extent dried and/or salted shark meat. Fins are exported primarily to Dubai, sometimes via Djibouti, and then re-exported to Asia for consumption in soup (TRAFFIC, 1997). While export figures for shark fins are largely unavailable, one report notes the export of 10,530 kg of fins from Bossassoo between January and July 1996 (Anon, 1996). A rough estimate of the yearly shark catch was 6,700 tonnes (but this does not account for all deep sea vessels operating in Somali waters as the are no data on these vessels) which is not thought to be a significant threat to shark populations in Somali waters (TRAFFIC, 1997). Other reports, however, remark on

Lobster, commonly fished in Somali waters. Credit: G. Farmer

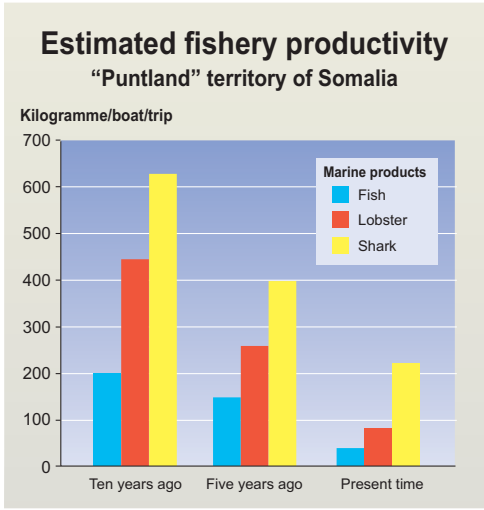
overfishing of sharks in the north-east region so, as with the lobster fishery, action should be taken to halt the overfishing and promote fisheries management in the area.

In "Puntland" at least, there has been a significant decrease in the catches of the three main fishery types in the past 10 years (FAO, 2005b). This is possibly due to the continuous and unsustainable offshore fisheries, but is also linked with the indiscriminate exploitation of lobster and shark resources by artisanal fishermen. A number of the once abundant shark species (saw, hammerhead, white and mako), have totally disappeared in some areas while the average sizes of some other shark species landed have decreased over the past five years. The same scenario has been reported to be the case for lobsters, with 80 per cent of the original stock now believed to have been lost (FAO, 2005b). Post-harvest losses of fish and shark catches along the "Puntland" coast are estimated at 60 per cent and 70 per cent, respectively.

A related threat to the coastal environment, in "Puntland" at least" is the presence of discarded lobster traps. According to a recent survey, local fishermen reported that wire lobster traps corrode easily and have an average life span of approximately 20 days, following which they are commonly dumped at sea (FAO, 2005b). Thousands of such traps can be discarded each year which may represent a potential environmental threat from heavy metals since the traps are constructed using galvanized wire mesh web and lead welding (see Figure 3).

The protracted civil strife in Somalia has disrupted all aspects of the fishing industry. The capacity to control foreign incursions into the exclusive economic zone (EEZ) of the Somali region does not exist, which leaves the door open for foreign vessels to exploit these resources. At the same time, the complete lack of any regulatory

Figure 3. Estimated average yield/boat/trip of fishermen in "Puntland" over the past 10 years



Source: FAO 2005

mechanisms or structures to prevent a crash of certain species provides an invitation for anyone to engage in what still remains a lucrative business opportunity at a small scale.

Adding to these pressures to some degree was the impact of the December 2004 tsunami along approximately 650 kilometres of the coastline, primarily in the stretch between Hafun and Garacad. Initial reports of leakage of possible toxic wastes from drums along part of this stretch of coast would appear to be unsubstantiated (see also Box 9). Waste pollution – mainly from coastal communities – however, has been cited in a number of reports (e.g. FAO, 2005a; UNDP, 1998), with wastes ranging from discarded batteries to household wastes and animal carcases. An estimated 1.5 million people live in coastal areas. Most coastal municipalities do not have capacity to handle the quantities of sewage and solid waste generated. Sewage treatment plants are few in number and are generally poorly maintained (Pilcher and Alsuhaibany, 2000) (see Box 16).

Mineral resources

Somalia's mineral sector has traditionally played only a small role in the country's overall economy – in 1988 it represented just 0.3 per cent of total GDP. While the local geology suggests the presence of valuable mineral deposits, as of 1992, however, only a few significant sites had been located. Somalia in particular has some large uranium deposits in the Galguduud and Bay regions, and in 1984 work began to develop them. Significant iron ore deposits have also been recorded in the Bay region.

Other rocks and minerals are known to exist and available for exploitation include tin in the Majiyahan-Dhalan area (south of Boosaaso-Ceelayo coastal strip), sepiolites from Ceel Bur, and quartz, granite, marble, limestone and gypsum in different parts of the country. These natural resources include primary raw materials for various kinds of industry, for example, manufacturing cement, prefabricated walls, roofing materials, floor, wall tiles and aggregates.

Existence of good petroleum indicators has been known for a while, and recent data highly encourage the exploration potential of the country (Hersi, 2000).

Box 16. Decentralization of 'fisheries enforcement' to the community level: a response to the absence of organized government

In a potentially hostile area lacking a national fisheries administration, community empowerment has filled an institutional vacuum. The driving forces behind community empowerment in fishery enforcement stem from:

- recognition of the basic property rights problem of an open access fishery and its unlikely resolution in the current socio-economic and political context; and
- the precarious state of the fisheries resources, especially lobster and shark.

Somali coastal communities have taken enforcement action against illegal fishing. Two prosecutions have been undertaken under Islamic Shari'ah law generating in excess of US$1 million which was reportedly given to the villages apprehending the offending vessels (rather than for use to increase surveillance capacity). The international publicity resulting from such prosecutions may act as a deterrent against continued illegal fishing and ensure compliance by foreign vessels, either with or without a dubious license.

Challenges facing coastal fishing communities include:

- lack of physical enforcement capacity;
- logistics to gather evidence;
- lack of procedural code for boarding and prosecutions; and
- presence of armed guards on foreign fishing vessels.

Source: UNCTAD, 1998

Biological diversity

Arid and semi-arid conditions have persisted in the Somali region throughout the long-term climatic fluctuations that have affected much of the African continent (Simonetta, 1988). As a result, this region has been an evolutionary centre of fauna and flora adapted to these conditions. Ruthless overexploitation, however, has meant that many of the country's wildlife species are now endangered or rare, while key ecosystems have been seriously degraded.

Early explorers, hunters and colonial officials travelling through Somalia during the late 1800s reported on the astonishing abundance and diversity of wildlife – Somalia at the time had a reputation of being one of the best wildlife havens in Africa. This, however, is no longer the case. Even as recently as the mid-1980s, the status of wildlife in Somalia was reported as being sparse and scattered due to a combination of livestock grazing and illegal hunting (IUCN/UNEP, 1986). Now only small remnant pockets of wildlife exist, with many species approaching extinction. Some, such as the elephant (*Loxodonta africana*), black rhino (*Diceros bicornis*) lion (*Panthera leo*) and Swayne's hartebeest (*Alcelaphus buselaphus swaynei*) have been wiped out from most of the country, while the wild ass (*Equus asinus somalicus*) – which once occurred here in their thousands, have been reduced to just a few dozen (Sommerlatte and Umar, 2000). Environmental problems such as desertification due to the loss of forests and pastures, soil erosion and the formation of sand dunes are increasingly exacerbated by drought and increased pressure from human and livestock populations.

Among the country's mammals there are 22 species of antelope, of which 14 are considered to be threatened. Seriously reduced numbers have been noted of the following species: the beisa oryx (*Oryx gazella*

beisa), formerly widespread, but now reduced by poaching to a mere 1,000-1,200; the hirola (*Beatragus hunteri*), which occurs only in the Lake Dere region along the Kenyan border; the beira (*Dorcatragus megalotis*), which is restricted to the northern mountains and whose numbers have decreased because of drought; the dibatag (*Ammodorcas clarkei*), found along the central coastal region, threatened by drought, overgrazing and poaching; Soemmerring's gazelle (*Gazella soemmerringi*) and Speke's gazelle (*Gazella spekei*), both of which are still widespread but greatly reduced in numbers; and Pelzeln's gazelle (*Gazella dorcas pelzelni*), which is found along the northern coastal zone (IUCN, 1990).

Elephants, belonging to what may be a distinct small subspecies *Loxodonta africana orleansi*, still survive in the south, but poaching is extensive and their numbers have fallen below 6,000. The black rhinoceros has been poached almost to extinction, although it might survive in the Lag Badana area at the southernmost tip of the country. The cheetah (*Acinonyx jubatus*), giraffe (*Giraffa camelopardalis*), Grevy's zebra (*Equus grevyi*) and three rare species of gerbil are also reduced to numbers considered critical. The Abyssinian genet (*Genetta abyssinica*) might occur in the north, and the rare golden-rumped elephant shrew (*Rhynchocyon chrysopygus*) might occur in coastal forest in the extreme south, but their status and conservation requirements are not known (IUCN, 1990).

Ten species of bird are threatened in Somalia, of which two are critically endangered. The Somali thrush (*Turdus ludoviciae*) occurs only in mountain-top woodlands in northern Somalia. It was considered to be locally common in 1979, most notably in Daloh Forest Reserve, but its population is known to be in decline as its habitat (juniper woodland) has been cleared. The bulo burti boubou (*Laniarius liberatus)* is known only from an individual caught in Acacia scrub in 1988, 140 km inland on the Shabeelle river in central Somalia. Although subsequent searches were carried out in 1989 and 1990 no further sightings were made. This, however,

Biodiversity in Somalia. Credit: G. Farmer

Table 4. Rare and endangered bird species

Species	Threat Category
Socotra Cormorant *Phalacrocorax nigrogularis*	Vulnerable
Lappet-faced Vulture *Torgos tracheliotus*	Vulnerable
Lesser Kestrel *Falco naumanni*	Vulnerable
Madagascar Pratincole *Glareola ocularis*	Vulnerable
Ash's Lark *Mirafra ashi*	Endangered
Archer's Lark *Heteromirafra archeri*	Vulnerable
Bulo Burti Boubou *Laniarius liberatus*	Critical
Somali Thrush *Turdus ludoviciae*	Critical
Basra Reed-warbler *Acrocephalus griseldis*	Endangered
Warsangli Linnet *Carduelis johannis*	Endangered

Source: BirdLife International

is likely to be a result of the difficulty of accessing this region due to security concerns. Any remaining population may be tiny (BirdLife International, 2004) (see Table 4).

Three endemic species are found on the coastal grass plains – the lesser hoopoe (*Alaemon hamertoni*), Obbia lark (*Calandrella obbiensis*) and Ash's lark (*Mirafra ashi*). Four endemic bird areas are recognized – the Central Somali coast, East African coastal forests, the Jubba and Shabeelle valleys and the North Somali mountains (BirdLife International, 2004). A further 24 important bird areas have also been identified.

Somalia is the most important country for bustards in the northern hemisphere, with restricted populations of Heuglin's bustard (*Neotis heuglini*), Hartlaub's bustard (*Eupodotis hartlaubi*), and the little brown bustard (*E. humilis*). Larger species, namely the Arabian bustard (*Ardeotis arabs*) and Denham's bustard (*Neotis denhami*), a declining species, are heavily hunted (IUCN, 1990).

Despite its harsh physical environment, Somalia is home to some 3,028 species of higher plants, of which 17 are known to be threatened (WRI, 2003). Somalia is considered a centre of floral endemism (White, 1983) and of the known species 700 (17 per cent) are endemic – a feature only surpassed by the South African floral region. Endangered flora include *Euphorbia cameroni* and *Whitesloanea crassa*, rare succulent scrubs found only in the northern mountains, *Wissmania carinensis*, the Bankoale palm, found in small numbers in the north-east, and *Cordeauxia edulis*, the Yaheb (*yicib*) nut bush, which survives near Adawalif. This last species is under severe threat because its highly prized edible nuts are often collected, preventing regeneration (IUCN/EC, 1993). As with the fauna, however, large concentrations of livestock together with the felling of trees for charcoal and firewood have had a profound impact on species composition, ground cover and the structure of vegetation (Sommerlatte and Umar, 2000). Grazing pressure and soil erosion are now a serious problem and, together with periodic droughts, have had a devastating effect on the vegetation and soils.

Somalia has the most extensive and least spoiled coastline in Africa. Important coral reefs, seabird colonies and turtle nesting beaches are currently unprotected. At the end of the last century there were believed to be large dugong populations and extensive seagrass beds in nearshore waters. Important seabird nesting sites include Mait island, Zeila island and islets off Mogadishu.

Lesser Hornbill in Eyl, Somalia. Credit: G. Farmer

Thousands of green turtles (*Chelonia mydas*) used to nest annually along the eastern coast (IUCN, 1990), but the status of this population is not known. Four other species of marine turtle – loggerhead (*Caretta caretta*), hawksbill (*Eretmochelys imbricata*), olive ridley (*Lepidochelys olivacea*) and leatherback (*Dermochelys coriacea*) – are known from Somali waters but there is no knowledge of these species nesting. The main threat to turtles is from opportunistic harvest of green turtles which includes direct harpooning, incidental gill net entrapment and capture of nesting females (Schleyer and Baldwin, 1999). Eggs are also collected during the southwest monsoon season occasionally by fishermen but also by nomadic herdsmen who maintain temporary shelters and animal pens on certain beaches.

Small cetaceans are abundant in the waters off Somalia. The impact of the coastal fisheries on dolphin and porpoise populations is not known, and it is unclear whether conservation action is needed (see map Somalia: Biodiversity and protected areas).

Many of these species and their habitats are threatened by drought, security problems, overgrazing, deforestation, and poaching. Other less obvious species which are also endangered can expect to receive even less attention: two of the country's 223 reptile species and three of its 331 species of fish are known to be threatened, for example (WRI, 2003). With no protected area system and woefully inadequate legislation and enforcement, over-use of natural resources continues and the country's critical sites are being impoverished rapidly. Hunting of most species of large mammal has been intense, leading to catastrophic declines in population; the long-term survival of several species seems unlikely. Somalia has ratified the CITES Convention (see Legislation), but few if any practical measures are being taken to ensure due implementation.

Source: IUCN-EEC 1992, UNHCR Somalia Atlas 2005, EC Joint Research Centre Global Land Cover 2000, UNEP-WCMC 2005

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Protected Areas

Latest reports (WRI, 2003) show that there are 14 protected areas in total, but only one exceeds 100,000 hectares. Eleven wildlife areas have been declared since 1970 but only two are thought to be functional (IUCN/UNEP, 1986). Less than one per cent of the country is included in protected areas, much of this being occupied by the Lag Badana National Park. In reality, however, there has been no formal protection offered to any of these sites since at least the early 1990s. With such an incomplete network of protected areas – terrestrial and marine – there are serious grounds for concern over the long-term prospects for biodiversity conservation and to any form on development based on sustainable use of resources.

The most important sites in need of protection are Zeila, Las Anod-Taleh-El Chebet (already proposed as a national park), Ras Hajun-Ras Gubah, El Nammure, Hobyo, Haradere-Awale, Jowhar-Warshek, Harqan-Dalandoole, and Lack Dere (also proposed for national park status) (IUCN, 1990). Two mountain sites of particular interest are Goan Libaax and the Daalo forest, the latter which has some *Juniperus* forest.

Priority wetlands in need of protection include Jowhar-Warshek, Har Yiblame, Eji-Oobale, Awdghegle-Gandershe, Arbowerow, the Boja swamps, Angole Farbiddu (which includes riverine forest) and lake Radidi (IUCN, 1990). Since Somalia is not a Party to the Ramsar Convention, no wetlands of international importance have been declared under it.

Overall, if key representative examples of this country's natural heritage are to be preserved, a massive increase in public awareness is needed, coupled with appropriate solutions being found that will enable and encourage traditional range and land management systems to be used and perhaps further refined. Rural communities especially must be involved in decisions relating to future intended development and management of any existing or intended protected area systems (see Table 5).

Hunting wild animals for meat has never been widely practised in Somalia, although certain species were hunted prior to the enactment of the 1969 Law of Fauna (Hunting) and Forest Conservation for their skins and as trophies (UNEP, 1984). During the 1960s, approximately 60,000 gazelle skins, 250,000 dik dik skins, 18,000 kg of ivory and between 3,000 and 5,000 live monkeys were exported.

Table 5. Protected areas of Somalia

Name	Type of Reserve	Size (ha)	Year Established
Bushbush	Game	334,000	1969
Geedkabehleh	Game	10,360	1969
Mandera	Game	-	1969
Mogadishu	Game	-	1969
Alifuuto (Arbowerow)	Nature	180000	-
Balcad	Nature	200	1985
Belet Wein	Partial game	-	1969
Bulo Burti	Partial game	-	1969
Jowhar	Partial game	-	1969
Oddur	Partial game	-	1969

Source: UNEP, 2003

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Godfrey Mwakikagile, KENYA: IDENTITY OF A NATION (2007)

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Chapter Five:

The People of Kenya: An Ethnic Profile

KENYA has people of all races but the vast majority of them are members of indigenous groups. They are black African.

Although there are significant numbers of Kenyans of Asian, Arab and European origin, they are vastly outnumbered by the members of black African tribes or ethnic groups.

The main non-indigenous groups are Gujaratis, Punjabis and Goans from India; Arabs mostly from Oman; and the British. Although they are not black, they are also African since Africa is their home.

Kenyan Professor Ali Mazrui classifies non-indigenous people in Africa as Africans of the soil, as opposed to black Africans whom he calls Africans of the blood.

There are basically 42 black African ethnic groups or tribes in Kenya.. But the number goes up to 49 depending on who defines them.

Some of them are related and are so close that they are not considered to be separate tribes.

All 49 are listed here in alphabetical order:

Ameru, Bajuni, Bukusu, Choyi, Digo, Duruma, Elgeyo, Embu, Giryama, Isukha, Jibana, Kalenjin, Kamba, Kambe,

Kauma, Kikuyu, Kipsigis, Kissi, Kore, Kuria, Luhya, Luo, Maasai, Maragoli, Marakwet, Marama, Miji Kenda, Nandi, Ogiek, Orma, Oromo, Pokomo, Pokot, Rabai, Rendille, Ribe, Sabaot, Samburu, Sengwer, Somali, Suba, Swahili, Tachoni, Taita, Taveta, Terik, Tugen, Turkana, Yaaku.

Together with the five non-black groups we mentioned earlier – the Gujaratis, Punjabis, Goans, Arabs, and Britons – Kenya has 53 ethnic groups.

We are going to take a closer look at some of them to get a better understanding of the ethnic composition of this East African country.

Black African ethnic groups in Kenya are divided into three linguistic categories: Bantu, Nilotic, and Cushite. The Bantu constitute the majority. They include the Kikuyu, the Kamba, and the Luhya who are also among the five largest ethnic groups in the country.

The Kikuyu, the Luhya, the Kamba, the Meru, the Embu and the Gusii (Kisii) constitute the majority of the Bantu in Kenya. And they are mostly farmers like most Bantus are. But many of them also own cattle.

The Kikuyu homeland is around Mount Kenya and it is believed they arrived in the area in the 1700s.

There are many theories concerning their origin. Some say they migrated from Mozambique; others say from Congo.

What is clear from archaelogical and linguistic evidence is that they arrived in East Africa about 2,000 years ago from West Africa, especially from the Nigeria/Cameroon border area, as did the rest of the Bantu-speaking people, and their language belongs to the Niger-Congo family.

They have interacted with their neighbours, the Maasai, for a long time. The Maasai usually raided the Kikuyu for cattle and women, and the Kikuyu fought back. But in spite of all that, the two groups built strong commercial ties through the years and their people have been

intermarrying almost from the time they first came into contact with each other in central Kenya.

Another major Bantu ethnic group, the Kamba, also has an interesting history. It is said the Kamba migrated from what is now western Tanzania, a region occupied by the Nyamwezi ethnic group, one of the largest in Tanzania; implying that they were part of the Nyamwezi or are related to them. They moved east to the Usambara Mountains in northeastern Tanzania and eventually found their way to a semi-arid region in eastern Kenya which became their new home.

Other researchers contend that the Kamba are a product of many ethnic groups who intermarried and ended up creating a new ethnic group.

Whatever the case, it is generally believed that they arrived in their present homeland east of Nairobi towards the Tsavo National Park about 200 years ago.

The Kamba today are one of the most successful groups in Kenya, and one of the most well-known in East Africa.

In the past, they had a reputation as excellent traders, carrying on trade from the coast all the way to Lake Victoria, and all the way up to Lake Turkana. They traded in ivory, honey, weapons, beer, and ornaments.

They also excelled in barter, exchanging goods for food with their neighbours: the Maasai and the Kikuyu. It was a matter of survival. They could not always produce much since their home region was arid or semi-arid land, forcing them to find food elsewhere.

And during colonial rule, the British "respected" them for their intelligence. They also had a reputation as fighters, another quality the British liked since they could use them as soldiers and as policemen. Many Kambas were conscripted into the army and fought in both world wars.

Even today, many Kambas serve in the armed forces and in law enforcement.

The Luhya are another major Bantu ethnic group in Kenya. Although successful, they have had to contend with problems of high population density through the years in a region where there is not enough fertile land for all the people.

The Meru and the Embu are the other Bantu ethnic groups in Kenya. They are related to the Kikuyu and are essentially farmers. They grow coffee, tea, maize, potatoes and pyrethrum as well as other crops. The Embu are also well-known for their honey and for dancing on stilts.

Then there are the Nilotic-speaking people as a major linguistic category in Kenya besides the Bantu.

The Nilotic group includes the Luo, the third largest ethnic group in the country. Other Nilotic-speaking groups include the Maasai, the Turkana, the Samburu, and the Kalenjin.

Originally, the Luo were pastoralists. But they changed their way of life when rinderpest killed their cows and they became farmers and fishermen. Their involvement in fishing was facilitated by their geographical proximity to Lake Victoria in their new home region after they migrated from Sudan via Uganda. Some of them came straight from Sudan.

Like the Kikuyu, the Luo also played a major role in the struggle for independence. Some of the most prominent Luo politicians of national and international statures include former Vice President Oginga Odinga, Minister of Economic Planning Tom Mboya, Foreign Affairs Minister Dr. Robert Ouko, and independence leader Achieng Oneko.

And the most prominent Luo outside Kenya and Africa is United States Senator Barack Obama of Illinois. His father, also named Barack Obama after whom the son was named, earned a Ph.D. in economic from Harvard University and returned to Kenya where he served under President Jomo Kenyatta. He died in a car accident in Kenya in 1980.

He was one of the hundreds of Kenyan students who went to school in the United States on scholarships on the famous Tom Mboya Airlift in 1959.

Another Nilotic group, the Kalenjin, has an interesting history in terms of identity. The Kalenjins are actually a collection of related ethnic groups who speak the same language. They include the Kipsigis, renowned worldwide as long-distance runners; the Nandi, the Tugen and the Elyogo. President Daniel arap Moi was a Tugen.

The Kalenjin were once mainly pastoralists like the vast majority of the Nilotic-speaking people. And many of them still are today. But they are also engaged in agriculture in their fertile home region, the Rift Valley Province.

Besides the Luo, the most well-known Nilotic-speaking Kenyans are the Maasai, followed by the Turkana and the Samburu. The Maasai, who also came from Sudan like other Nilotic-speaking peoples in Kenya, Tanzania and Uganda, are a small minority in both Kenya and Tanzania but are known worldwide because of their lifestyle and reputation as warriors.

They are also fiercely proud of their culture and way of life and have strongly resisted external pressure – including pressure from some national leaders – to change and adapt to "modern" ways, which is a euphemism for the "Western" way of life.

They own not only cows but also goats. But cows are their most important possession in their social, political and economic life.

There are two ethnic groups closely related to the Maasai: the Samburu and Turkana.

The traditional homeland of the Samburu is around Maralal in northern-central Kenya, an arid region. Like the Maasai, they also have the *morani*, the young warriors; also like the Maasai, they prefer red blankets and use red ochre to paint their heads.

The women wear beads. And like the Maasai, they also

own cows and goats, with the cows being their most important possession and the centre of their social, political and economic life.

Unlike some Nilotic-speaking people who have adopted other ways of life to adjust to new realities, the Samburu have remained pastoralist, preferring a nomadic way of life. When pasture becomes scarce in their arid and semi-arid homeland, they pack up and go, taking their *manyata* (portable houses and other essential items) on their camels to find better pastures. This is similar to what Somalis do. But they are not related. The Somali are Cushitic.

The other major Nilotic-speaking group is the Turkana. The Turkana have a reputation as fierce fighters, just like their kith-and-kin the Maasai and the Samburu. They own other animals besides cows. They have goats, sheep, and camels, but cow ownership is still the most important aspect of their social, political and economic life. They live in an arid region near Lake Turkana.

And all three – the Maasai, the Samburu and the Turkana – are cattle rustlers. The government has not been able to stop them and law enforcement officials usually leave them alone.

Disputes among them are settled by their elders. They were colonised like the rest of the Africans but the colonial rulers failed to conquer them in one fundamental respect: their way of life which has remained intact for hundreds of years.

The other major linguistic group is the Cushitic. The Cushites are a minority in Kenya and live mostly in the North Eastern Province which borders Somalia and Ethiopia. They include the Somali, the Boran, the El Molo, the Burji Dassenich, the Gabbra, the Orma, the Sakuye, the Boni, the Wata, the Yaaka, the Daholo, the Rendille, and the Galla.

The Somali and the Galla are the most well-known. But it is the Somali who are the dominant group in the region.

They own cattle, goats, sheep, and camels in the arid and inhospitable region of northern Kenya and lead a nomadic way of life in search of water and pasture for their herds. They also have a reputation as fierce fighters.

Another group is the Swahili. They are some of the most well-known people in East Africa, especially in Kenya and Tanzania, but they don't constitute an ethnic group the way the Kikuyu or the Luo do. They are essentially a linguistic and cultural group, and a product of many tribes and non-indigenous groups especially the Arabs. They live mostly along the coast.

Also most of the Arabs live along the coast. They are one of the three main non-indigenous groups in Kenya, the other ones being Asian and British.

Most Arabs speak Swahili and see themselves as Africans, not as citizens of the Arab world. Most Arabs in Kenya are Kenyan citizens.

There are also many Arabs in Kenya who are not Kenyans. They come mainly from Yemen and are small traders. They are commonly known as *Washihiri* or simply *Shihiri*, but mostly as *Washihiri* in Kiswahili; a term also applied to them in neighbouring Tanzania.

The British are also a significant minority and Kenya has one of the largest European communities in Africa. Kenyans of British descent include members of the aristocracy. And many of them continue to have great influence in the country especially among the elite including national leaders.

Kenyans of Asian descent, commonly known as Indians, are the most prosperous group in Kenya – and the rest of East Africa – besides the British and other whites who have always been on top.

The term "Indian" is collectively used to identify Pakistanis as well, although the majority of the Asians in Kenya came from India.

India and Pakistan were one country until 1947 and most of the immigrants in East Africa today immigrated to

the region before Indian independence in 1947 when the sub-continent was split into India and Pakistan.

So, in a way, the term "Indian" is the appropriate designation even for those who came from Pakistan. They all came from the Indian sub-continent as a geographical entity.

The prosperity of Indians in Kenya and other parts of Africa has been a source of resentment towards them among many black Africans. But the resentment is also attributed to the mistreatment of the indigenous people whom the majority of Indians see as inferior to them.

It is raw-naked racism even if one may argue that they are clannish more than anything else. Indians are both clannish and racist; a fact acknowledged even by some Indians themselves who admit that black Africans are exploited and mistreated by them.

And social interaction between the two as equals is almost totally out of the question. It is also extremely rare for black Africans and Indians to intermarry. Where such unions have taken place, mostly illicit relationships, it has been between Indian men and black African women. Black men dating Indian girls or women, let alone marrying them, is considered taboo by most Indians, although there have been a number cases where this taboo has been broken especially in recent times.

Marriage within the "clan," that is, within the Indian or Asian community as it is also called, is strictly enforced almost with religious zeal and devotion. And anyone who defies that risks ostracisation.

However, many Indians are tolerant of marriage with whites – and even accept it whether or not it involves Indian women and white men. The biggest concern has been about non-Indians, especially blacks, dating or marrying Indian women.

The willingness of Indians to accept unions between whites and Indians has only reinforced the belief and vindicated the claim of those who say Asians are racist

towards blacks more than anybody else.

In spite of the poor race relations between Indians and black Africans in Kenya and other African countries, there is no question that the vast majority of Indians consider Africa to be home.

This was clearly demonstrated in the late sixties and in the seventies when many Indians left Tanzania and Kenya for India with the intention of living there permanently. They said they were returning to their homeland. And they did in large numbers.

But they couldn't fit in and returned to East Africa despite the fact that India was their ancestral homeland. That is because they were African more than anything else. India was the home of their ancestors, not theirs. They were born and brought up in East Africa, as were their parents and grandparents in many cases, and were therefore East Africans, not Indians of India.

After looking at the major ethnic and linguistic groups in the country, we now turn our attention to some of the other groups which are numerically smaller but no less important as an integral part of Kenya.

The Bajuni are among those groups. They are a small ethnic group in the Coast Province. They live mostly in northern Kenya. Some of them also live in southern Somalia. And they are mostly fishermen and sailors. But they are also involved in other economic activities including metalwork. They speak a language which is basically Kiswahili, or Swahili, although they call their version Kibajuni.

The word Kibajuni is also a Kiswahili term. Ki- is a prefix in Kiswahili applied to all languages. Thus, the Kikuyu speak Kikuyu, the Kamba, Kikamba, and the Luo, Kiluo. It goes on and on.

The Bajuni call themselves and are known as Wabajuni; which is another Swahili or Kiswahili term. Wa- is a prefix denoting collective identity. The Kikuyu are called Wakikuyu in Kiswahili; the Meru are called

Wameru; the Somali are called Wasomali; and Swahili are called Waswahili.

Then there are the Bukusu among the smaller groups. They don't constitute a distinct ethnic entity but are a sub-ethnic group of the Luhya. There are 17 such sub-groups which collectively constitute the Luhya ethnic group.

The Bukusu are therefore an example of many other groups in Kenya which are not considered by some people to be tribes or separate ethnic groups but sub-tribes. But they are the largest sub-group in the Luhya ethnic entity which some people call the Luhya "nation."

The Luhya is called a "nation" - mostly by the Luhya themselves - mainly because of its size; the same thing which could be applied to other large ethnic groups such as the Kikuyu, the Luo and the Kamba.

The Nandi, although a sub-group of the Kalenjin, are considered to be a separate tribe just like the other Kalenjin sub-groups – the Turkana and the Kipsigis. They live mostly in the highland areas of the Nandi Hills in the Rift Valley Province and have a reputation as fierce fighters like their brethren, the other Kalenjins. They are farmers and cattle-herders.

The Pokot are also Kalenjin but a distinct group. They live in West Pokot District and Baringo District. They are found in eastern Uganda in Karamoja District. They also have a reputation as fierce fighters as most Nilotic-speaking tribes do. They are both farmers and pastoralists, usually depending on where they live. The Hill Pokot live in the highlands and are farmers; while the Plains Pokot in the dry and infertile plains own livestock – cattle, sheep, and goats.

The Gusii, also known as Kisii, are Bantu and live in Kisii (Gusii) District in Nyanza Province in western Kenya whose dominant group is the Nilotic Luo.

They are isolated as a Bantu group in the sense that they are surrounded by Nilotic-speaking tribes – the Luo, the Maasai, the Kipsigis, and the Nandi – who

traditionally have been hostile towards them. As a result, they became tough fighters themselves in order to be able to defend themselves against the Nilotic cattle raiders.

The Kisii live in a very fertile hilly district where they grow a lot of tea, coffee, bananas and other crops. But there is shortage of land and many Kisii have migrated to other parts of Kenya.

The Kisii are also one of the largest ethnic groups in Kenya. They rank fifth after the Kamba who are preceded by the Kikuyu, the Luhya, and the Luo.

All the largest ethnic groups in Kenya are Bantu – Kikuyu, Luhya, Kamba, and Kisii – except the Luo who rank third; they used to be second until they were surpassed by the Luhya.

The Kuria straddle the Kenyan-Tanzanian border close to Lake Victoria. They are found in Mara Region in northern Tanzania – which is also the home region of former Tanzanian President Julius Nyerere who was a member of the Zanaki tribe in Musoma District, Mara Region – and in Nyanza Province.

The Digo are another ethnic group found in both Kenya and Tanzania. They are a Bantu group and live along the coast in both countries between Mombasa in southern Kenya and Tanga in northern Tanzania. The majority of them live in Kenya.

The Orma live in southeastern Kenya mostly along the lower Tana River. They are also called Galla, a term commonly used in Ethiopia to identify the same ethnic group.

They are semi-nomadic and move from their southeastern desert homes only during the rainy season when they go inland in search of pastures for their livestock.

The Oromo are found mostly in Ethiopia but also in Kenya and Somalia in smaller numbers. In fact, they are the largest ethnic group in Ethiopia. They are Cushitic.

They are also one of the largest Cushitic-speaking

ethnic groups in Eastern and Northeastern Africa which includes the Horn of Africa. And their physical features, and language as well as culture, clearly distinguishes them from Bantu and Nilotic groups in Kenya, pointing to their "origin" in the Horn of Africa. The Orma or Galla are related to them.

The Pokomo are a Bantu group who live along the Tana River in the Tana River District and are mostly farmers.

The Rendille are one of the groups which are considered to be on the verge of extinction unless something is done to save them from this catastrophe.

They are nomadic pastoralists and live in the Kaisut Desert. in Northern Kenya where they roam on their camels with their livestock which is their main source of sustenance. Meat and milk are a main part of their diet.

Another group that is considered to be a part of another tribe yet is distinct from that tribe and has its own identity is the Samburu whom we earlier briefly looked at.

They are related to the Maasai. And they call themselves Lokop or Loikop. And they speak the Samburu language, not Maasai.

But like the Maasai, they are part of the Maa-speaking people. And about 95 per cent of the words of both languages – Samburu and Maasai – are the same, showing that they are indeed basically the same people.

In fact, even the name Samburu is of Maasai origin and comes from the word *samburi* which is a leather bag used by the Samburu to carry a variety of items. But, for whatever reason, they acquired their own ethnic identity. Some people have attributed this to the colonial rulers who sometimes divided people to "create" different ethnic groups for administrative purposes and to facilitate colonial rule.

They are also said to have multiple origins, although all related. Some Samburu are descended from the Maasai, and others from the Turkana, Borana (also called Boran),

and Rendille. And all these are Nilotic groups.

Although they own mainly cattle, they also have sheep, goats and camels as an important part of their livestock in an arid region which forces them to have a large number of animals many of which don't survive because of the harsh climate.

Samburu District was once a large part of the Northern Frontier District (NFD) - as the region was called before and a few years after independence - which is now the North Eastern Province. It was isolated for all practical purposes and only government officials were allowed to enter the region.

It was closed to foreigners and one had to get special permission to enter the Northern Frontier District. Even today, Samburu District is a remote, harsh area.

Like the Maasai, the Samburu also came from Sudan. And they are more conservative – much more traditional in life and attitude – than their cousins the Maasai; which is quite a distinction since the Maasai themselves have quite a reputation for resisting alien influences. And they are equally proud of such stiff resistance.

Another small tribe is the Taveta. The Taveta are a Bantu ethnic group who live in south-central Kenya. They are called Wataveta in Kiswahili, and call themselves that, and their language – also in Kiswahili – is known as Kitaveta.

There are also elements of other tribes in the Tavetan population, especially the Taita, the Kamba, the Maasai, and the Chaga. The Chaga are a tribe in northeastern Tanzania in Kilimanjaro Region on the southern and southeastern slopes of Mount Kilimanjaro and throughout Moshi District.

The Taveta live mostly between Tsavo National Park and the Tanzanian border and are mostly subsistence farmers. Some of them also work on local sisal plantations and are engaged in other economic activities.

Then there are the Yaaku. They are of Cushitic origin

but gave up their original language and now speak a Maasai variant known as Mukogodo-Maasai. They were assimilated by the Maasai but some words from their old Yaaku language are a part of their vocabulary today.

They live in the Mukogodo forest west of Mount Kenya, which is a division of the Laikipia District in the Rift Valley Province, and were once hunter-gatherers and bee-keepers. They eventually adopted the Maasai pastoralist culture, although some of them are still bee-keepers.

They now consider themselves to be a sub-tribe of the Maasai, and are indeed Maasai in terms of language and culture. All the old people who spoke the original Yaaku language are dead.

Tragically, the Yaaku are some of the people who have lost their original language and culture due to assimilation, a fate that has befallen other indigenous groups in different parts of the world with dire consequences: loss of identity, turning them into carbon copies, poor carbon copies, of other people.

It is a tragic loss.

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E. Milano and I. Papanicolopulu, "State Responsibility in Disputed Areas on Land and at Sea", *Zeitschrift für ausländisches öffentliches Recht und Völkerrecht (ZaöRV)*, Vol. 71 (2011)

State Responsibility in Disputed Areas on Land and at Sea

Enrico Milano[*]/*Irini Papanicolopulu*[**]

Abstract

Departing from the observation that traditionally the law of State responsibility has hardly interacted with the law of territory, the article examines how these two fields of international law may relate in the case of State action in contested areas, be they terrestrial or marine. Assessing recent international practice, particularly the case law of the International Court of Justice and arbitral tribunals, and differentiating between land and maritime

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disputes, it identifies the primary obligations incumbent upon States when acting in contested areas – relating to State sovereignty and sovereign rights, *ius ad bellum*, *ius in bello*, procedural obligations pending the final settlement of the dispute – and it examines the consequences of the breach of those primary norms, in terms of secondary obligations, as well as third States' duties and obligations. The legal framework specifically created for disputed maritime areas by Art. 74 para. 3 United Nations Convention on the Law of the Sea (UNCLOS) and Art. 83 para. 3 UNCLOS, including its implications for land disputes, is specifically analysed. The authors submit that, at a time of increasingly pro-active policies and robust actions taken by States in contested areas, more attention should be devoted to the extent to which the law of State responsibility, especially with regard to relevant forms of reparation, has to adapt to the content and scope of primary norms applicable to that specific context.

I. Introduction

It is undisputed that, according to well-established principles and norms of international law, a State exercises sovereignty over its land territory and its territorial sea and sovereign rights and jurisdiction in adjacent maritime zones. Sovereignty involves the possibility of acting upon a territory and of excluding other States from acting thereupon. Sovereign rights at sea entail exclusiveness as to the exploration and exploitation of resources, thereby preventing other States from exercising such activities (though not from the maritime space where such activities take place). Consequently, whenever a State acts on the territory or in the territorial sea of another State without the latter's permission, it is in breach of the latter's territorial sovereignty. In the same way, whenever a State engages in activities relating to the resources of another State or in other activities that fall under the latter's exclusive rights or jurisdiction in the latter's maritime zones, it is in breach of its exclusive rights. This necessarily entails the former's international responsibility and a duty to provide full reparation for the injury caused.

Traditionally, however, the law of territory (we use here the term in a broad sense, comprising not only land and sea areas subject to the sovereignty of a State, but also maritime areas subject to the jurisdiction of a State) and the law of State responsibility have hardly interacted. Three circumstances seem to have determined such an "uncosy relationship" between the two bodies of law. Firstly, the settlement of boundary disputes normally requires the drawing of a boundary or a line of delimitation,

whether effected through diplomatic means or through judicial means. Claims of State responsibility will be considered in the ancillary at best, at worst an impediment to the settlement of the dispute.[1] Secondly, most boundary disputes on land derive from the lack of demarcation and from the diverging views on the interpretation of an existing boundary. An *ex post facto* characterisation of a territorial situation as "adverse occupation" will not automatically lead to a determination of State responsibility for wrongful occupation or for acts related to the occupation prohibited under international law. Primary norms protecting territorial sovereignty in the context of territorial disputes are arguably based on a standard of due diligence; that, in turn, renders disputes over territory less amenable to the application of standard forms of reparation. Thirdly, with regard to delimitation disputes at sea, the question is even more intricate. Most of the times, delimitation with regard to maritime zones by the parties or by a judicial body will not be simply declaratory of an existing boundary, but it will draw that boundary "from scratch". Till their delimitation, disputed sea ar-

[1] It is not to be wondered at that although nineteen cases concerning maritime delimitation have been decided by international judges, in only two cases the parties have raised issues of responsibility; see *Land and Maritime Boundary between Cameroon and Nigeria*, Judgement of 10.10.2002, ICJ Reports 2002, 303 (*Cameroon/Nigeria* Judgement), and *Guyana and Suriname*, Award of 17.9.2007, 47 ILM 166 (2008) (*Guyana/Suriname* Award); and in the latter the judge has only decided on the merits. Numbers with regard to disputes on land are equally striking: if we take the ICJ case law, eighteen cases concerning territorial disputes have been brought before the Court; in three cases only, *Cameroon/Nigeria, Nicaragua/Colombia* and *Costa Rica/Nicaragua* issues of State responsibility have been raised by the applicants. In *Cameroon/Nigeria*, the claim has been left unanswered by the judges (see below), in *Nicaragua/Colombia* the Judgement on preliminary objections has upheld Colombia's objections to the effect that the dispute over the Islands of San Andres and Providencia, in respect of which Colombia had reserved its right to seek reparation, would fall outside the scope of the Court's jurisdiction; see *Territorial and Maritime Dispute*, Judgement of 13.12.2007, ICJ Reports 2007, 832 (*Nicaragua/Colombia* Judgement). In the recent dispute between Costa Rica and Nicaragua over the wetland of the Isla Portillos (listed by Costa Rica under the Ramsar Convention's List of Wetlands of International Importance) and the activities conducted by Nicaragua in the area, Costa Rica has requested the Court to determine the reparation which must be made by Nicaragua for breaches of its territorial integrity and of a number of international instruments relating to territorial delimitation between the two Sates; see *Certain Activities Carried Out by Nicaragua in the Border Area*, Application Instituting Proceedings, 18.11.2010, para. 9, http://www.icj-cij.org. With regard to the activities of the Permanent Court of International Justice during the inter-war period, in 1932 in the dispute between Denmark and Norway concerning the status of South-Eastern Greenland, Denmark, in its application, reserved the right to seek reparation for Norway's violation of the status of South-Eastern Greenland (*Legal Status of the South-Eastern Territory of Greenland*, Application Instituting Proceedings, 18.7.1932, PCIJ Series C 1933, no. 169, 12 et seq.). The case was discontinued the year after. In all these cases, the application was brought unilaterally under an optional clause declaration in accordance with Art. 36 para. 2 Statute of the International Court of Justice.

eas might be considered, up to a certain extent,[2] as belonging to either of the parties to the dispute, without there being one with a definitive claim. In such a legal context, it is even harder to substantiate a claim of State responsibility for acts prohibited by international law. On the other hand, unlike for territorial disputes on land, the United Nations Convention on the Law of the Sea provides some guidance through Art. 74 para. 3 UNCLOS and Art. 83 para. 3 UNCLOS concerning the rules regulating States' conduct pending a final delimitation agreement on the exclusive economic zone and on the continental shelf respectively.

Yet, in the last decade, judicial litigation in at least three cases, namely *Cameroon/Nigeria*, *Eritrea/Ethiopia*[3] and *Guyana/Suriname*, has shown that claims of State responsibility may be raised, that the interplay between the law of State responsibility and the rules on contested territory and maritime areas is far from unproblematic and that a consistent and thorough elaboration by international tribunals, together with further scholarly analysis, is especially due. The question does not affect international judicial bodies only, in that they are the actors most likely to have to consider and make determinations with regard to claims of State responsibility in the context of territorial or delimitation disputes. It is also of great import for policy makers, diplomats and private operators, as in many parts of the world interest for contested areas, both on land and at sea, is on the increase as a result of a number of factors, including: a) the global economic crisis and the process of gradual exhaustion of resources in traditional gas and oil fields, hence the need to explore and exploit new fields, including in the continental shelf beyond 200 n.m., even where legal title is contested;[4] b) the

[2] This extent is determined by the concept of "reasonable claim" discussed below.

[3] See the following decisions by the Eritrea/Ethiopia Claims Commission: *Central Front*, Ethiopia's claim no. 2, Partial Award of 28.4.2004, 43 ILM 1275 (2004); *Jus ad Bellum,* Ethiopia's Claims no. 1-8, Partial Award of 19.12.2005, 45 ILM 430 (2006); *Guidance Regarding Jus ad Bellum Liability*, Decision no. 7 of 27.7.2007, 46 ILM 1121 (2007); *Ethiopia's Damages Claims*, Final Award of 17.8.2009, 49 ILM 177 (2010).

[4] E.g. the dispute over the Spratly Islands and related sea areas involving a considerable number of south Asian countries, see *C. Schofield/I. Storey*, The South China Sea Dispute: Increasing Stakes and Rising Tensions, 2009, http://www.jamestown.org; the dispute between Bangladesh and India and Myanmar, that has resulted in the submission to the International Tribunal on the Law of the Sea and the constitution of an arbitral tribunal; the continuing tensions over the exploitation of natural resources in the Timor Sea, see *N. S. M. Antunes*, Spatial Allocation of Continental Shelf Rights in the Timor Sea, Centre for Energy, Petroleum and Mineral Law and Policy 13 (2003), Online Journal, Art. 13, http://www.dundee.ac.uk; *C. Schofield*, Minding the Gap: The Australia-East Timor Treaty on Certain Maritime Arrangements in the Timor Sea (CMATS), IJMCL 22 (2007), 189 et seq.; the recent "flare-up" in the dispute between the UK and Argentina over the exploitation of natural resources in the continental shelf off the Falkland/Malvinas Islands. Numerous disputes relate to areas of conti-

threat of international terrorism and piracy, leading States to take robust enforcement measures even in areas where previously they were hesitant to affirm their jurisdiction;[5] c) the great emphasis, especially in richer countries, on the control of illegal immigration fluxes, again leading them to take enforcement measures in disputed areas.[6] The legal questions raised by these phenomena are manifold, complex and they invest different areas of domestic and international law. In terms of international law, they relate to the precise identification of the primary obligations incumbent upon States when acting in contested areas; they require a working distinction between disputed areas on land and disputed areas at sea, as the law of the sea is codified in UNCLOS; they impose the determination of a threshold beyond which legitimate manifestations of claim may result in an infringement of the counterpart's right; and they must consider the extent to which the law of State responsibility, especially with regard to relevant forms of reparation, has to adapt to the content and scope of primary norms applicable to that specific context.

The present article endeavours to address these questions. It examines the relevant legal principles concerning the application of the law of State responsibility to territorial disputes both on land and at sea, that is disputes involving two or more States' competing claims over land territory and/or sea areas. It is divided in three sections. In the first section, it identifies the relevant primary rules applicable in the context of territorial and boundary disputes on land and the consequences deriving from breaches thereof, with reference to the practice of States and international organisations and to relevant case law. The same methodology is adopted in the second section, yet looking at the context of delimitation disputes at sea. The commonalities and differences in terms of applicable primary rules and how the application of these rules may affect determinations of State responsibility and consequent reparation in each of the two territorial contexts are brought to the fore. In the third section, the article examines the position of third parties with regard to disputed areas on land and at sea. Finally, an overall appraisal of relevant State practice, applicable rules and case law is made with a view

nental shelf beyond 200 n.m. and have impacted the work of the Commission on the Limits of the Continental Shelf (CLCS); see *A. Oude Elferink/C. Johnson*, Outer Limits of the Continental Shelf and "Disputed Areas": State Practice concerning Article 76(10) of the LOS Convention, IJMCL 21 (2006), 461 et seq.

[5] See *J. Bayoria*, The Troubled Afghan-Pakistani Border, Council on Foreign Relations, 2009, http://www.cfr.org.

[6] See *I. Gonzales Garcia*, El acuerdo España-Marruecos de readmision de immigrantes y su problematica applicacion: les avalanches de Ceuta y Melilla, Anuario español de derecho internacional 22 (2006), 255 et seq.

to highlighting similarities and differences between the two contexts and to identifying existing gaps in the understanding of this area of international law.

II. Territorial and Boundary Disputes on Land

As mentioned, issues of State responsibility have hardly arisen in the context of boundary or territorial dispute settlements on land, which makes a reading of the interplay between the law of territory and the law of State responsibility particularly complex. The only two cases in which claims related to State responsibility have been considered by international judicial bodies in that context are quite recent – we are referring to the 2002 Judgment of the International Court of Justice (ICJ) in the *Cameroon/Nigeria* territorial dispute and to some awards of the Eritrea/Ethiopia Claims Commission – but they are not free from ambiguities in their application of the law of State responsibility. State practice is not of much help either. Diplomatic means of dispute settlement normally involve a determination or demarcation of the boundary and the withdrawal of any military presence or civilian administration established by the "adverse occupant": issues of State responsibility are left aside for the sake of a speedy implementation of the settlement.

As anticipated, the first task we have endeavoured to accomplish is that of identifying the most important primary rules regulating the actions of States, how they operate in the context of territorial disputes and the legal consequences deriving from breaches thereof. We have identified four sets of relevant primary rules, whose relevance and practical operation in the context of territorial disputes are worth attention.

1. Territorial Sovereignty of States

The first set of rules relates to the protection of the State's territorial sovereignty, generally put, the right that every State enjoys to freely act upon its land territory and to exclude others from doing so. It is telling that among the examples of continuing wrongful acts cited by the International Law Commission (ILC), we may also find the "unlawful occupation of the

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BY

JAMES CRAWFORD, SC, FBA

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MARITIME DELIMITATION AND ASSOCIATED QUESTIONS

Coram et judice in alto mare sumus in manu Dei.

1. INTRODUCTION[1]

The rules of entitlement to maritime zones are set out in chapter 11. But a coastal state may be so located vis-à-vis its neighbours that its potential zones overlap considerably—what may be termed 'overlapping potential entitlement'. In fact there is no coastal state in the world that does not have an overlapping maritime zone with at least one other state (see Figure 12.1). There is also a question of entitlement vis-à-vis the high seas and its seabed, an effective delimitation between the coastal states severally and the international public domain or 'global commons', a commons until recently in sharp retreat.

Most maritime boundaries are determined by agreement and recorded in a treaty.[2] Many remain undelimited. A significant number are disputed.[3] Resolving such disputes has become an important task for the International Court and, to a lesser extent, other tribunals.[4] A great variety of geographical situations is encompassed, from

[1] Generally: O'Connell, 2 *The International Law of the Sea* (1984) 684–732; Jagota, *Maritime Boundary* (1985); Kittichaisaree, *The Law of the Sea and Maritime Delimitation in South-East Asia* (1987) 57–119; Johnston & Saunders (eds), *Ocean Boundary Making* (1988); Weil, *The Law of Maritime Delimitation* (1989); Evans, *Relevant Circumstances and Maritime Delimitation* (1989); Evans (1991) 40 *ICLQ* 1; Churchill & Lowe, *The Law of the Sea* (3rd edn, 1999) ch 10; Antunes, *Towards the Conceptualisation of Maritime Delimitation* (2003); Lagoni & Vignes (eds), *Maritime Delimitation* (2006); Tanaka, *Predictability and Flexibility in the Law of Maritime Delimitation* (2006); Rothwell & Stephens, *The International Law of the Sea* (2010) ch 16; Scovazzi, 'Maritime Delimitation Cases before International Courts and Tribunals' (2008) *MPEPIL*.

[2] For a partial collection: www.un.org/Depts/los/LEGISLATIONANDTREATIES/regionslist.htm.

[3] Including, perhaps surprisingly, the maritime boundaries between Canada and the US: McDorman, *Salt Water Neighbours* (2009).

[4] Since the first decision in 1969, 18 cases out of 87 on the Court's docket (including cases later consolidated) have concerned either maritime delimitation or applications for the reconsideration of earlier

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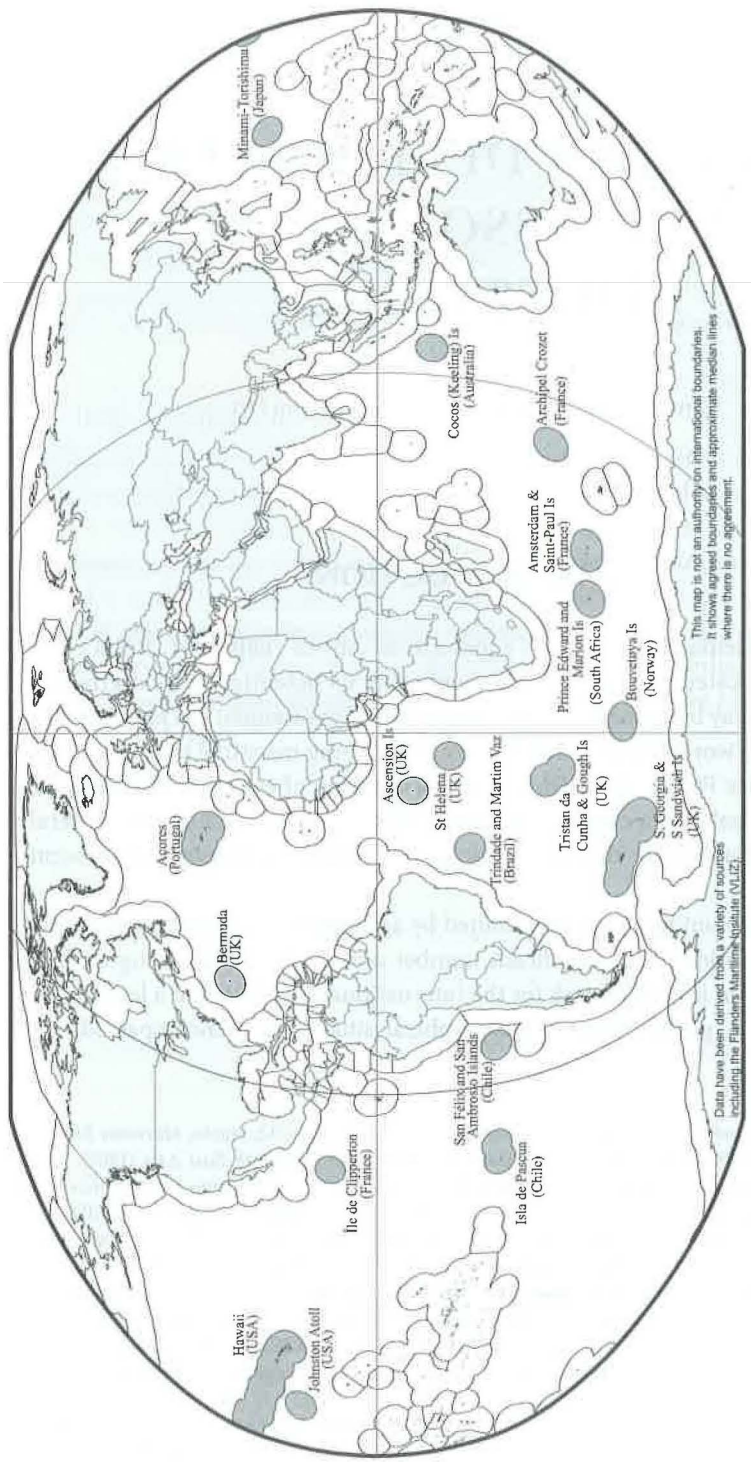

Map showing 200m maritime zones and associated boundaries.
Highlighted areas are those islands without overlapping zones; all of which are dependencies.

Figure 12.1 Global Maritime Zones

Source: Dr Robin Cleverly, Head, Law of the Sea, UK Hydrographic Office, Taunton

long-coastline adjacent states crowded together on a concave coastline[5] to small islands facing out into the open ocean.[6] Yet courts and tribunals are expected to decide on maritime delimitation in a principled way, without recasting geography yet still achieving an equitable result. The consequence has been a considerable test of judicial technique—or according to some, a demonstration of its failure.

2. TERRITORIAL SEA DELIMITATION BETWEEN OPPOSITE OR ADJACENT STATES[7]

Delimitation of territorial seas between states opposite or adjacent to each other is primarily governed by Article 15 of the UN Convention on the Law of the Sea (UNCLOS),[8] which is virtually identical to Article 12(1) of the Geneva Convention on the Territorial Sea (GCTS)[9] and is considered reflective of customary international law.[10] Article 15 provides:

> Where the coasts of two States are opposite or adjacent to each other, neither of the two States is entitled, failing agreement between them to the contrary, to extend its territorial sea beyond the median line every point of which is equidistant from the nearest points on the baselines from which the breadth of the territorial seas of each of the two States is measured. The above provision does not apply, however, where it is necessary by reason of historic title or other special circumstances to delimit the territorial seas of the two States in a way which is at variance therewith.

Article 15 stipulates primacy of agreement, and failing that, application of the principle of equidistance. Departure from the equidistance principle is possible only where necessary by reason of historic title or other 'special circumstances'.[11] Thus a presumption of equidistance exists in the case of the territorial sea, justified by the comparatively small distances involved.

decisions on maritime delimitation. A further four cases have concerned related questions of sovereignty over islands in overlapping maritime zones or boundaries lying along rivers.

[5] E.g. *North Sea Continental Shelf (Federal Republic of Germany/Netherlands; Federal Republic of Germany/Denmark)*, ICJ Reports 1969 p 3; *Guyana v Suriname* (2007) 139 ILR 566.

[6] E.g. *Barbados v Trinidad and Tobago* (2006) 139 ILR 449.

[7] Generally: Arnaut (2002) 8 *OCLJ* 21; Shi (2010) 9 *Chin JIL* 271, 279–81.

[8] 10 December 1982, 1833 UNTS.

[9] 29 April 1958, 516 UNTS 205.

[10] *Maritime Delimitation and Territorial Questions between Qatar and Bahrain (Qatar v Bahrain)*, ICJ Reports 2001 p 40, 93–4.

[11] As to what may be considered 'special circumstances', there is no closed list: *Continental Shelf (Libya/Malta)*, ICJ Reports 1985 p 13, 40; *Guyana v Suriname* (2007) 139 ILR 566, 650–1. On occasion, a tribunal may need to have recourse to the ILC commentary to the 1956 draft articles to determine the meaning of the term: e.g. *Guyana v Suriname* (2007) 139 ILR 566, 650; *Territorial and Maritime Dispute between Nicaragua and Honduras in the Caribbean Sea (Nicaragua v Honduras)*, ICJ Reports 2007 p 659, 744. Also: Rothwell & Stephens (2010) 400.

Given the institutional age of the territorial sea, many of the disputes surrounding its application have been resolved. Major cases have included *Qatar v Bahrain*,[12] *Caribbean Sea*,[13] *Guyana v Suriname*,[14] *Eritrea v Yemen*,[15] and *Bangladesh/Myanmar*[16] but several decisions were handed down pre-UNCLOS, notably the *Banks of Grisbadarna* between Norway and Sweden[17] and the *St Pierre and Miquelon* arbitration between France and Canada.[18] Following the *Qatar v Bahrain* and *Caribbean Sea* maritime delimitations, a methodology[19] has developed; in *Caribbean Sea* the Court considered the application of the following process in the context of an UNCLOS Article 15 territorial sea boundary delimitation:

(1) Consideration should first be given to the drawing of a provisional line of equidistance.[20]

(2) But the provisional equidistance line may be abandoned due to special circumstances.[21]

(3) The tribunal in question may then consider its own means of delimitation, or adopt those proposed by the parties.[22]

(4) At all stages, the tribunal will need to take into account relevant coasts, including the geography of the immediate coastline, the delimitation of the territorial sea of adjacent states and geomorphological features of the area adjacent to the endpoint of a land boundary.[23]

[12] ICJ Reports 2001 p 40.

[13] ICJ Reports 2007 p 659.

[14] (2007) 139 ILR 566.

[15] *Eritrea v Yemen (Phase Two)* (1999) 119 ILR 417.

[16] *Dispute concerning Delimitation of the Maritime Boundary between Bangladesh and Myanmar in the Bay of Bengal (Bangladesh/Myanmar)*, Judgment of 14 March 2012, ITLOS Case No 16. Further; Churchill (2012) 1 *CJICL* 137.

[17] (1909) 11 RIAA 147.

[18] *Delimitation of Maritime Areas between Canada and the French Republic (St Pierre and Miquelon)* (1992) 95 ILR 645 (though in that case, the parties continued to update their positions based on developments occurring at UNCLOS III).

[19] In the context of the territorial sea, boundaries are often delimited within the context of a single determination encompassing both the EEZ and related continental shelf areas: e.g. *Guyana v Suriname* (2007) 139 ILR 566, where an UNCLOS Annex VII tribunal first delimited the territorial sea, followed by the continental shelf and the EEZ.

[20] *Caribbean Sea*, ICJ Reports 2007 p 659, 740.

[21] ICJ Reports 2007 p 659, 744–5. Also: *Qatar v Bahrain*, ICJ Reports 2001 p 40, 179 ('The most logical and widely practiced approach is first to draw provisionally an equidistance line and then to consider whether the line must be adjusted in light of the existence of special circumstances.'). Cf *Bangladesh/Myanmar*, ITLOS Case No 16, §§151–2 (holding that St Martin's Island was not considered a special circumstance requiring abandonment of equidistance).

[22] Thus, in *Caribbean Sea*, the Court found that the presumption of an equidistance line was displaced due to the nature of the coastline and the difficulty in identifying suitable baseline points from which a determination of equidistance could be made. The alternative was a 'bisector' line: ICJ Reports 2007 p 659, 741–5.

[23] Ibid, 748. This will be especially important where a river mouth forms part of the land boundary: Rothwell & Stephens (2010) 398.

Whether or not there is a formal presumption of equidistance in territorial sea delimitation may be debated, but it is certainly the norm.

3. CONTINENTAL SHELF DELIMITATION BETWEEN OPPOSITE OR ADJACENT STATES[24]

(A) SOURCES

The continental shelf has its immediate origins in the Truman Proclamation of 28 September 1945. In a remarkable exercise in prescience, the Proclamation addressed delimitation in the following terms:

> In cases where the continental shelf extends to the shores of another State, or is shared with an adjacent State, the boundary shall be determined by the United States and the State concerned in accordance with equitable principles.[25]

At this time there was almost no delimitation practice: the 1942 Gulf of Paria Treaty, the first seabed delimitation treaty, represented an attempt by Venezuela and the UK to delimit the Gulf, a shallow inland sea between the British colony of Trinidad and the Venezuelan coast.[26] At its core, the treaty simply described three lines according to longitude and latitude, allocating to the UK those areas east and north of these lines.[27]

Practice was not much further advanced upon consideration by the ILC beginning in 1953.[28] On cartographical advice, the ILC proposed and the Geneva Conference adopted GCCS Article 6.[29] Article 6 applies to those cases where the 'same continental shelf' extends between opposite or adjacent states. In separate provisions, it stipulates that the boundary is determined by agreement but 'in the absence of agreement, and unless another boundary line is justified by special circumstances', the boundary shall be determined by a median line, that is, a line equidistant from the nearest points of the baselines from which the breadth of the territorial sea of each state is measured.

[24] Generally: Bowett (1978) 49 *BY* 1; Pazarci, *La Délimitation du plateau continental et les îles* (1982); Hutchinson (1984) 55 *BY* 133; Colson (2003) 97 *AJIL* 91; Kunoy (2006) 53 *NILR* 247; Rothwell & Stephens (2010) ch 16.

[25] 1945 United States Presidential Proclamation No 2667, reprinted in Lowe & Talmon, *The Legal Order of the Oceans* (2009) 19.

[26] Treaty relating to the Submarine Areas of the Gulf of Paria, 26 February 1942, 205 LNTS 121.

[27] Ibid, Art 3.

[28] In 1952, Chile, Peru, and Ecuador adopted the Santiago Declaration, 18 August 1952, 1006 UNTS 323, establishing an EEZ-type zone; its effect on delimitation is *sub iudice* in *Maritime Dispute (Peru v Chile)* (2008, pending). Further: Colson (2003) 97 *AJIL* 91.

[29] 29 April 1958, 499 UNTS 311.

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A. C. Beier and E. Stephansson, *Environmental and Climate Change Policy Brief: Somalia* (28 Oct. 2012)

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Environmental and Climate Change Policy Brief
Somalia

Photo: Somali Center for water and Environment

2012-10-28

Anja-Christina Beier
Eva Stephansson

Executive Summary

This environment and climate change policy brief aims at briefly presenting key environmental sustainability challenges and opportunities in Somalia, their linkages to poverty reduction and the millennium development goals three, four and five. It is a 'light version' and does not contain in-depth analysis.

The key environmental challenges in Somalia are several and are related to deforestation, land degradation, increasing aridity and overgrazing, water scarcity, waste disposal, climate change and ecosystem services. These challenges cause negative trends to poverty, health, economy and ecological and human resilience. Climate change is expected to add to already existing stresses.

The key poverty-environment linkages in Somalia are related to: increased conflict and general instability particularly related to further marginalisation of vulnerable men and women; lack of secure tenure to land and other natural resources; vulnerability to natural disasters and resilience; polluted water and waste disposal especially along coastland destructive to health; unreliable access to food and water leading to malnutrition and famine; low ability of particularly female-headed households to accumulate assets including land; and access to forest produce for monetary income. Women and girls are disproportionately at risk due to gender roles and inequalities. Corruption is an issue holding back the development of Somalia and is a dilemma also affecting further environmental degradation or an environmental recovery.

Somali men and women have different and unequal access to agriculture, livestock and fisheries production inputs and technology. They also experience vulnerabilities differently and resort to distinct coping strategies. Female Headed Households (FHH) among Somali populations experience higher vulnerability to shocks related to livestock losses relative to male headed households in the same wealth groups. Women and girls are often the ones responsible for collecting water, an assignment that gets more difficult when water gets degraded. It is also a highly security issue as many women and girls are becoming victims to violence.

Children's health and nutritional well-being are strongly linked to their access to safe water and proper sanitation. Lack of sanitation, safe water facilities and services and poor hygiene are significant contributors to the high rates of disease in Somalia. A comprehensive approach to reducing malnutrition and disease must include increasing access to sanitation and safe water services and addressing hygiene behaviour.

Maternal Health in Somalia is worse than in almost any other country in the world. A major problem is the infrastructure, transport facilities and distance to professional medical assistance as well as the access to safe water and sufficient and adequate nutrition.

A key concern relating to sound environmental management relates to the adoption and effective enforcement of a suite of international, regional and national agreements which define the country's own responsibilities. The regulatory framework for most of Somalia is poorly developed, although the country has had signed a number of important international conventions. While there is a clear need for a thorough revision of the country's national legislation on management of natural resources, it will require considerable effort and co-operation from all interested parties.

The list of problems and challenges in Somalia can be made very long, however there are also positive aspects to grasp; despite the collapse of the public sector, people have shown remarkable resilience, and an energetic and engaged private sector and vibrant civil society

have emerged, as for example in communications and money transfers, transportation and import/exports. Not least in the light of a newly elected parliament, a new presidency and a new constitution there are opportunities for Somalia. The transition process lying ahead of the Somali people will be a good window of opportunity to find ways to combat environmental degradation in order to act for poverty reduction.

Contents

1. Introduction

This Environmental and Climate Change Policy Brief[1] has been written as an input to the Swedish results strategy process in preparation of a revised strategy document for Somalia. It aims at briefly presenting key environmental sustainability challenges and opportunities in Somalia, and focuses on the millennium development goals 3, 4, and 5.

The analysis was conducted as a desk study during end of October and beginning November and is based on selected reports, research papers and statistics. It has been written as a 'light version' as the time constrain has been significant, therefore this is only a first draft.

In the case of Somalia it has to be noted that statistics and reports are not always comprehensive or existent, which also shapes this desk study in the sense that there may be discrepancies in statistics and figures may not be up to date. However, some of the statistical data on Somalia is currently collected and disseminated by a number international agencies and NGOs; but such data collection is mostly guided by the needs and priorities of external actors linked to their areas of intervention rather than the national needs and priorities of Somalia.

The Swedish Government has identified environment and climate change as one of three thematic priorities for development cooperation. This is reinforced in the Swedish policy on environment and climate change in development cooperation concluding that these aspects are a "central point of departure for all development cooperation"[2]. The Policy further requires that environmental impacts, effects of climate change and associated risks are assessed and integrated in analysis, planning, strategies, implementation and follow-up in Swedish development cooperation.

The previous country strategy[3] is based on a combination of humanitarian assistance and support for reconstruction. The humanitarian assistance was aimed at mitigating the effects of the humanitarian disaster. The reconstruction programmes were designed to lend support to the regional and local peaceful political structures which have grown up and to contribute to poverty reduction efforts.

For the forthcoming strategy period focus is set on women and children as well as their resilience and a development towards transparent and participative governance.

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[1] This Environmental and Climate Change Policy Brief was written, at the request of Sida (*Urban Sjöström*) by Anja-Christina Beier and Eva Stephansson at Sida's Helpdesk for Environment and Climate Change. The views expressed in this Environmental and Climate Change Policy Brief are those of the authors and do not necessarily represent the views of Sida.

[2] Swedish Government Offices, 2009

[3] Country strategy for development cooperation Somalia January 2003 – December 2005 Development assistance to Somalia

2. Key Environmental Challenges

Somalia is one of the poorest and least developed countries in the world and as such presents exceptional challenges in terms of natural resource management. As a result of more than 25 years of civil unrest, Somalia's governance structures have fallen apart, and militias control different parts of the country. In addition, the regions of Somaliland and Puntland have unilaterally declared autonomy.[4]

Somalia has five main World Ecosystem types: Coastal Aquatic (11 percent), Desert and Semi-Desert (38 percent), Grass and Shrub (36 percent), Crop and Settlements (one percent), and Interrupted Woods (14 percent).[5] The three main productive sectors are livestock, charcoal production and crops. Livestock (mainly live animals and some products) is the largest export with charcoal production ranking second. Fifty-nine percent of the population practice nomadic and semi-nomadic agro-pastoralism, followed by 17 percent made up by farmers.[6]
Food insecurity and livelihoods, lack of marine and coastal management, probable hazardous waste, and the mitigation and management of environmental degradation along with natural disasters are environmental concerns.

The ***key environmental challenges*** in Somalia are related to women and children, natural resource degradation and democratic instability. Most challenged areas are:

- Deforestation
- Land degradation
- Increasing aridity and overgrazing
- Water scarcity
- Waste disposal
- Climate Change
- Ecosystem services

Deforestation[7]

Forests cover about 11.4 percent of the total land area of Somalia. Large areas of rangelands used to be covered by various tree species, mainly acacias. Flood plain forests along the Shebelle River have been destroyed by clearing land for small farms and plantations.

Forests form the habitat of many of Somalia's 1,078 known species of animal and 3,028 plant species some of which are unique. The rate of loss of forest and wooded habitat between 1990 and 2005 is estimated at 13.9 percent or 1,151,000 ha with pressure coming from charcoal production and agriculture. Charcoal-burning has become a major source of income for 70 percent of poor and middle-income pastoralists. It is estimate that four trees are cut to produce one sack of charcoal. The charcoal industry has significant implications on livelihood security exacerbating community conflicts and increasing vulnerability to drought as well as it is rapidly depleting the forest resource.

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[4] CIA Fact Book
5 FAO strategy and plan of action 2011-2015 http://faosomalia.org/uploads/FAO%20Somalia%205-year%20strategy.pdf and Animal Info http://www.animalinfo.org/country/somalia.htm
[6] FAO strategy and plan of action 2011-2015 http://faosomalia.org/uploads/FAO%20Somalia%205-year%20strategy.pdf
[7] FAO strategy and plan of action 2011-2015 http://faosomalia.org/uploads/FAO%20Somalia%205-year%20strategy.pdf and trading economics http://www.tradingeconomics.com/somalia/forest-area-percent-of-land-area-wb-data.html

Land degradation

Somalia is a semi-arid country with about 1.6 percent of arable land[8]. Arable land (in hectares) includes land defined by the FAO.[9]

Land tenure system is based on communal ownership combined with individual ownership. Usually property transfers from male to male with few exceptions. Female heritance is seldom allowed.

As the livestock sector is based on a nomadic system high mobility is required as well as access to extensive grazing resources. As land use is limited by soil quality, low rainfall and limited water availability, besides opportunistic movement that is possible, overgrazing is a consequence.[10]

Land degradation is a key environmental issue in Somalia, closely linked to desertification, drought and unsustainable livestock and agricultural practices and is also leading to conflict. Conflicts as such also result in land degradation as it obstructs and hinders a more sustainable traditional agricultural practice.

Aridity and Overgrazing

Increasing aridity of Somalia's climate, excessive logging and overgrazing, are leading to rapid environment degradation (deforestation and extension of the desert area) in the Horn of Africa country. As livestock is the main livelihood for approximately 60% Somali's the available land is overused and under ecological resilience stress. Growing competition for land is leading to conflict and further aridity and overgrazing.[11]

The transient rights to use resources that are so critical to nomadic pastoralism were ignored when the national land tenure regime was being developed. Among the direct results of this action has been land degradation, resource use conflicts, a decline in pastoral production and impacts on Somali clan alliances, which in many cases serve to regulate rational natural resource access and use.[12]

Overgrazing in parts of the coastline has resulted in the gradual movement of coastal sand dunes inland, posing a serious threat to agricultural areas and human habitation.[13]

Water scarcity

Somalia has 6 cubic kilometers of renewable water resources with 97% used for livestock and agriculture. Three percent is for urban and domestic use. A bit more than 26% of the entire population have access to safe drinking water.[14]

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[8] https://www.cia.gov/library/publications/the-world-factbook/geos/so.html

[9] Land under temporary crops (double-cropped areas are counted once), temporary meadows for mowing or for pasture, land under market or kitchen gardens, and land temporarily fallow. Land abandoned as a result of shifting cultivation is excluded.

[10] FAO strategy and plan of action 2011-2015 http://faosomalia.org/uploads/FAO%20Somalia%205-year%20strategy.pdf

[11] FAO strategy and plan of action 2011-2015 http://faosomalia.org/uploads/FAO%20Somalia%205-year%20strategy.pdf

[12] UNEP 2005 The State of the Environment in Somalia

[13] http://www.nationsencyclopedia.com/Africa/Somalia-ENVIRONMENT.html#ixzz2AsViUk3D

Most of the country receives less than 500 mm of rain annually, and a large area encompassing the northeast and much of northern Somalia receives as little as 50 to 150 mm. Generally, rainfall takes the form of showers or localized torrential rains and is extremely variable. The main rainy season, referred to as the *Gu*, lasts from April to June. This period is characterized by the southwest monsoons, which rejuvenate the pasture land, especially the central plateau, and briefly transform the desert into lush vegetation. The *Dayr*, which is the shortest rainy season, lasts from October to December.[15]

With an extremely low, variable and often unreliable rainfall, and misuse, mismanagement and ongoing conflict etc water scarcity is at its worse.

Less than 30 % of Somali people have safe drinking water and for rural community, the number spirals to almost zero. The lack of access to safe water is a striking feature in almost all parts of Somalia.

Waste disposal

Somalia's long, remote shoreline has been used as a dump site for the disposal of toxic waste for many years now. Circumstantial evidence indicates that the dumping of illegal waste have been made for almost 20 years. Although unverified, there are persistent reports of illegal, unreported and unregulated fishing and illegal waste dumping off the coast up until today[16]. The illegal dumping includes radioactive, hazardous and medical waste.

The huge waves which battered northern Somalia after the tsunami in 2004 are believed to have stirred up tons of nuclear and toxic waste dumped illegally in the country by industrialised countries and foreign firms over the years.[17] There is a total lack of any waste management.

Climate Change

Due to Somalia's proximity to the equator, there is not much seasonal variation in its climate. Hot conditions prevail year-round along with periodic monsoon winds and irregular rainfall.

Recurring droughts; dust storms over eastern plains in summer; floods during rainy season[18] are becoming more frequent and prolonged making the situation for people and the environmental degradation in the country even worse. In the most recent drought famine was increased.

Natural resources and Ecosystem Services

Somalia's natural resources fall into three broad categories: marine resources such as fish and salt; surface resources which include forests and forest products such as NTFP (Non-Timber Forest Products) as well as surface water; and subsurface resources such as rocks and minerals, fossil fuels, and groundwater. Many of them have been directly or indirectly

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[14] http://www.nationsencyclopedia.com/Africa/Somalia-ENVIRONMENT.html#ixzz2AsViUk3D
[15] http://en.wikipedia.org/wiki/Geography_of_Somalia
[16] UN security council 2011
[17] http://en.wikipedia.org/wiki/Somalia#cite_note-factbook-3
[18] https://www.cia.gov/library/publications/the-world-factbook/geos/so.html

impacted by the extended civil conflict, but competition for access to some resources has also been, and continues to be, a source of conflict in itself.[19]

In the absence of a government, many traditional forms of natural resource management and control systems have been abandoned or are now ignored. In several instances, this has resulted in clearly unsustainable exploitation, a trend which may prove difficult to reverse.[20]

Ecosystems provide different types of life supporting services that are vital for livelihoods, good health and economic development and provide resilience to natural disasters and climate change. Conversely, if ecosystem services are degraded or access is denied, poverty is exacerbated. This profound connection between the environment and poverty is likely to be increasingly visible as the impacts of climate change manifest.

Ecosystem services are the benefits people derive from nature and one obvious ecosystem service in Somalia is drinking water. As freshwater habitats are destroyed, the beneficial ecosystem services they provide to people are lost. It directly affects the livelihoods of many poor men and women who depend on these services.

3. Effects of the environmental challenges

Somalia's major environmental challenges constitute over dependency on trees for energy and charcoal exports, increasing population pressures and urbanization and natural resource based conflicts. Degradation of water catchments, rangelands, agricultural lands and the marine environment, combined with illegal fishing and logging remain critical and urgent issues to address.

3.1 Impacts on Poverty

The regions that have established autonomy and experienced relatively peaceful conditions — Somaliland in the north-west and Puntland in the north-east — have achieved a greater degree of stability than the rest of the country. The southern part of the country is inevitably poorer and in a more critical situation regarding food security, infrastructure and services.[21]

In terms of measuring deprivations related to poverty, Somalia's Multidimensional Poverty Index (MPI) of 0.47 out of 1 would place it at 94 out of 104 countries in 2010 if comparisons were made to the ranking in the global HDR for that year. An estimated 82 percent of Somalis (99% of the nomadic population) are considered poor across multiple dimensions. The divide between urban and rural populations is significant – 61 percent and 94 percent, respectively. In south central Somalia, 89 percent of people are poor across several dimensions, compared to 75 percent in Puntland and 72 percent in Somaliland.[22]

Women and men that were already vulnerable prior to the 1990s have been further marginalized by the conflict and general instability. In particular indigenous groups and ethnic

[19] UNEP 2005 The State of the Environment in Somalia
[20] UNEP 2005 The State of the Environment in Somalia
[21] IFAD 2011 http://www.ruralpovertyportal.org/country/home/tags/somalia
[22] The Somalia Human Development Report 2012 http://www.so.undp.org/shdr/

minorities have fallen into greater poverty, and many have been expelled from their traditional lands.

Women have particularly low status in Somalia. Many are illiterate or poorly educated, and they have inadequate access to health and family planning services. Female genital mutilation is widespread. The country has one of the highest rates of maternal mortality in the world.[23] Every day about 45 women die as a result of pregnancy and childbirth (see further in chapter 4.3).

Forests are economically important for the production of NTFP and charcoal. From the environmental standpoint (as ecosystem services) forests are valuable as habitat, for soil stabilization and fertility and water runoff control.

Charcoal production is a major cause of deforestation. Traditionally, Somalis used wood collected from forests for fuel but charcoal is now the preferred local source of fuel and has become a lucrative export commodity, ranking second behind livestock. As a result of charcoal production, trees in traditional grazing areas of Northern Somalia were devastated and the damage continued as the industry moved south.[24] Forest management for recovery, sustainable use and protection is an urgent issue. Public policy, regulations and the institutional capacity to implement, monitor and enforce will need rebuilding along with programmes to inform and enlist people's participation. Alternative energy sources are needed to reduce the demand for charcoal and wood for fuel. Other income earning opportunities will also help to limit poor people's reliance on destructive forest exploitation.[25]

Today, about 60% of all Somalis are nomadic or semi-nomadic pastoralists who raise cattle, camels, sheep, and goats. About 25% of the population is settled farmers who live mainly in the fertile agricultural zone between the Juba and Shabelle Rivers in southern Somalia. The remainder of the population (approximately 15%) is urban.

Extreme poverty has become widespread and large numbers of people are unable to meet basic food requirements. Many Somalis have been internally displaced, often from rural to urban areas. The strongest clans have taken over valuable agricultural land, expelling weaker clans and indigenous peoples from their traditional lands. Vulnerable people have lost their assets and livelihoods. Famine and disease have raged unchecked, causing the death of about one million people. Extensive damage to roads and other infrastructure makes it extremely difficult.[26]

Extended civil conflict has had a direct or indirect impact on many resources, but competition for access to some resources has also been and continues to be a source of conflict itself. In the absence of a central government and regulation, many traditional forms of ***natural resource*** management have been abandoned, leading to unsustainable exploitation. For example, ***overgrazing and deforestation*** have led to environmental degradation that may be difficult to reverse. Un-regulated off-shore fishing threatens marine resources.[27]

Livestock is a key local consumption commodity for household food security.

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[23] IFAD 2011 http://www.ruralpovertyportal.org/country/home/tags/somalia
[24] IFAD 2011 http://www.ruralpovertyportal.org/country/home/tags/somalia
[25] FAO strategy and plan of action 2011-2015 http://faosomalia.org/uploads/FAO%20Somalia%205-year%20strategy.pdf
[26] IFAD http://www.ruralpovertyportal.org/country/home/tags/somalia
[27] IFAD http://www.ruralpovertyportal.org/country/home/tags/somalia

3.2 Impacts on Public Health

Approximately 30% of the population in Somalia has access to improved drinking ***water*** sources; 67% in urban areas while 9% only in rural areas[28]. Approximately 23% of the population has access to improved sanitation facilities; 52% in urban areas while 6% in rural areas. This is a reason why cholera is endemic in Somalia and Acute Watery Diarrhea (AWD) and cholera peaks generally following the rains. Cholera can be devastating during the rains, especially for a region in famine as well as it claims hundreds of lives annually, particularly in densely populated areas.[29] Increasing access to safe water must also be accompanied by efforts to ensure the quality of drinking water. Water quality monitoring and house water treatment and safe storage are critical interventions that aim to reduce the risk of contamination of water supplies.[30]

Safe water can make the difference between life and death in a poverty-stricken environment. As the present famine crisis forced more than a million Somalis to flee their homes in search of food and water, many Somalis have fled to Mogadishu. There are now more than 100 camps for displaced Somalis scattered around the capital.

Water may also become severe; half dried and flooded water pumps and wells can spread life threatening deceases when polluted. Heavy floods contribute to soil erosion, destroy crop and swamp unprotected villages and lead to additional ***land degradation***. Together with lack and/or absence of governmental services like infrastructure, health care centers etc the situation has become cruel.

According to reports by the UNEP, illegal and uncontrolled ***waste disposal*** has resulted in far higher than normal cases of respiratory infections, mouth ulcers and bleeding, abdominal haemorrhages and unusual skin infections and diseases consistent with radiation sickness among many inhabitants of the areas around the north eastern towns and along the Indian Ocean coast. UNEP adds that the current situation along the Somali coastline poses a very serious environmental hazard not only in Somalia, but also in the eastern Africa sub-region.[31]

Qat is considered an illegal substance in the regions controlled by the Islamists. In the regions under Al-Shabab the selling of qat leaves is completely prohibited in small towns and villages, whereas in the densely populated cities, (Kismayo, Marka, Mogadishu, etc.) they have designated special selling places, usually outside the city centre. Qat addiction among the population has increased with years of war. Excessive chewing of qat leaves leads to apathy and disinterest in family and work: It reduces productivity and leads farmers to abandon animal husbandry[32].

Despite the lack of coherence in overall statistics (coverage versus mortality), they indicate there are major gains to be made through basic health activities, water and sanitation services, and increasing and sustaining high levels of vaccination coverage, as well as improved food security with particular focus on improving feeding practices and the quality of food for young children.

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[28] The statistic figures for water availability are very variable and not very reliable. Also some sources rely on old figures mixed with uncertain estimates to attain more recent figures.
[29] WASH Cluster Somalia; http://ochaonline.un.org/somalia/WASH
[30] http://www.unicef.org/somalia/wes_95.html
[31] FAO strategy and plan of action 2011-2015 http://faosomalia.org/uploads/FAO%20Somalia%205-year%20strategy.pdf
[32] IFAD http://www.ruralpovertyportal.org/country/home/tags/somalia

3.3 Impacts on Food Security and nutrition

Food security in Somalia is severely constrained by recurrent ***drought and land degradation***, and ***climate change*** will make the problems worse over time. A report released by UNDP in February 2012 showed that ensuring food security goes beyond addressing agricultural production. It also requires better basic rural infrastructure, access to credit, resilience to shocks, and an end to armed conflict. A comprehensive developmental approach with a medium to longer-term focus is required to build greater food security. [33]

The nutrition situation shows continued improvements from the past two seasons. The number of acutely malnourished children under 5 years is now estimated to be 236,000 down from 323,000[34]. However, the south of the country remains in a state of acute nutrition emergency. The central and northeast parts of the country have displayed sustained improvements and are classified as serious.

The situation began to improve following reasonable *Deyr rains* during October and December of 2011, and in February 2012, the FSNAU (Food Security and Nutrition Analysis Unit)[35] and FEWS NET (Famine Early Warning Systems Network)[36] announced that famine conditions had receded. Other factors that contributed to this improvement included a slight decrease in the price of food, enhanced access to food and the impact of humanitarian assistance. However, more than 2.5 million people remain in crisis throughout the country, and any gains made in food security and nutrition must be considered fragile as communities are recovering from many seasons of failed rains and subsequent drought. The *Gu rains* (April to June) have been uneven in geographical coverage and below average and there are fears that recent gains could be lost without continued humanitarian assistance. Furthermore, another 1.8 million people are also estimated to be acutely food insecure and in a stress situation where they are barely able to meet their minimum food requirements. Without livelihoods assistance and adequate rains in the coming months, this portion of the population could revert to severe malnutrition. Meanwhile, insecurity and conflict continue to contribute to poor household food security and high malnutrition rates.[37]

Since the start of the Somali civil war, the country's 3,330 km (2,000 miles) of coastline – the longest in Africa – remains the country's most untapped resource[38]. Domestic fresh fish consumption is limited to coastal areas because of poor infrastructure, which has restricted access to fish for a large portion of the population, lack of familiarity with fish, seasonality of supply and a tradition of meat-eating among the Somali communities, are among other reasons for one of the lowest per capita fish consumption rates in the world.

While traditional tastes and lack of consumer education programmes to promote fish consumption have confined the market to certain coastal areas, the shortage of meat experienced particularly during the recurring droughts has diverted some demand towards

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[33] UNDP http://www.undp.org/content/undp/en/home/ourperspective/ourperspectivearticles/2011/07/13/drought-is-life-or-death-issue-in-horn-of-africa.html

[34] WFP https://www.wfp.org/countries/somalia/food-security

[35] FSNAU http://www.fsnau.org/

[36] FEWS NET http://www.fews.net/Pages/default.aspx

[37] WFP https://www.wfp.org/countries/somalia/food-security

[38] WFP https://www.wfp.org/countries/somalia/food-security

fish, especially among low income groups like internally displaced people (IDP) [39]. They are today the driving force for a growing demand for fish.

Somalia's fisheries sector lacks key equipment such as jetties and fishing boats. Lack of research and training opportunities for fishing communities and absence of a regulatory framework for the industry and serious limitations in the cold chain, compound the problem.[40]

3.4 Impacts on Economic development

In Somalia there is a mix of Agro-pastoralist; agriculture and livestock production based livelihood and Agriculturalist; agriculture based livelihood.[41] Pastoralists exist throughout Somalia with high concentrations of strict pastoralists in the north and central areas and pastoralists and agro-pastoralists in the southern areas. Throughout greater Somalia (including areas of Ethiopia and Kenya), rainfall patterns force a complex series of movements in search of grazing-land between the different seasons[42].

The livestock sector is the largest contributor to Somali livelihoods with over 65% of the population engaged in some way in the industry. Exports of livestock and their products account for 80 percent of exports in normal years but exports have been periodically interrupted by droughts and international bans. Despite the ban imposed by Saudi Arabia in 2000, livestock exports continue to be the largest traded commodity for Somalia[43].

Agriculture is an important economic activity in Somalia not only in terms of meeting the food needs of the population but also in terms of generating income through crop sales and agricultural labour opportunities. With roughly 50% of population's cereal requirements are met through domestic production, agriculture is a major component particularly for two of the main rural livelihood systems in Somalia; Agro-pastoralist, mix of agriculture and livestock production based livelihood and Agriculturalist, agriculture based livelihood[44].

Somalia is not abound in resources and depends heavily on agriculture to sustain its economy. Agricultural productivity is often at the mercy of climatic extremes, including periodic droughts and flooding. Livestock is essential to the economy. Over 60 percent of the population depends directly on livestock for food and income. Outbreaks of disease frequently go unchecked and untreated as a result of the lack of an effective disease control strategy. Over the last decade Saudi Arabia has imposed several livestock bans because of disease concerns, and these have severely hampered the sector and generated serious problems for the pastoralists whose livelihoods depend upon the sale of livestock.[45]

Large stocks of animals put considerable pressure on grazing land, causing land degradation and generating disputes over land rights. In the absence of regulatory measures and the competition over resources, especially land and water, is a major component of the current conflict and affects economic development tremendously.

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[39] FAO strategy and plan of action 2011-2015 http://faosomalia.org/uploads/FAO%20Somalia%205-year%20strategy.pdf
[40] FAO strategy and plan of action 2011-2015 http://faosomalia.org/uploads/FAO%20Somalia%205-year%20strategy.pdf
[41] http://www.faosomalia.org/environment
[42] http://www.faosomalia.org/environment
[43] FAO strategy and plan of action 2011-2015 http://faosomalia.org/uploads/FAO%20Somalia%205-year%20strategy.pdf
[44] http://www.faosomalia.org/environment
[45] IFAD http://www.ruralpovertyportal.org/country/home/tags/somalia

Qat addiction among the population has become a real problem[46]. The consumption of Qat is deeply entrenched within the Somali society, albeit gradually diminishing. However it has also become an important trading commodity and for traders it appears to be a good alternative[47].

Corruption is an issue hampering the development of Somalia and is a dilemma also affecting further environmental degradation or an environmental recovery. A UN report say that 70 percent of money donated never made it into public coffers in 2009 and 2010[48].

The Corruption Perceptions Index ranks[49] countries and territories according to their perceived levels of public sector corruption. It is an aggregate indicator that combines different sources of information about corruption, making it possible to compare countries. Both petty and grand forms of corruption are prevalent in Somalia, permeating key sectors of the economy such as ports and airports, tax and custom collection, immigration, telecommunication and management of aid resources. According to a recent audit report by the Prime Minister's office, corruption manifests itself through various practices, including gross public financial mismanagement, large scale misappropriation of public and donor funds, and concealment of actual resource flows.[50]

3.5 Resilience

Resilience is the ability to anticipate, resist, absorb and recover in a timely and efficient manner from external pressures and shocks in ways that preserve integrity and do not deepen vulnerability. This includes the ability to *withstand threats* and the ability to *adapt if needed* and the ability to *further develop* to new options in the face of shocks and crises.

The people of Somalia are remarkably resilient, especially given the multiple and protracted challenges that have marked Somalia over time but this varies by gender, age and livelihood group. This resilience is grounded in determination, entrepreneurialism, mobility and communities of solidarity and generosity. More than other societies, given the inadequacies in public and private, formal and informal systems that provide support, Somalis principally have had to rely on their own resilience to protect their lives and livelihoods.

The following characteristics[51]can help to acknowledge and understand where it is possible to find entry points to work with resilience in different areas.

- **...knowledgeable and healthy**. Have the ability to assess, manage and monitor risks. Learn new skills and build on past experiences.

- ...manage **natural assets**. Recognises their value and has the ability to protect, enhance and maintain them.

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[46] IFAD http://www.ruralpovertyportal.org/country/home/tags/somalia
[47] Somaliland press http://somalilandpress.com/qat-in-somalia-the-multi-million-dollar-battle-18693
[48] Voice of America http://www.voanews.com/content/un-reports-says-somali-government-corrupt/1405372.html
[49] Transparency International
[50] Overview of corruption and anti-corruption in Somalia 2012
[51] IFRC 2012

- **...organised**. Has the capacity to identify problems, establish priorities and act.

- **...connected**. Have relationships with external actors who provide a wider supportive environment, and supply goods and services when needed.

- engaged in the development of **local policy** for reducing risks.

- **...infrastructure and services**. Has a strong system in place to help mitigate for instance climate change. Has strong housing, transport, power, water and sanitation systems, and the ability to maintain and renovate them.

- ...**economic opportunities**. Has a diverse range of employment opportunities, income and financial services. Is flexible, resourceful and has the capacity to accept uncertainty and respond (proactively) to change.

Local resiliency has its difficulties, especially given sustained and myriad threats often generated by factors well beyond the control of individuals or communities. One Minister neatly summarizes these threats as "war, weather and weak governance/economy"[52]. As witnessed in the famine of 2011, some shocks overwhelm the resiliency of the poorest or marginalised, leading to destitution, displacement, hunger, illness, death and the breakdown of families and communities. These intolerable outcomes needs a paradigm shift in support of the resiliency of the poor or marginalised. The delayed response to the warnings of crisis issued from 2010 starkly demonstrated the limits of the international humanitarian and development community as well as the extent of inadequate efforts to build resilience in the years prior to the famine.[53]

However in promoting resilience it is necessary to recognise the need for an enabling environment based on an understanding of local resilience and vulnerability as well as a policy and regulatory framework for effective service delivery as possible.

Building resilience can be done by different actions addressed comprehensively.

- **Improve basic social services** – to strengthen/empower vulnerable households and human capital (men and women) by creating systems able to assess communities, capture the information needed and assure participation for men and women.

- **Establish predictable safety nets** – to address the most vulnerable people's basic need through predictable and sustainable transfer of food or cash for the destitute or seasonally at risk populations without discrimination.

- **Strengthen the productive sectors** – to increase household income by diversifying livelihood strategies, enhancing the access to markets and market information and assure impartial access to natural resources such as land, forest and water as well as eco system services.

[52] Partnership Forum on Resilience 2012 Preparing Somalia's Future: Goals for 2015
[53] Partnership Forum on Resilience 2012 Preparing Somalia's Future: Goals for 2015

4. Millennium Development Goals

The last population census was done in 1985/86, but no data was released. Only a few data were released from the earlier census conducted in 1975. A settlement survey was done by United Nations Development Program back in 2005/06[54].

A lack of baseline data in all areas is a major constraint facing Somalia for policy making and planning in the country general and in South/Central in particular. Over the past 25 years neither national population census nor national demography and household income and expenditures survey were conducted due to prevailing political situation.[55]

The Millennium Development Goals (MDGs) have been signed by Somalia.

In terms of progress toward achieving Millennium Development Goals, Somalia has seen a gradual improvement in maternal, under-five and infant mortality rates. However, the current humanitarian crisis (famine) may have implications for maternal and child health. In addition, the poor quality health services may jeopardize the recent health gains and limit the progress in achieving the MDG targets.[56]

4.1 Goal 3. Promote gender equality and empower women

Gender inequality is alarmingly high at 0.776 out of a value of 1 (complete inequality), with Somalia at the fourth lowest position globally on the Gender Inequality Index (GII) if internationally comparable data were available. Women suffer severe exclusion and inequality in all dimensions of the index – health, employment and labour market participation. Somali girls are given away in marriage very young, and violence against girls and women is widespread. Traditional laws, used in lieu of a state judiciary, are highly discriminatory against women.[57]

Many courageous efforts of Somali women to rise above patriarchy have been isolated and short lived, and they have yet to achieve the critical mass in decision-making required to effect wider change. Young women end up greatly disadvantaged in all spheres of life, a reality that hinders their rights and development, and perpetuates intergenerational cycles of gender inequality and the feminization of poverty.

For Somalia, the Gender Parity Index (GPI), which is the ratio of female to male primary and secondary net attendance ratios, for both secondary and tertiary education is significantly behind by global comparisons, at 27% and 18% respectively. The GPI for tertiary education has actually declined to 18% from 22% in 1990.[58]

Women generally have a weak position in the labour market and represent a large proportion of vulnerable employment. The share of women in wage employment in the non-agricultural sector remained constant at 22% from 1990 to 2002, experiencing a significant increase only afterwards to a share of 36% in 2010. Women in wage employment in the non-agricultural

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[54] UNFPA
[55] UNDP 2010 Millennium Development Goals Progress Report Somalia
[56] WHO cooperation Strategy at a glance
http://www.who.int/countryfocus/cooperation_strategy/ccsbrief_som_en.pdf
[57] http://www.indexmundi.com/somalia/millennium-development-goals.html and The Somalia Human Development Report 2012 http://www.so.undp.org/shdr/
[58] The Somalia Human Development Report 2012 http://www.so.undp.org/shdr/

sector reached its highest value in Puntland 40% followed by Somaliland 36%, while the lowest value is in South Central at 33%.[59]

Despite national gender equality policies and provisions, for example, gender-based violence and discrimination against Somali women continue to brutally suppress human rights and often go unpunished. Traditional Somali society is conditioned not to openly discuss issues such as domestic violence and rape, which further hampers women's access to justice and to have equal rights with men in the society.[60]

Further, Somali men and women have different and unequal access to agriculture, livestock and fisheries production inputs and technology. They also experience vulnerabilities differently and resort to distinct coping strategies. For example, Female Headed Households (FHH) among Somali populations experience higher vulnerability to shocks related to livestock losses relative to male headed households in the same wealth groups.[61]

Women and girls are often the ones responsible for collecting water, an assignment that gets more difficult when water gets degraded. It is also a highly security issue as many women and girls are becoming victims to violence.

Sound management of chemicals can improve women's working and living conditions, increase their knowledge about health risks and proper handling of chemicals and thereby help protect them and their families. Proper integration of gender dimensions into safe chemical management initiatives can promote women's participation in regulatory and policy decision-making processes on chemical safety, and enable women to play a more informed role in the management of chemicals.[62]

Overall, only 30% of pupils in upper primary education are females, compared with 30% in lower Primary education (2006/2007). Gender disparity rapidly increases in higher grades. Early marriage, timing of classes and economic constraints force many girls to leave school early, leading to higher girl dropout rates. Secondary and tertiary enrolment ratios are very low, gender specific data is not readily available. Many women are forced to take up informal and unskilled employment due to their low educational attainment, which further marginalizes them from professional employment opportunities.[63]

Men and women who depend on small-scale farming in developing countries will be differently vulnerable to climate change impacts due to pre-existing inequalities. For example, rural women tend to have less financial, physical and human resources than men, so they will have fewer options for responding to the effects of climate change. Also, poor women tend to rely more than men on natural resources, so when these are directly hit by climate change, women's livelihoods will also be affected. Adaptation strategies that do not take into account

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[59] http://www.so.undp.org/index.php/Millennium-Development-Goals.html and UNSD 2010 Somalia Household Survey

[60] The Somalia Human Development Report 2012 http://www.so.undp.org/shdr/

[61] UNDP http://www.undp.org/content/dam/aplaws/publication/en/publications/environment-energy/www-ee-library/chemicals-management/how-is-the-sound-management-of-chemicals-related-to-the-mdgs/banner_A3_web1.pdf

[62] UNDP http://www.undp.org/content/dam/aplaws/publication/en/publications/environment-energy/www-ee-library/chemicals-management/how-is-the-sound-management-of-chemicals-related-to-the-mdgs/banner_A3_web1.pdf

[63] The Somalia Human Development Report 2012 http://www.so.undp.org/shdr/

the differences between men's and women's vulnerabilities and resources are less likely to succeed.[64]

4.2 Goal 4. Reduce child mortality

The infant mortality rate is defined as the number of infants who die before reaching one year old for each 1000 live births. This rate has decreased from 152 deaths per 1000 live births in 1990 to 86 deaths per 1000 live births in 2006.[65]

The under-five mortality rate (U5MR) reached its highest (in South-Central Somali) with 231 deaths per 1,000 live births and its lowest with 188 (in Somaliland), and 225 (in Puntland) in 1999.[66]

Children's health and nutritional well-being are strongly linked to their access to safe water and proper sanitation. Across Somalia, unpredictable rainfall patterns, ongoing conflict, and lack of maintenance has resulted in only 29 per cent of the population having access to clean water and 39 percent to sanitation. Diarrhoea, a key water and sanitation related illness, is closely associated with malnutrition and is the cause of nearly one in five deaths (19 percent) of children under five.[67]

Lack of sanitation, safe water facilities and services and poor hygiene are significant contributors to the high rates of disease in Somalia. A comprehensive approach to reducing malnutrition and disease must include increasing access to sanitation and safe water services and addressing hygiene behaviour. The mapping of access to water and sanitation taken from an analysis of WASH data collected during FSNAU household surveys in 2009 and 2010[68]services shows a close correlation between areas of high malnutrition and areas with poor access to water and sanitation. Frequently poor hygiene and sanitation practices combined with the use of unsafe water combine to cause chronic and/or acute diarrhea. Integrated interventions which include nutrition and WASH components can help to reduce the incidence of diarrhoea.[69]

Children are particularly sensitive to adverse effects from the improper use of chemicals. Raising awareness about the importance of sound management of chemicals is essential to help safeguard children's mental and physical development and enable them to attend school. In addition, providing basic science education will help countries develop the skills needed to manage chemicals safely. Every year many children die as a result of chemical poisoning in the home, and in the case of Somalia there is a special high risk along the coastal area. Sound

[64] How men and women farmers are differently affected (10 March 2008, Rome). Climate change a further challenge for gender equity
[65] UNDP http://www.so.undp.org/index.php/Millennium-Development-Goals.html
[66] UNSD, UNICEF MICS 2000 and 2006
[67] UNDP http://www.so.undp.org/index.php/Millennium-Development-Goals.html
[68] FSNAU http://www.fsnau.org/sectors/gender
[69] UNICEF http://www.unicef.org/somalia/wes_95.html

management of chemicals plays a vital role in reducing children's exposure to hazardous chemicals and improving their working and living conditions.[70]

4.3 Goal 5. Improve maternal health[71]

The level of maternal mortality in Somalia, which is extremely high and on the rise, has been the highest worldwide, at 1200 per 100,000 live births in 2008.

Maternal Health in Somalia is worse than in almost any other country in the world. Most deliveries are still being done home attended by family members or traditional birth attendants (TBA) which has limited knowledge and resources when it comes to complications related to pregnancy.[72] A major problem is the infrastructure, transport facilities and distance to professional medical assistance.

The vast majority of childbirths (55.9%) take place with the help of Traditional Birth Attendants (TBA). Conversely, only 3.4% of deliveries are handled by medical doctors, 9.4% are assisted by family members, and 25.4% are done with the help of nurses and midwives.

The percentage of current contraception use among married women (15-49 years old) in Somalia is no more than 15%. In addition, use of modern contraception methods is even much lower (1.2%).

Antenatal care coverage, an indicator of access and use of health care during pregnancy, is very low, at 31.6% in 2006 (Source: MICS 2006). After birth access to safe water and sufficient and adequate nutrition is problematic.

Female genital mutilation (FGM) afflicts an estimated 98 percent of Somali women. The highest maternal and infant mortality rates are in FGM-practicing regions. The actual number of girls who die as a result of FGM is not known. Under the new Somali Constitution 2012 FGM has been banned[73].

Certain types of chemicals can build up to dangerous levels in humans, causing adverse reproductive, developmental, immunological, hormonal and carcinogenic effects. Exposure to these chemicals can also result in miscarriages, low birth weight babies and premature births. Women can pass on these toxic chemicals to their children, both prenatally and through breastfeeding. There is no evidence on how chemicals inflict on maternal health, however in Somalia with high levels on waste disposal it is important to consider.[74]

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[70] UNDP http://www.undp.org/content/dam/aplaws/publication/en/publications/environment-energy/www-ee-library/chemicals-management/how-is-the-sound-management-of-chemicals-related-to-the-mdgs/banner_A3_web1.pdf

[71] If no other source given; STATISTIC Trends in maternal mortality: 1990 to 2010 WHO, UNICEF, UNFPA and The World Bank WHO 2012

[72] UNFPA http://countryoffice.unfpa.org/somalia/2012/05/23/5039/succeeded_delivering_triplets/

[73] http://somalilandpress.com/21-years-somalia-adopts-constitution-abortion-islam-fgm-32914 and http://www.guardian.co.uk/global-development/2012/aug/17/female-genital-mutilation-banned-somalia

[74] UNDP http://www.undp.org/content/dam/aplaws/publication/en/publications/environment-energy/www-ee-library/chemicals-management/how-is-the-sound-management-of-chemicals-related-to-the-mdgs/banner_A3_web1.pdf

5. Policy Framework to manage environmental challenges

The Transitional Federal Government (TFG) was the internationally recognised government of the Republic of Somalia until 20 August 2012, when its tenure officially ended and the Federal Government of Somalia was inaugurated. The TFG was established as one of the Transitional Federal Institutions (TFIs) of government as defined in the Transitional Federal Charter (TFC) adopted in November 2004 by the Transitional Federal Parliament (TFP).[75]

A new constitution is about to be taken in force, however there is no Supreme Court functioning, also no nationwide legal system is in place.

Somalia has not had a central body for environmental issues nor functioning environmental policies, environmental management plans or strategies.

More than 15 years without an effective central government and a chaotic state of ongoing civil conflict and lawlessness have had a devastating effect on the country's population and the resources they depend upon for their survival.[76]

As an example; many of the environmental aspects are related to water in Somalia. The country never had a water act, socially and political acceptable legal-based mechanism reflecting climatic conditions and cultural values of the people is needed and has to be developed in consultation with local communities. In the making of a Water Resource Management system being effective, separation of functions of the national and local institutions in water business is absolutely necessary, while encouraging private-public partnership. At the time of peace, water institutions with centralised and decentralised elements will be necessary. Future development of the two rivers Juba and Shabelle, which supply the most fertile regions and the rice bowl of the country, requires a national authority with an autonomous structure.[77]

5.1 Key actors

Somali civil society

A meeting that took place in Istanbul May 27 -30, 2012 was hosted by the Government of Turkey. The meeting was intended to create a space for Somalis to come together and to talk about the post-August 2012 transition. This conference was for Somalis and by Somalis.[78] The conference did provide space for Somalis to come together and to talk about collective issues. It proved to be very positive and for development cooperation to be sustainable it is important that there is a committed and thriving civil society.

Although civil society plays an important role in assisting vulnerable and unarmed civilians, it suffers a lack of adequate support[79], nevertheless new initiatives are signs of hope in the current situation in Somalia.[80]

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[75] http://en.wikipedia.org/wiki/Somalia#cite_note-factbook-3
[76] IFAD http://www.ruralpovertyportal.org/country/home/tags/somalia
[77] Somali Centre for Water and Environment (SCWE) 2000 http://www.somwe.com/water.html
[78] http://www.internationalpeaceandconflict.org/profiles/blogs/somali-civil-society-discusses-somalia-s-future-by-ladan-affi?xg_source=activity
[79] IRIN http://www.irinnews.org/Report/81760/SOMALIA-Civil-society-support-is-key-to-success-of-919m-relief-plan
[80] UNEP 2005 The State of the Environment in Somalia

Somali Diaspora

In 2012 UNDP commissioned an investigation of the role of the Somali Diaspora in relief, development and peace building. It was found that in all areas, the Diaspora was heavily involved in promoting education, healthcare, public infrastructure and private enterprise. In the relatively peaceful north the emphasis was on post-conflict reconstruction and development, whereas in the south the humanitarian situation meant more people were involved in providing life-saving support to their relatives and communities. It was also found that in many areas, people from the Diaspora were returning temporarily to provide technical skills, advice and leadership in addition to their financial support. Support came not only from older people, but crucially – and unexpectedly – from young Somalis as well, even people who had been born and raised outside the country.[81]

Swedish actors

In connection to the environmental aspects and its challenges, Sweden has several actors that may contribute with skills and knowledge.

These may be; Swedish Civil Contingencies Agency (MSB) is in Somalia already supporting in the area of humanitarian aid through multinational organisations; Swedish Chemical Agency (KemI) accomplish activities for the sound management of chemicals and has cooperation in the region as well as with UN organisations also active in Somalia; Swedesurvey (Lantmäteriet) has in-depth experience in e.g. mapping, cadastral and land registration; Swedish National Heritage Board (RAÄ) working for the cultural heritage has also good insights in development cooperation in working with UNESCO; Swedish Environmental Protection Agency (Naturvårdsverket) work according to the saying Cooperation across boundaries is a prerequisite for a healthy environment; Swedish University for Agricultural Sciences (SLU) work with many of the environmental areas important in Somalia for a healthy future, for example livestock, pollution, crop production, climate change issues etc.

5.2 Governance, implementation and enforcement

Historic legacy and situation today

Somalia has ended 20 year-long era of transitional and interim administration that spawned statelessness, protracted conflicts, political vacuum and warlordism.

With the collapse of the central government in 1991 Somalia was not able to regain internal political unity because of internal schisms and widespread conflict. In 2000 the Transitional National Government (TNG) was formed, but was not effective and was succeeded by the TFG in 2004.

After more than two decades, the country has assumed its full responsibility of post transitional government, adopted a new – federal - Constitution, installed a new president and a prime minister and downsized parliament.

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[81] Cash and Compassion 2011 Laura Hammond et.al. http://www.so.undp.org/docs/Cash%20and%20compassion.pdf and http://www.guardian.co.uk/global-development/poverty-matters/2012/feb/20/what-role-somalia-diaspora-rebuilding

Given Somalia's recent past, this is a historic and generational moment.

The appointment of Hassan Sheikh Mohamud, a longtime civil society activist represents a new and genuine leader who seeks to resuscitate Somalia from the quagmire, and unlike previous governments he was appointed in the capital Mogadishu and thus enjoys a degree of legitimacy[82].

However, fundamental facts remain unchanged; government institutions are woefully dysfunctional, insecurity has reached unacceptable levels, Somali forces are heavily dependent on AMISOM's assistance every step of the way and the government is bankrupt. And despite al-Shabaab being severely degraded, they still remain a very potent force that controls a sizable swath of territory in the central parts of Somalia.[83]

Somalia has a mixed legal system of civil law, Islamic law, and customary law (referred to as Xeer).

Skilled labour is scarce or unavailable due to loss of talent abroad, a 20-year lapse in educating and training new generations and financial constraints that hamper the mobilization of available talent. On the positive side, with the collapse of the public sector, people have shown remarkable resilience, and an energetic and engaged private sector and vibrant civil society have emerged, as for example in communications and money transfers, transportation and import/exports.

National Environment management

The lack of any effective government has meant that many people, both local and foreign, have engaged in many kinds of illegal and damaging activities. Despite a number of international investigations, rumours have persisted for many years concerning hazardous pollutants being dumped in Somali waters and on beaches by foreign vessels. The rampant trade in charcoal as well as unregulated off-shore fisheries are also widely reported as having a damaging impact on the country's natural assets, which can be expected to limit and restrict options for national recovery and sustainable development.[84]

Until the establishment of the Ministry of Environment and Disaster Management in 2005, Somalia lacked a central body responsible for environmental matters. Instead, a National Environmental Committee, with representatives from 13 Ministries/Agencies, served as the coordination body for environmental governance.

A key concern relating to sound environmental management relates to the adoption and effective enforcement of a suite of international, regional and national agreements which define the country's own responsibilities as well as those of the international community. The regulatory framework for most of Somalia is poorly developed, although the country has had signed a number of important international conventions. While there is a clear need for a thorough revision of the country's national legislation on management of natural resources, it will require considerable effort and co-operation from all interested parties; nationally as well as internationally. A number of gaps in the legal system also need to be addressed, for example the lack of any reference to a national water act or adhesion to the Contracting Parties to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and

[82] Abdihakim Aynte; The Road Forward for Somalia, Challenges for the Post-Transitional Government. 2012 NAI
[83] Abdihakim Aynte; The Road Forward for Somalia, Challenges for the Post-Transitional Government. 2012 NAI
[84] UNEP 2005 The State of the Environment in Somalia

Other Matter, 1972 (the London Convention), the latter being especially relevant to the alleged dumping of toxic and hazardous materials along the coastline.[85]

Other opportunities to benefit natural resource management could be based on improved regional co-operation and co-ordination. Somalia's natural assets – its grazing and agricultural lands as well as its rich marine fisheries – are a platform on which the peoples' livelihoods might be rebuilt. Taking control of these assets and managing them productively, sustainably and equitably will, however, remain a considerable challenge for the decision-makers and population of the country. Finding a solution to the current levels of over-exploitation will therefore not only depend on reaching acceptable solutions between stakeholders within the country, but also hinges on the co-operation and assistance from neighbouring states.[86]

6. Conclusions

Somalia currently has an historic opportunity to choose a new and better path. A government is becoming established and is seeking popular recognition throughout Somalia, despite the country's fragmentation with two breakaway regions and a third still plagued by conflict.

Peace and stability are absolute prerequisites for any future rebuilding and development of Somalia, and continued access to natural resources and ecosystem services is essential to the livelihoods of the majority of its people. This is basic if the Millennium Development Goals, for instance the ones that will be targeted by Swedish development cooperation are going to have any progress in near future.

In Somalia adaptive capacity and building resilient livelihoods are fundamental challenges but also crucial for survival and combating deep poverty. The ability to adapt will be of increasing importance not least in the shade of climatic change[87].

Security is being threatened by climate change and resulting in natural disasters, such as the drought afflicting Somalia 2011[88]. *As vulnerability, natural resources, health and gender-issues are so closely connected having a holistic approach in programming is necessary* and will also positively strengthen the outcome of a contribution.

Multiple risks and their impacts on vulnerable people must be considered together with assessments of capacities and efforts to strengthen these. *Relevant both to humanitarian work and for development programming is inclusiveness, sustainability, accountability and participatory approaches.*

Human health and well-being and also individual knowledge and awareness are central to the ability of households individually and collectively to be able to prepare, respond, to recover from environmental shocks and stresses and develop afterwards. As well as it is important to have assets and access to wider resources beyond the immediate control for individuals and of a community.

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[85] UNEP 2005 The State of the Environment in Somalia
[86] UNEP 2005 The State of the Environment in Somalia
[87] Moench: Water, Climatic Variability and Livelihood Resilience: Concepts, Field Insights and Policy Implications. 2012
[88] http://www.climateactionprogramme.org/news/extreme_drought_climate_change_and_security_in_somalia/

7. Recommendations to Sida

In regard to resilience the environment and climate change policy brief recommend the following:

'Ingångsvärden' for Swedish development cooperation in Somalia are:

- MDG 3, 4 and 5
- strengthening peoples livelihood in regard to / regarding their resilience
- development of a democratic society with emphasis on human rights, transparency and accountability
- further suggestions in areas where Sweden has comparative advantages; waste management

As pointed out in chapter 3.5 resilience includes the ability to *withstand threats* and the ability to *adapt if needed* and the ability to *further develop* to new options in the face of shocks and crises (man-made or natural). The people of Somalia are remarkably resilient, especially given the multiple and protracted challenges that have marked Somalia over time. Somalis principally have had to rely on their own resilience to protect their lives and livelihoods; however this varies by gender, age and livelihood group.

In order to understand what resilience may contain in development cooperation a few statements are made:

- To achieve resilience in programming objectives has to be comprehensive. The starting point for support must be recognition and appreciation of the efforts of individuals and their households and communities. This includes of course the participation and contribution of the target group which is paramount to reduce their vulnerability.

- Understanding diverse underlying causes of vulnerability and disaster and crisis risks requires holistic assessments, planning and implementation across various sectors. It is not possible to isolate issues or relate to one sector.

- Working with vulnerability and resilience is not possible in short term; it requires long-term engagements and investment.

- Building strategic partnerships; relevant stakeholders on different levels; locally, regionally and nationally (as well as international, not least within the donor community).

By striving to achieve progress in MDG, strengthening livelihood and democratic development there are certain activities that can be introduced when building resilience and integrating environmental and climate change aspects.

- Including training;
- Assure that men and women access training on equal terms in areas of health, environment and good governance both in urban and rural areas.
- Include advocacy and increased knowledge in sustainable natural resource management practises, adapted to local situations and future scenarios.

- For example train local water operators on the operation and maintenance of newly constructed or rehabilitated water supplies as well as the importance of security matters to raise the issue of violence in relation to water collection.

- Building partnerships;
- Linking to different national institutions agencies and ministries to ensure the sustainable management of the country's natural resource base.
- Revitalising environmental co-operation with neighbouring countries and within the region, in order to support peace building, enhance important environmental initiatives, share knowledge and information and strengthening institutional development.
- For example use of environmental management, analysis and assessments as a tool to build community resilience to crises and influence policy-making at community and national levels.

- Strengthening institutional capacity:
- Conducting environmental assessments to guide the setting of priorities for environmental recovery, resource management and development planning.
- Development of an adequate policy and legal framework for environmental management.
- Conducting field-based environmental assessments to inform future decision making.
- For example include capacity development in all areas of programming.

- Locally adapted technical solutions;
- Assure access through improved infrastructure and locally placed health service/clinics in especially rural areas.
- Incorporate proper management of waste, to achieve effective containment and/or clean-up of all remaining stocks of pesticides in the country.
- For example investing in systems powered by renewable energy (solar powered pumps) that are accessible, affordable and possible to maintain on local basis.

- Supporting communities' ability to cope and respond to emergencies;
- for example strengthening the sustainability of infrastructure and services means that in times of crisis communities can continue to access essential water and sanitation services and that there are mechanisms in place to guide local governments to manage the emergency.
- Increasing access to safe water must be accompanied by efforts to ensure the quality of drinking water. Water quality monitoring and house water treatment and safe storage are critical interventions that aim to reduce the risk of contamination of water supplies.
- Combating climate change requires investment in soil conservation, water harvesting, reforestation and restoration of grazing and control of soil erosion.
- For example assure system and registration of ownership and land tenure by male and female headed households to secure natural resource management.

It might be difficult to measure resilience as well as to apply to different programmes. Nevertheless, achieving positive outcomes will require that we fall back to more familiar concepts like adequate risk and risk management, and not least allow cross-disciplinary and cross-issue discussions.

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Annexes

Annex 1

POPULATION (2010):

9.3 MILLION

GDP (1990):

$917.04 MILLION

INFANT MORTALITY RATE (PER 1,000 LIVE BIRTHS - 2010):

108.3

LIFE EXPECTANCY (2009)

50.63 YEARS

CORRUPTION MEASUREMENT TOOLS

The Corruption Perceptions Index ranks countries/territories based on how corrupt a country's public sector is perceived to be. It is a composite index, drawing on corruption-related data from expert and business surveys carried out by a variety of independent and reputable institutions.

RANK:

182 /183

Scores range from 0 (highly corrupt) to 10 (very clean).

SCORE:

1 /10

OTHER GOVERNANCE AND DEVELOPMENT INDICATORS

Rule of law N/A

Press freedom index N/A

Voice and accountability N/A

Annex 2 MDG reference for Somalia

Indicator	***1990***	***2002***	***2007***	***2015 Target***
Female Primary school enrollment rate%	*No Data*	*54*	*31*	*100*
Female Secondary school and Tertiary enrollment rate%	*22*	*18*	*31*	*100*
Proportion of seats held by Women in the national parliament%	*No Data*	*No Data*	*8*	*100*
Source: UNICEF				

Annex 93

Jeff R. Vogel, *Fishing for Answers to Piracy in Somalia*

Fishing for Answers to Piracy in Somalia

Jeff R. Vogel

Since the collapse of the Somali government in 1991, illegal, unreported and unregulated (IUU) fishing in the Somali Exclusive Economic Zone (EEZ) has decimated fish stocks and left Somali fishermen with little economic opportunity. IUU fishing led Somali fishermen to take violent measures to protect the Somali EEZ in the absence of a centralized government and coast guard. The initial attacks revealed the profit potential of piracy, providing income for displaced fishermen and opportunistic Somali militants. Violence then became the norm in Somali waters, undermining the economic and security interests of the United States and the entire region. To reduce the incidence of piracy in the Gulf of Aden and Indian Ocean, the U.S. must provide alternative and superior income streams to Somalis engaging in piracy. The U.S. can achieve this strategic effect by focusing its efforts on fisheries redevelopment, which represents the greatest potential for economic and social development in Somalia. By ensuring the rights of Somalia within its EEZ, directing U.S. aid toward Somali fishermen, and employing existing government programs to develop a novel aquaculture industry, the U.S. can achieve its security objectives and help to foster a stable and moderate Somalia.

Historical Fisheries in Somalia

The marine fisheries industry has historically held an important position in the Somali economy and culture. Somalia has a large coastline, covering 3,300 kilometers and a corresponding EEZ covering 39,000 kilometers.[1] In 1990, prior to the collapse of the Somali government, fisheries contributed 2

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percent of the overall Gross Domestic Product (GDP), an estimated $15 million USD per annum, while providing over 18,000 tonnes of fish for human consumption.[2] Domestic demand for fish remains high throughout the country, "especially in the capital Mogadishu . . . since fish consumption is estimated at over 9 tonnes per day."[3] Redevelopment of the fisheries industry represents an opportunity to reinvigorate the Somali economy. Furthermore, the inability of Asian and European countries to meet their domestic demand for fish within their own EEZs drives IUU fishing throughout African waters. These countries, if pressured to comply with international laws regulating fishing rights, represent tremendous prospective trading partners for Somali fishermen.

Collapse of Somali Fisheries

Article 56 of the United Nations Convention on the Law of the Sea (UNCLOS), ratified by Somalia in 1989, provides Somalia with "sovereign rights for the purpose of exploring and exploiting, conserving and managing the natural resources, whether living or non-living, of the waters superjacent to the seabed and of the seabed and its subsoil."[4] Additionally, UNCLOS Article 58 provides that "states shall have due regard to the rights and duties of the coastal state and shall comply with the laws and regulations adopted by the coastal State."[5] Somalis have clear rights to harvest fish stocks from their EEZ under UNCLOS; however, these rights are predicated upon the ability of Somalia to protect its waters and the good faith of signatory states to respect these sovereign rights.

The collapse of the Somali government in 1991 created a significant void in the ability of Somalia to protect its EEZ. Elliott Anderson points out that "The absence of a functional method for enforcement of maritime fishing law, due to a non-functioning government and complete lack of naval force, meant that fishing vessels from Europe and Asia were able to deplete the nation's fisheries."[6] The United Nations estimated that in 2005 over 700 unlicensed foreign vessels were fishing in Somali waters.[7] The Marine Resources Assessment Group estimates that the total value of fish stocks removed from Somali waters each year totals over 100 million US dollars.[8] This number represents nearly 15% of the total Somali GDP from 1990 and is likely a larger percentage of the current GDP. The catch sizes are nearly ten times more than prior to 1991 because Somalis typically use artisanal fishing methods and have not had the benefit of new fishing technologies used by foreign fishermen. Additionally, foreign fishermen have no stake in the future of Somali fish stocks and are willing to over-fish species that are slow to reproduce, such as tuna and sharks, leading to an aggregate collapse in Somali fish stocks.

Fisheries Collapse and Piracy

The absence of a coast guard protecting the Somali EEZ drove Somali fishermen to take direct, often violent, action against foreign fishermen.[9] Piracy in Somalia thus grew out of the desperate actions of fishermen, who sought to protect their natural resources and livelihoods. A Somali pirate leader, Sugule Ali, recently explained that the foundational motive of the Somali pirate remains "to stop illegal fishing and dumping in [Somali] waters."[10] From the original laudable goal of protecting the Somali EEZ, however, piracy developed into a multi-million dollar industry as opportunistic Somali militants realized the profit potential of holding foreign mariners and cargo for ransom. Piracy quickly grew beyond the original fishermen as Somalis with ties to various militias, who also lacked sufficient economic

opportunities, entered the fray. Militia leaders within destabilized Somalia realized the income potential and began providing pirates with more sophisticated speedboats and weapons designed to intercept larger targets.[11] With the backing of these militias, the focus of Somali pirates has changed from targeting IUU fishing to capturing larger commercial vessels, which yield larger ransoms. Somali fishermen navigational skills, combined with the fearless disposition of Somali militia members, resulted in increasingly audacious actions and larger ransom payouts, estimated to total $100 million in 2009 alone.[12]

The response to the threat of piracy around the Horn of Africa has been aimed at deterrence through increased patrol and naval intervention. Both the US and the North Atlantic Treaty Organization (NATO) have established operations to patrol the Somali EEZ and the Horn of Africa.[13] The incidence of piracy continues to rise in the Gulf of Aden and Indian Ocean, despite US and NATO deterrence efforts, as shown below. [14]

Year	Somali Pirate Attacks	Percent Increase
2006	10	N/A
2007	42	320%
2008	63	50%
2009	167	165%
2010	219	31%
2011	236	8%

The numbers above indicate that the current U.S. deterrence strategy is unsuccessful, and it is time to find alternative means to subjugate Somali piracy.

Rebuilding Fisheries and Aquaculture

Any security strategy aimed at defeating piracy must be based upon the premise that piracy exists as a means of income for otherwise displaced Somalis. To ensure a successful security strategy in Somalia, the U.S. needs to provide alternative and superior income streams to the Somalis. The U.S. experienced success employing this strategic model during the early 1970s in Vietnam. Land reforms under Vietnamese President Nguyen Van Thieu in 1971 led to greater rice crop yields in 1972-1974. As a result of increased income and stability from the rice crop, there was a marked decrease in participation in the Viet Cong because the opportunity cost of violence had been raised.[15] Somali pirates, like those who participated in the Viet Cong, are less likely to participate in violent behavior if they are provided greater economic incentive. Piracy comes at a very high risk and often very little reward because the pirates themselves normally keep little of the ransom, with the majority paid out to the controlling militia leaders.[16] By rebuilding Somali fisheries through focused legal and economic reform, and by encouraging investment in novel business practices such as aquaculture, the US can provide Somali

pirates with a viable, low risk, and sustainable income alternative. Fisheries development will thereby reduce the flow of the piracy labor force as well as cut off a vital funding source for Somali militias, bolstering U.S. economic and security interests.

Legal Reform

To rebuild Somali fisheries, IUU fishing in the Somali EEZ must end, allowing fish stocks to rebuild. IUU fishing, particularly originating out of Europe and Asia, continues to be a persistent problem to this day. Estimates show European fishermen take a total catch out of Somali waters worth more than five times the value of European annual aid sent into Somalia.[17] The USS Kidd's recent rescue of thirteen Iranian fishermen held hostage by Somali pirates confirms that fishing vessels continue to be a primary target for piracy and reinforces the need to secure the Somali EEZ.[18] Article 56 and 58 of UNCLOS already provide for the necessary legal rights needed to secure the EEZ, but these provisions must be enforced. The US must increase pressure on its NATO allies and Asian trading partners to respect the substantive provisions of UNCLOS, which the US accepts as conventional international law. The U.S. Africa Command (AFRICOM) and U.S. Central Command (CENTCOM) should lead a coalesced effort through the Navy, Coast Guard, and NATO forces to protect the Somali EEZ from IUU fishing. Vessels found fishing within the EEZ should be inspected and, if necessary, escorted by force to international waters. In addition, legal action must be brought against noncompliant countries that continue to allow their fishing vessels to harvest catches from the Somali EEZ. Annex VI, Article 21 of UNCLOS provides jurisdiction to the International Tribunal on the Law of the Sea (ITLOS) for all disputes arising under UNCLOS.[19] AFRICOM, CENTCOM, and NATO forces should keep accurate records of any vessels engaging in IUU fishing so Somalia can bring appropriate action against other signatory countries before the ITLOS.

The US and its NATO partners cannot, however, be expected to enforce international laws in the Somali EEZ indefinitely. Therefore, as suggested by Tayé-Brook Zerihoun, UN Assistant Secretary-General for Political Affairs, the US and its international partners must start "developing Somali capacity to deal with piracy on land and waters close to shore through the establishment of a coast guard."[20] Mr. Zerihoun's proposition, however, is merely one piece of a much larger puzzle. A Somali coast guard would be meaningless without the proper domestic legal infrastructure to prosecute those who are caught in Somali waters participating in IUU fishing or piracy activities. This legal infrastructure, of course, cannot exist without a stable and legitimate central government. What results is a causality dilemma wherein economic development cannot take place without a centralized government but such a government will not exist until the economic situation improves. It is clear that there is no single panacea to the Somali problem and both economic and security reform must take place simultaneously. By focusing on fisheries first, however, both benefits can be achieved incrementally because it provides economic opportunity while also reducing the Somali pirate's base. Even at this early stage, plans should be simultaneously created to allow for the long-term sustainability of Somali redevelopment, such as the initial training of a Somali coast guard force and preliminary drafting of the supporting legal framework.

Fisheries Aid

Agricultural development is currently the principal focus of the current U.S. strategy for Somali aid. According to the FAO, "The fishing sector has received very little attention from the international community and aid agencies, while, in contrast, the livestock and crop husbandry sectors have received more attention and more aid."[21] Efforts by the United States Agency for International Development (USAID) should shift focus from an agrarian-based approach to a marine-based approach. Fisheries redevelopment not only provides a significant opportunity to provide necessary protein to the Somali people but also has tremendous growth potential to allow Somalia to reinvigorate its economy. USAID is facing significant budget constraints, however, existing programs and budget authorities through a "whole of government" approach could compensate for these shortfalls.

USAID should engage in an interagency cooperative process with the National Oceanic and Atmospheric Administration (NOAA) and the National Marine Fisheries Service (NMFS) in order to provide Somalis with the appropriate level of expertise and equipment to redevelop its fisheries industry. Section 312(b) of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) empowers NMFS to engage in a fishing capacity reduction program.[22] Under the capacity reduction program, NMFS has the authority to purchase fishing vessels and equipment to prevent over-fishing and rebuild fish stocks within the U.S. EEZ. NMFS scraps the vessels and their appurtenances purchased under the current program, but a simple change in the statute could allow NMFS to provide the purchased vessels and fishing equipment to Somalia with little or no additional cost to taxpayers. This change would continue to allow NMFS to meet the goals of the Magnuson-Stevens Act while providing crucial aid to rebuild Somali fisheries. However, the US must ensure that Somali militias do not overtake the aid provided to Somali fishermen. The vessels provided should have minimal cruising speed so that they are of little use in piracy operations. Diligent oversight on all levels would be key during implementation.

It is not enough to simply deliver vessels under the Magnuson-Stevens Act and expect Somali fisheries to immediately rebound. Education, along with vessels and equipment, is also essential. By working through the interagency process, USAID, NOAA and NMFS could educate Somalis on the necessity of developing sustainable fishing practices that ensure continued fish stocks and greater long-term economic benefit. Education regarding fish life cycles, habitat protection, and breeding and migratory patterns would allow for more efficient use of Somali marine resources. In addition, education regarding fish processing on an industrial level would allow for greater economic development on land once the fishing industry begins to rebound. As previously described, the international demand for fish in Somali waters already exists and proper processing techniques would allow this demand to be fully captured. This education would have an additional benefit of providing for greater food safety for both exported and domestically consumed fish, which in turn would provide for greater nutritional value for the Somali population.

The education programs must go beyond just fishing to include supportive marine trades. The vagaries of the sea would inevitably wear down the fishing vessels and equipment provided under the Magnuson-Stevens Act. To deal with this inevitability, Somalis must be educated in marine mechanics so

that they can perform the necessary repairs. This education would not only allow for greater use of the provided fishing equipment, but will also help to develop a secondary marine mechanic industry, allowing for further domestic economic development. USAID has budget constraints; however, the primary and secondary effects of the suggested aid programs would provide for greater economic development in Somalia than could be achieved through the delivery of food aid and agrarian support alone. In addition, the proposed programs would provide tremendous nutritional potential for the Somali population while having a direct and substantial impact on U.S. security and international trade.

Aquaculture

There is an additional opportunity to grow Somali fisheries beyond previous levels through the development of a new aquaculture industry. Somalia's rich waters and pelagic species provide an idyllic setting for the development of a fish-farming industry. Aquaculture now represents over 30 percent of all fish products consumer worldwide, accounting for over 52.5 billion USD per annum and could have a remarkable impact on the Somali economy.[23] Additionally, reliance on aquaculture would allow wild fish stocks sufficient time to rebuild, ensuring the environmental sustainability of a redeveloped Somali fisheries industry.

A perfect model for aquaculture development already exists in Chile. The rise of aquaculture in Chile has caused many artisanal fishermen to transition to aquaculture due to the guarantee of a steady paycheck. Chile is now one of the top five fish-producing countries in the world, with aquaculture products accounting for 46.5 percent of its total fish exports.[24] A partnership between the Chilean government and international nonprofit organizations led the development of the Chilean aquaculture industry.[25] The Chilean artisanal fishing culture was also a key component during the development of the Chilean aquaculture industry. This cultural consideration helped to ease the transition to sustainable aquaculture practices and yielded a higher satisfaction of life for Chilean fishermen.[26] Using the Chilean model, USAID, NOAA, AFRICOM, and CENTCOM should engage with nonprofit organizations to develop a Somali aquaculture industry. Somali waters are home to many of the same fish and mollusks found in Chilean waters; therefore, much of the requisite technology already exists. It would also be imperative to account for Somali fishing culture, to empower stakeholders in the transition from artisanal fishing to modern aquaculture practices. Direct communication with Somali representatives would also be a necessary during the development process. To achieve the greatest efficiency, engaging AFRICOM's in-theater resources to work with local populations and to act as sensors in identifying any potential development opportunities is essential.

The complete development of a Somali aquaculture industry would require a significant investment in infrastructure and education. To encourage domestic investment, the US could explore the use of amnesty programs for those currently engaging in piracy. For example, amnesty could be granted to those funding piracy in exchange for disarmament, repentance, and investment in aquaculture projects. Similar programs have been attempted by the Nigerian government, which has offered education and business development assistance in exchange for disarmament in an effort to reduce terrorism in Niger Delta, with positive results.[27] Amnesty would allow those that take advantage of the program to reap the financial benefits of aquaculture development while providing a tremendous

service to their communities. Offers of amnesty could also be coupled with existing U.S. programs to foster aquaculture development. The Export-Import Bank (Ex-Im Bank) could offer direct or secondary loans to Somalis within the amnesty program seeking to invest in U.S. goods and services related to aquaculture development. This program would guarantee agreeable financing terms to make aquaculture development more palatable to Somali investors, while offering a secondary economic benefit to U.S. companies. Somali investment could also be coupled with domestic U.S. investment through the Overseas Private Investment Corporation (OPIC), allowing for economic growth in both nations while further opening diplomatic ties with Somalia. These diplomatic ties, fostered through aquaculture development, would be aimed at slowly enhancing the political and social status of moderate Somalis with an end focus of a stable and prosperous Somalia, free of piracy.

Conclusion

Somali piracy continues to grow at an alarming rate, placing the lives of U.S. mariners at risk, impeding free navigation in the Indian Ocean, and adding significant cost to the waterborne transportation of goods. Deterrence efforts by the U.S. and EU in the Gulf of Aden and Indian Ocean are ineffective, further threatening U.S. and international security. Within the US, popular support does not exist for military action against the Somali people to address this security threat. Despite the disinterest in the use of force, there are steps that can be immediately taken by the U.S. Government to eliminate the threat of piracy. Policymakers must first recognize the fundamental issue: that piracy itself is not the problem, but merely a symptom. Government instability, economic despondency, and international indifference have left Somalis with few options, as exemplified by the desperation of the Somali fishermen who first entered into piracy. Therefore, to combat piracy, the US should develop a security strategy focused on economic development in Somalia. New economic opportunities would raise the opportunity cost of engaging in piracy and allow for greater social and political stability.

The initial focus on fisheries development represents the greatest potential for economic and social growth. Fisheries development harnesses the skills already possessed by Somali pirates, embraces traditional Somali culture, and develops the rich natural resources of Somali waters. The proposed legal reforms would provide stability in the Somali EEZ, allowing for the development of Somali fisheries, and the corresponding decline in IUU fishing would help to ensure additional trade partners in Europe and Asia. Existing U.S. programs under USAID, Ex-Im Bank and OPIC, coupled with a novel approach of the Magnuson-Stevens Act by NOAA, offer tremendous investment opportunities, fostering domestic and Somali economic and social growth. These programs, in combination with offers of amnesty, could provide further economic incentive to move Somalis away from piracy and toward an innovative aquaculture industry. Fisheries redevelopment, as a starting point, would therefore greatly contribute in providing a sustainable peace in Somali waters, which in turn could help to foster social and political change throughout the country.

[1] Food and Agriculture Organization of the United Nations (FAO), "Fishery Country Profile: The Somali Republic" (2005), p. 1.
[2] Ibid., 1.
[3] Ibid., 8.

[4] United Nations Convention on the Law of the Sea, Art. 56 (1982), 40.
[5] Ibid., Art. 58, 44.
[6] Elliott A. Anderson, "It's a Pirate's Life for Some: The Development of an Illegal Industry in Response to an Unjust Global Power Dynamic," *Indiana Journal of Global Legal Studies*, Vol. 17, No. 2 (2010), 327.
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[8] Marine Resources Assessment Group, "Review of Impacts of Illegal, Unreported and Unregulated Fishing in Developing Countries," (June 17, 2005), 6.
[9] Anderson, "It's a Pirate's Life for some: The Development of an Illegal Industry in Response to an Unjust Global Power Dynamic," 328.
[10] Ganesh, Arun, "How Western Companies Motive Somali Pirates," *Business Pundit*, (Fed. 22, 2011).
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[13] CMDR Bruce A. Apgar, Jr., USN, "USAWC Strategy Research Project: Countering 21st Century Piracy in the Horn of Africa," (Feb. 2010), 5.
[14] ICC International Maritime Bureau, "Piracy and Armed Robbery against Ships Report for the Period 1 July 2011 – 30 December 2011," 5-6.
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[18] Chiver, C.J. "For Iranians Held by Pirates, U.S. to the Rescue." *New York Times*, (Jan. 7, 2012), A1.
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[20] "Current Efforts to Stem Piracy Off Coast Must Be Strengthened." *UN News Service*, (Oct. 31, 2011).
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[22] 16 U.S.C. § 1861a(b).
[23] Ana Pitchon, "Sea Hunters or Sea Farmers? Transitions in Chilean Fisheries," *Human Organization*, Vol. 70 No. 2 (2011), 201.
[24] Ibid., 201.
[25] Ibid., 203.
[26] Ibid., 205.
[27] Ogunmade, Omololu, "Amnesty Has Boosted Economic Growth," *This Day* (Nigeria), (Dec. 16, 2011).

Annex 94

L. Persson et al., "Failed State: Reconstruction of Domestic Fisheries Catches in Somalia 1950-2010", *University of British Columbia Working Papers Series*, Working Paper No. 2014-10 (2014)

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Failed State: Reconstruction of Domestic Fisheries Catches in Somalia 1950-2010

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Failed state:
Reconstruction of domestic fisheries catches in Somalia 1950-2010

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Abstract

Somalia is a country in north eastern Africa that has suffered a high degree of political and social instability since the collapse of its last national government in 1991. This study reconstructs domestic fisheries catch data between 1950 and 2010, including the industrial, artisanal, subsistence and recreational sectors. We found that the Somali reconstructed total catch was nearly two times the landings reported by the FAO on behalf of Somalia for the time period, most of which is attributed to the reconstructed small-scale sector. Although there is an initial decline in catches after the collapse of government, small-scale catches increase significantly after the mid-1990s, as a result of increased private investment in artisanal fisheries, changes in seafood consumption habits and population displacement to the coast due to the civil war. However, the absence of monitoring and enforcement in Somali waters, coupled with the lack of transparency amongst international monitoring agencies in the Indian Ocean, resulted in a lack of reliable data for the significant level of illegal and semi-illegal foreign fishing activity also taking place in Somalia's EEZ and therefore it is not included in this study.

Introduction

Somalia is located on the Horn of Africa, has the second longest coastline of any country in Africa (after Madagascar), and is bordered in the north by the Gulf of Aden and in the east by the Indian Ocean (Figure 1). The marine ecosystem is characterized by seasonal monsoons driving a strong south-north current along the east African coast, resulting in a significant upwelling off the coast of northeast Somalia. This system is highly productive, but the great quantity of small pelagic fish usually found in upwelling areas (Rykaczewski and Checkley 2008) does not occur to the same extent in the upwelling area off Somalia. However, the region is known for the seasonally high abundance of large pelagic fish (tuna and billfishes) that has attracted Distant Water Fleets (DWF), mainly from Europe and East Asia, to fish for these high value species (Bakun *et al.* 1998). In contrast, the environmental conditions have not been quite as favorable for the domestic fisheries sector; the coast does not have many natural harbors, and climate and ocean features give rise to large variation in the available resources between seasons and years (Haakonsen 1983). The Somali people have historically been largely nomadic, and despite their abundant fish resources, the Somalis in general have had very limited interest in fishing and their seafood consumption is thought to be among the lowest in the world. However, the coastal communities have a tradition of fishing, but the fraction of fishers compared to the total population has always been small (UNEP 2005).

Somalia gained its independence in 1960, when the former colonial territories of Italian Somalia and British Somaliland united and became the Somali Republic. During the 1960s, two elections were held. In 1969 the sitting president was assassinated and Mohamed Siad Barre came into power (UNEP 2005). He declared Somalia a socialist state, and the establishment of co-operatives became the basis for the socio-economic development in the country (Laitin and Samatar 1984). In the late 1980s, a civil war started in the northwestern part of Somalia, and in 1991 the Siad Barre regime ended. The fight among different clans for power and control of the capital city of Mogadishu and other areas has impacted the country ever since. In 1991, former British Somaliland in the northwest claimed independence (as 'Somaliland'), and in 1998 the northeastern part of Somalia claimed an autonomous state of Puntland (UNEP 2005). Neither Somaliland nor Puntland have been recognized by the international community (UNEP 2005). The population in Somalia was about 2.2 million at the time of independence in 1960, and in the most recent census in 1986 it was 6.4 million (http://www.populstat.info/; accessed January

2010). Due to the fighting, recent population numbers are highly uncertain and range from about 8-10 million (Kelleher 1998; Anon. 2009b).

After the fall of the Siad Barre Government in 1990, Somalia was not able to effectively manage its natural resources due to the lack of effective national governance (Kelleher 1998; Jennings 2001). Although foreign fishing in the offshore waters off Somalia was prevalent during the early decades from 1950 to 1980, no major illegal fishing incidents or confrontations with foreign vessels was reported during that time period (Sabriye 2005). Given that EEZs were not internationally recognized until the late 1970s or early 1980s, and Somalia's status and recognition of their claim for jurisdiction beyond 12 nm territorial waters remains uncertain and challengeable (but see below), any such offshore fishing was only considered 'illegal' in the context of international law with the ratification of UNCLOS by Somalia in 1989. As Somalia declared a 200 nm *territorial* sea in 1971 that is contested and not based on accepted international law (Schofield 2008), but ratified UNCLOS in 1989, this ratification could be argued to supersede Somalia's previous territorial sea claim and replace it with a legitimate 200 nm EEZ since 1989 (C. Schofield, pers. comm.). Furthermore, the effective collapse of the national government in 1990 also exposed its coastal waters to uncontrolled access by foreign fleets (Samatar 2007). During the post-regime period, the state failed to exercise its rights both at land and sea due to a dysfunctional government (Dupont 2003).

Several issues contributed to the problem with unregulated and unlicensed fishing vessels. The majority of Somalia's maritime neighbours are not equipped with adequate monitoring, control and surveillance (MCS) infrastructure to address violations by foreign fishing vessels. This includes Kenya (Anon. 2008a, 2008b, 2008d), Tanzania (Anon. 2008e)[1], Yemen (Anon. 2009a). None of these countries have regular or adequate fisheries observer schemes, port state control, mandatory Vessel Monitoring System (VMS) requirements or aerial surveillance for foreign vessels operating in their own EEZs. After the fall of Siad Barre's government in the early 1990s, the majority of Somali licensed foreign vessels re-flagged their vessels to Kenya or Flag of Convenience countries (e.g., Belize, Honduras) to conduct illegal fishing operations in Somali waters (Kulmiye 2001; Anon. 2008c). Starting in the mid 1990s, foreign illegal fishing vessels started encountering increasing resistance from local clans along Somalia's coastline, and started paying local warlords and militia a nominal amount for protection to fish in local waters. The

[1] "Tanzania, SADC join forces against illegal fishing". Available at www.stopillegalfishing.com [Accessed Feb. 2010].

majority of fishing vessel arrests locally during this time appear to be for failing to pay the clans for illegal fishing, rivalries between two clans claiming authority over the same territory (Anon. 2005; von Hoesslin 2006) or for fishing too close to the coast (Anon. 1998).

For the purposes of the present catch reconstruction, we do not deal with the illegal foreign fishing presence in Somali waters, despite its historic significance and likely massive scale. Data presented here pertain only to domestic Somali fisheries and licensed foreign and joint venture operations.

Fisheries development

Of the two former colonial powers, Britain and Italy, only Italy is known to have tried to establish a fishing industry (e.g., by building three canning factories on the north shore in the mid 1930s), but without much success (Haakonsen 1984). After independence in 1960, the fisheries sector was not paid much attention until Siad Barre came to power in the late 1960s. To increase fisheries production, the government launched fisheries development programs and created about 20 fishing co-operatives which were supplied with motorized boats, fuel, fishing gear, etc. In 1974, the nomadic population was heavily affected by a severe drought that killed much of their livestock. Consequently, fifteen thousand nomads were resettled into four fishing co-operatives. The fisheries development programs were largely supported by the former Soviet Union.

Pre 1991: Industrial and foreign fishing

Somalia has never had a large domestic industrial fishing fleet, and most of the industrial fishing in Somali waters has been carried out by what were essentially foreign fleets, for many years through so-called 'joint ventures'. During the 1950s, the Italians were fishing mostly for their canning industry on the north coast, with 95% of the production exported to Italy and the remainder marketed locally or sent to Yemen. Occasional Japanese longlining occurred offshore on the east coast (Johnson 1956), and in the 1960s, Japan undertook test fishing for tuna (Lawson *et al.* 1986). Some Greek trawlers also operated in Somali waters in the mid 1960s (Haakonsen 1983). In 1974, SOMALFISH was established as a joint venture between Somalia and the Soviet Union. It operated ten trawlers and one fishmeal factory ship until late 1977, when political relations between the two countries broke down and the Soviet Union withdrew their boats and support (Haakonsen 1983). According to national statistics, these vessels caught 2,000 - 5,000 $t \cdot year^{-1}$ of finfish and spiny lobster (FAO 1978; Haakonsen 1983). However,

according to Yassin (1981) SOMALFISH exported between 10,000 - 20,000 t·year^{-1}. After the Soviets terminated their operations in Somalia, industrial fishing was carried out through joint ventures and licensing of foreign vessels from countries such as Italy, Japan, Greece, Singapore and Egypt (Van Zalinge 1988) as well as China.[2] SOMALFISH itself purchased two Australian built shrimp trawlers and nine Yugoslavian built trawlers (Lawrence 1980). The two Australian vessels started operating in the late 1970s, but it is unclear if the nine Yugoslavian trawlers ever operated (Haakonsen 1983). An Italian company called Amoroso e Figli operated three freezer trawlers off the north east coast in 1978 and 1979 (Stromme 1987). SIDACO, a joint venture between Somalia and Iraq was formed in 1977 (FAO 1978). However, according to Haakonsen (1983) their vessels never operated, while another source (Anon. 1982) stated that in 1982 SIDACO operated four trawlers. SOMITFISH, a joint venture between Somalia and Italy, operated three Italian built trawlers between 1981 and 1983 (Van Zalinge 1988). In 1983, ten Japanese longliners were fishing for large pelagic fish, and in 1984 six Japanese and eighteen Korean longliners fished in Somali waters. In 1983 and 1984, Romanian trawlers fished for small pelagic fish as a scientific expedition. Italian and Japanese bottom trawlers as well as several pelagic pair trawlers from Singapore operated in Somali waters in late 1984 (Elmer 1985). In 1985, ten licenses were issued to foreign vessels from four different countries (Anon. 1987). After a few years of inactivity, SOMITFISH was re-established as SHIFCO, and with new and rehabilitated vessels started operations in 1987 (Anon. 1988; Sabriye 2005). In addition, five Italian trawlers and one French trawler were licensed to fish in Somali waters (Anon. 1988). During the 1980s, China increasingly supported the Siad Barre government with direct supplies of weapons and other military supplies. In exchange, Somalia transferred its territorial fishing rights to China, which was formalized through an agreement signed in 1989. In essence this was a 'guns-for-fish' agreement. It is likely that with the fall of the Siad Barre government in 1990, this fishing may have continued uncontrolled for some time.

Post 1991: collapsed government

The Siad Barre regime maintained a surveillance force to protect the offshore waters of Somalia, although nothing is known about its effectiveness. When the government collapsed in 1991, the waters were left unmonitored and unguarded, and this was exploited by fishing vessels from various countries

[2] Country Studies Series by Federal Research Division of the Library of Congress. Available at www.country-data.com/cgi-bin/query/r-12055.html [Accessed August 2012].

(Qayad 1997; Jennings 2001; Mohamed and Herzi 2005; UNEP 2005; Mwangura 2006b; Samoilys *et al.* 2007; Schofield 2008; Weir 2009). This unlicensed exploitation by foreign vessels (synonymous with resource-piracy) has been proposed as a major reason for the initial rise of piracy in the waters of Somalia (Lehr and Lehmann 2007). It is argued that local fishers who were deprived of their livelihoods, and the warlords who saw an opportunity to make money, formed 'coast guards' to enforce the waters of their perceived 'territories'. These 'coast guards' attacked foreign fishing vessels and demanded compensation for fish caught. Local warlords also started to sell 'licenses' for fishing (Jennings 2001; Menkhaus 2009), thus creating what can be called 'semi-illegal' licensing schemes for foreign vessels.

For example, during 1996 – 1997, 43 longliners, 61 purse seiners and a few Kenyan trawlers were fishing in Somali waters through such local warlord agreements. In addition, four Saudi-Arabian trawlers and some Pakistani vessels occasionally fished along the coast, and three Sri Lankan vessels based in Berbera fished for sharks. Two Syrian and one Taiwanese vessel were captured and accused of illegal fishing by the 'Somali Salvation Army' (Kelleher 1998). In 2005, Somaliland had about 36 Egyptian trawlers operating in their waters, landing about twice as much as the small-scale fleet was assumed to land (Gulaid 2004). Interestingly, the remaining 'domestic' industrial fleet (operating under the joint venture SHIFCO) had been operating out of Aden (Yemen) since the late 1990s (Jennings 1998).[3]

Small-scale fisheries

The small-scale fisheries development programs during the Siad Barre era were not only supported by the Soviet Union, but also by other countries through foreign aid. However, the desired growth of the sector failed to materialize. The absence of fishing traditions translated into a lack of fishing experience and infrastructure such as storage and processing facilities. There was also a lack of equipment and knowledge on how to repair boats, which made it hard to maintain the fishing fleet. For example, more than 50% of the new motorized boats distributed in the mid 1970s were out of commission after only a few years. The marketing of fish from the co-operatives was centralized during the 1970s and early 1980s, diminishing incentives for increased production (Haakonsen 1983). Fishing activities increased when the government started to liberalize the sector during the 1980s (Pierconti and Dunn 1990).

After the collapse of the central government in 1991 and during the ensuing civil war, much of the existing small-scale fishing sector was reduced, which amplified the already existing shortage of spare

[3] FAO country profile, Somalia. Available at www.fao.org/fishery/countrysector/FI-CP_SO/en [Accessed January 28, 2010].

parts and infrastructure. The small-scale fishers also suffered from the cessation of government support (Lovatelli 1996) and their catches declined (Kelleher 1998). However, in later years, the absence of government control of the fishing industry resulted in increased influence of the private sector and entrepreneurs which was the main force behind the gradual revival of the fishing trade (Lovatelli 1996). In more recent times, the investment from the private sector together with foreign aid, and also the change in consumption habits of Somalis seem to have resulted in an expansion of the small-scale fisheries sector and substantially increased small-scale catches in the post-war period (Gulaid 2004; Mohamed and Herzi 2005; Sabriye 2005).

Lack of statistics and reliable data

Lack of sufficient and reliable statistics was identified as a major problem for the development and management of fisheries in the Indian Ocean (IOFC 1982). The Somali Ministry of Fisheries does not seem to have had a tradition of collecting fisheries statistics. For example, Elmer (1985) reported that it was difficult to make the Ministry pay the people responsible for gathering of data, as there was a lack of understanding of the importance of data collection. The national legislation in Somalia (i.e., the Maritime Code) also hindered the gathering of fisheries statistics since it did not give the Ministry of Fisheries the authority to collect fishing data. The national statistics law did cover data collection to some extent, however, it did not include provisions ensuring the Ministry of Fisheries would receive data on fisheries (Lawrence 1980). The absence of workable government institutions since the late 1980s has prolonged and exacerbated the problem of unreliable data (UNEP 2005).

The existing fisheries statistics from the 1970s and the 1980s are thought to be incomplete. For example, the 'production from all sectors' in 1985 as reported by the Somali government (Anon. 1985), was based solely on catches by the 23 co-operatives and re-settlements, the offshore catches, and the purchases by companies from small-scale artisanal fishers. The reported production from the co-operatives and re-settlements was deemed to represent the artisanal (i.e., small-scale, commercial) production and was reported as 6,223 t in 1985. This is thought to be an underestimate, since it excluded data from fishing villages along the coast that were not part of a co-operative. For example, Jennings (1998) reported 31 fishing communities, while Mohamed and Herzi (2005) suggested that before the civil war there were about 50 fishing villages. Furthermore, the FAO country profile reports

that there are about 50 fishing villages along the coast.[4] Hence, the artisanal fish production from villages that were not associated with the 20 co-operatives or the three re-settlements, together with non-commercial catch (i.e., subsistence catch), seems to be missing from reported data. In addition, the Ministry of Fisheries acknowledged that a substantial part of the landed catch was sold directly at the beach landing sites to the public, and deemed the amount sold as 'unquantifiable' (Anon. 1987). Shaves (1984) also reported that sales of fish occurred outside the controlled market during the time when, according to national law, all fish had to be sold through the co-operatives at a fixed price.

Furthermore, the total production reported by the Ministry in 1985 was 11,938 t (Van Zalinge 1988). This included 2,039 t of artisanal landings that were purchased by public companies, and 1,130 t of large pelagic fish caught by Korean longliners and 240 t of small pelagic fish caught by Romanian survey trawlers (Van Zalinge 1988). If the artisanal catch component and the Korean and Romanian catches were subtracted, the remaining production (i.e., 8,529 t) matched what was reported as demersal industrial production (i.e., 8,528 t) in 1985 (Van Zalinge 1988).

The Food and Agriculture Organization of the United Nations (FAO) is mandated to report data provided by their member countries. The examples described above matches what FAO reports as Somali catch for 'marine fishes nei' in FAO FishStat for 1985. This suggests that FAO data for Somalia are incomplete due to the use of national data reported by the Somali Ministry of Fisheries.[5]

Discards

Industrial fisheries

Tropical waters have a large number of species, and it seems rare if one species makes up more than 20% of the catch (Tussing *et al.* 1974). In Somali waters, there is a large diversity of fish, but only a few species are of commercial interest (Lovatelli 1996). Trawl surveys in the late 1970s reported non-commercial by-catch of more than 50% (Kelleher 1998). Van Zalinge (1988) reported that only the high value species, accounting for less than 50% of the catch, were retained on demersal trawlers. Therefore, discarding was likely high in demersal trawl fisheries. Depending on the species composition, the

[4] FAO country profile, Somalia. Available at http://www.fao.org/fishery/countrysector/FI-CP_SO/en [Accessed January 28th, 2010].
[5] As part of our search for information on Somali fisheries statistics, we attempted repeatedly to contact Mr. Graham Farmer who apparently is (or was) the officer in charge of the FAO Somali program, but without success.

acceptability for various species by markets, onboard storage capacity, and distance to port, between 40% and 80% of the total catch was discarded (Tussing *et al.* 1974). In the shrimp trawl fishery, discards may have been as high as 90% (Hariri 1985). For later years, Kelleher (2005) reported that the general discard rates in the western Indian Ocean were 9% in the tuna fishery, 92.3% in the shark fin fishery, 30-40% in the long-range longline fishery, 5% in the purse seine fishery, and 21.7% in regular longline fisheries. Kelleher (2005) did not report a specific demersal trawling discard rate for the western Indian Ocean, but his global weighted average discard rate for demersal finfish trawling was 19.6%.

Small-scale fisheries

In the small-scale fishery, a large number of different species are fished and consumed (Mohamed and Herzi 2005), although pelagic species such as tuna and mackerel are commonly favored (Costello *et al.* 2012). Furthermore, in some cases or areas, this fishery may focus on a narrow range of species for retention (UNEP 2005). Kelleher (2005) reports that east African artisanal fisheries have negligible discards. However, due to the eating habits of the Somalis, the lack of storage/processing facilities and market opportunities, some sources acknowledged that discarding occurred also in the small-scale fishery (e.g. Lovatelli 1996; Mohamed and Herzi 2005)

Here, discarding by small-scale fisheries is considered negligible overall, and has not been included in the catch reconstruction. Discarding of shark meat as part of the shark fin fishery, however, has been estimated here. Many of the small-scale fishers target shark for their fins and only a few of the fishers retain the meat (Lovatelli 1996).

Overall, we follow a catch reconstruction approach as described by Zeller *et al.* (2007), with the main purpose of comprehensively estimating total catches taken from the EEZ-equivalent waters of Somalia since 1950, by domestic fisheries.

Methods

Somalia's domestic fisheries

Landings data for Somalia supplied to FAO were reported as 'marine fishes nei', 'cephalopods nei' and 'tropical spiny lobster nei', and were assumed to represent industrial catches, the production from the co-operatives and purchases of some artisanal catches by smaller companies. Here, the total reported landings were assigned to small-scale and industrial fisheries based on a breakdown of landings between

1974 and 1987 reported by the Ministry of Fisheries (Van Zalinge 1988). For the years where no breakdown was available (prior to 1974 and after 1987) the averages of the first and last three years of the breakdown were used, respectively. Thus, prior to 1974, 25% of landings were assigned to industrial landings, and after 1987 49% were assigned to industrial. 'Tropical spiny lobsters nei' were split using these proportions with no further adjustments made. The 'marine fishes nei' and 'cephalopods nei' were then added together and the total was split using the proportions listed above. This was done because all cephalopod catches were determined to be small-scale, and doing the split this way allows the total catch to be split using the determined proportions, while allowing allocation of a greater proportion of the 'marine fishes nei' to the industrial sector and all of the cephalopods to the artisanal sector. This is addressed further in the description of the species breakdown below. The FAO data that were assigned to industrial fisheries were taken at face value, while a separate reconstruction of the small-scale fisheries allowed us to determine an add-on to the small-scale portion of reported FAO data derived here. For this reconstruction, we used the 2010 FAO data as our baseline.

Small-scale catches

Small-scale catches (i.e., artisanal and subsistence catches) were estimated using the number of operational boats and catch rate per operational boat per year. The earliest reported small-scale catch (Thurow and Kroll 1962) was taken at face value and extrapolated back to 1950. The most recent records of catches were reports for the fisheries in the three regions of former Somalia: southern central Somalia (Sabriye 2005), Puntland (Mohamed and Herzi 2005) and Somaliland (Gulaid 2004). The reported catches for Puntland and southern central Somalia were taken at face value. For the third region, Somaliland, shark catches were missing and were estimated based on the fraction of shark in catches in southern central Somalia. The estimated shark catch was then added to the reported fish catch for Somaliland (Table 1), and these data were used as the 2005 anchor point.

The total estimated small-scale catch for 2005 (Table 1) was carried forward to 2010 unchanged. For 1962, Thurow and Kroll (1962) report small-scale catches of 16,500 t, which we carried back to 1950 unaltered (Table 2). The small-scale catches in the period between 1963 and 2004 were estimated by deriving anchor points for the number of operational boats for 1978, 1980, 1988, and 1995 based on available information and assumptions (see below). The number of operational boats was then multiplied by a catch rate per boat based on Elmer (1985) to create anchor points for small-scale catch

(Table 2). To complete the time series, linear interpolation was done between the derived catch anchor points and the catches reported in 1962 and 2005 (Table 2).

Number of operational boats

The traditional boats in Somalia are the wooden canoe called '*houri*', and the less common sail boats called '*beden*' or '*mashua*' (Lovatelli 1996). According to Thurow and Kroll (1962), the small-scale fishing fleet in the early 1960s consisted of 1,875 *houris* of whom 1,500 were always active, 175 *beden* of which 150 were always operating, and 25 other boats (called '*dunnis*'), together accounting for a total catch of 16,500 t (Table 2). Thus, the fraction of traditional boats that were operational at any one time was about 80%. This fraction was applied to the reported total number of traditional fishing boats in later years (see below).

During the 1970s, a number of motorized boats were issued through fisheries development programs. Haakonsen (1983) reported that 685 motorized boats had been provided during the previous years and that 500 of those boats were issued during the five year development program 1974-1978. According to Hariri (1985), 700 motorized boats were issued from 1972 onwards, and by the late 1970s only 40% were working. UNDP/FAO (1992) reported that 600 motorized boats were issued between 1974-1978 and that in 1979, 150 new engines were provided by the UK to rehabilitate some of these boats. Jennings (1998) reported that 600 motorized boats were issued and that within five years only 20% were working. According to Lovatelli (1996), 450 boats had been issued by 1982. As the number of motorized boats reported by the above sources are all in the same range, we used the earliest source (i.e., Haakonsen 1983). The year 1978 is in the middle of the ten year period reported on by Haakonsen (1983) for the distribution of 685 boats, hence we assumed that all boats were distributed by 1978 to create an anchor point. By the time the report was written (1983), more than 50%, and maybe as much as 75%, of the distributed motorized boats were not operating due to lack of spare parts and knowledge on maintenance (Haakonsen 1983). Hence, we assumed that 40% were working and applied this to the total number of motorized boats to derive a total of 274 operational motorized boats for 1978 (i.e., 685 * 0.4 = 274).

The traditional boats are thought to have had a much higher fraction that were operational, due to lower mechanization and easier, more traditional maintenance requirements. Therefore, the fraction of operating traditional boats (80%) from Thurow and Kroll (1962) was used. Haakonsen (1983) reported

that the traditional fleet was 2,250 boats, but he also mentioned that use of traditional boats was declining due to the introduction of motorized boats and lack of maintenance. Therefore, for 1978, we assumed 2,000 traditional boats and a working rate of 80%. Together with the assumed 274 working motorized boats, this resulted in an anchor point in 1978 of a total of 1,874 operational boats (Table 2).

In 1980, Lawrence (1980) reported that about 125 motorized boats were working and that the traditional fleet was about 2,000. Hence, we derived a 1980 anchor point of 1,725 working traditional and motorized boats ([2,000 * 0.8] + 125 = 1,725; Table 2).

In 1988, the civil unrest started in northern Somalia, and by 1991 the government had collapsed. The civil war damaged much of the fishing sector; hence, there was a decline in the number of operational boats after 1988. Due to lack of other information, the anchor point in 1980 was carried forward to 1988 (i.e., 1,725 operational boats; Table 2).

Kelleher (1998) reported that the artisanal fleet in 1995 was made up of 627 *houris* and sailboats (i.e., 627 * 0.8 = 502 operational traditional boats) and 290 functional motorized boats. This was used to form an anchor point of 792 operational boats in 1995 (Table 2).

Catch rate

Elmer (1985) reported that around 737 operational boats caught 8,288 t. Thus, the average catch rate was 11.25 t per operational boat per year (8,288 / 737 = 11.25). To remain conservative, we used a catch rate of 10 t per operational boat per year as a default measure to derive the estimated tonnage of small-scale catch for 1978, 1980, 1988 and 1995 (Table 2). For years between anchor points, data were linearly interpolated.

Small-scale catches: artisanal versus subsistence

Although the majority of data sources used here for estimating small-scale catches relate to artisanal fisheries, we assume that a fraction of these catches can be deemed subsistence, i.e., are not for sale but for direct consumption or local barter. Thus, we assumed that the estimated total small-scale catches derived here were split into the two sectors as follows: For 2010, we assume 80% artisanal and 20% subsistence, while for 1950 we assume a 60% artisanal and 40% subsistence split. We interpolate these percentages over time to derive full time series for each sector.

Species composition

We assigned the estimated catch to different species, by sector, based on information found in various sources (Table 3).

Industrial

The domestic industrial catch was assumed to consist of demersal species caught by trawl (80%), and pelagic species (20%). The pelagic catch was in turn split between large (80%) and small (20%) pelagic taxa. Individual taxa were assigned percentages within each category (Table 4) based on the general information contained in the sources in Table 3.

Small-scale

Much of the literature suggested that sharks and rays made up a substantial part of the small-scale catch (artisanal sector only; shark fishing assumed to be a commercial endeavour); therefore they were treated as their own category. Thurow and Kroll (1962) reported that sharks made up 21% of the total catches in the early 1960s. The fraction of sharks and rays in the small-scale catch increased to about 40% during the 1980s (Anon. 1987), and to 55-65% by the 1990s (Lovatelli 1996). We assumed 55% of the catch in the mid 1990s was sharks. For each of these anchor points, in order to be conservative, it was assumed that these percentages applied to the artisanal catch only. For the most recent time periods, the fraction of sharks was 29% of the total small-scale catch in southern central Somalia (Sabriye 2005), whereas in Puntland it was 81% of the reported catches, although substantial finfish catches were missing from the data (Mohamed and Herzi 2005). We estimated the shark catches in Somaliland by assuming the same shark to finfish ratio as for south-central Somalia (i.e., 29%; Table 1), and added them to the reported artisanal catches (Gulaid 2004), which resulted in a total fraction of sharks of 43% in 2005 for Somalia (Table 1). Considering that the Puntland percentage is an over-estimate and that the Somaliland tonnage had to be estimated, we applied the 43% in 2005 to the artisanal catch only, in order to remain conservative. Note that this in turn resulted in a slightly lower shark tonnage for 2005 within our reconstruction than was found in the literature. All of this information was used to create a time series of the shark and ray fraction within the artisanal sector. Linear interpolation was done between the anchor points in 1962 (21%), 1985 (40%), 1995 (55%) and 2005 (43%). Data for 1962 was carried back to 1950 unaltered and the anchor point in 2005 was carried

forward to 2010 unaltered. Species composition of shark catches were derived from a variety of sources (Table 3) and applied in seven taxonomic groups (3 species, 2 families and 2 general groupings, Table 5).

The remaining, non-shark artisanal catch was split into demersal (40%) and pelagic (60%) catches, based on information from sources in Table (3). Artisanal finfish catch is thought to be dominated by pelagic taxa (60%), in contrast to industrial catch, in which demersal taxa (80%) predominate (Tables 4, 6). Individual taxonomic assignment of catches (Table 6) was derived from sources in Table 3.

The breakdown for the subsistence catches was derived from the artisanal breakdown, taking into account sectoral differences. Sharks and rays were excluded and the proportion of large pelagic fish was greatly reduced. Subsistence catches were disaggregated using the proportions shown in Table 8.

The FAO reported catches include cephalopods; however, there was no specific information on cephalopod catches in our sources. Therefore, the reported cephalopod catches were proportionally assigned to the artisanal and subsistence sectors using the same proportional split applied to the total small-scale catches. The tonnage determined for each sector was then assumed to be contained within the 'marine fishes nei' tonnage that was estimated above and subtracted out to determine the remaining amount of 'marine fishes nei' for each sector.

Discards

Industrial fisheries

Due to a lack of gear specific information in the Somali domestic industrial fisheries, we assumed that half of the pelagic fish in the industrial catch was caught with longliners and half with purse seiners, and applied associated discard rates (21.7% for longliners and 5% for purse seiners) reported by Kelleher (2005). For the demersal fraction of the domestic industrial catch, the global average discard rate for demersal finfish trawlers of 19.6% (Kelleher 2005) was used, as specific discard rates for demersal fisheries in the western Indian Ocean were not available. The by-catch of sharks in industrial trawlers has been estimated to be 5% of the total weight of the catch. Of this by-catch, only the fins were kept and the rest was discarded (Marshall 1997). The discard of shark meat was assumed to be included as part of the 19.6% discard rate. The demersal discard rate was split between sharks (4.5%) and fishes (15.1%). The sharks were taxonomically disaggregated using the artisanal shark breakdown, and fishes were disaggregated by family using the industrial demersal breakdown (Table 7a). Pelagic discards were broken down using the proportions shown in Table 7b.

The crustacean fishery incurs a small amount of discards as well. Discards were estimated to equal 1.1% of the crustacean landings. This is an assumption.

Small-scale fisheries

Although references have been made to some discarding of fish in the small-scale fisheries (e.g., Lovatelli 1996; Jennings 1998; Mohamed and Herzi 2005), they may be low (except for artisanal fisheries supplying Yemeni mother boats).

Here, we focused specifically on discards in the shark fin fishery which have been estimated. In Somalia, dried shark meat was an export commodity, hence, sharks were not only targeted for their fins (Lovatelli 1996; Jennings 1998). In 2005, it was reported that dried shark meat was collected in Mogadishu from all regions and thereafter exported to Mombasa in Kenya (Sabriye 2005). In the mid 1990s, Lovatelli (1996) reported that only a small percent of fishers retained the meat, and Gulaid (2004) reported that only fins were retained by fishers in Somaliland. Thus, overall discards of sharks (except fins) were assumed to be relatively large. To estimate the shark discards in the small-scale fisheries, data from IUCN (2003) and Mohamed and Herzi (2005) were used. According to IUCN (2003), the community of Eyl produced 200 t of shark fins, which requires about 10,000 t of live-weight sharks. In addition, Mohamed and Herzi (2005) stated that Eyl's estimated yearly locally landed and utilized shark catch (not finned) was 1,830 t in 2004. Thus, we assumed that the discards of shark meat in Eyl due to shark finning alone were about 8,170 t (10,000 t – 1,830 t = 8,170 t), which was 69% of the total estimated shark and ray catch in 2004 in Eyl (8,170 t / 11,830 t = 0.69). In order to remain conservative, and also because the retained fin weight was not taken into account in this calculation, we reduced this to 49.1%, and used this as a total small-scale shark discard rate in 2004 for all of Somalia. Half of the 2004 discard rate was used as an anchor point in 1990 (i.e. 24.5%) to reflect the rapidly growing demand for shark fins reported during the 1990s (Clarke 2004). Thurow and Kroll (1962) reported that dried sharks were exported from Somalia and that shark fins fetched a higher price, however, there were no indications of shark meat discards in the report. Therefore, we conservatively assumed that shark discards were 0% in 1960. Linear interpolation was done between the 1960, 1990 and 2004 discard rates to derive the fraction of artisanal shark meat discards over time, and the 2004 rate was carried forward to 2010 unaltered.

Adjustments

From 1992 to 1996, reported catches were greater than reconstructed catches. Therefore, catches in these years were assumed to be 100% reported (except for discards which are known to be unaccounted for in reported data) and a negative adjustment of the reported data was done. Previously, when the reported cephalopod catches were subtracted from the total artisanal and subsistence 'marine fishes nei', the result was a negative catch in these years (1992-1996). Therefore, the cephalopods were adjusted independently of the rest of the catch. All of the 'marine fishes nei' were assigned as cephalopods for 1992-1996 and the difference was allocated as a negative adjustment to the reported cephalopod catches. 'Tropical spiny lobster' catches were left unadjusted as they were assumed to be well reported. The remaining catch was compared to the 'marine fishes nei' reported catch. The difference between these totals represents the negative adjustment applied to the 'marine fishes nei' category of the reported data. Please note that all comparisons of reconstructed data to the reported FAO data refer to the adjusted baseline derived here.

Results

Reported catches

Total landings reported by FAO on behalf of Somalia were 922,930 t (944,999 t before adjustment) from 1950-2010, with catches varying between 5,000-15,000 t·year^{-1} from 1950 to the early 1980s, before increasing rapidly to around 25,000 t·year^{-1} by the early 1990s. Following a decline in landings during the 1990s, reported landings increased again to 30,000 t·year^{-1} in the early 2000s and have been fixed at this amount since (Figure 2a). Here, we split these data into assumed industrial and small-scale components of reported landings, and added unreported catches as well as discarding to both components.

Industrial

Of the total FAO reported landings, about 420,700 t, or 46%, were assigned to industrial landings from 1950-2010 (Figure 2a). Prior to 1975, industrial landings accounted for about 25% of total landings reported by Somalia to FAO. After the mid 1970s, industrial landings started to increase until 1995, when they peaked at around 15,700 t·year^{-1}, or 66% of total FAO reported landings (Figure 2a). The erratic nature of reported industrial landings, especially during the 1980s, was largely driven by serial failures of joint venture operations. The only source of unreported catch we examined and estimated for

the industrial fishery was discards, which contributed 15% of the total reconstructed industrial catch (75,200 t).

The overall species composition of the industrial catches suggested that *Diagramma picta* was the most important individually identifiable taxon for the industrial fisheries (15.7%), consistently contributing between 14.5-16.1% of the catch each year. This was followed by *Lethrinus nebulosus* (9.3%) and *Epinephelus areolatus* (8.6%), while the most important pelagic species were yellowfin tuna (*Thunnus albacares*; 6.4%) and bigeye tuna (*Thunnus obesus*; 4.9%). Discards accounted to 15% of the total reconstructed industrial catches (Figure 2a).

Small-scale

Reconstructed total small-scale catches were over 1.3 million t for the entire period (Figure 2a), which was just over 2.6 times the volume of FAO landings assumed to represent small-scale catches. The reconstructed total small-scale catches during the colonial era (1950s) were estimated to be 16,500 $t \cdot year^{-1}$. After 1960, total small-scale catches started to increase to almost 20,000 $t \cdot year^{-1}$ by 1977, before declining during the 1980s to about 18,500 $t \cdot year^{-1}$. After the collapse of the national government in the early 1990s, catches dropped substantially to a low of 9,200 $t \cdot year^{-1}$ in 1995. Small-scale catches increased substantially thereafter to approximately 47,700 $t \cdot year^{-1}$ by the late 2000s. Small-scale catches were estimated to consist to 74% of artisanal catches and 26% subsistence catches. Discards contributed 10% to the overall artisanal catch.

The species breakdown of small-scale catches, based on information available to us, suggested that sharks and rays dominated catches. Their fraction of the landed artisanal catch (subsistence fisheries were assumed not to target sharks) increased from about 21% in the earlier period (2,100 $t \cdot year^{-1}$), steadily rising from the mid-1960s to a peak of almost 54% in 1996 (4,600 t), and then declined to about 43% (14,000 $t \cdot year^{-1}$) in the most recent years (2005-2010). Discards of shark meat (the result of targeted shark finning) were estimated at around 100,000 t between 1950 and 2010.

Although sharks and rays as a group were dominant in the small-scale catches, the most dominant individual taxa in the total small-scale catch were *Lethrinus nebulosus* (7.5%) and *Thunnus albacares* (6.1%).

Total catches

The reconstructed total catch was around 1.8 million t from 1950-2010, which was 98% larger than the adjusted landings of 922,930 t reported to FAO on behalf of Somalia for the same period (Figure 2a). For the first 20 years (1950-1969), total reconstructed catches averaged around 18,600 t·year^{-1}. During the 1970s and the 1980s, catches increased to around 22,000 t·year^{-1} and 28,000 t·year^{-1}, respectively. After the government collapsed in 1991, total catches stabilized at 28,000 t·year^{-1} until 1995, before rapidly increasing to 41,000 t·year^{-1} by the end of the decade. This increase continued into the 21st century and levelled out at almost 65,000 t·year^{-1} after 2006.

The spangled emperor (*Lethrinus nebulosus)* and yellowfin tuna (*Thunnus albacares*) were the most prevalent species in the total reconstructed catch, contributing 8.0% and 6.2% respectively. Rays and mantas (Batoidea) made up 6.0%, whilst the areolate grouper (*Epinephelus areolatus*) was 5.1% of the total catch, followed by the painted sweetlip (*Diagramma pictum*) at 4.3% (Figure 2b).

Discussion

Since the early 1990s, Somalia has been a failed state without a functioning central government (Nincic 2008). The country is suffering extensively from poverty and violence, and its fisheries statistics are highly unreliable (Anon. 2001). Based on the information and data available to us, and the assumptions outlined in the methods, catches from 1950-2010 were reconstructed in an attempt to gain a better understanding of likely total Somali domestic catches. The reconstructed total catch estimates were nearly two times the data reported by FAO on behalf of Somalia, with reconstructed small-scale catches as the major contributor to the difference.

Interestingly, industrial catches showed an increase during the initial phase of the civil war instead of the expected decline. This may reflect the loss of monitoring and enforcement capacity of Somalia during hat time, which seems to have been taken advantage of by foreign vessels engaging in illegal fishing. Unlike industrial catches, the reconstructed small-scale catches were thought to better reflect the unstable situation in Somalia starting in the late 1980s, with a rapid decline after the collapse of the legitimate government in 1991. After this initial decline, small-scale catches started to increase substantially after 1995. Increased involvement and private investments in the domestic artisanal fisheries sector was the main reason for the observed increase in catches (Lovatelli 1996). Other contributing factors could have been the change in seafood consumption habits among the Somalis

(Gulaid 2004), the relocation of displaced people due to war, and the increased use of motorized boats by artisanal fishers (Anon. 2001).

The landings data reported by FAO on behalf of Somalia were for many years incomplete or highly uncertain. This is not surprising, given the lack of a central government and administration, and FAO is to be commended for being able to provide any estimates at all, given that national reporting of catches collapsed in the late 1980s due to civil unrest (Anon. 2001).

Foreign illegal and semi-illegal fishing

Since the Siad Barre government collapsed in 1991 (and possibly even before that), Somalia has not been able to comprehensively patrol and protect its waters. Numerous vessels from various countries are thought to have exploited the situation by fishing illegally in Somali waters (e.g. Qayad 1997; Jennings 2001; Mwangura 2006b; Schofield 2008). There are contradictory reports about the number of illegal fishing vessels operating off the Somali coastline. Some of the more recent numbers suggest a decline from 500 foreign fishing vessels in 2006 (Mwangura 2006a) to 200 fishing vessels in 2009 (Anon. 2009c). However, exact numbers are not known due to the absence of monitoring and enforcement capacity within Somali waters. Furthermore, the number of foreign fishing vessels operating in Somali waters is also difficult to monitor due to the lack of transparency in data sharing among international monitoring agencies working in the Indian Ocean. As a matter of fact, misleading the public seems commonplace, as many fishing vessels, even while being attacked by Somali pirates, systematically withheld accurate position reports from relevant agencies, such as the IMB (International Maritime Bureau) and IMO (International Maritime Organization), and these agencies avoid reporting positions in favor of likely dubious self-reporting by vessels (Hansen 2009). In contrast, the commercial MaRisk system, using position data collected via satellites and remote sensors from the military coalition fleet, showed that fishing vessels were deep within Somalia's EEZ when captured by pirates (Hansen 2009).

The autonomous, but unrecognized territories of Somaliland and Puntland had some limited success in controlling illegal fishing for short periods. For example, the Puntland administration assigned responsibility for controlling coastal resources to private security companies such as Hart Security (British) for 2000-2001, SOMCAN (United Arab Emirates) from 2001-2006, and Al Hababi Marine Services (Saudi Arabia) in 2006 (Hansen 2008). However, these initiatives met with limited success as

most foreign vessels escaped into international waters whenever the private security vessels approached. Thus, for example, only four fishing vessels were arrested by Hart Security. None of the private security arrangements survived the interplay of local clan politics and changing political equations in these territories (Hansen 2008; Kinsey 2009).

It has been suggested that illegal foreign fishing in Somali waters has been the social reason for the resurgence of piracy in the region during the 2000s (Jennings 2001; Lehr and Lehmann 2007; Menkhaus 2009). Our catch reconstruction illustrates that domestic artisanal catches did decline after the start of the civil war and the collapse of central governance control. At the same time, foreign fishing fleets started to substantially increase their illegal fishing activities in Somali waters. The initial decline of artisanal catches was most likely caused by the lack of gear and boats, as well as the increased risk due to civil war, but might also have been impacted by the illegal foreign fleets. It has been reported that foreign vessels fished very close inshore and destroyed local fishing gears (Lehr and Lehmann 2007), which would have fueled anger towards foreign fishers. Irrespective of the initial reasons and drivers for the resurgence of piracy, it did not take long for it to grow into big business for warlords and criminals utterly unrelated to domestic fisheries, who increasingly used foreign fishing as an excuse to hijack vessels and demand ransoms (Menkhaus 2009).

One example was the “National Volunteer Coast Guard of Somalia” which in 2005 took over three Taiwanese-owned trawlers and demanded ransom for the crew, claiming it was a fine for fishing illegally within Somali waters (Lehr and Lehmann 2007). At the time (2005), the argument that pirates were deprived local fishers appeared to be already out of date, since our reconstruction suggests that by the mid-late 2000s, domestic artisanal fisheries catches had increased considerably. This is also supported by other observations (Gulaid 2004; Mohamed and Herzi 2005; Sabriye 2005). Therefore, the increasing piracy activities in the 2000s may have reduced illegal foreign fishing in coastal waters, permitting and enabling an increasing domestic artisanal sector to re-emerge.

Irrespective of the issue of piracy, the problem of foreign fishing fleets illegally exploiting Somali waters illustrates a severe failure of flag-state control, and further illustrates that illegal fishing is a matter of international, trans-boundary criminal activity rather than a fisheries management failure (Österblom *et al.* 2011; UNODC 2011). The value of illegal catches taken out of Somali waters in 2005 was estimated as being at least US$300 million (Lehr and Lehmann 2007). This lucrative illegal business is thought to have

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contributed to the prolongation of instability in the country, since neither foreign fishing interests or local authorities (warlords) would have benefited as much from properly controlled legal operations (Coffen-Smout 1998; Jennings 2001). Importantly, the value taken out of Somali waters by the illegal foreign fleets would not be available to the Somali people and society (David Ardill pers. comm., February 2010). In contrast, with fully transparent and legal licensing through foreign fishing access agreements, a functional national government would have been able to derive benefits for all of Somali society from one of their largest natural resources. Such controlled access would be an important source of foreign exchange income for legal national authorities, and may contribute to stability in the country (UNEP 2005).

If one examines semi-illegal fishing, i.e., foreign fishing based on 'licenses' and protection bought from local or regional authorities in contravention of international law, one finds that fishing companies that bought semi-illegal licenses were often treading a thin line, as being licensed by one warlord or local authority did not ensure safe treatment by another if the vessel entered the perceived local territories of another warlord. Furthermore, the UN Monitoring Group on Somalia has documented misuse of revenues generated from the sale of semi-illegal fishing licenses to the benefit of local warlords to maintain militias and purchase weapons (UN 2006). This concern is not restricted to central and southern Somalia, but is also prevalent along the coast of Somaliland, where Yemeni vessels exchanged arms for fishing rights (UN 2008).

Conclusions

Overall, the likely total catches taken from the waters of Somalia by domestic vessels, as derived through our catch reconstruction, increased from 18,250 t·year^{-1} in 1950 to 64,900 t·year^{-1} in 2010, and total catches were 98% higher than officially reported data. The occurrence of extensive illegal foreign fishing in the waters of a sovereign state, mainly during a time of severe internal instability, although not quantified here, illustrates an astounding lack of flag-state control by predominantly European and Asian fleets, and a global failure of control over rampant unregulated fisheries exploitation. It seems a poor testimony of international affairs that, in the 21st century, the global community continues to be incapable or unwilling to act decisively in the interest of poor and developing countries. The clear show of unanimous inaction with respect to the renewable resources in the waters of Somalia can only be called 'commercial colonialisms' in the name of globalization and the pursuit of unfettered profit.

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Table 1. Small-scale catches reported and estimated (in italics) for 2005 for Somalia.

Region	Fish (t)	Shark (t)	Total (t)	Shark (%)	Source
South-central Somalia	14,825	6,113	20,938	29	Sabriye (2005)
Puntland	2,144[a]	8,990	11,134	81	Mohamed and Herzi (2005)
Somaliland	6,030	*2,486*[b]	8,516	29	Gulaid (2004)
Total Somalia	**22,999**	**17,589**	**40,588**	**43**	

[a] A substantial part of the finfish catches from Puntland are sold to Yemen and not included in the reported catches for Puntland; [b] Estimated using the fraction of shark catches from south-central Somalia

Table 2. Anchor points used for interpolation of small-scale catch for Somalia. Values in italics are interpolated.

Year	Operational boats[a]	Catch anchor points (t)	Source
1950	n/a	16,500[b]	
1962	n/a	16,500	Thurow and Kroll (1962)
1978	1,874	18,740[c]	Thurow and Kroll (1962), Haakonsen (1983)
1980	1,725	17,250[c]	Lawrence (1980)
1988	*1,725*	17,250[c]	
1995	792	7,920[c]	Kelleher (1998)
2005	n/a	40,588[d]	Gulaid (2004), Mohamed and Herzi (2005), Sabriye (2005)
2010	n/a	40,588[e]	

[a] See text for sources; [b] Assumed equal to 1962 value; [c] Based on average catch rate of 10 $t \cdot boat^{-1} \cdot year^{-1}$ (Elmer 1985); [d] Estimated shark catches for Somaliland were added; [e] Assumed equal to 2005 value.

Table 3. Sources used for species composition for the catch reconstruction for Somalia, by fishing sector.

Source	Fisheries sector				
	Industrial	**Artisanal**	**Pelagic**	**Demersal**	**Sharks & rays**
Corfitzen and Kinzy (1950)					x
Ogilvie *et al*. (1954)		x	x	x	
Johnson (1956)		x	x	x	
Thurow and Kroll (1962)	x	x			x
Losse (1970)		x	x	x	x
FAO (1972)	x	x			
FAO (1978)		x			x
Anonymous (2011)		x	x	x	x
Bihi (1984)	x	x			
Johnsen (1985)	x			x	
Anonymous (1985)		x			x
Van Zalinge (1988)	x	x	x	x	
Sanders and Morgan (1989)	x	x	x	x	
Lovatelli (1996)		x	x	x	x
Marshall (1997)		x			x
Kelleher (1998)	x	x	x	x	x
Jennings (1998)	x	x	x	x	x
Anonymous (2004)		x			x
Sabriye (2005)		x			x
UNEP (2005)	x	x			x
IUCN (2006)		x			
IOTC database[a]	x		x		

[a] Indian Ocean Tuna Commission (IOTC) database available at www.iotc.org/English/index.php [Accessed: March, 2011]

Table 4. Species breakdown of industrial catches for Somalia, as derived for the present study, based on qualitative information from sources listed in Table (3). Percentage breakdown relates to the total industrial catch.

Category	Size[a]	Family/group	Species	Common name	Industrial catch (%)
Pelagic	Large	Scombridae	*Thunnus albacares*	Yellowfin tuna	7.7
Pelagic	Large	Scombridae	*Thunnus obesus*	Bigeye tuna	5.9
Pelagic	Large	Istiophoridae	*Tetrapturus audax*	Striped marlin	0.7
Pelagic	Large	Istiophoridae	*Makaira mazara*	Indo-Pacific blue marlin	0.3
Pelagic	Large	Xiphiidae	*Xiphias gladius*	Swordfish	0.4
Pelagic	Large	misc. billfish		Other billfish	0.1
Pelagic	Large	misc. pelagic fishes		Pelagic fishes	0.9
Pelagic	Small	Clupeidae	*Sardinella longiceps*	Indian oil sardine	1.9
Pelagic	Small	Clupeidae	*Etrumeus teres*	Round herring	0.8
Pelagic	Small	Scombridae	*Scomber japonicus*	Chub mackerel	0.8
Pelagic	Small	Carangidae	*Decapterus* spp.	Scad	0.3
Pelagic	Small	misc. pelagic fishes		Pelagic fishes	0.2
Sub-total pelagic					***20.0***
Demersal		Lethrinidae	*Lethrinus nebulosus*	Spangled emperor	11.3
Demersal		Lethrinidae	*Lethrinus lentjan*	Pink ear emperor	5.7
Demersal		Lethrinidae	*Lethrinus olivaceus*	Longfaced emperor	5.7
Demersal		Lethrinidae		Misc. emperors	5.7
Demersal		Serranidae	*Epinephelus areolatus*	Areolate grouper	10.4
Demersal		Serranidae		Misc. groupers	2.6
Demersal		Lutjanidae	*Etelis* spp.		4.1
Demersal		Lutjanidae	*Aprion* spp.		4.1
Demersal		Lutjanidae		Misc. snappers	2.0
Demersal		Haemulidae	*Diagramma pictum*	Painted sweetlips	19.0
Demersal		Mullidae	*Parupeneus indicus*	Indian goatfish	9.4
Sub-total demersal					***80.0***
Total					**100.0**

[a] Large = 80%, small =20% of the pelagic fraction of the industrial catch.

Table 5. Species breakdown of small-scale shark and ray catches for Somalia, based on sources in Table (3).

Category	Family	Species	Common name	Catch (%)
Sharks	Carcharhinidae	*Carcharhinus melanopterus*	Blacktip reef shark	15.0
Sharks	Carcharhinidae	*Carcharhinus amblyrhynchos*	Grey reef shark	7.5
Sharks	Alopiidae	*Alopias vulpinus*	Thintail thresher	15.0
Sharks	Lamnidae		Mako sharks	15.0
Sharks	Sphyrnidae		Hammerhead sharks	15.0
Sharks			Other sharks	7.5
Rays			Rays and mantas	25.0
Total				**100.0**

Table 6. Species breakdown of artisanal catches (excluding sharks and rays) for Somalia, based on qualitative information from sources listed in Table (3).

Category	Family	Species	Common name	Catch (%)
Pelagic	Scombridae	*Thunnus albacares*	Yellowfin tuna	15.0
Pelagic	Scombridae	*Thunnus tonggol*	Longtail tuna	5.0
Pelagic	Scombridae	*Euthynnus affinis*	Kawakawa (Little tuna)	5.0
Pelagic	Scombridae	*Scomberomorus commerson*	Narrow-barred Spanish mackerel	10.0
Pelagic	Scombridae			5.0
Pelagic	Clupeidae	*Sardinella longiceps*	Indian oil sardine	4.0
Pelagic	Clupeidae			1.0
Pelagic	Carangidae	*Selar crumenophthalmus*	Bigeye scad	2.0
Pelagic	Carangidae	*Trachurus indicus*	Arabian scad (Horse mackerel)	2.0
Pelagic	Carangidae			1.0
Pelagic	Coryphaenidae	*Coryphaena hippurus*	Common dolphinfish	5.0
Pelagic	Istiophoridae	*Tetrapturus audax*	Striped marlin	1.7
Pelagic	Istiophoridae	*Makaira mazara*	Indo-Pacific blue marlin	0.8
Pelagic	Xiphiidae	*Xiphias gladius*	Swordfish	2.0
Pelagic	Misc. billfish		Other billfish	0.5
Sub-total pelagic				***60.0***
Demersal	Lethrinidae	*Lethrinus nebulosus*	Spangled emperor	8.0
Demersal	Lethrinidae	*Lethrinus lentjan*	Pink ear emperor	4.0
Demersal	Lethrinidae	*Lethrinus olivaceus*	Longfaced emperor	4.0
Demersal	Lethrinidae		Emperors	4.0
Demersal	Lutjanidae	*Etelis* spp.		2.0
Demersal	Lutjanidae	*Aprion* spp.		2.0
Demersal	Lutjanidae		Snappers	1.0
Demersal	Serranidae	*Epinephelus areolatus*	Areolate grouper	4.0
Demersal	Serranidae		Groupers	1.0
Demersal	Mullidae	*Parupeneus indicus*	Indian goatfish	2.5
	Misc. marine fish			7.5
Sub-total demersal				***40.0***
Total				**100.0**

Table 7a. Breakdown by family name for industrial demersal fish discards.

Family	Percentage
Lethrinidae	28.4
Serranidae	13.0
Lutjanidae	10.2
Haemulidae	19.0
Mullidae	9.4

Table 7b. Breakdown by family name for industrial pelagic discards.

Family	Percentage
Scombridae	20%
Istiophoridae	20%
Coryphaenidae	20%
Clupeidae	20%
Marine fishes nei	20%

Table 8. Breakdown for subsistence catches.

Taxon	Percentage (%)
Marine fishes nei	7.50
Scombridae	10.00
Clupeidae	2.04
Indian oil sardine	8.15
Carangidae	2.04
Bigeye scad	4.07
Arabian scad/Horse mackerel	4.07
Lethrinidae	8.15
Spangled emperor	16.30
Pink ear emperor	8.15
Long faced emperor	8.15
Lutjanidae	2.04
Aprion spp	4.07
Serranidae	2.04
Areolate grouper	8.15
Mullidae	5.09

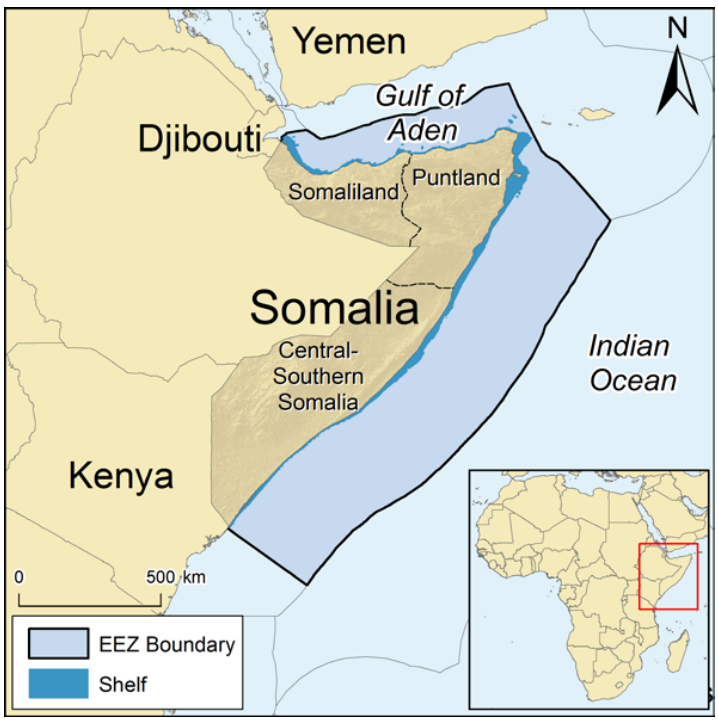

Figure 1: The Exclusive Economic Zone (EEZ) of Somalia, based on general UNCLOS principles, and the shelf waters to 200 m depth.

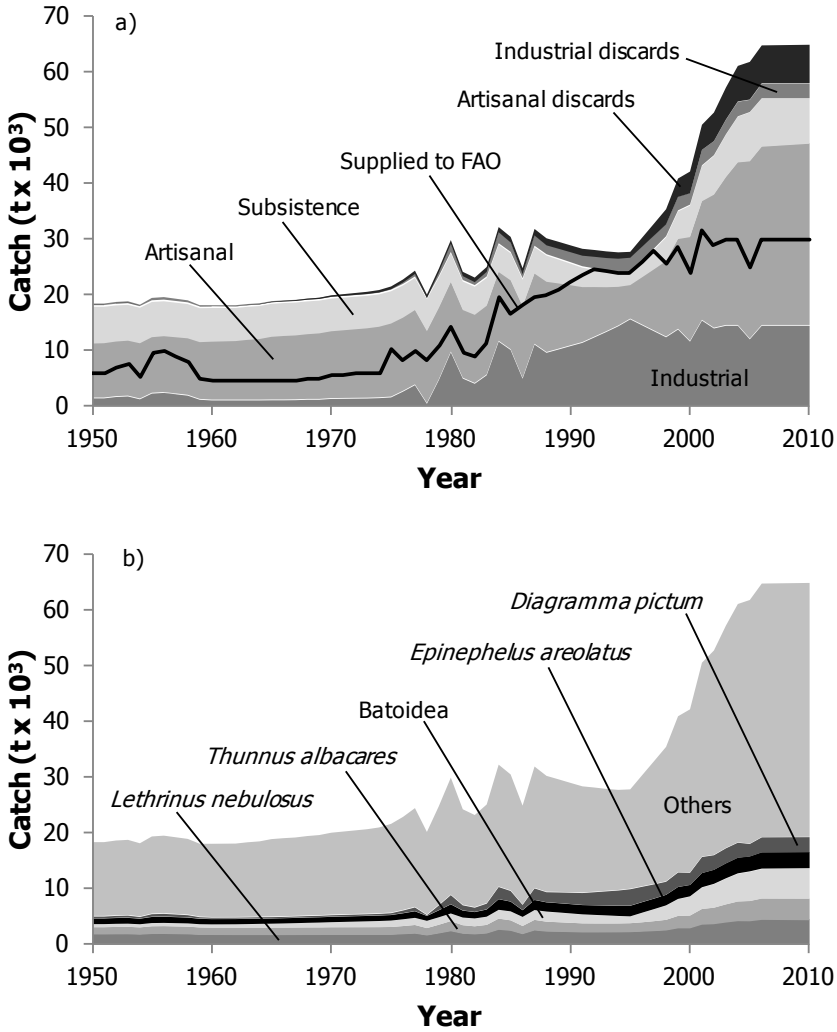

Figure 2. Total reconstructed catches in Somali waters, 1950-2010, a) by sector with reported catches overlaid as a line, b) by major taxa. 'Others' includes 42 additional taxonomic categories.

Appendix Table A1. FAO landings vs. total reconstructed catch (in tonnes), as well as total reconstructed catch by sector, with discards shown separately, for Somalia, 1950-2010.

Year	FAO landings[1]	Total reconstructed catch	Industrial	Artisanal	Subsistence	Discards
1950	6,000	18,300	1,480	9,900	6,600	272
1951	6,000	18,300	1,480	9,960	6,550	272
1952	7,000	18,500	1,730	10,010	6,490	317
1953	7,400	18,700	1,830	10,070	6,440	335
1954	5,300	18,000	1,310	10,120	6,380	240
1955	9,500	19,300	2,340	10,170	6,330	430
1956	10,000	19,400	2,470	10,230	6,270	453
1957	9,000	19,100	2,220	10,280	6,220	407
1958	8,000	18,800	1,970	10,340	6,160	362
1959	5,000	18,000	1,230	10,390	6,110	226
1960	4,500	18,000	1,110	10,600	6,050	195
1961	4,500	18,000	1,110	10,660	6,000	213
1962	4,500	18,000	1,110	10,710	5,940	231
1963	4,500	18,200	1,110	10,930	5,930	249
1964	4,500	18,400	1,110	11,080	5,930	272
1965	4,600	18,800	1,130	11,450	5,920	289
1966	4,600	19,000	1,130	11,600	5,910	315
1967	4,700	19,100	1,160	11,670	5,910	353
1968	5,000	19,300	1,230	11,820	5,900	398
1969	5,000	19,500	1,230	11,970	5,880	435
1970	5,600	19,900	1,380	12,200	5,870	494
1971	5,700	20,200	1,410	12,350	5,860	537
1972	5,800	20,400	1,430	12,500	5,850	583
1973	5,900	20,600	1,460	12,660	5,830	631
1974	5,980	20,900	1,520	12,870	5,820	685
1975	10,350	21,500	1,650	13,320	5,800	766
1976	8,268	22,800	2,690	13,330	5,780	980
1977	9,830	24,400	3,850	13,530	5,770	1,225
1978	8,384	20,100	510	13,090	5,750	745
1979	10,984	24,700	4,780	13,010	5,460	1,495
1980	14,330	29,900	9,760	12,650	5,180	2,285
1981	9,523	24,200	5,040	12,360	5,120	1,648
1982	8,730	23,100	4,110	12,420	5,060	1,542
1983	11,195	25,000	5,640	12,530	5,000	1,869
1984	19,639	32,200	11,690	12,530	4,950	3,034
1985	16,467	30,400	10,180	12,540	4,890	2,828
1986	18,255	24,800	5,020	13,000	4,830	1,971
1987	19,546	31,900	11,150	12,780	4,770	3,154
1988	19,827	30,200	9,680	12,790	4,720	2,999
1989	21,046	29,600	10,270	11,900	4,300	3,090
1990	22,295	28,900	10,880	10,970	3,890	3,178
1991	23,500	28,300	11,470	10,040	3,490	3,295
1992	24,620	28,100	12,450	9,080	3,100	3,465
1993	24,212	27,800	13,420	8,070	2,720	3,623
1994	23,904	27,700	14,450	7,110	2,340	3,755
1995	23,851	27,800	15,690	6,180	1,980	3,900
1996	26,044	30,300	14,620	8,670	2,760	4,265
1997	27,750	32,800	13,540	11,180	3,520	4,606
1998	25,550	35,400	12,470	13,710	4,250	4,972
1999	28,400	40,900	13,860	16,290	4,970	5,798
2000	23,950	42,200	11,690	18,800	5,660	6,009
2001	31,700	50,600	15,470	21,460	6,330	7,295
2002	28,800	52,800	14,060	24,050	6,980	7,663
2003	29,800	57,200	14,540	26,700	7,610	8,369
2004	29,800	61,100	14,540	29,370	8,210	9,001
2005	24,800	61,800	12,100	32,000	8,790	8,947
2006	29,800	64,800	14,540	32,190	8,660	9,415

Appendix Table A1. FAO landings vs. total reconstructed catch (in tonnes), as well as total reconstructed catch by sector, with discards shown separately, for Somalia, 1950-2010.

Year	FAO landings[1]	Total reconstructed catch	Industrial	Artisanal	Subsistence	Discards
2007	29,800	64,800	14,540	32,320	8,520	9,444
2008	29,800	64,900	14,540	32,460	8,390	9,472
2009	29,800	64,900	14,540	32,590	8,250	9,501
2010	29,800	64,900	14,540	32,730	8,120	9,530

[1] These are the adjusted FAO landings.

Appendix Table A2. Total reconstructed catch (tonnes) for Somali, 1950-2010, by major taxonomic group.

Year	*Lethrinus nebulosus*	*Thunnus albacares*	Batoidea	*Epinephelus areolatus*	*Diagramma pictum*	Others[1]
1950	1,870	1,290	533	1,005	281	13,300
1951	1,860	1,290	536	1,002	281	13,300
1952	1,890	1,320	541	1,025	328	13,400
1953	1,890	1,330	545	1,032	347	13,500
1954	1,830	1,300	543	976	248	13,200
1955	1,940	1,390	555	1,081	445	13,900
1956	1,950	1,400	559	1,091	469	14,000
1957	1,910	1,390	560	1,062	422	13,800
1958	1,880	1,380	561	1,034	375	13,600
1959	1,790	1,330	557	954	234	13,100
1960	1,770	1,320	558	933	202	13,200
1961	1,760	1,330	565	931	202	13,200
1962	1,760	1,330	573	928	202	13,200
1963	1,750	1,340	608	926	197	13,400
1964	1,750	1,340	644	927	197	13,500
1965	1,750	1,340	681	922	187	13,900
1966	1,750	1,340	719	922	187	14,000
1967	1,760	1,350	759	927	197	14,100
1968	1,760	1,360	801	935	211	14,300
1969	1,760	1,360	844	935	211	14,400
1970	1,780	1,370	888	947	234	14,700
1971	1,780	1,370	933	949	239	14,900
1972	1,780	1,380	980	951	244	15,000
1973	1,780	1,380	1,027	953	248	15,200
1974	1,780	1,390	1,076	956	257	15,400
1975	1,800	1,400	1,129	971	285	16,000
1976	1,890	1,470	1,189	1,060	451	16,700
1977	2,010	1,540	1,251	1,165	646	17,800
1978	1,680	1,320	1,279	862	95	14,900
1979	2,040	1,560	1,308	1,230	839	17,800
1980	2,430	1,820	1,336	1,619	1,621	21,000
1981	1,990	1,520	1,348	1,223	910	17,200
1982	1,880	1,440	1,384	1,123	742	16,600
1983	2,020	1,550	1,443	1,267	1,018	17,700
1984	2,690	2,000	1,544	1,884	2,159	21,900
1985	2,510	1,870	1,578	1,724	1,881	20,900
1986	1,910	1,460	1,600	1,184	912	17,800
1987	2,560	1,900	1,724	1,793	2,042	21,800
1988	2,360	1,780	1,783	1,629	1,792	20,800
1989	2,320	1,720	1,723	1,636	1,901	20,300
1990	2,270	1,670	1,654	1,641	2,017	19,700
1991	2,220	1,620	1,586	1,642	2,128	19,100
1992	2,220	1,610	1,508	1,689	2,318	18,700
1993	2,230	1,600	1,419	1,741	2,513	18,300
1994	2,240	1,590	1,316	1,795	2,708	18,000
1995	2,270	1,600	1,201	1,868	2,938	17,900
1996	2,360	1,680	1,694	1,861	2,734	20,000
1997	2,450	1,780	2,128	1,857	2,530	22,100
1998	2,570	1,900	2,555	1,865	2,326	24,200
1999	2,950	2,220	2,994	2,121	2,585	28,000
2000	2,950	2,280	3,393	2,019	2,183	29,300
2001	3,600	2,810	3,832	2,522	2,890	34,900
2002	3,680	2,950	4,215	2,498	2,626	36,800
2003	3,980	3,250	4,599	2,668	2,717	40,000
2004	4,220	3,520	4,968	2,791	2,717	42,900
2005	4,200	3,620	5,239	2,667	2,263	43,900
2006	4,450	3,820	5,282	2,906	2,717	45,600
2007	4,440	3,830	5,304	2,899	2,717	45,600

Appendix Table A2. Total reconstructed catch (tonnes) for Somali, 1950-2010, by major taxonomic group.

Year	*Lethrinus nebulosus*	*Thunnus albacares*	Batoidea	*Epinephelus areolatus*	*Diagramma pictum*	Others[1]
2008	4,420	3,840	5,326	2,891	2,717	45,700
2009	4,410	3,850	5,348	2,883	2,717	45,700
2010	4,390	3,860	5,369	2,875	2,717	45,700

[1] 'Others' contains 42 additional taxonomic categories.

Annex 95

Luke Patey, *Kenya: An African oil upstart in transition*, Oxford Institute for Energy Studies Paper Series No. WPM 53 (Oct. 2014)

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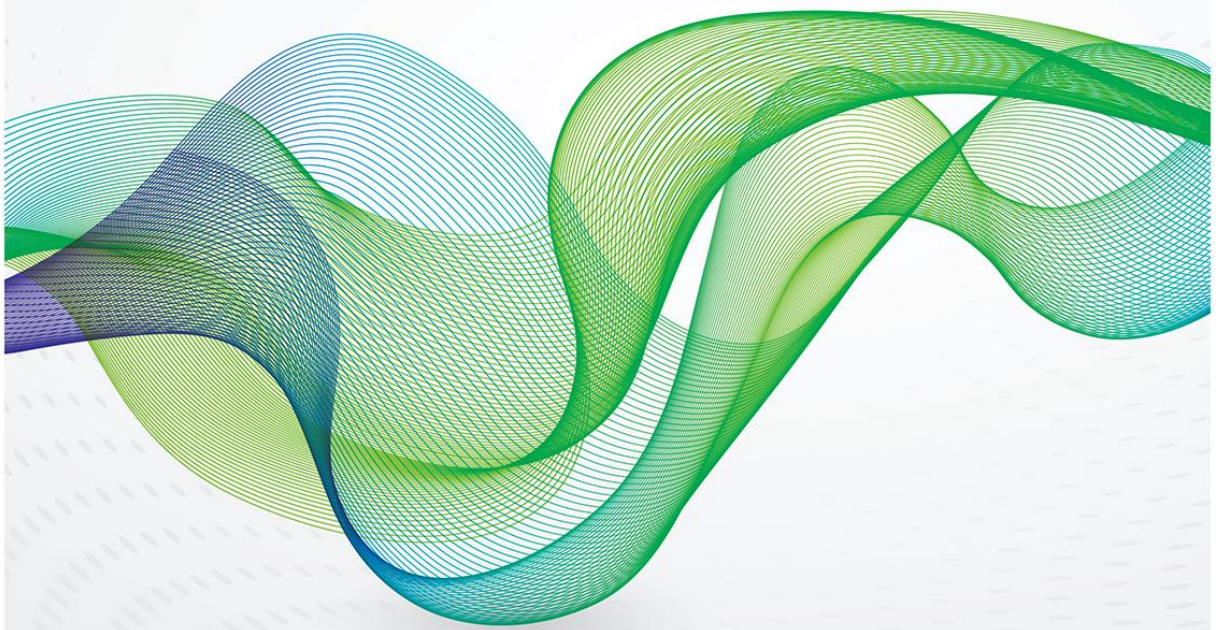
October 2014

Kenya:

An African oil upstart in transition



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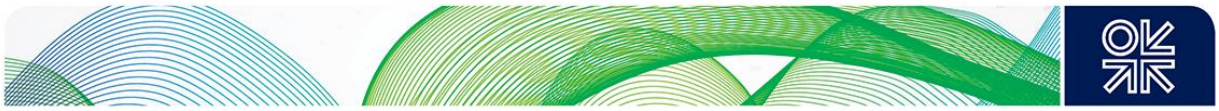

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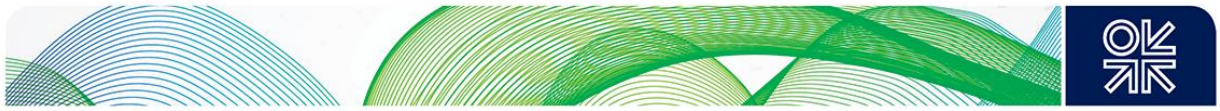

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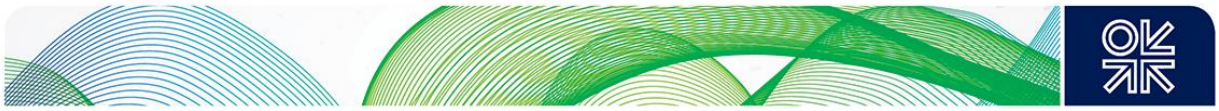


Executive Summary

In late March 2012, Kenya entered the East African oil scene with a surprising splash. After decades of unsuccessful on-and-off exploration by international oil companies, Tullow Oil, a UK-based firm, discovered oil in Kenya's north-west Turkana County. This paper analyses the opportunities and risks facing Kenya's oil industry and its role as a regional oil transport hub. It provides a snapshot of Kenya's economic, political, and security environment, offers a comprehensive overview of the development of Kenya's oil industry and possibilities for regional oil infrastructure cooperation with neighbouring countries in East Africa, and considers the potential political, social, and security risks facing the oil industry and regional infrastructure plans.

Kenya Overview

In the aftermath of the large-scale violence that followed its December 2007 general elections, Kenya has turned a corner. In June 2008 its government launched Vision 2030, an ambitious development blueprint, to modernize and make Kenya a middle-income economy; in 2010 it passed a new constitution; and in 2013 contested, yet largely peaceful, general elections were held. The discovery of oil in 2012 immediately provided an extra boost to Kenya's already growing and diverse economy and its position as East Africa's strategic transport and communications hub.

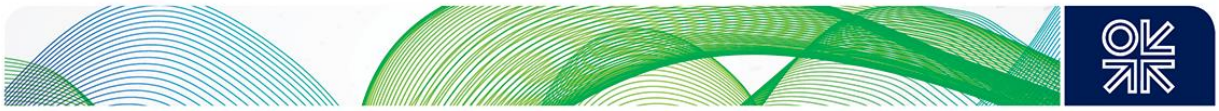
But over the past two years, political and security tensions have risen dramatically to threaten Kenya's bright future. In the political arena, the 2010 constitution stipulated the devolution of powers from the central government to newly constituted counties, but its full realization must overcome enormous systematic, structural, and political implementation hurdles. At the same time, devolution will hardly be a success if it only leads to the decentralization of Kenya's political troubles (which include ethno-politics and corruption) to the local level, where more political officials are now in competition with one another. Oil and other resources will influence disputes between central authorities and counties and communities seeking to assert new-found powers.

On the security front, terrorist attacks, highlighted by the September 2013 killings by the Somalia-based militant group al-Shabaab at Nairobi's upscale Westgate Shopping Mall, have grown in Kenya's coastal and north-eastern regions. These attacks threaten to enflame and intermingle with long-standing animosities between communities in these regions and the central government in Nairobi, undermining the popular development aspirations introduced by the new constitution. Possible insecurity from political and social tensions sits ominously alongside the oil industry's plans to move from the exploration to development phase and to construct key export infrastructure on the coast.

Kenya's oil sector and regional infrastructure cooperation

Kenya's role as a regional hub for East African crude oil and petroleum products may be more significant than its potential position as an oil and gas producer. To date, Kenya's oil resources are estimated to be 600 million barrels and new discoveries may still only make the country a small African producer. Oil exploration in Kenya began in the 1950s with Shell and BP carrying out the first survey work, mapping out major geological basins, and drilling the first oil well in 1960. Over 40 wells have since been drilled on and offshore, but it was not until 2012 that potential commercially viable oil resources were discovered through Tullow Oil's Ngamia 1, together with subsequent findings in Turkana County in Kenya's north-west.

Recent interest grew out of Uganda's 2006 onshore oil discoveries, and offshore gas findings in Mozambique and Tanzania. The regional proximity of proven oil and gas reserves, coupled with sustained high international oil prices, attracted a wide variety of oil companies to Kenya; these included Africa Oil, Tullow Oil, BG Group, and Total. Tullow is seeking to finalize appraisal and testing of an estimated 600 million barrels of oil resources held in Turkana by the end of 2015. At that point, if



the discoveries prove to be commercially viable, the company aims to also settle plans with the Kenya government for an export pipeline to the coast at either Lamu or Mombasa.

However, the huge and diverse infrastructure development goals of Kenya's $25 billion Lamu Port, South Sudan, Ethiopia, Transport (LAPSSET) Corridor will be significantly delayed and likely need to be downsized. A piecemeal approach – beginning with a basic export pipeline and port terminal at Lamu – may well be adopted. Rather than Kenya joining Ethiopia and South Sudan in plans for export and product pipelines to Lamu, it is more likely that, in the short term, Uganda and Kenya will establish the first pipeline links while other neighbours join through oil, road, and rail links in the medium and long term.

Kenya could go it alone and develop an 850 kilometre export pipeline from Turkana to the coast for its oil resources, but since its findings still remain relatively small, a regional agreement with Uganda to share an oil pipeline would be more viable. But there remain hurdles to achieving such cooperation. It will take two to four years to ascertain final commerciality of Kenya's oil discoveries and in the meantime Uganda remains eager to push forward with generating revenues from its long idle but proven oil reserves.

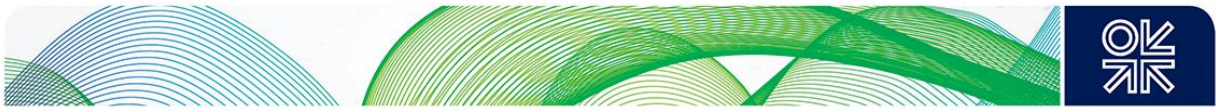
Political, social, and security risks

As the oil industry shifts from exploration to development and production in Kenya, required investments will grow from hundreds of millions to billions of dollars for new oil infrastructure. Tullow Oil, and in particular its smaller and more exploration-orientated partner Africa Oil, will likely sell a share of their interests in the Turkana concessions to larger industry players, such as oil majors and Asian national oil companies, to provide the required capital investments to develop the oil fields. It is at this juncture that risk incentives among the involved oil companies will decline profoundly. During the exploration phase, in the initial drive to discover oil, oil industry operations have been left relatively free from regulatory constraints and political interference. In the upcoming development and production phase this will likely not be the case. The nascent oil industry will not be completely insulated from increased risks in a shifting political and security landscape.

First, the regulatory environment for the oil industry in Kenya is in flux. The establishment and implementation of a new National Energy Bill and Petroleum Exploration and Development Production Act will have important consequences for the oil industry. New laws will encourage investment on one hand, particularly in natural gas where there is a lack of regulation, but on the other hand such laws can increase the costs of doing business. And since the political and regulatory environment in Kenya is intertwined, the government may exploit new rules and regulations to advance political and economic goals. Once production does begin, and petrodollars flow into government coffers, oil revenue sharing will become a fixture of Kenya's often-divisive politics.

Second, the successful advancement of the 2010 constitution offers potential economic and social development benefits and help in reversing high levels of inequality in Kenya. Such a process, however, offers challenges to the oil industry as communities in oil regions, and their political representatives, grapple with the convergence of new economic resources and increased political power through devolution. But a failure by the Kenyan government to implement devolution could be even more damaging to the timely development of the oil industry. Such an outcome could see aggrieved counties contest oil resources with the national government and international oil companies. If the objectives of devolution in the new constitution are fulfilled and political power and economic resources shift from the centre to county level (particularly in restless peripheral regions such as Turkana) then conflicts over scarce resources can be mitigated.

Third, political instability and insecurity is threatening not only the commencement of Kenya's oil production, but also its exit to international markets on the coast. Kenya's coastal and north-eastern communities have longstanding social and political grievances with the central government in Nairobi. Internal politics alone has the capacity to create insecurity for the oil industry if planned pipeline and other downstream infrastructure are targeted. But there is also the possibility that these disputes



could become a toxic mix with the incursion of the Somalia-based militant group al-Shabaab, delaying and hampering large-scale investments.

Al-Shabaab may be positioning itself to exploit social and political tensions to win support from local populations on Kenya's coast. But if the Kenyan government is able to advance political devolution to coastal counties, while working to contain al-Shabaab in an apolitical manner, then there is a strong likelihood that, with regional and international support, Nairobi can curb the militant group's activities, providing the oil industry with a relatively secure environment. If Kenya is to become the transit hub for East Africa's oil boom then relative stability and security on the coast must be achieved.


KENYA
National capital
Provincial capital
Town, village
Airports
International boundary
Main road
Secondary road
Other road or track
Railroad
SOUTH SUDAN
ETHIOPIA
UGANDA
SOMALIA
UNITED REPUBLIC OF TANZANIA
INDIAN OCEAN
Lake Turkana (Lake Rudolf)
Lake Victoria
Lake Natron
Lake Chew Bahir
Nairobi
Mombasa
Kisumu
Nakuru
Eldoret
Kakamega
Embu
Garissa
Kilimanjaro
5895 m
Mt. Kenya
5199 m
Administrative Boundary
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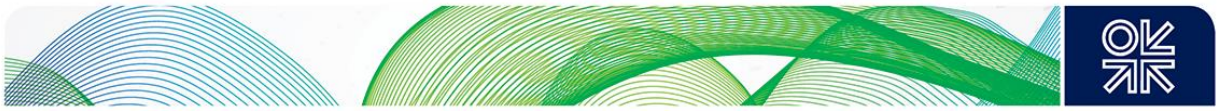

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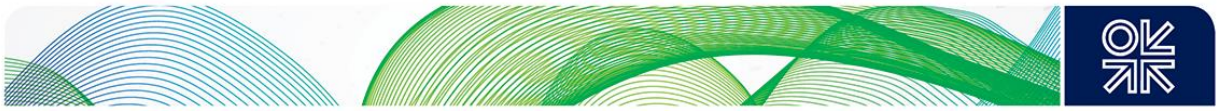


Introduction

In late March 2012, Kenya entered the East African oil scene with a surprising splash. After decades of unsuccessful on-and-off exploration by international oil companies, Tullow Oil, a UK-based firm, discovered oil in Kenya's north-west Turkana County. Quite unceremoniously, then President Mwai Kibaki announced the find at the end of a planned speech on performance evaluation results for public agencies: 'I wish to make an important announcement to the nation ... This morning, I have been informed by the Minister for Energy that our country has made a major breakthrough in oil exploration … This is the first time Kenya has made such a discovery and it is very good news for our country. It is, however, the beginning of a long journey to make our country an oil producer…'[1]

This paper analyses the opportunities and challenges facing Kenya's oil industry and role as a regional oil transport hub. First, it provides a snapshot of Kenya's political and economic environment. Second, the paper offers a comprehensive overview of the development of Kenya's oil industry, from exploration to the upcoming production phase, the main players, and the possibilities for regional oil infrastructure in cooperation with neighbouring countries in East Africa. Finally, the paper considers the potential political risk from new rules and regulations, the social risk from relations with local communities and officials in Turkana County (where oil has been discovered), and the security risk facing oil industry and regional infrastructure plans. The paper does not fully engage questions revolving around the 'resource curse' in Africa – concerning how oil will impact Kenya's economic, political, and social development. Rather it does the reverse, by examining how Kenya's political economy and security environment will impact the industry in the future.

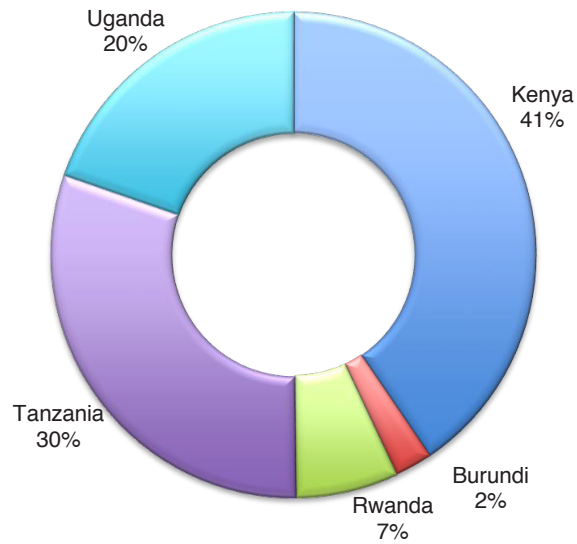
Kenya Overview

Economic aspirations

Kenya is the economic centre of East Africa. It has the largest economy in the East African Community (Figures 1 and 2) and one of the largest in Africa. It also has one of the most diverse economies on the continent. Tea, coffee, and other agriculture, alongside tourism and services, are a major part of Kenya's economic success story (Figure 3). This is in sharp contrast to other large African economies where oil, gas, and minerals dominate. On the back of growth in tourism and telecommunications, Kenya enjoyed average annual growth rates of 5.4 per cent between 2002 and 2007.[2] The economy was unsettled by the insecurity that followed the 2007 general elections, but it has picked up pace again in recent years. In 2014, international investors demonstrated their confidence in the economy when Kenya raised $2 billion in its first sovereign bond offering, a record-breaking debut for an African country.[3]

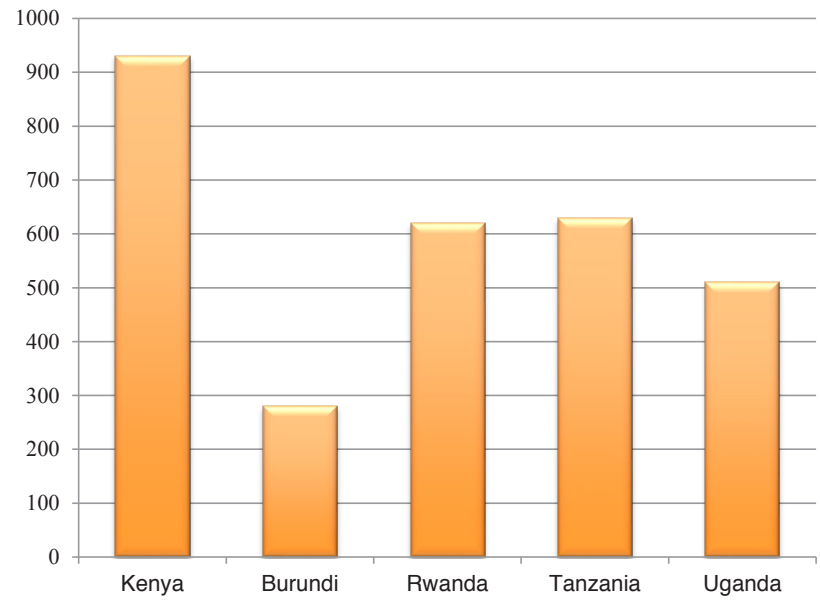
[1] 'Speech by his excellency Hon. Mwai Kibaki, C.G.H., M.P., President and Commander-in-Chief of the defence forces of the Republic of Kenya during the official announcement of the evaluation results of the performance of public agencies for the financial year 2010/11', Kenyatta International Conference Centre, Nairobi, 26 March 2012, statehousekenya.go.ke, accessed 23 July 2014.
[2] Geir Sundet & Eli Moen, 'Political Economy Analysis of Kenya', Norwegian Agency for Development Cooperation, Oslo, 2009, 10.
[3] Katrina Manson & Javier Blas, 'Kenya's debut $2bn bond breaks Africa record', *Financial Times*, 16 June 2014.

Figure 1: East African Community – GDP billion (USD, 2013)



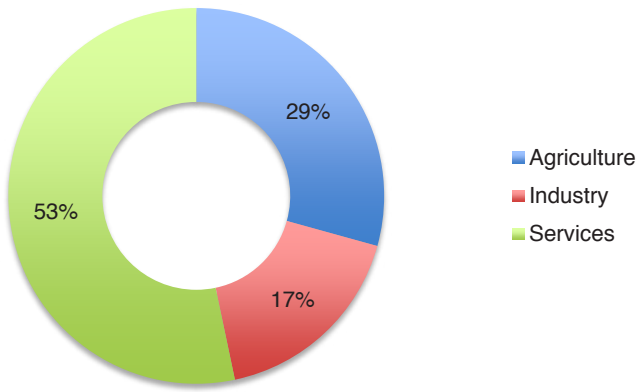
Source: World Bank

Figure 2: East African Community – GNI per capita (USD, 2013)



Source: World Bank

Figure 3: Economic Structure, Kenya 2013



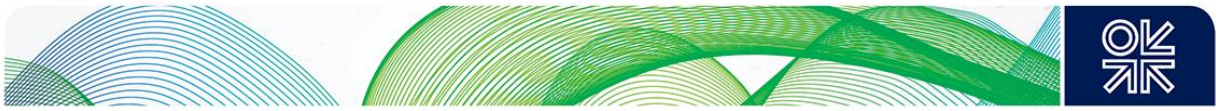
Source: CIA – The World Factbook

Kenya's economic strength is bolstered by its strategic position in East Africa. It is the main entry and exit point for trade from landlocked East and Central African countries – Uganda, Rwanda, Burundi, and South Sudan. Uganda was its largest export partner in 2013, accounting for 13.6 per cent of total Kenyan exports.[4] Mombasa is East Africa's largest port, followed by those in Tanzania and Djibouti. Kenya is seeking to exploit its strategic location on the Indian Ocean further by leveraging its relative proximity to large and growing Asian markets, particularly those in India and China which are Kenya's largest import partners, representing 14.2 per cent and 12.2 per cent respectively of total imports in 2013.[5] Kenya is also the financial and communications hub for East Africa. 'Silicon Savannah', an initiative to establish a major techno-city in Konzo, 40 miles outside Nairobi, seeks to make Kenya East Africa's technology hub as well. IBM established its first African research lab in Nairobi, while Google, Microsoft, and Intel also have regional headquarters there.[6]

Kenya's diversified economy needs substantial infrastructure development in order to industrialize. In 2008, the Kenyan government under then President Mwai Kibaki established Vision 2030 to modernize Kenya and make it a middle-income country. One of the flagship projects of the initiative is the $25 billion Lamu Port, South Sudan, Ethiopia, Transport (LAPSSET) Corridor. This seeks to establish road, rail, and oil pipeline links between the regional neighbours, airports, and resort cities at Isiolo and Lamu, as well as a new port at Manda Bay and a 120,000 barrels/day (b/d) oil refinery at Lamu.[7] The twin goals of this ambitious undertaking are to promote regional economic development and to develop northern Kenya (which has long been economically marginalized compared to central counties) and integrate it into the national economy.

Although there has been little progress in its implementation since the 2012 official launch of LAPSSET,[8] Kenya is also spearheading other related regional infrastructure agreements. President Uhuru Kenyatta hosted Chinese Premier Li Keiqiang in May 2014 and, alongside regional leaders

[4] Economist Intelligence Unit, 'Kenya', Country Report, EIU, London, 1 June 2014.
[5] Economist Intelligence Unit, 'Kenya', Country Report, EIU, London, 1 June 2014.
[6] Mwangi S. Kimenyi & Josephine Kibe, 'Africa's Powerhouse', Brookings, Opinion, 6 January 2014 www.brookings.edu/research/opinions/2013/12/30-kenya-economy-kimenyi, accessed 28 July 2014.
[7] 'Lamu Port and New Transport Corridor Development to Southern Sudan and Ethiopia (LAPSSET)', Progress Report, Kenya Vision 2030, Government of the Republic of Kenya, www.vision2030.go.ke.
[8] Drazen Jorgic, 'Kenya attacks undermine plans for east African trade hub', *Reuters*, 20 June 2014.



from South Sudan, Rwanda, and Uganda, signed an agreement to establish a new East African railway line. At nearly $4 billion, Chinese companies will build the first stage, a 610-kilometre line from Mombasa to Nairobi.[9] As a sign of Kenya's broadening international ties, the planned Chinese-built railway will replace the original line established during British colonial rule over 100 years ago. If Kenya is to continue to act as the gateway to East Africa in the face of outside competition (Tanzania is busy enhancing its own ports with Chinese cooperation), then such infrastructure projects will need to move forward.

The discovery of oil could help Kenya finance its large infrastructure needs. The current government, under Uhuru Kenyatta, included oil, gas, and mineral resources as a sixth priority sector within the economic pillar of Vision 2030; this seeks to harness oil to increase export earnings and produce higher GDP growth, broader social development, infrastructure development, and job creation.[10] The oil industry needs billions in infrastructure development investment if it is to act as a driver for Kenya's broader economic and social development goals. But over the past two years political and security tensions have risen dramatically, threatening to upend Kenya's economic aspirations.

Political and security challenges

It had been expected that 2013 would be a breakout year for Kenya – the country was turning a corner after having held largely peaceful general elections in March that year. Its new Jubilee government may have been dogged by the indictment of President Uhuru and Deputy President Ruto by the International Criminal Court (ICC) for their alleged role in the 2007/08 post-election violence, but a resurgent economy gave promise for the future. Jubilee pushed forward with former president Kibaki's Vision 2030 to modernize Kenya; the government was generally business friendly, engaging a younger generation of industrialists and entrepreneurs compared to previous governments.[11]

But 2013 would not be the year of stability and growth for which Kenya had hoped. The 2010 constitution stipulated the devolution of powers from the central government to newly constituted counties, but its full realization needed to overcome enormous systematic, structural, and political implementation hurdles. All the while terrorist attacks – prominent among which was the September 2013 massacre carried out by the Somalia-based militant group al-Shabaab at Nairobi's upscale Westgate Shopping Mall – have grown in Kenya's coastal and north-eastern regions. These attacks threaten to enflame and intermingle with long-standing animosities between communities in these regions and the central government in Nairobi, undermining the popular development aspirations put forward by the new constitution.

Oil and other resources will influence disputes between central authorities and counties and communities seeking to assert new-found powers stipulated by the constitution. Possible insecurity due to political and social tensions sits ominously alongside the oil industry's plans to move from the exploration to the development phase, combined with construction of key export infrastructure on the coast. The insecurity has hurt Kenya's tourism sector, one of its main economic engines and job producers. The World Bank downgraded its forecast on economic growth in 2014 and 2015 from 5.2 per cent to 4.7 per cent for both years on account of the insecurity.[12] A failure to grapple with these structural problems through fully implementing devolution, to settle the ICC indictment, and to tackle terrorism will undermine development.

Kenyan politics are ethnically and regionally-driven and are deeply embedded in business. Kenya has been described as an 'ethnocracy'; a democracy in which politics are steered along ethnic lines and

[9] 'China to build new East Africa railway line', *BBC News*, 12 May 2014.
[10] 'Second Medium Term Plan 2013-2017', Kenya Vision 2030, Government of the Republic of Kenya, Nairobi, 2013, 68.
[11] David Booth, Brian Coosey, Frederick Golooba-Mutebi, and Karuti Kanyinga, 'East African prospects: An update on the political economy of Kenya, Rwanda, Tanzania, and Uganda', Overseas Development Institute, Report, May 2014, 22.
[12] David Malingha and Sarah McGregor, 'East Africa Powerhouse Kenya Shaken as Attacks, Politics Mix', *Bloomberg*, 8 July 2014.

Annex 96

U.S. Central Intelligence Agency, *The World Factbook: Somalia*, *available a*t https://www.cia.gov/library/publications/the-world-factbook/geos/so.html (last accessed 3 Apr. 2015)

The World Factbook

Africa :: Somalia

Introduction :: Somalia

Background:

Britain withdrew from British Somaliland in 1960 to allow its protectorate to join with Italian Somaliland and form the new nation of Somalia. In 1969, a coup headed by Mohamed SIAD Barre ushered in an authoritarian socialist rule characterized by the persecution, jailing, and torture of political opponents and dissidents. After the regime's collapse early in 1991, Somalia descended into turmoil, factional fighting, and anarchy. In May 1991, northern clans declared an independent Republic of Somaliland that now includes the administrative regions of Awdal, Woqooyi Galbeed, Togdheer, Sanaag, and Sool. Although not recognized by any government, this entity has maintained a stable existence and continues efforts to establish a constitutional democracy, including holding municipal, parliamentary, and presidential elections. The regions of Bari, Nugaal, and northern Mudug comprise a neighboring semi-autonomous state of Puntland, which has been self-governing since 1998 but does not aim at independence; it has also made strides toward reconstructing a legitimate, representative government but has suffered some civil strife. Puntland disputes its border with Somaliland as it also claims portions of eastern Sool and Sanaag. Beginning in 1993, a two-year UN humanitarian effort (primarily in the south) was able to alleviate famine conditions, but when the UN withdrew in 1995, having suffered significant casualties, order still had not been restored. In 2000, the Somalia National Peace Conference (SNPC) held in Djibouti resulted in the formation of an interim government, known as the Transitional National Government (TNG). When the TNG failed to establish adequate security or governing institutions, the Government of Kenya, under the auspices of the Intergovernmental Authority on Development (IGAD), led a subsequent peace process that concluded in October 2004 with the election of Abdullahi YUSUF Ahmed as President of a second interim government, known as the Transitional Federal Government (TFG) of the Somali Republic. The TFG included a 275-member parliamentary body, known as the Transitional Federal Parliament (TFP). President YUSUF resigned late in 2008 while United Nations-sponsored talks between the TFG and the opposition Alliance for the Re-Liberation of Somalia (ARS) were underway in Djibouti. In January 2009, following the creation of a TFG-ARS unity government, Ethiopian military forces, which had entered Somalia in December 2006 to support the TFG in the face of advances by the opposition Islamic Courts Union (ICU), withdrew from the country. The TFP was doubled in size to 550 seats with the addition of 200 ARS and 75 civil society members of parliament. The expanded parliament elected Sheikh SHARIF Sheikh Ahmed, the former ICU and ARS chairman as president in January 2009. The creation of the TFG was based on the Transitional Federal Charter (TFC), which outlined a five-year mandate leading to the establishment of a new Somali constitution and a transition to a representative government following national elections. In 2009, the TFP amended the TFC to extend TFG's mandate until 2011 and in 2011 Somali principals agreed to institute political transition by August 2012. The transition process ended in September 2012 when clan elders replaced the TFP by appointing 275 members to a new parliament who subsequently elected a new president.

Geography :: Somalia

Location:

Eastern Africa, bordering the Gulf of Aden and the Indian Ocean, east of Ethiopia

Geographic coordinates:

10 00 N, 49 00 E

Map references:

Africa

Area:

total: 637,657 sq km
country comparison to the world: 44
land: 627,337 sq km
water: 10,320 sq km

Area - comparative:

almost five times the size of Alabama; slightly smaller than Texas

Land boundaries:
total: 2,340 km
border countries: Djibouti 58 km, Ethiopia 1,600 km, Kenya 682 km

Coastline:
3,025 km

Maritime claims:
territorial sea: 200 nm

Climate:
principally desert; northeast monsoon (December to February), moderate temperatures in north and hot in south; southwest monsoon (May to October), torrid in the north and hot in the south, irregular rainfall, hot and humid periods (tangambili) between monsoons

Terrain:
mostly flat to undulating plateau rising to hills in north

Elevation extremes:
lowest point: Indian Ocean 0 m
highest point: Shimbiris 2,416 m

Natural resources:
uranium and largely unexploited reserves of iron ore, tin, gypsum, bauxite, copper, salt, natural gas, likely oil reserves

Land use:
arable land: 1.73%
permanent crops: 0.05%
other: 98.23% (2011)

Irrigated land:
2,000 sq km (2003)

Total renewable water resources:
14.7 cu km (2011)

Freshwater withdrawal (domestic/industrial/agricultural):
total: 3.3 cu km/yr (0%/0%/99%)
per capita: 377.6 cu m/yr (2003)

Natural hazards:
recurring droughts; frequent dust storms over eastern plains in summer; floods during rainy season

Environment - current issues:
famine; use of contaminated water contributes to human health problems; deforestation; overgrazing; soil erosion; desertification

Environment - international agreements:
party to: Biodiversity, Desertification, Endangered Species, Law of the Sea, Ozone Layer Protection
signed, but not ratified: none of the selected agreements

Geography - note:
strategic location on Horn of Africa along southern approaches to Bab el Mandeb and route through Red Sea and Suez Canal

People and Society :: Somalia

Nationality:
noun: Somali(s)
adjective: Somali

Ethnic groups:
Somali 85%, Bantu and other non-Somali 15% (including 30,000 Arabs)

Languages:
Somali (official), Arabic (official, according to the Transitional Federal Charter), Italian, English

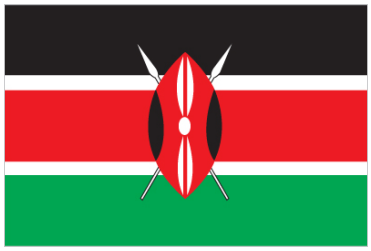
Religions:
Sunni Muslim (Islam) (official, according to the Transitional Federal Charter)

Population:

Annex 97

U.S. Central Intelligence Agency, *The World Factbook: Kenya*, *available at* https://www.cia.gov/library/publications/the-world-factbook/geos/print/country/countrypdf_ke.pdf (last accessed 3 Apr. 2015)

The World Factbook



Africa :: Kenya

Introduction :: Kenya

Background:

Founding president and liberation struggle icon Jomo KENYATTA led Kenya from independence in 1963 until his death in 1978, when President Daniel MOI took power in a constitutional succession. The country was a de facto one-party state from 1969 until 1982 when the ruling Kenya African National Union (KANU) made itself the sole legal party in Kenya. MOI acceded to internal and external pressure for political liberalization in late 1991. The ethnically fractured opposition failed to dislodge KANU from power in elections in 1992 and 1997, which were marred by violence and fraud, but were viewed as having generally reflected the will of the Kenyan people. President MOI stepped down in December 2002 following fair and peaceful elections. Mwai KIBAKI, running as the candidate of the multiethnic, united opposition group, the National Rainbow Coalition (NARC), defeated KANU candidate Uhuru KENYATTA and assumed the presidency following a campaign centered on an anticorruption platform. KIBAKI's NARC coalition splintered in 2005 over a constitutional review process. Government defectors joined with KANU to form a new opposition coalition, the Orange Democratic Movement (ODM), which defeated the government's draft constitution in a popular referendum in November 2005. KIBAKI's reelection in December 2007 brought charges of vote rigging from ODM candidate Raila ODINGA and unleashed two months of violence in which as many as 1,500 people died. African Union-sponsored mediation led by former UN Secretary General Kofi ANNAN in late February 2008 resulted in a power-sharing accord bringing ODINGA into the government in the restored position of prime minister. The power sharing accord included a broad reform agenda, the centerpiece of which was constitutional reform. In August 2010, Kenyans overwhelmingly adopted a new constitution in a national referendum. The new constitution introduced additional checks and balances to executive power and significant devolution of power and resources to 47 newly created counties. It also eliminated the position of prime minister following the first presidential election under the new constitution, which occurred on 4 March 2013. Uhuru KENYATTA, the son of founding president Jomo KENYATTA, won the March elections in the first round by a close margin and was sworn into office on 9 April 2013.

Geography :: Kenya

Location:

Eastern Africa, bordering the Indian Ocean, between Somalia and Tanzania

Geographic coordinates:

1 00 N, 38 00 E

Map references:

Africa

Area:

total: 580,367 sq km
country comparison to the world: 49
land: 569,140 sq km
water: 11,227 sq km

Area - comparative:

five times the size of Ohio; slightly more than twice the size of Nevada

Land boundaries:
total: 3,477 km
border countries: Ethiopia 861 km, Somalia 682 km, South Sudan 232 km, Tanzania 769 km, Uganda 933 km

Coastline:
536 km

Maritime claims:
territorial sea: 12 nm
exclusive economic zone: 200 nm
continental shelf: 200 m depth or to the depth of exploitation

Climate:
varies from tropical along coast to arid in interior

Terrain:
low plains rise to central highlands bisected by Great Rift Valley; fertile plateau in west

Elevation extremes:
lowest point: Indian Ocean 0 m
highest point: Mount Kenya 5,199 m

Natural resources:
limestone, soda ash, salt, gemstones, fluorspar, zinc, diatomite, gypsum, wildlife, hydropower

Land use:
arable land: 9.48%
permanent crops: 1.12%
other: 89.4% (2011)

Irrigated land:
1,032 sq km (2003)

Total renewable water resources:
30.7 cu km (2011)

Freshwater withdrawal (domestic/industrial/agricultural):
total: 2.74 cu km/yr (17%/4%/79%)
per capita: 72.96 cu m/yr (2003)

Natural hazards:
recurring drought; flooding during rainy seasons
volcanism: limited volcanic activity; the Barrier (elev. 1,032 m) last erupted in 1921; South Island is the only other historically active volcano

Environment - current issues:
water pollution from urban and industrial wastes; degradation of water quality from increased use of pesticides and fertilizers; water hyacinth infestation in Lake Victoria; deforestation; soil erosion; desertification; poaching

Environment - international agreements:
party to: Biodiversity, Climate Change, Climate Change-Kyoto Protocol, Desertification, Endangered Species, Hazardous Wastes, Law of the Sea, Marine Dumping, Marine Life Conservation, Ozone Layer Protection, Ship Pollution, Wetlands, Whaling
signed, but not ratified: none of the selected agreements

Geography - note:
the Kenyan Highlands comprise one of the most successful agricultural production regions in Africa; glaciers are found on Mount Kenya, Africa's second highest peak; unique physiography supports abundant and varied wildlife of scientific and economic value

People and Society :: Kenya

Nationality:
noun: Kenyan(s)
adjective: Kenyan

Annex 98

African Energy, "SOMALIA - TotalFinaElf to explore offshore", *Financial Times: Energy Newsletters* (26 Feb. 2001)

Financial Times, Energy Newsletters - African Energy February 26, 2001 Oil

SOMALIA - TotalFinaElf to explore offshore

SOURCE: African Energy

TotalFinaElf has secured rights to conduct preliminary exploration work offshore southern Somalia. A spokesman told African Energy the company signed a technical evaluation agreement in Mogadishu in late January with officials from the ministry of water and mineral resources.

The agreement - valid for up to 12 months - allows the company to conduct 2D seismic work in the Jorre region off the southern coast. TotalFinaElf said that work would commence shortly and that the agreement could "evolve towards a concession" should the seismic studies prove fruitful.

Minister of water and mineral resources Hassan Abshir Farah said the company had agreed to open a liaison office in Mogadishu.

For Mogadishu's transitional government, which has said it is eager to attract foreign investment, the arrival of TotalFinaElf comes as something of a blessing. Other companies such as Sweden's Lundin Oil, which has two onshore concessions, have been forced to declare force majeure and are not treating their properties as a high priority. But TotalFinaElf maintains that its work offshore will be free from interference. "We are an oil company so we don't want to get involved in any political aspect," the spokesman said.

Officials in the breakaway republic of Somaliland meanwhile have said that the deal with Mogadishu has no bearing in the north-west where it claims the most prospective hydrocarbon targets are located.

TotalFinaElf has maintained a presence in Somaliland in recent years with the rehabilitation and operational management of the oil terminal at Berbera port, as well as providing aviation fuel services at the airports in Berbera and the breakaway capital Hargeisa.

The French firm told African Energy that it had no immediate plans to pursue exploration in Somaliland. The Somaliland oil and water ministry has said in the local press that no E&P companies have visited the country and that no negotiations are under way with any companies to open up the upstream oil and gas sector.

Annex 99

Dana Petroleum plc, *Annual Report & Accounts 2002* (2003)


Dana Petroleum plc Annual Report & Accounts 2002

EXPLORATION AND DEVELOPMENT POTENTIAL

Africa

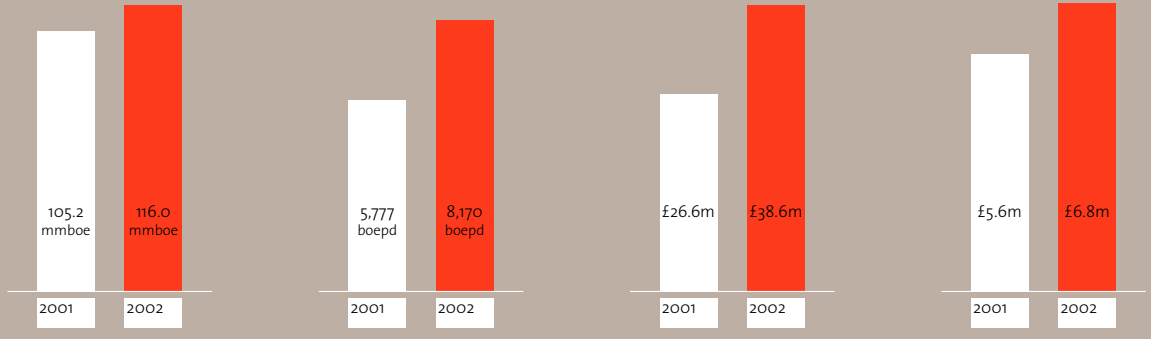
Offshore Africa holds some of the world's most prolific hydrocarbon basins which have delivered a series of giant discoveries with very low finding and development costs. Dana has built extensive licence interests offshore Ghana, Mauritania and Kenya – three potentially high impact regions with a range of exciting exploration prospects emerging.

Far East

Indonesia and Australia continue to offer material opportunities to the Group with further exploration and appraisal drilling expected during the next year. The planned development of the Ujung Pangkah field, following earlier exploration success, should turn the region into a cash generator by 2006.

Russia

Dana's early entry into the West Siberian basin has left it well positioned to exploit the recent resurgence of industry activity in the region. The development of the vast Salym group of fields offers organic growth, building on the success of the South Vat-Yoganskoye field which continues as a baseline source of oil production.



Dana Petroleum plc is a British independent oil and gas company focused on growth through high-impact international exploration and the development of low risk production from the UK North Sea.

Chairman's & Chief Executive's Review

Charles M Smith, CBE
Chairman

Thomas P Cross
Chief Executive

2002 was an excellent year for Dana. A successful acquisitions and divestments programme complemented ongoing field development activity and was enhanced by further exploration success, all resulting in a record operating and financial performance.

Annual production grew by 41% and this delivered record levels of turnover, cash flow and profit in 2002, placing Dana in a strong position to execute its exploration and development work programme during 2003 and 2004. The combination of acquisitions, new discoveries and development of existing fields, led to proven and probable oil and gas reserves rising to an all-time high at year-end.

Dana's 2002 exploration effort focused on high potential areas offshore Africa and commercially attractive opportunities in the North Sea. Extensive new seismic was acquired and four exploration wells were drilled, with three discoveries being recorded, continuing the Company's excellent strike rate. A number of exploration deals were concluded, leading to new acreage and licence extensions in the UK, Ghana, Mauritania and Australia, as well as farm-outs on blocks in Australia and Mauritania to reduce Dana's overall cost exposure. Positive outcomes from ongoing technical work have enabled significant new seismic and drilling work to be planned for offshore Ghana, Mauritania and Kenya over the next two years.

The Board's strategy of ensuring Dana maintains a balanced portfolio of production, development and exploration opportunities is showing clear benefits, with new reserves being added at very low finding cost and strongly rising UK cash flow. The Company is now well positioned for further growth with a balance of attractive exploration prospects, rising production from new developments and a platform to execute further commercially astute acquisitions.

Results

Average daily oil and gas production increased by 41% from 5,777 boepd to 8,170 boepd, primarily due to the addition of Hudson, Banff and Otter field interests, during the second half of 2002. Overall, the ratio of oil to gas produced by the Group in the year was approximately 85% to 15%. As a result of increased production and an increased average realised UKCS oil price of $24.7/boe (2001: $20.3/boe), turnover for the period increased by 45% to £38.6 million (2001: £26.6 million). Operating profit and operating cash flow were £9.3 million and £16.4 million respectively. Profit after tax and minority interest increased 22% to a record high of £6.8 million (2001: £5.6 million). Earnings per share rose to 0.62 pence.

"Four exploration wells yielded three discoveries, continuing Dana's successful track record with 11 oil and gas finds from its last 14 wells. Ongoing field developments are further increasing cash flow, which will enable our high-impact exploration plans to be actively pursued."

In connection with the acquisition of assets from ENI-Agip, the Company put in place a US$75 million revolving credit facility, which has now been substantially drawn down to fund the acquisition and ongoing development of these assets. Discussions to extend this facility in 2003 are now well advanced.

The Board has carefully considered the financing requirements for Dana's current exploration and development programme, which, although capital intensive at present, demonstrates the capacity to deliver significant future value. The Directors believe that at this relatively early stage of Dana's development it is important to apply the Company's cash resources to leverage those projects which have the potential to yield exceptional returns. Therefore the Directors do not recommend payment of a dividend at this time but will keep this under review as profits build.

Total hydrocarbons produced in 2002 were 3.0 mmboe. A total of 13.8 mmboe of proven and probable reserves were added, due to the net effect of additional discoveries, field revisions and new acquisitions. At year-end, total proven and probable oil and gas reserves therefore increased to a new record level of 116 mmboe. Dana's balance sheet remains strong with total net assets at 31st December 2002 of £137.3 million (31st December 2001: £130.4 million).

Production and Development

The first half of 2002 saw Dana's existing fields, Claymore, Victor and South Vat-Yoganskoye, continue to provide a sound base of production and cash flow for the Company, much in line with expectations.

However, the Company's production and development business expanded materially in the second half, following two important North Sea asset portfolio deals with ENI-Agip and ConocoPhillips. Both transactions were in line with Dana's strategy and involved acquiring current and near term UK production at attractive prices, using a mixture of cash and exploration positions as currency. The results were very positive. By year-end peak production of 15,000 boepd had been achieved, an almost three-fold increase from the levels seen in the first half of the year. Furthermore, Dana's production now originates from seven different fields thereby lowering the potential impact of any single field event and materially improving the reliability of its cash flow base.

The ENI-Agip deal also provided an entry for Dana into the Northern North Sea, with interests in the Hudson oil field, the Otter oil development and the Brent pipeline system into which both fields now deliver. Dana also gained an interest in the Banff oil & gas field in a core area of the Central North Sea. Since completion, all three fields have exceeded expectations. Hudson oil rates increased following a workover campaign; Otter achieved first production some two months ahead of schedule; and a significant boost to Banff production was achieved with a new infill well. In addition, Dana's commercial team also renegotiated the crude sales agreements for these fields, achieving improved premiums. The ConocoPhillips deal began to deliver its aim of accelerated UK cash flow in February 2003, as the Caledonia oil field was brought onstream.

Exploration and Appraisal

The past year witnessed further North Sea exploration success, with the discovery of the Barbara gas-condensate field and the drilling of a high reach well to examine the Drum structure to the west of the Claymore field. Barbara was encouraging, finding a substantial section of Forties sand reservoir full of rich gas-condensate, but the field will require further appraisal before reserves can be determined. The Drum well, which was drilled from the Claymore platform and found oil in a complex reservoir setting, has been tied directly into the Claymore facilities.

Turning to international exploration, Dana drilled its second well, WT-2X, in the shallow water area offshore Ghana. The well encountered a high quality Maastrichtian age sandstone reservoir containing a relatively viscous oil. Subsequent remapping of this accumulation has demonstrated the potential for oil-in-place volumes of around 200 million barrels. However, future commerciality will be heavily dependent on recovery efficiency which will be the subject of further development studies during 2003. In the deep water area, the focus is on the most significant prospect, known as Fan 6. Indications are that additional 3D seismic may be required in order to lower technical risk and hence optimise the location for this first deep water well.

In Mauritania, Dana has concentrated its resources on the acquisition and interpretation of 3D seismic over its Block 7 and Block 1 licences. Following the identification of a large number of prospects in Block 7, some with stacked geological horizons providing multiple targets for a single well, Dana has elected to proceed into the first drilling phase of the PSC. Consequently a well is being planned for later this year to test the most interesting prospect in Block 7, with reserves potential of several

hundred million barrels. In Block 1, following signature of a farm-out agreement with Energy Africa to cover Dana's costs, a major 3D seismic survey was acquired in the fourth quarter of 2002. This survey is now under accelerated interpretation with the aim of identifying specific drilling targets to enable a decision on the first drilling phase of this PSC by July 2003. This may ultimately lead to a two well drilling programme being undertaken over both blocks.

In Kenya, Dana completed the work programme for the first two year exploration period in October 2002. Presented with very encouraging results, Dana has now elected to proceed into the next two year period, which will see the Company acquiring 2D seismic over each of its four Kenyan Blocks. It is expected that this new survey will be shot in the second half of 2003 to allow sufficient time to make the 'drill-or-drop' decision required by October 2004.

In Indonesia, preliminary interpretation of a transition zone seismic programme acquired in 2002 has confirmed the possibility of a significant western extension to the Ujung Pangkah field. This is likely to be the subject of appraisal drilling during the early part of the field development so that additional reserves, if proven, can be accommodated within the existing core development scheme. Additional exploration prospects are emerging in this PSC and the first of these, the West Sidayu oil prospect, may be drilled before the end of 2003.

The Morangie well offshore Western Australia, in which Dana negotiated a complete cost carry, proved non-commercial. However, the presence of significant volumes of residual oil and excellent quality reservoir has provided sufficient encouragement for the joint venture group to extend the licence by several years and continue exploration in this area. Further 3D seismic is planned this summer.

Acquisition & Divestment

The Company continued to prioritise portfolio management in 2002. Dana's business development team demonstrated its proficiency with the negotiation and closure of two UKCS production and development deals, with ENI-Agip and ConocoPhillips. A key element in both transactions was the use of exploration interests by Dana as part of the consideration. This strategy has the dual benefit of providing Dana with a competitive edge and reducing the cash element paid by Dana for the acquired production. The Company also took the opportunity in December 2002 to increase its stake in the new UK holding company for Føroya Kolvetni, named Faroe Petroleum Limited, to the maximum available stake prior to the 2003 Faroes drilling programme.

Board Development & Corporate Governance

The Directors recognise that Dana is a growing public company and therefore aim to set and maintain high standards for managing the Group's assets, business development and corporate governance.

The recommendations contained in the Higgs and Smith Reports on corporate governance, which were issued in January 2003, have been reviewed in detail and Dana exhibits a high level of compliance.

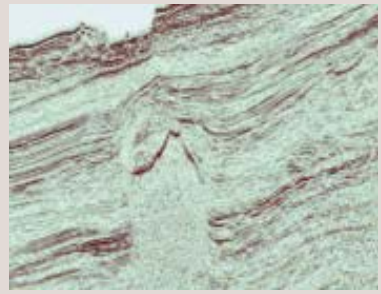
Once the revised Combined Code has been finalised and published, the Board will consider any minor adjustments which are appropriate for the Company.

In June 2002, Mr Colin Goodall joined the Board as a non-executive director following a career spanning 24 years with the BP group. In addition to his normal board duties, Mr Goodall also serves as a member of Dana's Audit and Remuneration Committees. Mr David MacFarlane joined the Board as Group Finance Director, in November 2002. Mr MacFarlane holds more than 20 years' experience in financial control and management in the upstream oil and gas business. Both Colin and David have already made very valuable contributions to the business.

In December 2002, it was agreed that Mr Graham Stewart would step down from the Board in order to become Chief Executive of Faroe Petroleum Limited, in which Dana now owns a direct shareholding. We thank Graham for his excellent work at Dana over recent years and we are pleased that he will still be adding value to the Group through his important role at Faroe Petroleum.

Strategy

Dana's strategy is to create significant, shareholder value by delivering strong growth in hydrocarbon reserves, production and earnings. In the Board's experience, this is best achieved by a balanced approach. Dana therefore combines a portfolio of exploration opportunities, which each have the potential for material step increases in reserves, with the exploitation of cost effective production and development assets which generate strong, stable cash flow to finance the exploration programme.



Dana's strategy has four key elements:

1. Balancing investment in high-impact, medium risk oil and gas exploration, with value enhancing acquisitions, and investment in low risk, low cost oil and gas production and field developments;

2. Maximising the probability of exploration and development success by reducing the technical risk associated with individual investments to a minimum and by ensuring the Company holds a portfolio of attractive exploration prospects and development opportunities;

3. Commercialising exploration success with a bias towards asset trading for existing or near-term production when this allows accelerated value extraction; and

4. Operating a sound financial framework which seeks to ensure that the exploration programme can be financed from cash flow generated by the production portfolio.

OUTLOOK

Exploration and Appraisal

North Sea exploration activity in 2003 will include a proposed well to test an undrilled fault block adjacent to previous discoveries in the Melville area, to the South of the Hudson field. Faroe Petroleum, in which the Company now holds a 20.6% interest, will drill the Marimas well this summer to test multiple prospects in Licence 002 of the Faroe Islands, with potential reserves of up to 500 mmboe. The ENI-Agip/ Faroe Petroleum joint venture has already identified further prospects in its two Faroes licences and Dana's shareholding provides the Company with a stake in this upside.

Looking ahead, following the completion of intensive 3D seismic programmes this year, deep water drilling is scheduled in Mauritania and Ghana. Planning is also in progress for Dana's first seismic programme offshore Kenya. Further wells are also being considered in Europe and the Far East, such that by end 2004 Dana can expect to participate in a total of up to eight additional exploration wells.

Production and Development

Production is expected to grow further during 2003 as the Caledonia field reaches full capacity and with the completion of two additional production wells on Otter by mid year.

Development sanction is anticipated this year for two new developments, the Cavendish gas field in the Southern North Sea and the Ujung Pangkah gas field in Indonesia, both of which should contribute significantly to production targets in 2005. Commercial discussions have been moving forward positively between neighbouring coventure groups in the Greater Kittiwake Area of the Central North Sea area and this should enable plans to be advanced for development of the Goosander field.

Looking further ahead, Dana now has, through both discovery and acquisition, a substantial inventory of development opportunities which will provide the basis for organic production growth in future years. This includes several potential field developments which will be subject to further technical study and commercial negotiation in 2003. In the case of new UKCS projects, the current complex ownership structures prevalent can often hinder progress towards development sanction. However, the Company is working hard to speed up timetables and is optimistic that the current divestment programmes, initiated by the majors, may be a catalyst for the acceleration of projects of this type.

Commercial Transactions

Dana will continue to actively pursue new opportunities, particularly production and development assets in its home base of the UK North Sea, where attractive targets are being created by the asset rationalisation of major oil companies. In order to maximise future potential, Dana will also seek opportunities to gain early entry into new exploration areas which offer exceptional upside. As the Company's portfolio builds, both acquisition and divestment opportunities will arise from within the existing asset base. These will be exploited where cash or other forms of value can be added quickly and efficiently.

In summary, Dana has a solid foundation and continues to perform well against a background of increasing production and healthy crude oil prices. These factors, combined with a strong balance sheet, sound financial management and a portfolio of high quality opportunities will allow Dana to continue to grow over the coming years. The future success of the Company depends on the commitment, enthusiasm and hard work of the Dana team. On behalf of the Board, we would like to thank all staff for their important contributions in 2002 and commend to shareholders their technical excellence and dedication to the Company.

27 March 2003

Review of Operations
continued

John Downey
Exploration Manager

Africa

"Offshore Africa positions Dana with substantial growth potential. The vast acreage and prospectivity of the areas under licence give us important strategic holdings across a range of geological provinces. Following two discovery wells in shallow water Ghana and the extensive acquisition and interpretation of high definition seismic, we will soon be ready to drill the first of our large, deep water targets offshore Mauritania."

Mauritania

Following the success of Woodside Energy's 2001 Mauritanian drilling campaign which resulted in the discovery of the Chinguetti field in offshore Block 4, the hydrocarbon potential of the region was further demonstrated in 2002 with the discovery of the nearby Banda field and a successful two-well appraisal of the Chinguetti field which is now expected to lead to the country's first oil development.

Offshore Northern Mauritania, Dana continued its regional geological studies in Blocks 7 and 8. The Company concentrated its resources on the interpretation of the 3D seismic survey which was acquired over Block 7 (Dana 80.0%). Following the identification of a number of very significant exploration prospects, many indicating stacked reservoir horizons, the original Block 7 co-venturers elected to enter into the first drilling phase of the PSC. Woodside, which had an option to join the group in the next phase, decided not to proceed. Preparations are now underway to drill a well before the end of 2003 to test an exciting prospect located in the South of Block 7, which has reserves potential of several hundred million barrels.

Interpretation of the infill 2D seismic survey acquired over Block 1 (Dana 48.0%) in 2001 has resulted in an upgrading of the Block's potential. Consequently, following signature of a farm-out agreement with Energy Africa that covered Dana's costs, a major 1,340 km² 3D seismic survey was acquired offshore Southern Mauritania in the fourth quarter of 2002 with the aim of firming up specific drilling targets in Block 1. The data from this survey is now being fast-track interpreted to allow a decision to be taken on the first drilling phase of the PSC by July 2003.

Ghana

Dana drilled its second discovery well, WT-2X, in the Western Tano Contract Area (Dana 90.0%) in 2002. Whilst the quality of the lower Albian age sandstone target proved disappointing, the well discovered 75 feet of high quality oil bearing sandstone reservoir in a shallower Maastrichtian age formation at a depth of around 6,100 feet. Subsequent remapping of this accumulation has demonstrated the potential for significant oil-in-place volumes of around 200 million barrels. Oil samples recovered from the well have shown the crude to be relatively viscous. Therefore, future commerciality will depend on how appropriate technology can be applied to maximise recovery efficiency and this will be the subject of development studies to be conducted in 2003.

Good progress was made in 2002 in understanding the exploration potential of the deepwater region of the Western Tano licence, with the focus now largely on the most significant prospect currently identified, known as Fan 6. With some of the highest potential oil-in-place volumes in the area, this prospect also exhibits good apparent reservoir continuity and evidence of direct hydrocarbon indicators on the 3D seismic data. In line with its strategy, Dana is considering a plan to further reduce technical risk ahead of drilling, and thus increase the chance of a first deepwater discovery, by shooting a further 3D seismic survey in 2003 over a previously unsurveyed part of Fan 6. This would enable an optimum drilling location to be selected for 2004.

In recognition of the importance of Dana's exploration work to date and the value of taking forward the deepwater work programme, the Ghanaian authorities have offered Dana a three year extension of the term of its exploration licence, to mid 2007.

Kenya

Dana has now successfully completed the agreed work programme for the first two-year exploration period, which ended in October 2002, for each of the four exploration Blocks which it operates offshore Kenya, namely L-5, L-7, L-10 and L-11 (Dana 80.0%). This involved a thorough study of all available historic geological and seismic data for the area under licence, which represents a vast (45,000 km²) under-explored Cretaceous-Tertiary basin in water depths of 200 to 2000 metres. The study identified seven potential 'play' types, both structural and stratigraphic, from which around 100 early stage exploration prospects have been characterised to date.

Presented with these very encouraging results, Dana elected to proceed into the next two-year exploration period in Kenya, during which the Company plans to acquire a minimum of 500 km of 2D seismic over each block. It is likely that Dana will shoot this new survey in 2003 to allow sufficient time to evaluate the new data and make the 'drill-or-drop' decision required by October 2004.

Annex 100

Thomas Pearmain, "Woodside Spuds Offshore Well; Kenya's Oil Future to Be Determined in 2007", *Global Insight* (5 Dec. 2006)

Same-Day Analysis

Woodside Spuds Offshore Well; Kenya's Oil Future to Be Determined in 2007

Published: 12/5/2006

Kenya's first offshore well for 28 years has been spudded; the next 12 months should give a clear indication of whether Kenya will become an oil-producing country

Global Insight Perspective	
Significance	Woodside Petroleum has spudded a deepwater well in Block L5 offshore Lamu on the Kenyan coast. China is also set to prospect for oil in the country, having signed a deal earlier this year
Implications	Residents of Lamu already believe they will be shortly enjoying huge oil riches; however, even if commercial oil deposits are discovered, this will not lead to local employment opportunities as the Lamu workforce is unskilled.
Outlook	Kenya's upstream activities will also determine the scale of investment and the future of the country's downstream sector, with Mombasa's refinery either set to be expanded or shut down and turned into a mass storage facility for imported products. The next 12 months will determine Kenya's future as an oil producing nation.

Drilling Begins for Oil in Kenya

Offshore drilling has begun in Kenya as Australia's Woodside Petroleum spudded the Pomboo-1 exploration well in deepwater Block L5. By the end of next year, when other test wells have been drilled, analysis of initial results should tell whether the country has the commercial deposits to become an oil-producing nation.

Woodside leads a consortium of independent exploration companies and is the operator in Block L5 with a 30% stake, Dana Petroleum (30%), Repsol (20%), and Global Petroleum (20%) are the other partners (see **Kenya: 10 August 2006: Dana, Woodside and Global Petroleum Get Ready to Sink Exploratory Wells in Kenya**).

Woodside has said that it will spend more than US$90 million to drill a single well in Blocks L5 and L7 in the Indian Ocean. Woodside has previously stated that the Kenyan coast is "the most prospective part of East Africa with several large geological structures hosting multiple targets similar to those found on Australia's North-West Shelf". Dana Petroleum has also said that it believes that the blocks could contain over one billion barrels each. The first well is being drilled in 2,200 metres of water to a planned total depth of 5,005 metres. The drilling will be undertaken by the Japanese deepwater drilling vessel MV Chikyu.

Oil Deposits Will Not Bring Employment Opportunities

The drilling is taking place about 135 km off Lamu, but residents have already started believing that a future living off the riches of petrodollars is only a short time away. Mary M'Mukindia the managing director of Kenya's National Oil Co. (NOCK) is therefore having to calm the levels of excitement by organising seminars and public rallies to educate the local population. Even if commercial oil deposits are discovered in the Lamu basin, revenue is not expected to start rolling in until 2011-14. Another problem that the residents of Lamu are set to experience is that oil production would not increase the employment opportunities as the local workforce is largely unskilled and most jobs would be contracted out.

There is also the need for an independent environmental impact assessment as Lamu's waters represent the livelihood of its fisherman and despoliation of the environment would be a catastrophe for them and for the vital tourism sector. A National Environment Management Authority (NEMA) investigation is being carried out, but NEMA represents the government, which has a vested interest in oil being found in Lamu's deepwaters.

China to Prospect for Oil in Kenya

In April 2006, Chinese President Hu Jintao flew to Kenya to meet President Mwai Kibaki and conclude a deal for the China National Offshore Oil Corp. (CNOOC) to prospect for oil in mainly offshore areas (see **Kenya: 27 April 2006: Chinese President Agrees to Offshore Oil Exploration Deal During State Visit to Kenya**). Fu Chengyu chief executive of CNOOC Ltd, announced last week that the company’s subsidiary, CNOOC Africa Ltd, would take on six production-sharing contracts (PSCs) in Kenya. These six PSCs cover Blocks 1, 9, 10A, L2, L3, and L4 in three basins of Lamu, Anza, and Mandera, with a total area of 115,343 sq. km. This marks the first time that CNOOC has explored in East Africa (see **Sub-Saharan Africa: 1 May 2006:China Increases Security of Supply with Energy Deals in Nigeria and Kenya**). The agreement appears to be a low-risk investment for Kenya, with China taking on all exploration costs. While Kenya is seen as a highly prospective region, China's deal with Kenya can be seen as an insurance policy for its government, which is desperate to protect its investment in neighbouring Sudan, which ships the majority of its oil to Chinese markets. Most of Sudan’s oilfields are in the centre or south of the country and the Kenya Pipeline Corp. (KPC) has offered to build a pipeline transporting oil from southern Sudan to the port of Lamu. This could protect Sudanese marketing routes in the event that the south of the country decides to secede under the terms of its six-year interim peace agreement with the government in the Sudanese capital, Khartoum.

KPC managing director George Okungu told officials from southern Sudan that Kenya's position on the eastern coast of Africa and its experience in pipeline management would best enable Sudan to exploit its proven oil reserves (see **Kenya: 8 April 2006: Kenya Pipeline Corporation Wants to Build Pipeline from Southern Sudan to Kenyan Coast**). However, it is believed that a pipeline connecting south Sudan to the Kenyan coast would cost around US$1.4 billion, which makes the idea very much a long-term project.

Outlook and Implications

Next year will be crucial in determining whether Kenya has a future as an oil-producing country. Woodside, which has already spent 852 million Kenya shillings (US$12 million) in exploration work and seismic data since 2003, is committed to drilling at least two wells over the next 12 months, and it will sink 13 wells throughout Africa in the next year.

Kenya will be hoping the test results show hydrocarbon deposits, not least because its neighbour Uganda proved this year it has commercial amounts of oil and is set to become an oil-producing country by 2009. Ugandan President Yoweri Museveni has stated his government will launch an "Early Oil-Production Scheme" that will see the creation of a mini-refinery next year that will produce diesel, kerosene, and heavy oil by 2009. At a later date, the country will be able to produce gasoline (see **Uganda: 10 October 2006:President Museveni Says Uganda Will Begin Producing Oil in 2009**).

The question of whether Kenya discovers oil through its exploratory activities also has downstream implications. The Kenya Petroleum Refineries Ltd (KPRL) needs around 21 billion Kenya shillings (US$300 million) to redevelop the country's Mombasa refinery; in its current state it is a burden on the economy. The inefficient refinery costs the taxpayer 5 billion Kenya shillings a year as a result of its poor performance; any upgrade to the refinery would need to enable it to produce environmentally friendly low sulphur diesel as the current refinery does not contain a de-sulphurisation plant. Also, by modernising the Mombasa refinery, one of the government's aims—of increasing Kenya’s production of liquid petroleum gas—could be achieved. If drilling results show a future as an oil-producing nation, this could lead to a much larger expansion and investment in the Mombasa refinery.

However, if over the next 12 months no commercial oil deposits are discovered in Kenya it could lead to the refinery being shut down and transformed into a mass storage facility for imported refined products. George Wachira general manager at the Petroleum Institute of East Africa said that it cost 2-3 Kenya shillings per litre more to refine a litre of fuel compared with importing refined products from the Middle East, where large and efficient refineries take advantage of economies of scale. (see **Kenya 1 November 2006: Inefficient Kenyan Refinery a Burden on Economy**). With Uganda already saying that it will construct a mini refinery on the basis of its known crude reserves, this could place Uganda in control of the East Africa fuels market.

Now the first well has been spudded in Kenya—the first offshore well for 28 years—the country has stepped up its programme to determine whether Kenya has a future as an oil-producing nation. This has been accompanied by the country's Energy Minister Kiraitu Murungi publishing a gazette of 38 exploration blocks in the country, in total covering 115,242 sq. km. Kenyans and energy industry observers will gain a clearer in 2007 as to whether the country will join Sudan and Uganda in having proven hydrocarbon reserves.

Related Content

Energy Industry Analysis, Forecasts, and Data

Annex 101

Thomas Pearmain, "Woodside Well in Kenya a Duster", *Global Insight* (23 Jan. 2007)

Publication Logo

Global Insight

January 23, 2007

Woodside Well in Kenya a Duster

BYLINE: Thomas Pearmain

SECTION: In Brief

LENGTH: 202 words

Australia's Woodside Petroleum, which spudded the Pomboo-1 exploration well in deepwater Block L5 in Kenya last December, has announced that it has failed to detect any hydrocarbons .Woodside said logging tools had confirmed the absence of hydrocarbons in the well, which was drilled to a depth of 4,887 metres. The drilling took place about 135 km off Lamu and the Japanese deepwater drilling vessel MV **Chikyu** will now plug and abandon the well. Woodside leads a consortium of independent exploration companies and is the operator in Block L5 with a 30% stake, Dana Petroleum (30%), Repsol (20%), and Global Petroleum (20%) are the other partners (see Kenya: 10 August 2006:).

Significance: This is very disappointing news for Kenya and for the consortium, which believed the Kenyan coast to be "the most prospective part of East Africa with several large geological structures hosting multiple targets similar to those found on Australia's North-West Shelf". Dana Petroleum had also said that it believed the block could contain over one billion barrels. The offshore drilling will continue as Woodside has said that it will also drill a single well in Block L7 in the Indian Ocean (see Kenya: 5 December 2006:).

SUBJECT: PETROLEUM PRODUCTS (90%); OIL & GAS EXPLORATION (90%); OIL & GAS EXTRACTION (90%); OIL

Annex 102

Total S.A., *Press Release: Total Enters Exploration in Kenya by Acquiring a 40% Stake in Five Offshore Blocks in the Lamu Basin* (21 Sept. 2011)

TOTAL ENTERS EXPLORATION IN KENYA BY ACQUIRING A 40% STAKE IN FIVE OFFSHORE BLOCKS IN THE LAMU BASIN

September 21, 2011

Kenya Map

September 21, 2011: Total today announces its acquisition, through its Total E&P Kenya B.V. subsidiary, of a 40% interest in five offshore exploration blocks in the Lamu Basin, blocks L5, L7, L11a, L11b and L12. Subject to the approval of the Kenyan authorities, Total will acquire:

- a 20% stake from Anadarko Kenya Company, which will continue to be the operator with a 50% interest in the permits ;

- a 5% stake from Cove Energy, which will maintain a 10% interest in the permits ;

- a 15% stake from Dynamic Global Advisors, which is selling all of its interest to Total.

Covering an area of more than 30,500 square kilometres, the exploration blocks are located offshore the Lamu Archipelago in water depths of between 100 and 3,000 metres.

Following its recent entry in the exploration and development of reserves in Uganda's Lake Albert region, and its selection to develop exploration activities in Tanzania, this acquisition is another step in Total's strategic focus on strengthening its exploration and production presence in East Africa.

Total in Kenya

Total has been present in Kenya - one of its longest established host countries in Africa -since 1955 via Total Kenya, headquartered in Nairobi. Total Kenya is listed on the Nairobi Stock Exchange and employs 385 people.

Market leader since its acquisition of Chevron's assets in 2009, Total Kenya conducts all of the Group's marketing operations, which include general retail and lubricant, LPG and aviation fuel distribution operations, via a network of 165 service stations.

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Annex 103

Barry Morgan, "Kenyan block still attractive", *Biyokulule Online* (13 Apr. 2012)

Kenyan block still attractive

Barry Morgan
Upstream
April 13, 2012

LEAST heralded among Kenya`s prospective undrilled areas is Block 1, a sprawling tract operated by Lion Petroleum in partnership with Afren in the Mandera-Lugh basin, writes Barry Morgan .. The basin stretches into Somalia and the Ethiopian Ogaden, where significant quantites of oil have been found.

A total of 17 leads in Block 1 resemble similar gas finds across the border in Ethiopia, while oil-filled fractures abound in the Murri Formation, among which the Tarbaj oil seep has the potential on its own for designation as an oilfield, says Lion chief executive Alec Robinson.. Sproule International told Lion the leads could not be mapped without additional seismic, so Robinson ordered more before a planned listing on the Toronto Exchange and a one-well commitment in 2013.

Robinson pegs block reserves at 750 million barrels of oil equivalent, but hints the upside is much greater. Nairobi`s Energy Ministry appears to concur and is agitating for the block to be split into three parts.

Australian oil services outfit Amsas Consulting is targeting Somali acreage directly abutting Block 1. Amsas is run by Somali businessman Ali Abdullahi. Having already snared the Somali government block on the coast, Abdullahi has sought additional acreage off southern Somalia to the north of the Jorre block, contiguous with the disputed Kenyan maritime boundary. "I had the well logs and reports on my laptop, which was stolen, though I had it all backed up. I suspect foul play by those who might benefit if I couldn`t prove my claim, given the chaos in the present Somali administration.

"I worked hard for the Somali Energy Ministry in 2005 to secure all the digitised data from Harms & Brady in Colorado, then Shell sent most of its data back to Mogadishu but it was stolen en route. Nobody knows by whom - but we got it a year later." Jorre was secured by Total in 2007 as a technical evaluation area. However, Total failed to convert the play into a production sharing contract when the government collapsed on the very day it was scheduled to pay a $5 million signature bonus - that too, is now up for grabs.. Several homegrown Kenyan independents, such as Bahari Resources, have sensed relinquishment in the air, alongside regional operators Petrobras and Cove Energy, all actively pursuing demarcated acreage in southern Somalia.

Annex 104

Kelly Gilblom, "Kenya, Somalia border row threatens oil exploration", *Reuters* (20 Apr. 2012)

World | Fri Apr 20, 2012 7:36am EDT

Related: WORLD, UNITED NATIONS

Kenya, Somalia border row threatens oil exploration

NAIROBI | BY KELLY GILBLOM

A row between Kenya and Somalia over their maritime border may deter multinational oil companies from exploring for oil and gas offshore east Africa, and a Somali official warned that the argument could escalate.

The two coastal nations disagree over the location of their boundary line in the Indian Ocean. At stake are their legal claims to sell rights for exploration and collect revenue from any discovery.

Kenya recently identified eight new offshore exploration blocks available for licensing, and all but one of them are located in the contested area.

"The issue between Somalia and Kenya is not a dispute; it is a territorial argument that came after oil and gas companies became interested in the region," Abdullahi Haji, Somalia's minister of foreign affairs, told Reuters in Mogadishu.

"If the argument continues unsolved, it will change into a dispute that may result at least in souring the deep relation between our two countries and (cause a) war at last," he said.

East Africa has become a hot spot for oil and gas exploration, spurred by new finds in waters off countries including Uganda, Tanzania and Mozambique. In the Horn of Africa, Somalia's semi-autonomous Puntland and Somaliland regions have also licensed exploration blocks.

Kenya announced its first oil discovery in March by British oil firm Tullow Plc, which was on land.

The row between Kenya and Somalia threatens to upend some exploration rights that Kenya has granted to oil and gas companies, which have already started exploring in the area.

French firm Total and Texas-based Anadarko and the only two companies so far holding licenses from Kenya to blocks in the disputed area. They have no immediate plans to drill there. Both companies declined to comment on the border issue.

UN INTERVENTION?

Martin Heya, Kenya's petroleum commissioner, said he was confident the United Nations, which could be requested to help delineate the border, would agree with his country's view, and he expected companies to continue their exploration activities.

"Do you stop working just because the boundaries have not been determined? No," he told Reuters.

Consultants involved in border demarcation said the two countries won't have a legitimate boundary until they sign a treaty that delimits the border, but that is unlikely to happen until Somalia has a stable government.

Heya says the maritime border between the two countries should run horizontally east from the point at which the two countries touch on land. The practice in east Africa has

been for boundaries to run along the line of latitude, Heya said.

"For the time being, this is where we believe the border should be," he said, referring to the horizontal east-west maritime border.

Somali officials say the onshore border continues into the ocean diagonally southeast and that a horizontal border would be unfair.

If the Somalia-Kenya border was continuous from land into the ocean, making it lie diagonally from the northwest to the southeast, Kenya would be left with a small triangle in the Indian Ocean over which it could claim mineral rights.

Kenya has had stable diplomatic relations with its war-torn neighbor, but the east African economic powerhouse sent troops into Somalia last October in pursuit of al Qaeda-linked al Shabaab rebels, accusing the militants of cross-border attacks on its territory.

UNSTABLE SOMALIA

Joshua Brien, a legal adviser with the Commonwealth Secretariat, who has consulted with Kenya on maritime border matters, said the two countries won't have a legitimate boundary until they write and sign a treaty.

The absence of a stable government in Somalia could hinder this process, he said.

Somalia's government has been battling an insurgency by al Qaeda-linked rebels for years and barely controls the capital, even with the help of an African peace-keeping force executing a U.N. mandate to prop up its Western-backed government. It is unlikely it would have the ability to wage a war on Kenya.

Brien also said the two countries' border disagreement is not unique. Throughout the world there are unresolved maritime boundaries.

"It is not uncommon for maritime boundary issues to become heated, especially where petroleum exploration and development is concerned," he said.

"In the case of Somalia, the matter is exacerbated by the governance and offshore security situation in that country, both of which are well known."

Kenya is pushing on with oil and gas exploration, but petroleum commissioner Heya acknowledged the border dispute could cause problems in the future.

Heya said companies will be unable to drill in their respective blocks until the boundary is settled, because it will be unclear where to direct revenue from a resource discovery.

"Where the revenue goes is not apparent," Heya said.

(Additional reporting by Mohamed Ahmed in Mogadishu; Editing by James Macharia and Jane Baird)

Annex 105

Total S.A., *Press Release: Total Steps Up Exploration Activities in Kenya with the Award of the Offshore L22 License in the Lamu Basin* (27 June 2012)

TOTAL STEPS UP EXPLORATION ACTIVITIES IN KENYA WITH THE AWARD OF THE OFFSHORE L22 LICENSE IN THE LAMU BASIN

June 27, 2012

Kenya's Map

Paris, June 27, 2012: Total today announced the signature of a production sharing contract with the Kenyan government for Block L22, which it will operate with a 100% interest.

Covering an area of more than 10,000 square kilometers, the exploration license is located offshore the Lamu Archipelago in water depths of between 2,000 and 3,500 meters. The first phase of the exploration program consists of a 3D seismic survey.

Following the signing ceremony, Jacques Marraud des Grottes, Senior Vice President for Exploration & Production in Africa commented: "*This most recent award is aligned with Total's strategy of building a strong presence in the new basins of East Africa offering high-potential plays for exploration by leveraging our internationally recognized deep offshore expertise*."

Total in Kenya

Total has been present in Kenya — one of its longest established host countries — since 1955 through Total Kenya, headquartered in Nairobi. Total Kenya is listed on the Nairobi Stock Exchange and employs 385 people.

Market leader since its acquisition of Chevron's assets in 2009, Total Kenya conducts the Group's marketing operations in the country, notably with a network of 167 service stations, and positions in general retail, lubricants, LPG and aviation fuel distribution.

Total has been present in exploration and production in Kenya since 2011 and holds a 40% interest in the L5, L7, L11a, L11b and L12 exploration licenses in the Lamu Basin, which are operated by Anadarko. Drilling of an exploration well is scheduled to begin in 2012.

For further information, please contact:
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Send an e-mail to Media Relations (/en/media/media-relations-contacts)

Annex 106

Eni S.p.A., *Press Release: Eni enters Kenya with the acquisition of three exploration blocks* (2 July 2012)

Eni enters Kenya with the acquisition of three exploration blocks

San Donato Milanese (Milan), July 2, 2012 – Eni announces the signing of three product sharing contracts, awarded by the government of Kenya, for the acquisition of exploration blocks: L-21, L-23 and L-24, thus marking the entry of Eni in the country. The blocks are located in the deep and ultra-deep waters of the Lamu Basin, off the coast of Kenya.

The initial exploration phase of the three blocks, which will be operated by Eni with 100% participation and cover an area of more than 35,000 square kilometers, will consist of the execution of a seismic acquisition program.

Eni's entry into Kenya reinforces its presence in the exploration of the frontier basins of East Africa, which has recently led to the discovery of significant volumes of natural gas in the deep waters of Mozambique.

With this operation, Eni further strengthens its leadership in Sub-Saharan region where it is already present in Nigeria, Republic of Congo, Ghana, Togo, Angola, Democratic Republic of Congo and Mozambique with an operated overall production of 450,000 barrels of oil equivalent per day and a rapidly growing exploration activity.

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Annex 107

Kelly Gilblom, "Somalia challenges Kenya over oil blocks", *Reuters* (6 July 2012)

Industries | Fri Jul 6, 2012 10:14am EDT

Related: UNITED NATIONS, ENERGY

Somalia challenges Kenya over oil blocks

* Offshore blocks located in disputed seas

* Border row threatens exploration in new hotspot

* Kenya's plans to extend continental shelf stalled

By Kelly Gilblom

NAIROBI, July 6 (Reuters) - Somalia's government accused Kenya on Friday of awarding offshore oil and gas exploration blocks illegally to multinationals Total and Eni because the concessions lie in waters claimed by Somalia.

The spat between Kenya and its war-ruined neighbour could complicate the hunt for resources along a part of the East African coastline, rapidly emerging as one of the world's hottest oil exploration prospects.

Somalia's deputy energy minister, Abdullahi Dool, said contracts awarded for four blocks in deep waters were invalid and the government planned to complain to the United Nations, which oversees maritime border laws.

"We are concerned about the lease of blocks," Dool told Reuters. "I am sure we will lodge complaints."

The blocks are among seven awarded by Kenya last week, three of them to Italy's Eni and one to France's Total .

They lie in an area long contested by Kenya, East Africa's biggest economy, and Somalia, wrecked by more than two decades of civil war, split between an interim government and Islamist rebels and serving as the main base for Indian Ocean pirates.

Kenya rejected the accusation that ownership of the blocks was contested and said there was no need to hold up exploration.

Kenya's first major oil discovery in March has raised expectations of more to come.

"Saying these are not Kenyan blocks is like saying we don't have a full-fledged government, like we are a banana republic," petroleum commissioner Martin Heya said.

An Eni spokesman said the company would not comment on the challenge to its rights to blocks L21, L23 and L24. Total, awarded block 122, did not respond to requests for comment.

Kenya says the maritime boundary, over which there is no formal agreement, should run due east from the point at which the land border meets the coast, like the maritime boundaries of other countries along the coast.

Somalia says the boundary should extend perpendicular to the coastline, giving it a big chunk of the waters claimed by Kenya.

The dispute mirrors those in other parts of Africa where resources straddle boundaries that

were first drawn only vaguely by colonial era map makers.

Kenya and Somalia signed a memorandum of understanding in 2009 that the border would run east along the line of latitude, but Somalia, which has lacked an effective central government since 1991, then rejected the agreement in parliament.

The quarrel over the oil blocks strains otherwise close ties between Kenya and the Somali government. In fact, Kenya sent troops into Somalia last year to hunt down the Islamist al Shabaab rebels who control swathes of the country.

Joshua Brien, a legal adviser with the Commonwealth Secretariat who is advising Kenya on the matter, said no legal boundary can be established until both governments sign a U.N.-approved agreement or move the issue to an international court.

"It's not impossible they could come to a resolution, but the situation in Somalia is so uncertain," Brien told Reuters by phone from London.

An added frustration for Kenya is that it cannot extend its claim to the continental shelf beyond its 200 nautical miles (370 km) of territorial waters until the border spat is resolved. That holds up the award of more exploration licenses. (Editing by Richard Lough and Matthew Tostevin)

Annex 108

Kennedy Senelwa, "Kenya ministry signs contracts for oil drilling", *The East African* (7 July 2012)

The EastAfrican

Business

Kenya ministry signs contracts for oil drilling

The Ministry of Energy has signed production sharing contracts (PSC) for exploration of crude oil and gas in Kenya with six international prospecting firms.

Awarding of the seven exploration areas to the firms follows increased international interest after the discovery of oil in Ngamia well drilled in northwestern Kenya by Tullow Oil and Africa Oil Corporation.

Martin Heya, the Petroleum Commissioner at the Ministry of Energy, said the government has signed PSCs for onshore exploration area 11A and L19 with ERHC Energy and Rift Energy Corporation respectively.

Pacific Seaboard Investments was awarded the L20 acreage in Lamu basin.

“Kenya is asking for more favourable terms as the country is no longer a frontier exploration area as Tullow has discovered oil,” said Mr Heya.

Total was awarded offshore L22 acreage while ENI got L21, L23 and L24 exploration areas. Edgo of Qatar is negotiating for onshore L14 and offshore L26 exploration areas. Statoil is pursuing offshore L25 acreage.

In 2011, Total got 40 per cent interest in offshore exploration areas L5, L7, L11A, L11B and L12 where oil and gas wells will be drilled soon.

Total has been operating in Kenya since 1955, and is involved in marketing and distribution of refined oil products. The firm acquired Chevron (Caltex) in 2009.

ENI, which was known as Agip in Kenya, has returned and been awarded L21, L23 and L24 exploration areas.

“ENI’s entry into Kenya reinforces its presence exploration of frontier basins of East Africa, which has recently led to discovery of significant volumes of natural gas in deep waters of Mozambique,” said the Italian firm.

The company will map oil and gas sites through a seismic survey in exploration areas L21, L23 and L24 covering over 35,000 square kilometres in the deep and ultra-deep waters of Lamu basin.

Back to **The East African: Kenya ministry signs contracts for oil drilling**

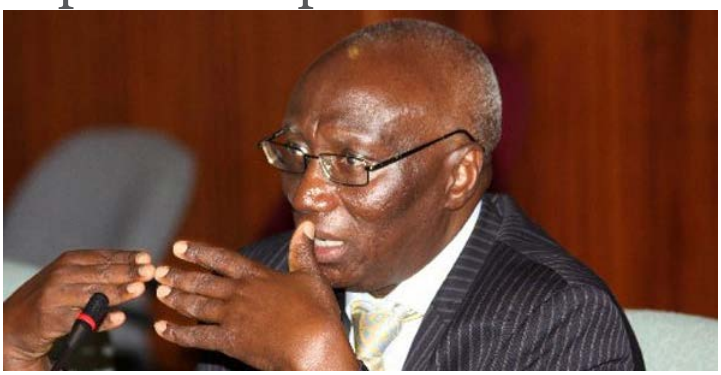
Annex 109

Rawlings Otini, "Kenya expels oil giant Statoil from exploration plan", *Business Daily Africa* (5 Nov. 2012)

BUSINESS DAILY

CORPORATE NEWS

Kenya expels oil giant Statoil from exploration plan



Energy Permanent Secretary Patrick Nyoike. File

IN SUMMARY

- Experts say the 3D survey system is more advanced and precise compared to the 2D, which is cheaper and preferred by operators who are not keen to pump money in exploration blocks that do not assure them a high success rate.

Norwegian oil giant Statoil has suffered a blow after Kenya expelled it from exploring oil in the country for flouting contract terms.

Also read: Norwegian firm Statoil joins the search for oil in Kenya

The company was among the latest entrants in the Kenya oil search that has so far attracted more than 24 players by August after it was awarded block L26 in the deep offshore and had planned to start drilling in January.

On Monday, the Permanent Secretary in the Energy ministry, Patrick Nyoike, said the government had withdrawn Statoil's licence for failing to stick to the 3D seismic survey, which is a more accurate exploration tool compared to the 2D that Statoil preferred.

"Statoil said they wanted to do it their own way but we could not accept and hence we had to let them go," said Mr Nyoike in an interview.

"These conditions are applying across the board with companies such as Total, ENI and Agip doing as we had instructed, but they instead rejected and we had to send them off."

Experts say the 3D survey system is more advanced and precise compared to the 2D, which is cheaper and preferred by operators who are not keen to pump money in exploration blocks that do not assure them a high success rate.

The offshore block awarded to Statoil is expected to be snapped by other oil majors amid increased demand for oil blocks in East Africa.

In recent months, East Africa has been a centre of oil and gas exploration after several big discoveries, including Kenya's second ever oil find announced by British explorer Tullow Oil and Canadian venture partner Africa Oil last week.

Licensing of the deep water offshore blocks at the Kenya coast has also been enhanced by discoveries along the coastlines of Tanzania and Mozambique. Some of the latest entrants included French oil major Total and Eni of Italy.

Experts reckon Kenya is keen on 3D seismic survey to boost oil finds that are expected to continue the country's surge of exploration activity as it races to find commercially viable oil.

Oil strikes will also make the country attractive to oil giants at a moment when Kenya is seeking to benefit more from foreign oil and gas

exploration firms.

The Business Daily yesterday failed to get a response from Statoil, which has a presence in more than 30 countries with a total revenue of Sh10 trillion ($119 billion).

The energy firm with operations in six African countries including Egypt, Algeria, Tanzania, Ghana, Angola and Libya, recently struck a rich vein in East Africa after securing large deposits of gas in Tanzania.

Kenya plans to gazette and auction off new blocks for oil and gas exploration.

The ministry of Energy said UK explorer Tullow Oil and Anadarko Petroleum would surrender acreage in a total of seven blocks in the coming weeks as required in their production-sharing contracts with the government.

Tullow Oil could give up a quarter of its territory in block 10BB, where it made its March oil discovery, as well as a quarter of block 13T. Both are onshore.

Anadarko will surrender 25 per cent of each of its five offshore blocks.

As part of production-sharing contracts, explorers must surrender a quarter of their unused blocks after two years if the block is onshore or three years if it is offshore.

On Monday, Mr Nyoike said Anadarko Petroleum is scheduled to begin exploring for oil and gas in Kenya in December, with plans to drill two wells.

Anadarko is the operator of blocks L7 and L11B and holds 45 per cent of the licences in each. Total has a 40 per cent stake and Cove Energy holds the remainder.

Anadarko has said it hopes to find oil, rather than gas, because it is cheaper and easier to produce. It plans to spend about Sh10 billion in its Kenya's exploration activities.

The Energy ministry expects explorers to drill at least a dozen more wells in the next 12 months onshore and offshore Kenya.

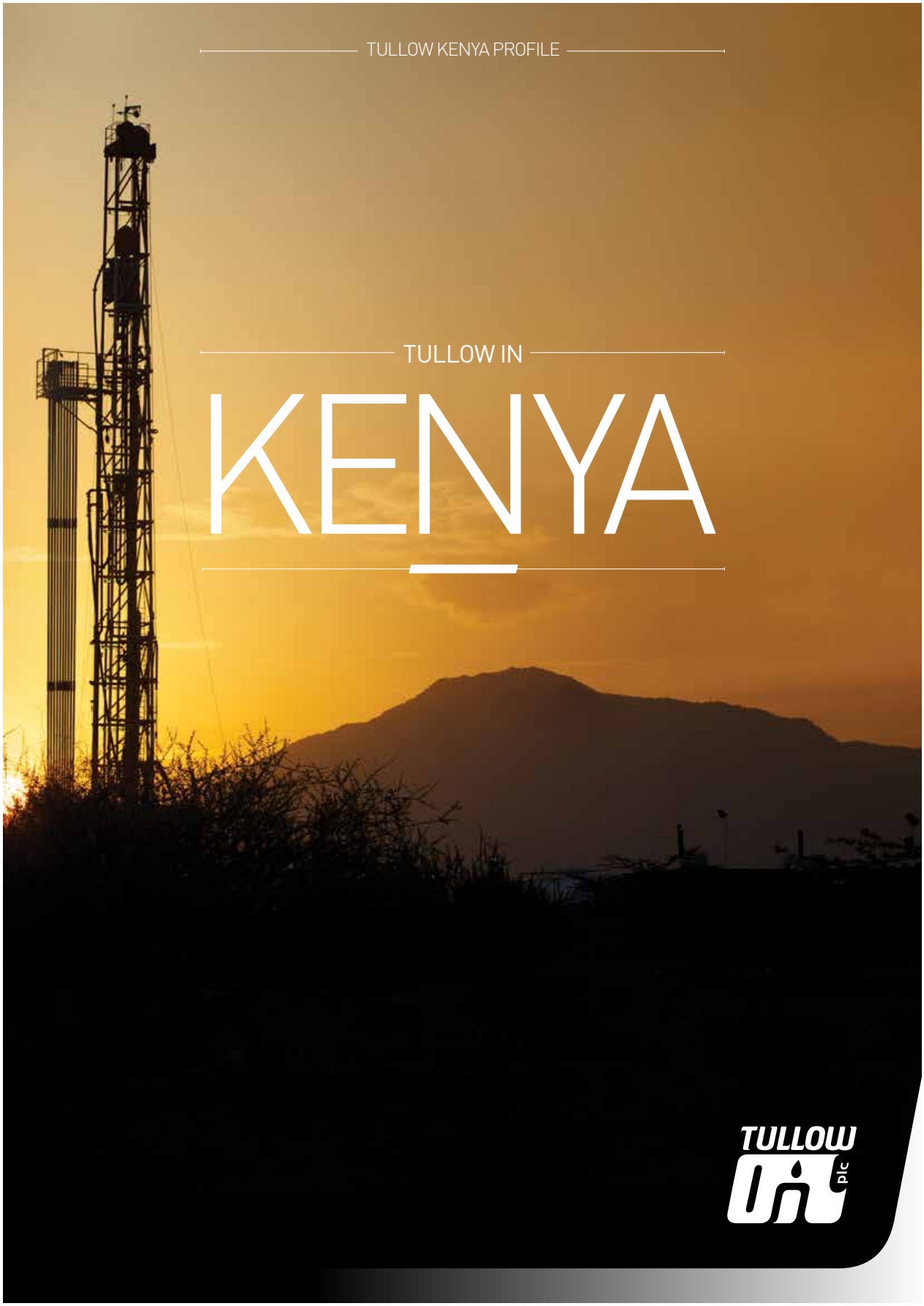
rotini@ke.nationmedia.com

Back to **Business Daily: Kenya expels oil giant Statoil from exploration plan**

Annex 110

Tullow Oil plc, *Tullow in Kenya* 2013

TULLOW KENYA PROFILE



TULLOW IN

KENYA

TULLOW OIL plc

ABOUT THIS REPORT

Tullow Oil is a leading independent oil and gas, exploration and production group.

Tullow acquired our first operated interests in the rift basins of Kenya in 2010. Just 18 months later we drilled the first wildcat exploration well. Since then we have discovered an estimated 600 million barrels of oil resources in the South Lokichar Basin.

This Kenya profile explores our journey so far in and the future for this potential new oil province.

We have included information on our operational activities, our economic contribution to Kenya and how we are playing a role in the country's social and economic development. We call this commitment to Kenya and our host countries, 'Creating Shared Prosperity'.

TULLOW OPERATIONS

	2013 Group totals
Countries	24
Licences	146
Acreage (sq km)	321,521
Total workforce	2,034
Working interest production (boepd)	84,200
Reserves and resources (mmboe)	1,409
Sales revenue ($m)	2,673
Operating profit ($m)	381
Profit after tax ($m)	216
Operating cashflow ($m)	1,901

ABOUT TULLOW OIL

Tullow is focused is on finding oil in Africa and the Atlantic Margins, combined with selective development and high-margin production to fund our exploration-led strategy.

Our history as Africa's leading independent oil company started almost 30 years ago in 1986, with the Group's first licence in Senegal. Now, our portfolio of over 140 licences spans 24 countries and is organised into three regions.

We are headquartered in London and we have a total global workforce of over 2,000 people, with over 50% of these working in our African operations.

Our shares are listed on the London, Irish and Ghana Stock Exchanges and the Group is a constituent of the FTSE 100 index.

CONTENTS

OUR JOURNEY

"THIS IS A VERY EXCITING TIME FOR KENYA & ITS NATURAL RESOURCES HOLD SIGNIFICANT POTENTIAL FOR THE COUNTRY."

The discoveries made by Tullow over the last two years have put Kenya at the heart of East Africa's emerging oil province. Despite this success, we do not underestimate the challenges that lie ahead in bringing first oil to market.

Development and production of these resources is a long-term proposition, and so we must work together with stakeholders to build understanding and knowledge about what activities need to take place at each stage of the journey.

Securing an appropriate and economically viable plan for development will be critical to project success. However having the right infrastructure in place to support oil production will be equally important. Significant infrastructure upgrades will be required in order to transport the oil from an area largely inaccessible today to the sea, over 850 kilometres away. Furthermore, Tullow will require access to a wide range of skills as well as competitive, high quality goods and services.

We also recognise the fragility of our operating environment. The environmental, social and cultural sensitivities will require careful management and extensive consultation. Our ability to develop the Nation's resources will be a collective effort and we are fully committed to working with the National and County Governments, the communities in which we operate, and other stakeholders to realise the full potential of Kenya's resources.

Kenya's natural resources hold significant potential for the country's people and we are committed to ensuring this is delivered in a responsible manner.

Martin Mbogo
Tullow Business Manager, Kenya

KENYA TIMELINE

2010

Tullow acquired a 50% interest in licences 10BA, 10BB, 10A, 12A and 13T after signing agreements with Africa Oil and Centric Energy. Agreements duly approved by authorised Government entity in Kenya

2011

Full Tensor Gradiometry (FTG) Gravity survey commenced and drilling starts at Ngamia-1

2012

First discovery at Ngamia-1, followed by Twiga South-1 well in Block 13T

2013

Three more discoveries at Etuko-1, Ekales-1 and Agete-1.
"Area of Interest" (AOI) agreed with the Government of Kenya to allow a multiple field approach to development

2014

Discoveries at the Amosing-1 and Ewoi-1 exploration wells. Estimate of discovered resources indicates overall South Lokichar basin potential of over one billion barrels of oil

2014+

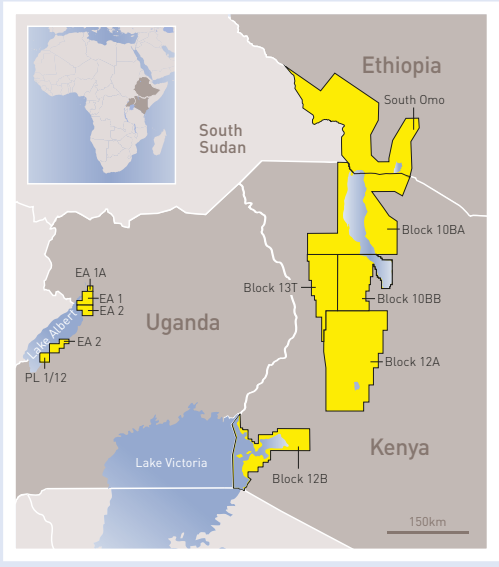
Accelerating parallel exploration, appraisal and development programmes

TULLOW IN EAST AFRICA

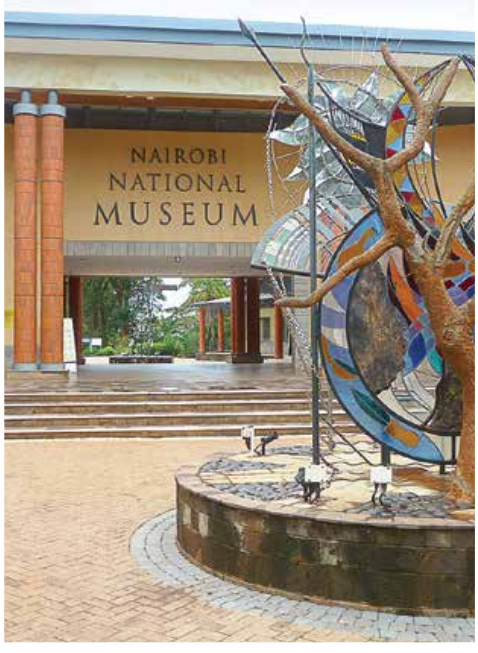
Tullow has had significant exploration success in the rift basins of East Africa, opening basins in the Lake Albert Rift Basin in Uganda in 2006 and more recently in the South Lokichar Kenya Rift Basin. Accelerated exploration, appraisal and early development campaigns are now under way in parallel in Kenya and Ethiopia, across the 11 basins where we have over 85,000 sq km of acreage.

"WE HAVE WORKED IN AFRICA FOR ALMOST 30 YEARS & RECOGNISE THE SIGNIFICANCE OF THE REGION'S WORLD-RENOWNED ENVIRONMENTAL & CULTURAL HERITAGE."

Aidan Heavey
Chief Executive Officer



WORLD-CLASS PETROLEUM PROVINCE POTENTIAL



KENYA ACREAGE

In Kenya, Tullow operates in one of the world's most environmentally and culturally sensitive regions including the Sibiloi, the South Island and the Central Island National Parks. These are home to sites of global archaeological and paleontological importance. From the outset, Tullow recognised the need to protect these areas of cultural and historical significance and partnered with the National Museums of Kenya (NMK) and Turkana Basin Institute (TBI) to help manage our operations in these areas.

Tullow's acreage comprises geography with a wide variety of topography including very rough volcanic terrains in the South and East of the region, to vast savannahs and far-reaching deserts in the North-West.

65,000 SQ KM
ACREAGE IN KENYA

RIFT BASINS

Rift basins are a core part of Tullow's East African exploration strategy and the plays targeted in Kenya are relatively young, at a few million years old. Geological rifts occurred when the Earth's plates were pulled apart by forces deep within the Earth's interior. As separation occurred, the ground collapsed to create lakes which deepened and linked to the sea.

Over time the lakes became isolated and filled with sediment deposits. The organic remains of micro-organisms that accumulated on the lake floor were then heated, compacted and converted to oil as they became buried in the collapsing rifts.

The early stages of rifting are present in Kenya as the chain of lakes were rapidly filled with sediment eroded from the surrounding mountains. The combination of shales and sands that are deposited contain the oil source and reservoir rocks that Tullow is now exploring.

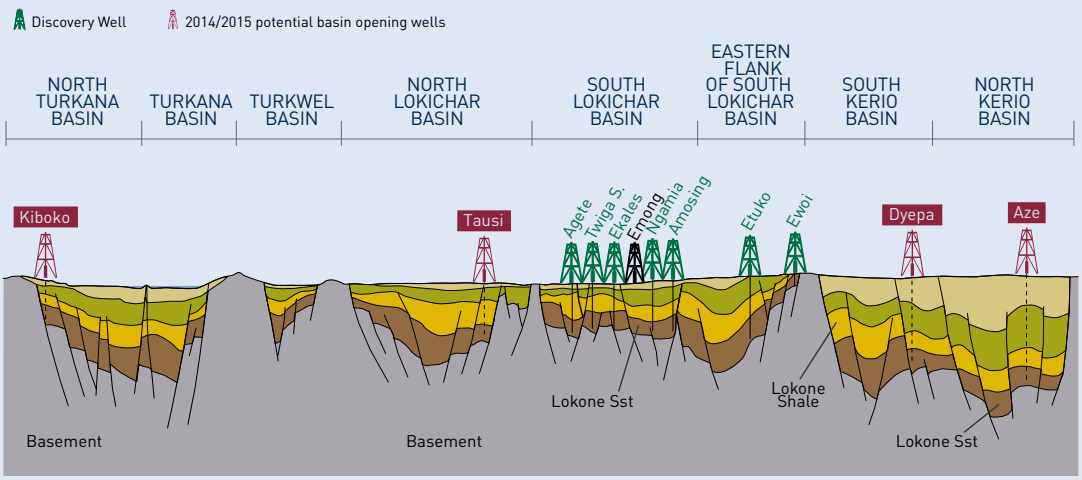
ACHIEVING EXPLORATIO

SURVEYING EXCELLENCE IS DRIVING EXPLORATION

Rift basins in Kenya share many similar geological qualities with the Lake Albert Rift Basin in Uganda where we have discovered estimated gross recoverable resources of over 1.7 billion barrels of oil since the first exploration well in 2006. This experience in the East Africa region gave us valuable and advantageous technical insights, which we combined with the early adoption of key technologies in developing our exploration campaign in Kenya. We conducted the world's largest airborne Full Tensor Gradiometry (FTG) gravity survey, at that time, as well as more conventional 2D surveys across Kenya's Tertiary Rift Basins. FTG is efficient in terms of time and provides high-resolution information about variations in the density of subsurface materials, which is highly valuable to our exploration teams in identifying possible hydrocarbon deposits.

A MULTI-BASIN EXPLORATION CAMPAIGN

This diagram shows the basins that Tullow has acreage in onshore Kenya. Success in South Lokichar significantly de-risked the remaining areas. Tullow plans to explore in the Kerio and Turkana Basins in 2014.



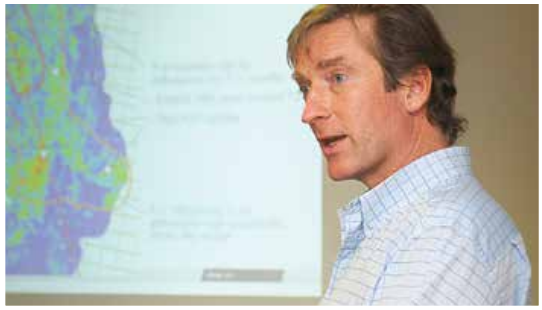
N SUCCESS

7/8
OIL DISCOVERIES TO DATE IN SOUTH LOKICHAR BASIN

c.60,000 SQ KM
FTG SURVEY ACROSS KENYA & ETHIOPIA

"WE USED INNOVATIVE EXPLORATION TECHNOLOGIES & VALUABLE TECHNICAL INSIGHT IN PLANNING OUR CAMPAIGN IN KENYA."

Robin Sutherland
Exploration Manager – Sub Saharan Africa



KES 6.1 BILLION

At Tullow, we are committed to being transparent about our payments to government as we believe this enables communities, citizens and governments to have a constructive debate on the sustainable management of oil revenues. Our total payments to all Kenyan stakeholder groups, including taxes to the national Government, expenditure with local suppliers and discretionary investment in community projects amounted to KES 6.1 billion in 2013.

Payments to major stakeholder groups (KES billion)

KES 1.9 BILLION

Over the last 12 months we paid KES 1.9 billion in taxes to the national Government of Kenya, which includes VAT, withholding tax on imported services and PAYE on our employee salaries. We have just over 100 permanent staff in Kenya and over 70% of these are Kenyan nationals. Tullow Kenya has also employed over 2,000 sub-contractors through our suppliers, 87% of whom are nationals, with 59% from Turkana, where our operational activities are taking place. The roles required by our suppliers call for different levels of experience, and are defined as skilled, semi-skilled and unskilled. Within these categories, Turkanas make up 24% of the skilled workforce, 78% of the semi-skilled workforce and 98% of the unskilled workforce.

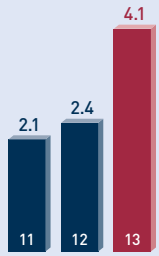
FOCUSED ON TRANSPARENCY

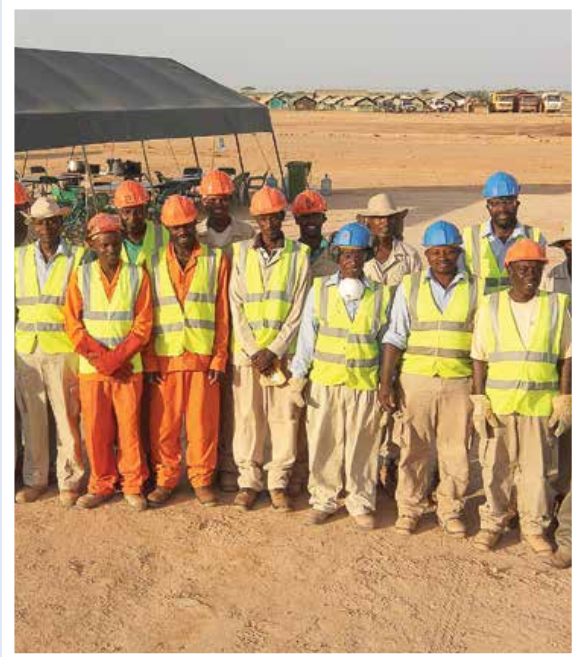
COMMITTED TO LOCAL CONTENT

Spend with Kenyan suppliers has been growing in line with our increased operational activity and also due to sensitisation of contractors on the need to optimise local content. In addition to the KES4.1 billion Tullow spent with local suppliers in 2013 (2012: KES2.4 billion), our contractors also spent KES 4.1 billion with Kenyan businesses in 2013, KES 259 million of which was with Turkana businesses.

KES 4.1 BILLION

Local content – Kenya (KES billion)





SUPPORTING LOCAL JOB CREATION

We are committed to bridging the existing skills gap to ensure that Kenya's emerging oil and gas industry brings real, lasting benefits to the country's people. At the end of 2013, there were approximately 100 permanent employees in Kenya, over 70% of whom are Kenyan nationals. To date, we have achieved 100% localisation of our HR, External Affairs and Legal roles. We are actively looking at development opportunities for graduates and experienced personnel to drive the localisation programme both nationally and with respect to the area of operation.

WATER SCARCITY

The amount of water needed for development and production will increase substantially from the exploration phase and typically approximately 3-4 barrels of water is used for every barrel of oil produced. Tullow is aware that its operations in Kenya are in a very arid region and is already working to understand the water sources needed by Tullow and the local communities. Tullow is mapping local subsurface water sources through a hydro-geological survey, which will establish a baseline of water sources in the region.

CREATING SHARED PROSPERIT

"ESTABLISHING THE COMMUNITY RESOURCE OFFICES NOT ONLY REINFORCES OUR COMMITMENT TO WORKING IN PARTNERSHIP WITH OUR HOST COMMUNITIES, BUT THEY ALSO PROVIDE A POINT OF CONTACT FOR STAKEHOLDERS WHO ARE INTERESTED IN & IMPACTED BY OUR OPERATIONS."

Martin Mbogo
Tullow Business Manager, Kenya

ADDRESSING STAKEHOLDER CONCERNS

In 2013, we faced stakeholder concerns as our operations ramped up. In late October, we temporarily shut down our drilling operations in Blocks 10BB and 13T after a disturbance triggered by community concerns over local employment and business opportunities.

We recognised the communities' concerns and worked closely with the Government to establish a Memorandum of Understanding which set out a way forward and sought to improve both impact management and engagement.

Y IN KENYA

SOCIAL INVESTMENT

In 2013, we invested KES 233 million in social projects in Kenya and have almost doubled this budget for 2014. Our spend will target priority areas that impacted communities have identified as essential to Turkana's long-term sustainable development, namely water, education, health, environment and alternative livelihoods.

An example of our social investment project includes working to improve community education levels by providing over 3,000 bursaries and scholarships to students over the past two years. Fifty primary and secondary schools have been provided with teaching materials in our efforts to build capacity in the local school system. Forty primary schools have been equipped with 80 solar lamps so that students studying for their national examinations can continue their revision after sunset.

While we aim to invest in long-term initiatives, we also recognise that our operating environment is fragile and host communities suffer from prolonged periods of drought. Recently, and in response to the worsening drought situation in Turkana County, Tullow contributed KES 20 million through the Kenya Red Cross Society and the County Government of Turkana to implement a school feeding programme in Turkana County.

ENGAGING WITH OUR HOST COMMUNITY

A robust community engagement strategy that encourages participatory engagement is a priority for Tullow and we utilise a range of methods to engage our neighbouring communities, amongst other key stakeholders. We engage on a range of issues including our core operations and future work programme, grievance management, social impact and also the social investment programmes which we execute in our areas of operation.

In December we opened community resource offices in the Lodwar, Lokori and Lokichar areas. These offices are staffed by dedicated teams who work closely with our mobile field based stakeholder engagement teams. Together these teams facilitate a dialogue between Tullow and our stakeholders so that we are able to more effectively manage our impacts and bring greater benefits to local communities.

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MEMBERS IN SOCIAL PERFORMANCE FIELD SUPPORT TEAM

FUTURE DEVELOPMENT POTENTIAL

WORLD-CLASS
OPERATED ONSHORE OIL PROJECT

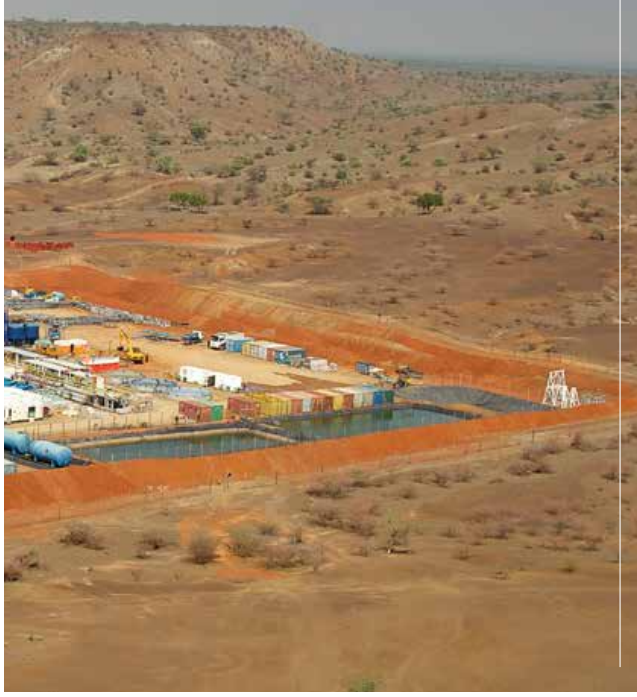
Given the significant volumes discovered and the extensive exploration, appraisal and seismic programme planned to fully assess the upside potential of the South Lokichar Basin, Tullow and its partner have agreed with the Government of Kenya to commence development studies. In addition, the partnership is involved in a comprehensive pre-FEED study for an export pipeline. The current ambition of the Government of Kenya and the joint venture partnership is to reach project sanction for development, including an export pipeline, in the period 2015/2016. If further exploration success opens additional basins there will be scope for the development to be expanded.

600 MILLION

ESTIMATED BARRELS OF DISCOVERED RECOVERABLE RESOURCES (GROSS) IN SOUTH LOKICHAR BASIN

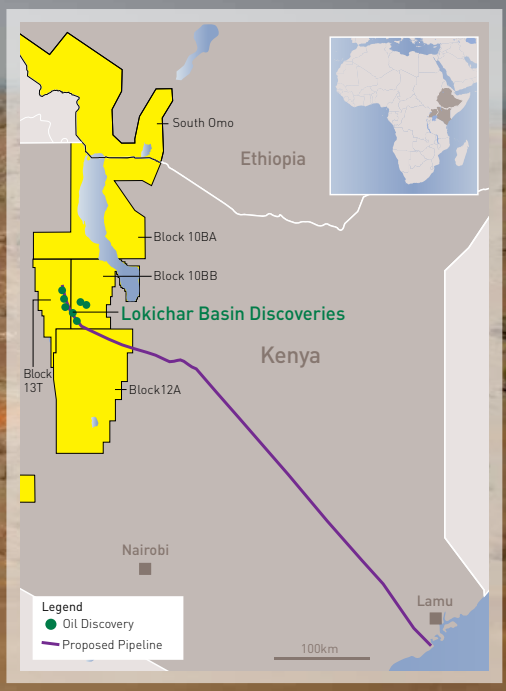
MAJOR ONGOING PROGRAMME

In 2013, we successfully flow tested the initial two oil discoveries of the Ngamia-1 well followed by the Twiga South-1 well. Both wells flowed at constrained rates of around 3,000 bopd of 25 to 35 degree API sweet waxy oil with no indication of pressure depletion. Unconstrained rates of over 5,000 bopd per well are considered possible. A significant programme of some 40 exploration and appraisal wells in the coming two years will assess not only the South Lokichar Basin but up to a further six separate Tertiary Rift Basins across Tullow's Kenyan acreage. Tullow is currently operating four rigs, including one test rig, in Kenya.



PROPOSED EXPORT PIPELINE

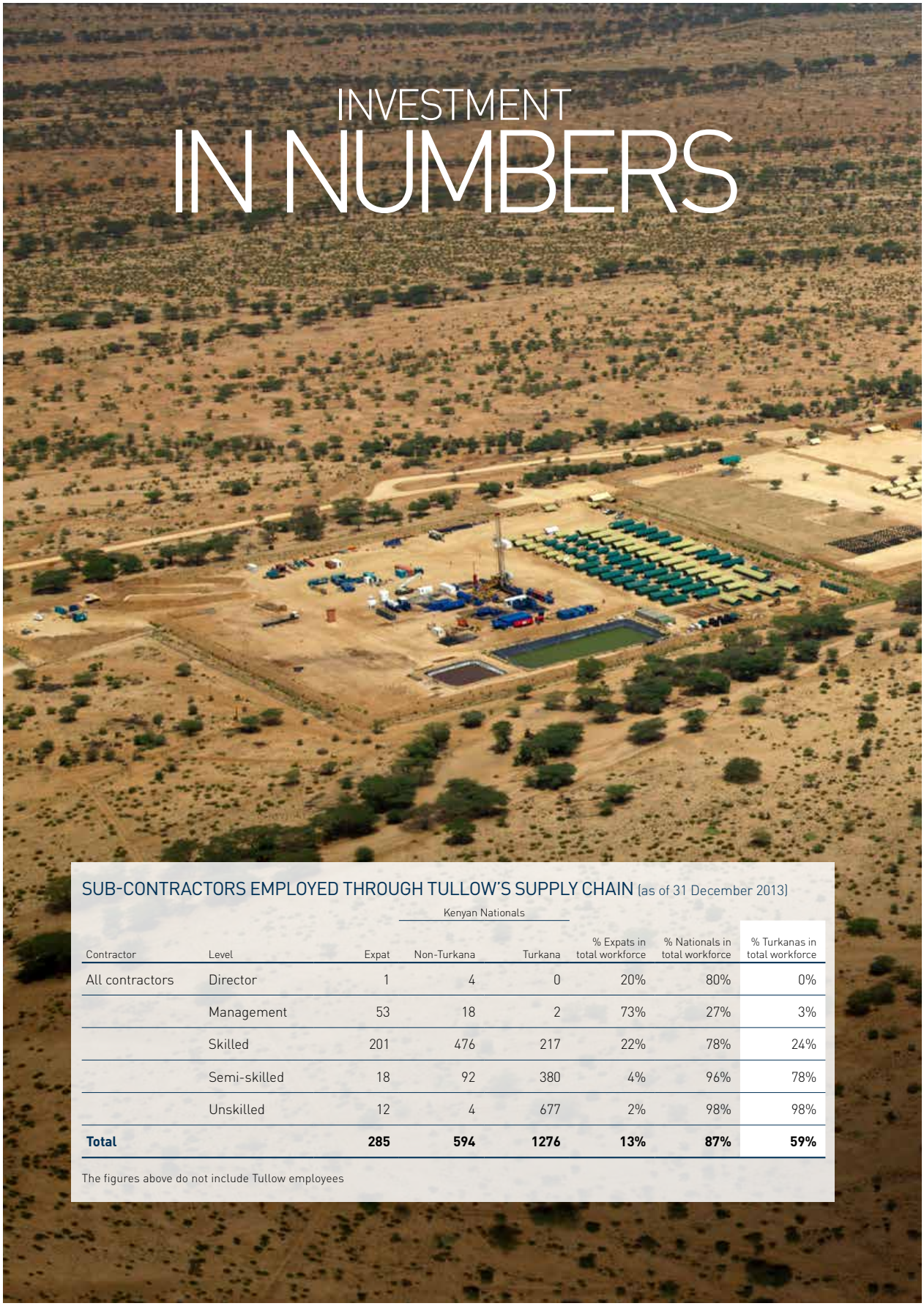
The proposed export pipeline route will run mostly underground over 850km from the Lokichar Basin to a marine terminal on the coast. As the waxy crude oil found in Kenya solidifies at ambient temperature, the pipeline will contain a specialised heating system to keep the crude oil flowing. Once built, the pipeline will be the longest heated pipeline in the world.



MILESTONES TO REACH PRODUCTION

Achieving first oil is dependent on many technological, legal, social and financial factors which have to be considered and agreed by a large group of stakeholders. In Kenya, the following key milestones need to be reached in order to progress development.

- Confirmation of commercial threshold oil volumes via field appraisal;
- Approval of Kenya's Petroleum Legislation;
- Commitment from all stakeholders to a Basin-wide Field Development Plan and subsequent Field Development Plans;
- Agreement and funding for regional infrastructure (major roads, rail and terminals);
- Agreement of basin-wide environment and social plans;
- Regional government alignment and support of export pipeline;
- Approval of pipeline route, terminal location and all fiscal and legislative frameworks;
- Land acquisition for export pipeline; and
- Securing investors for pipeline construction.

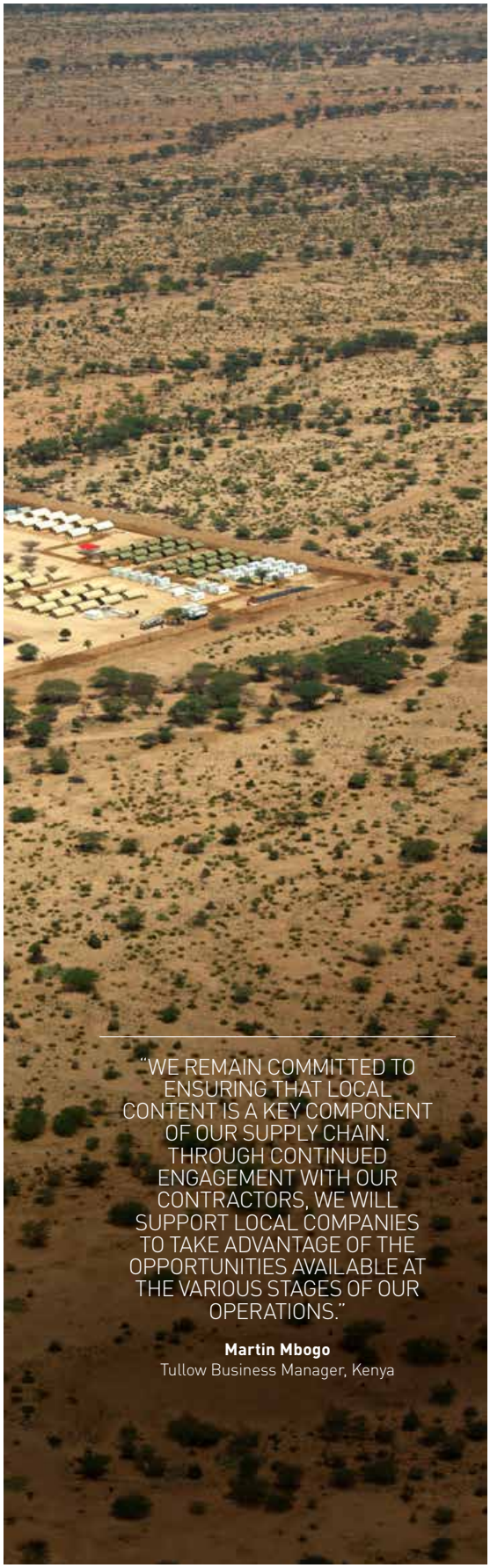


INVESTMENT IN NUMBERS

SUB-CONTRACTORS EMPLOYED THROUGH TULLOW'S SUPPLY CHAIN (as of 31 December 2013)

			Kenyan Nationals				
Contractor	Level	Expat	Non-Turkana	Turkana	% Expats in total workforce	% Nationals in total workforce	% Turkanas in total workforce
All contractors	Director	1	4	0	20%	80%	0%
	Management	53	18	2	73%	27%	3%
	Skilled	201	476	217	22%	78%	24%
	Semi-skilled	18	92	380	4%	96%	78%
	Unskilled	12	4	677	2%	98%	98%
Total		**285**	**594**	**1276**	**13%**	**87%**	**59%**

The figures above do not include Tullow employees



"WE REMAIN COMMITTED TO ENSURING THAT LOCAL CONTENT IS A KEY COMPONENT OF OUR SUPPLY CHAIN. THROUGH CONTINUED ENGAGEMENT WITH OUR CONTRACTORS, WE WILL SUPPORT LOCAL COMPANIES TO TAKE ADVANTAGE OF THE OPPORTUNITIES AVAILABLE AT THE VARIOUS STAGES OF OUR OPERATIONS."

Martin Mbogo
Tullow Business Manager, Kenya

2013

KES 4.1 BILLION

SPEND WITH KENYAN SUPPLIERS

Tullow spent KES 4.1 with Kenyan suppliers in 2013. The Group also spent KES 8.8 billion with international companies registered in country (INTRIC) and KES 8.5 billion with international companies for work carried out in Kenya.

KES 224 MILLION

SPEND BY TULLOW CONTRACTORS WITH TURKANA BUSINESSES

Tullow contractors spent KES 3.9 billion with Kenyan businesses in 2013, KES 224 million of this was with Turkana businesses.

KES 6.1 BILLION

TOTAL PAYMENTS TO STAKEHOLDER GROUPS

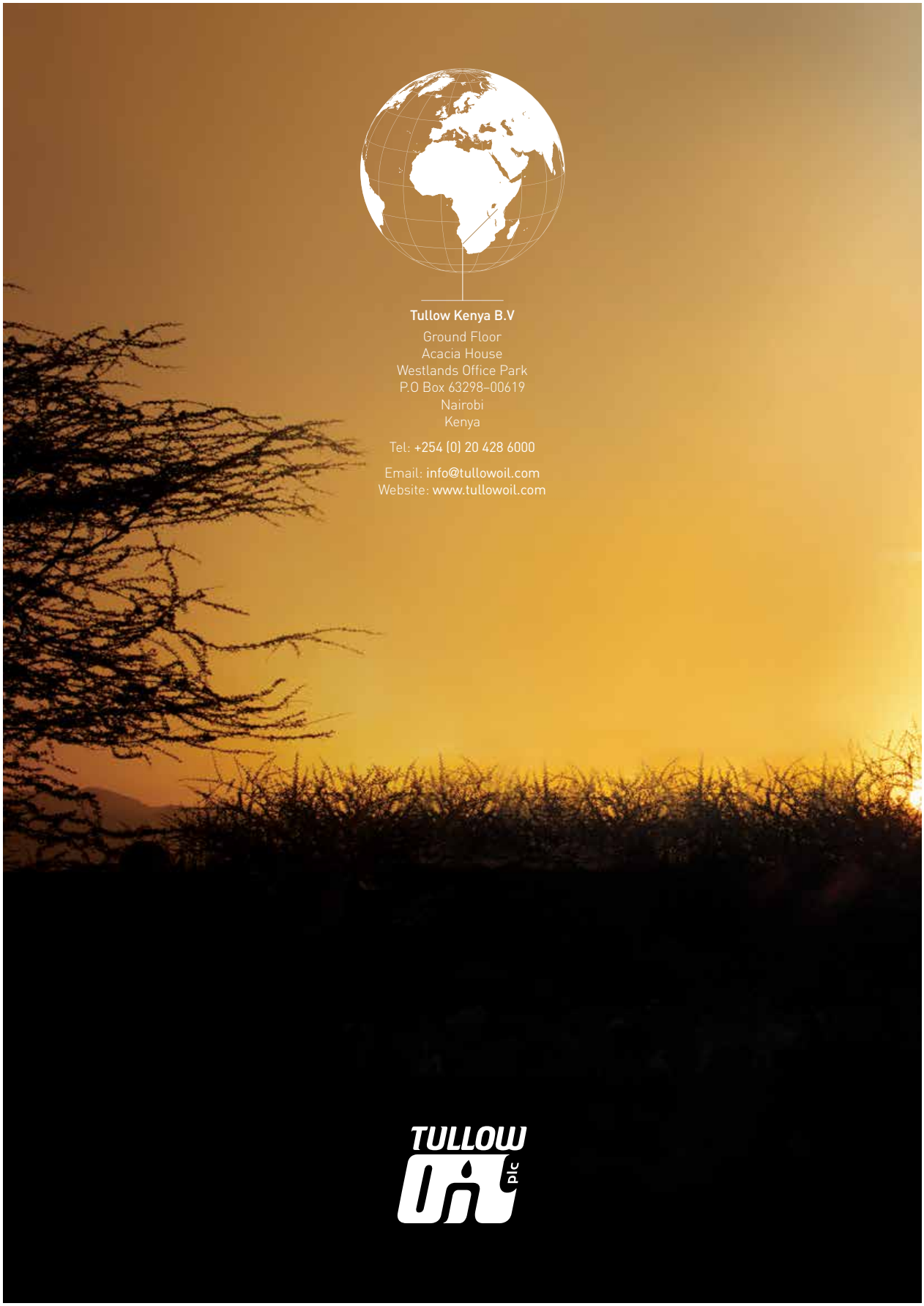
In 2013, Tullow paid KES 1.9 billion to governments, invested KES 4.1 billion with Kenyan suppliers and spent KES 0.1 billion on social investment activities.

2014

KES 390+ MILLION

COMMITTED FOR SOCIAL INVESTMENT IN 2014

This will be invested in priority projects such as education, water, health and environment in consultation with the community. This amount will more than double the amount spent in 2013.



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TULLOW OIL PLC

Annex 111

Total S.A., *Factbook 2013* (2013)

TOTAL
COMMITTED TO BETTER ENERGY

Factbook **2013**

SUMMARY

Need more information on a specific subject ?
Log on to www.total.com
Heading Investors/Institutional investors/Publications
You can display online TOTAL's factbook, download it in PDF or collect all the tables in Excel format.

DOWNLOAD ALL THE TABLES IN EXCEL FORMAT

Abbreviations

b:	barrel
cf:	cubic feet
/d:	per day
/y:	per year
€:	euro
$ and/or dollar:	U.S. dollar
t:	metric ton
boe:	barrel of oil equivalent
kboe/d:	thousand boe/d
kb/d:	thousand barrel/d
Btu:	British thermal unit
M:	million
B:	billion
MW:	megawatt
MWp:	megawatt peak (direct current)
TWh:	terawatt hour
AMF:	French Financial Markets Authority
API:	American Petroleum Institute
ERMI:	*European Refining Margin Indicator*. ERMI is an indicator intended to represent the margin after variable costs for a hypothetical complex refinery located around Rotterdam in Northern Europe. The indicator margin may not be representative of the actual margins achieved by TOTAL in any period because of TOTAL's particular refinery configurations, product mix effects or other company-specific operating conditions.
FEED:	Front-End Engineering and Design
FPSO:	Floating Production Storage and Offloading
IFRS:	International Financial Reporting Standards
LNG:	liquefied natural gas
LPG:	liquefied petroleum gas
ROE	Return on Equity
ROACE:	Return on Average Capital Employed
SEC:	United States Securities and Exchange Commission
SAGD:	Steam Assisted Gravity Drainage

Conversion table

1 boe = 1 barrel of crude oil = approx. 5,403 cf of gas[1] in 2013
1 b/d = approx. 50 t/y
1 t = approx. 7.5 b (for a gravity of 37° API)
1 Bm^3/y = approx. 0.1 Bcf/d
1 m^3 = approx. 35.3 cf
1 t of LNG = approx. 48 kcf of gas
1 Mt/y of LNG = approx. 131 Mcf/d

(1) This ratio is calculated based on the actual average equivalent energy content of TOTAL's natural gas reserves and is subject to change.

REPUBLIC OF SOUTH SUDAN

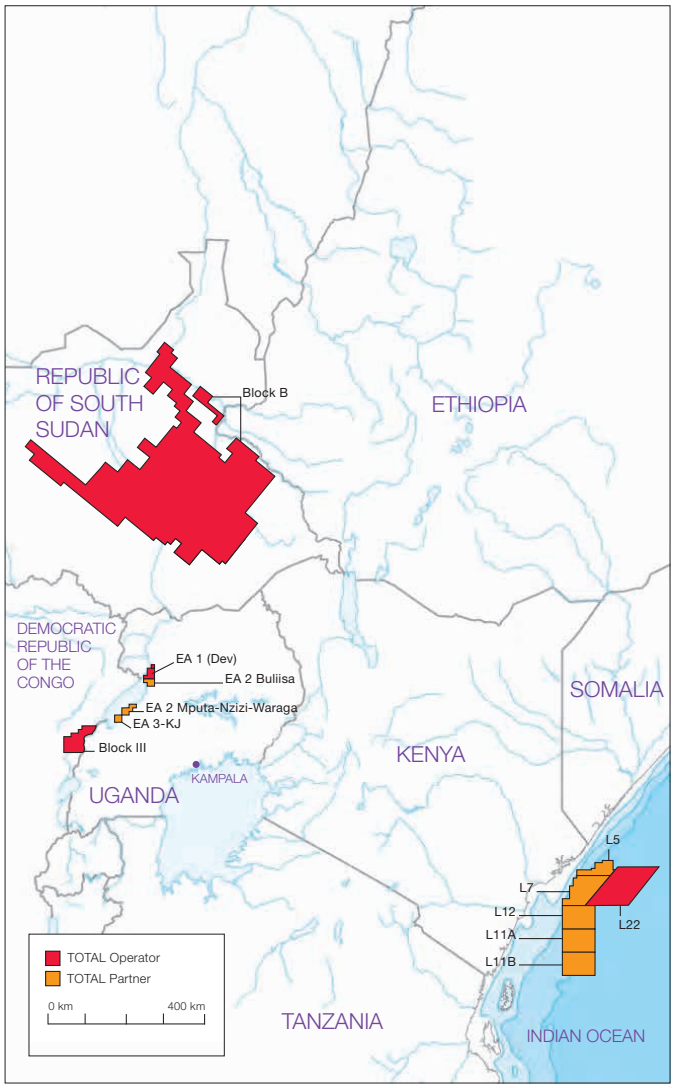
TOTAL is negotiating a new contract with the state authorities that would make it possible to resume exploration activities in part of Block B. Since the independence of the Republic of South Sudan on July 9, 2011, TOTAL is no longer present in Sudan.

UGANDA

TOTAL has been active since 2012 and holds a 33.33% interest in the EA-1, EA-1A and EA-2 licenses as well as the Kingfisher license. All of these licenses are located in the Lake Albert region, where oil resources have already been discovered. TOTAL is the operator of licenses EA-1 and EA-1A and a partner on the other licenses.

- On the appraisal license EA-1, a campaign of wells, production tests and a 3D seismic survey are underway. Five development plans will be submitted to the authorities before the end of 2014: Ngiri (submitted in December 2013), Jobi-Rii (April 2014), and Mpyo, Gunya and Jobi East (December 2014).
- The EA-1A license expired in February 2013, following a campaign involving the drilling of five exploration wells that resulted in one discovery (Lyec). With the exception of the scope relating to this discovery, the license has been returned to the authorities
- On the appraisal license EA-2, the campaign of wells and production tests started in 2012 continued during 2013. An additional well is due to be drilled in 2014. Two development plans were submitted to the authorities in June 2013 (Kasamene and Wahrindi fields, as well as those of Kigogole, Ngege, Ngara and Nsoga).
- The development plan for the Kingfisher field, which is located on the EA-3 production license, was approved by the authorities in September 2013. The basic engineering studies are currently being prepared.

At the initiative of the Ugandan government, discussions are underway concerning the construction of a refinery that will be developed in two phases (30 kb/d in the first phase followed by a second phase providing an additional 30 kb/d), as well as an export pipeline.



KENYA

TOTAL acquired a 40% stake in five offshore licenses in the Lamu basin in 2011, namely licenses L5, L7, L11a, L11b and L12. Following the 3D seismic survey campaign covering 3,500 km² that was conducted during the initial exploration period, 25% of the surface area of the five blocks was relinquished. In 2013, two exploration wells were drilled in Blocks L7 and L11b, but did not result in positive results. In 2012, the Group also acquired the L22 offshore license (100%, operator), located in the same basin. In December 2013, TOTAL sold 30% of its stake in this license. A 2D seismic survey and sea core drilling operations are in progress on the L22 offshore license.

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542 051 180 RCS Nanterre
www.total.com

Annex 112

Kelly Gilblom, "Middle Eastern oil explorer gives up licence in Kenya", *Reuters* (28 Jan. 2013)

Middle Eastern oil explorer gives up licence in Kenya

* Exploration block handed back to Kenyan government

* Edgo Energy blames technical problems, border dispute with Somalia

* Four companies to drill offshore in Kenya in 2013

By Kelly Gilblom

NAIROBI, Jan 28 (Reuters) - Edgo Energy, the exploration unit of Jordan's Edgo, has relinquished a licence to explore an area offshore Kenya, citing the technical difficulties of drilling in very deep water.

The licence area, a triangular block off Kenya's southern coast known as L26, lies in "ultra deep water" - meaning the ocean floor is more than 1,500 metres beneath the water's surface, which makes drilling complicated and expensive.

"Edgo Energy has agreed with the Kenyan Ministry of Energy to relinquish block L26 due to the technical challenges of its location in the ultra deep waters of the Lamu basin," said the company in an email sent to Reuters on Monday.

East Africa and the continent's Horn of Africa region have become hot spots for oil and gas exploration in recent years, spurred on by new finds in countries including Uganda, Tanzania and Mozambique.

Edgo obtained the L26 licence jointly with Qatar First Investment Bank in July 2012, according to the company. It has one additional licence with the same bank in onshore block L14 where it has already began preparing for seismic work.

Edgo said it was still interested in an upcoming licensing round offshore, which will be composed of an estimated five blocks within Kenyan waters.

"We will be looking at that ... we're interested," said Mazen Masri, managing director of Edgo, in a phone interview with Reuters last week.

With Edgo's surrender of L26, Kenya has additional acreage to licence to interested explorers, who flocked to the country in 2012 after U.S. explorer Apache Corp found non-commercial quantities of gas offshore and Tullow Oil discovered oil in two separate onshore wells.

Masri said last week a maritime border dispute between Somalia and Kenya was also a challenge in L26 -- which sits squarely in an area both countries claim to be part of their offshore commercial acreage.

However, a spokeswoman for the company said in a phone interview on Monday it was not the main factor in Edgo's relinquishment.

Currently one company, Houston's Anadarko Petroleum, is drilling offshore Kenya - in a non-disputed block called L11-B - while the UK's Tullow Oil is in the midst of drilling two onshore wells. BG Group, Ophir and Afren also each plan to drill offshore in 2013, though they are not drilling in contested territory.

Annex 113

Nina Rach, "Kenya forges ahead", *oedigital.com* (1 July 2013)

Kenya forges ahead

Written by Nina Rach
Monday, 01 July 2013 00:00

Recent offshore drilling by Apache and Anadarko help gauge the potential of the Lamu basin.

Vision 2030 is Kenya's development strategy which aims to transform the economy and "create a globally competitive and prosperous nation with a high quality of life by 2030." The government is committed to continued institutional reforms in the energy sector, and stresses public-private partnership.

NOCK

The National Oil Corporation of Kenya (NOCK) was incorporated in 1981, and began to oversee exploration activities delegated from the Ministry of Energy, in 1984. The Petroleum (Exploration & Production) Act, Cap 308, (1986) provides legal framework and regulates the negotiation of productionsharing contracts with potential investors. PSCs are also governed by the Environmental Management & Coordination Act (2000; NEMA).

In 2010, NOCK launched a program to digitize all of Kenya's oil and gas exploration data. In February 2013, CEO Sumayya Hassan-Athmani announced in the company's "Energized Bulletin" that the project was complete, data would soon be uploaded, and available to the public online.

Exploration history

The first wells drilled in Kenya were onshore, in the Lamu embayment, beginning in 1960.

The earliest offshore exploration activities were 2D seismic data acquisition programs, beginning in 1970. The first three offshore wells were drilled in the Lamu basin. Total drilled the Simba-1 well (Block L-9) in 1978, to 3604m (11,824ft) TD. In 1982, Cities Services drilled the Maridadi-1B well in Block L-6, to 4,198m TD. In 1985, Union drilled the Kofia well in Block L-7, to 3,629m TD.

After an in-house study in 1991, NOCK subdivided the Lamu embayment (both onshore and offshore) into 10 exploration blocks, created 2 more blocks in 2001, and several more in the last decade. Kenya signed seven production-sharing agreements (PSC) in 2000-2002.

Early 2D seismic acquired offshore Lamu basin

Operator	Years	Km acquired, 2D
BP, Shell	1970	1080
Shell	1972-1973	2103
Total	1973	3652
Oceanic	1975	451
Wainoco & Anchutz	1975	350
Sun Oil	1975	1099
GSI (African Marine)	1975	690
Seagap	1976	820
Cities Services	1980	1251
Lamont Doherty	1980	2400
Woodside Petroleum	2003	7881
PGS/NOCK	2008	3400
Data from National Oil Corporation of Kenya.	**Total**	**25,352**

In August-October 2003, Woodside Petroleum acquired 7884km of 2D seismic data in the offshore Lamu basin, over Blocks L5, L6, L7, L8, L9, L10, L11, and L12.

In 2006, Woodside drilled the first deepwater well off Kenya, the Pomboo-1, on Block L-5, in water 2193m (7195ft) deep.

NOCK acquired offshore Block 14T in Magadi in November 2010, and in 2012, signed an agreement with Japan national oil company, Japan Oil, Gas and Metals National Corp. (JOGMEC) for joint exploration. Full-tensor gravity gradiometry (FTG), 2D seismic, magneto telluric, and time-domain electromagnetic studies began in June 2012.

Recent offshore wells

In 3Q 2012, Apache Corp. drilled its Mbawa South well in Block 8, in water 864m deep. The well encountered 53m net gas pay, making it the first hydrocarbon discovery offshore Kenya. Apache operates the block with 50% interest.

Anadarko has working interests in five blocks off Kenya: L5, L7, L12, L11A, and L11B. It began work offshore in December 2012 with Transocean's *Deepwater Millenium* drillship. In April 2013, the company announced that it had completed the Kubwa well in the L-07 Block, which it operates (50% WI) on behalf of partners Total E&P Kenya B.V. (40%) and PTT Exploration & Production Plc (10%). The well had non-commercial oil shows.

"We are very encouraged with our first test of Kenya's previously unexplored deepwater basin, in which mudlog and well-site evaluation of core data indicates the presence of a working petroleum system with reservoir quality sands," said Anadarko Sr. Vice President, Worldwide Exploration. "The Kubwa well tested multiple play concepts and provided useful data regarding the prospectivity of our six-million-acre position offshore Kenya. The rig will now mobilize south to drill the Kiboko well."

Anadarko is drilling the Kiboko prospect on Block L-11B. Anadarko said the Kiboko well is testing both Upper and Lower Cretaceous sands, just above the thick Jurassic carbonate section. So we're just getting started in Kenya, and we're pretty excited about what we see." ***OE***

Annex 114

Midway Resources International, *Media Release: Midway Resources International ("MRI") completes gravity-magnetic seismic data acquisition programs on Blocks L13 and L4, Kenya* (19 July 2013)

Midway Resources

Media Release

RNS Number : 7093J
Midway Resources International
19 July 2013

19 July 2013

Media Release

MIDWAY RESOURCES INTERNATIONAL

http://www.midwayresources.com

MIDWAY RESOURCES INTERNATIONAL ("MRI") completes gravity-magnetic seismic data acquisition programs on Blocks L13 and L4, Kenya.

MRI, through its wholly owned subsidiary Zarara Oil & Gas Limited, holds a 75% working interest and operatorship of PSCs for Blocks L4 & L13, Kenya, now in their 1st Additional Exploration Period of 3 years. The Blocks cover 7,446kms^2 of the coastal region of Kenya, north of Lamu Island and straddle the Lamu geologic basin. The L4 Block contains the Pate-1 gas discovery well (drilled by Shell, 1971), hereafter designated as the 'Pate Prospect'.

Completion of Pate Island Prospect 2D Transitional Seismic Survey

MRI has now completed its 383 line kms 2D survey over the Pate Prospect. The survey covered Pate Island and surrounding transitional mangrove and sea channel areas and was undertaken by BGP Kenya Limited.

Seismic data are being processed by Geokinetics, Inc., of Houston USA and interpreted by MRI. Approximately 40% of the data has been processed and interpreted to date, with the balance anticipated to be completed over the next quarter.

Sufficient data has been interpreted to enable MRI to identify the location of a drilling site (Pate-2) which will replicate the original discovery well (Pate-1). Pate- 1 intersected and flowed (uncontrolled) gas and was subsequently plugged and abandoned. MRI will commence planning for Pate-2 in the next quarter which process could take up to 12 months before the well is spudded.

Depending on Ministry of Energy approval, MRI's intention is to complete

Pate-2 as a producing well which will undergo extended well testing to supply temporary electric power generating units. These could supply electricity to the local extension of the Kenyan national grid. Assuming that Pate-2 confirms MRI's current P50 resource estimate, this early gas production would represent Phase 1 of a full-field development to be based upon long term commericalisation of the gas resources. Phase 2 would involve development of a 350-500MW power station connected to the Kenyan domestic electricity grid. The grid is currently being extended to the proposed new Lamu Port, located some 15-20kms from the site of the original Pate-1 well.

Block L4 & L13 - exploration activities

Gravity-Magnetic survey: MRI has completed the acquisition, processing and interpretation of 6,262 line kms of gravity-magnetic data across the original area of its operated Blocks L4 and L13.

The survey was flown by New Resolution Geophysics, based in South Africa, using a 2km flight line separation with 10km north - south tie lines.

Analysis of the survey data has identified nine additional anomalies or leads on Blocks L4 & L13 which will be followed-up by an additional seismic survey programme to be executed by MRI over the next 24 months.

The Pate-2 well and regional seismic acquisition survey will be funded through a combination of additional equity and a possible partial farm-out of MRI's 75% working interest. MRI is now actively pursuing such funding.

For more details you are referred to the MRI website: http://www.midwayresources.com

History:

Midway Resources International was founded in 2005 by Dr. Mark Bristow, its chairman. Its strategy is to secure relatively lower risk discovered, but undeveloped, oil and gas resources across Africa, and to rapidly develop and commercialise them.

It acquired its interests in Zarara Oil & Gas Limited in quarter 2, 2012, and following extensive negotiations with the Kenyan Government regularised its PSCs by advancing into the 1st Additional Exploration Period of 3 years ending December, 2015.

MRI's other current focus area is Nigeria, where it is pursuing a material and attractive shallow offshore undeveloped discovery. It already has an existing Nigerian investment, via its 20% shareholding in Inergia Petroleum Limited, in the Oza (in development with production expected quarter 1, 2014) and Atala (awaiting appraisal) fields, onshore Nigeria.

For further information contact:

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END

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Annex 115

Anadarko Petroleum Corporation, *Second-Quarter 2013 Operations Report* (29 July 2013)

SECOND-QUARTER 2013 | **OPERATIONS REPORT** | JULY 29, 2013

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SECOND-QUARTER HIGHLIGHTS

ADVANCING MULTIPLE OIL MEGA PROJECTS

The company made significant progress on several large, international and deepwater oil projects. In Algeria, the first oil train at El Merk continued to increase production throughout the quarter, and the second oil train is being commissioned. El Merk remains on schedule to ramp toward a net rate of approximately 30,000 Bbl/d (barrels per day) around the end of the 2013.

In the Gulf of Mexico, the 80,000 BOPD (barrels of oil per day) Lucius spar was transported from Finland and first production remains on schedule for the 2nd half of 2014. In addition, the Heidelberg project was sanctioned during the quarter, with first oil expected in 2016.

In West Africa, the government of Ghana approved the Plan of Development for the TEN (Tweneboa, Enyenra and Ntomme) project, located approximately 19 miles west of the Jubilee field. The TEN development will utilize an 80,000 BOPD FPSO (floating production storage and offloading facility).

ENCOURAGING WOLFCAMP RESULTS

Anadarko completed its first two Wolfcamp shale wells in the Delaware Basin of West Texas during the 2nd quarter. The two wells recorded initial, 24-hour test rates of approximately 1,600 BOE/d and 1,000 BOE/d respectively. Based on these results, Anadarko will redirect additional capital to appraise the prospectivity of this emerging play across its 600,000 gross acres in the basin.

FOCUSED ON EFFICIENCIES AND COST

Anadarko continued to improve drilling cycle times across its portfolio. Anadarko reduced the average spud-to-rig-release from 9.5 days in the 1st quarter of 2013 to 8.1 days during the 2nd quarter, while drilling multiple wells in fewer than 5 days. In the Wattenberg field, Anadarko reduced average spud-to-rig-release cycle times from 10.8 days to 10.0 days compared to the 1st quarter of 2013. Average spud-to-rig-release cycle times in the Marcellus shale also improved from 16.5 days to 15.5 days during the quarter.

CONTINUED DEEPWATER EXPLORATION SUCCESS

Anadarko continued to deliver differentiating deepwater results with five successful exploration wells during the quarter. In the Gulf of Mexico, the company made oil discoveries at Raptor, Yucatan and Phobos. Internationally, Anadarko made significant natural gas discoveries at Espadarte and Orca offshore Mozambique. The company also had a successful appraisal well at Coronado during the 2nd quarter. These wells contributed to Anadarko's impressive year-to-date exploration and appraisal success rate of approximately 70%.

MIDSTREAM EXPANSION ENABLES FUTURE GROWTH

Significant midstream construction is under way across Anadarko's U.S. onshore portfolio. In the 1st quarter, the company completed the 100 MMcf/d (million cubic feet per day) Bone Spring plant in the Permian basin. During the 2nd quarter, Anadarko completed its 200 MMcf/d Brasada natural gas processing plant in the Eagleford shale. Construction continues in the Wattenberg field at the 300 MMcf/d Lancaster plant, where Western Gas Partners, LP (WES) recently announced an additional 300 MMcf/d expansion plant that is expected to come on line in the 1st quarter of 2015. Anadarko is also investing in both the Front Range Express and Texas Express NGL pipelines to gain access to firm fractionation capacity contracted at Mont Belvieu. Both pipelines are expected to be completed by late 2013. Lastly, crude oil takeaway capacity is being expanded through the looping of the 70,000 BOPD White Cliffs pipeline to Cushing, Oklahoma, along with the construction of a new crude oil rail-loading terminal.

SALES VOLUMES

Second-quarter sales volumes were in line with the midpoint of quarterly guidance at 68.3 million barrels of oil equivalent (BOE) or more than 750,000 BOE per day (BOE/d). This was achieved without the expected benefit of a tanker lifting in Algeria, which is now anticipated in the 3rd quarter. The company had liquids sales volumes of 309,000 barrels per day, about 73% of which were oil. Anadarko is increasing its full-year 2013 sales volumes guidance again to a range of 281 to 287 million BOE, from the previous range of 279 to 287 million BOE.

CAPITAL SPENDING

Capital investments during the 2nd quarter were within the guidance range at approximately $1.7 billion, excluding capital investments associated with WES. Capital expenditure expectations for the full-year 2013 remain within the range of $7.2 to $7.6 billion, excluding WES capital spending.

SALES VOLUMES

	2Q13 Oil MBbl/d	2Q13 NGLs MBbl/d	2Q13 Gas MMcf/d	2Q13 MMBOE	2Q12 Oil MBbl/d	2Q12 NGLs MBbl/d	2Q12 Gas MMcf/d	2Q12 MMBOE
*Rockies**	62	36	1,292	28.5	48	42	1,365	28.9
*Southern & Appalachia**	35	41	1,075	23.2	29	26	822	17.5
Lower 48	**97**	**77**	**2,367**	**51.7**	**77**	**68**	**2,187**	**46.4**
Alaska	12	0	0	1.1	14	0	0	1.3
Gulf of Mexico	46	6	280	9.0	65	9	357	12.1
Total U.S.	**155**	**83**	**2,647**	**61.8**	**156**	**77**	**2,544**	**59.8**
International	**71**	**0**	**0**	**6.5**	**85**	**0**	**0**	**7.7**
Total Company	**226**	**83**	**2,647**	**68.3**	**241**	**77**	**2,544**	**67.5**

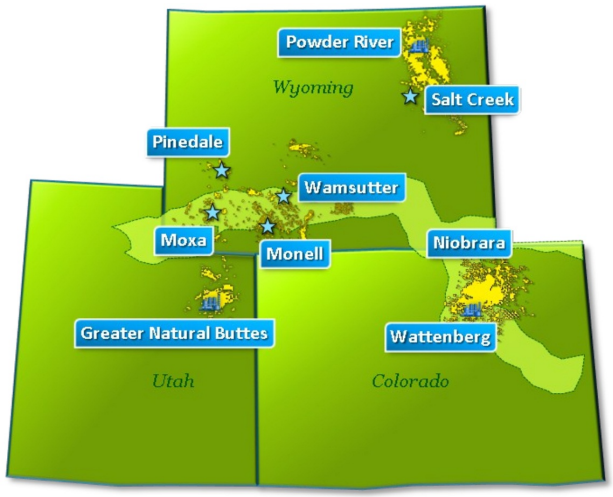
**Reflects impact of ethane rejection*

CAPITAL INVESTMENTS

	2Q13 $MM
Rockies	533
Southern & Appalachia	383
Lower 48	**916**
Alaska	25
Gulf of Mexico	251
Total U.S.	**1,192**
International	**333**
*Midstream**	230
Capitalized Items/Other	111
Total Company*	**1,866**

**Includes WES capital investments of $138 million*

ROCKIES



Anadarko's Rockies assets delivered sales volumes of approximately 312,900 BOE/d during the 2nd quarter. Due to the price environment during the quarter, the company made the economic decision to reject ethane. This reduced NGL sales volumes by more than 18,000 BOE/d, offset by 4,400 BOE/d of increased natural gas sales volumes. The company averaged 20 operated rigs during the quarter and drilled a total of 167 wells.

SALES VOLUMES*

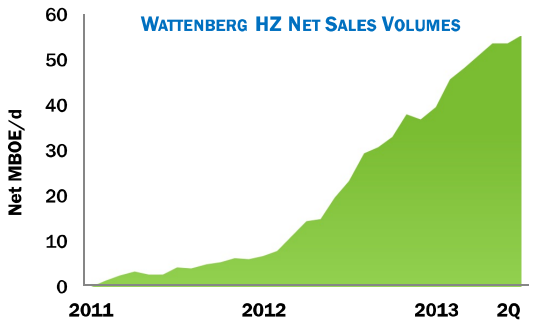
	2Q13 Oil MBbl/d	2Q13 NGLs MBbl/d	2Q13 Gas MMcf/d	2Q12 Oil MBbl/d	2Q12 NGLs MBbl/d	2Q12 Gas MMcf/d
Greater Natural Buttes	3	9	456	3	13	440
Wattenberg	42	18	274	30	13	251
Pinedale / Jonah	1	3	88	1	4	97
Wamsutter	1	3	89	2	9	103
Powder River Basin	2	0	270	1	0	377
EOR	12	0	1	9	0	1
Other	1	3	114	2	3	96
Total	**62**	**36**	**1,292**	**48**	**42**	**1,365**

*Reflects impact of ethane rejection

	CAPITAL INVESTMENTS	AVERAGE RIG ACTIVITY	
	2Q13 $MM	2Q13 Operated	1Q13 Operated
Greater Natural Buttes	94	5	4
Wattenberg	323	12	11
Pinedale / Jonah	11	0	0
Wamsutter	23	1	1
Powder River Basin	6	1	1
EOR	51	0	0
Other	25	1	0
Total	**533**	**20**	**17**

WATTENBERG:

- The Wattenberg field averaged 106,100 BOE/net sales volumes during the quarter. The company operated 12 horizontal rigs during the quarter and drilled a total of 83 horizontal wells.
- Anadarko continued to see outstanding performance from its operated horizontal program, increasing almost 7,000 BOE/d during the quarter to an average rate of approximately 52,000 BOE/d. This represents a 16% increase over the prior quarter and a more than tripled from the 2nd quarter of 2012.
- As expected, the strong growth from the horizontal program led to increased line pressure, which temporarily shut-in more than 1,300 low-rate gas wells during the quarter. Line pressure is expected to improve in the 3rd quarter when 140 MMcf/d of additional processing capacity is expected to come on line.
- Anadarko continues to make significant investments in midstream infrastructure to enable future growth. Construction is under way at the Lancaster cryogenic plant, Front Range NGL pipeline and Texas Express NGL pipeline, which are all expected to be completed by late 2013. Crude oil export capacity also is being expanded with the addition of an oil rail terminal and the looping of the White Cliffs pipeline. Lastly, the 300 MMcf/d Lancaster II cryogenic plant expansion was announced by WES during the quarter.



POWDER RIVER OIL:

- Anadarko continued to successfully test multiple oil objectives across the company's approximate 350,000 net-acre position in the Powder River Basin, including the Parkman, Shannon, Niobrara and Frontier/Turner formations. The company is currently producing from 14 operated wells, with additional drilling planned for the 2nd half of 2013.

GREATER NATURAL BUTTES:

- Net sales volumes averaged approximately 526 million cubic feet equivalent per day (MMcfe/d) for the quarter, and the field continues to be in ethane rejection.
- Anadarko operated 5 rigs and drilled 67 wells during the quarter.

SOUTHERN & APPALACHIA

During the 2nd quarter, sales volumes in the Southern & Appalachia region were approximately 255,000 BOE/d, an 8% increase over the 1st quarter of 2013 and a 33% increase over the 2nd quarter of 2012.

SALES VOLUMES

	2Q13 Oil MBbl/d	2Q13 NGLs MBbl/d	2Q13 Gas MMcf/d	2Q12 Oil MBbl/d	2Q12 NGLs MBbl/d	2Q12 Gas MMcf/d
Permian	7	2	38	8	2	46
Marcellus	0	0	511	0	0	314
Eagleford	18	14	97	12	8	61
Bossier	0	0	84	0	0	96
East Texas/Haynesville	3	16	224	1	8	158
Hugoton	0	2	39	0	2	41
Ozona	0	3	25	0	3	27
Chalk	6	4	27	7	5	34
Other	1	0	30	1	(2)	45
Total	**35**	**41**	**1,075**	**29**	**26**	**822**

	CAPITAL INVESTMENTS	AVERAGE RIG ACTIVITY	
	2Q13 $MM	2Q13 Operated	1Q13 Operated
Permian	114	5	5
Marcellus	91	4	4
Eagleford	35	9	8
Bossier	4	0	0
East Texas/Haynesville	94	7	7
Hugoton	2	0	0
Ozona	0	0	0
Chalk	38	2	1
Other	5	0	0
Total	**383**	**27**	**25**

SOUTHERN & APPALACHIA

EAGLEFORD:

- Anadarko's net sales volumes for the quarter averaged approximately 48,000 BOE/d, an increase of 13% from the 1st quarter of 2013 and an increase of 61% relative to the 2nd quarter of 2012. Total liquids sales volumes averaged almost 32,000 Bbl/d, representing a 62% increase in liquids sales volumes over the 2nd quarter of 2012.

- The company operated an average of 9 rigs and spud 96 wells during the quarter and expects to drill a total of approximately 325 wells in 2013. Anadarko reduced its average spud-to-rig-release from 9.5 days in the 1st quarter of 2013 to 8.1 days during the 2nd quarter, while drilling multiple wells in fewer than 5 days.

- The 200 MMcf/d Brasada natural gas processing plant was completed during the quarter, and the facility was brought on line in June. The facility is capable of recovering up to 30,000 Bbl/d of NGLs. Additional compression capacity is planned to be added to the field during the 3rd quarter.

EAST TEXAS/HAYNESVILLE:

- The company's net sales volumes for the quarter were nearly 56,000 BOE/d, an increase of 54% relative to the 2nd quarter of 2012. Total liquids volumes averaged more than 18,000 Bbl/d, representing an 87% increase in liquids volumes over the 2nd quarter of 2012.

PERMIAN:

- Anadarko's average net sales volumes for the quarter were approximately 16,000 BOE/d. The company exited the quarter with 5 operated rigs and plans to increase activity during the 3rd quarter.

- During the quarter, Anadarko completed its first two Wolfcamp shale wells with encouraging results. The wells, located in Ward and Loving Counties, recorded 24-hour test rates of approximately 1,600 BOE/d and 1,000 BOE/d respectively. The company is in the process of appraising the prospectivity of the Wolfcamp shale across its 600,000 gross-acre position in the Delaware Basin.

MARCELLUS:

- Anadarko's net sales volumes for the quarter averaged 511 MMcf/d, an increase of 63% over the 2nd quarter of 2012. Gross operated and non-operated production exceeded 2 billion cubic feet of natural gas per day (Bcf/d).

- During the quarter, the company spud 13 wells using 4 operated rigs and participated in 11 non-operated wells. Spud-to-rig-release cycle times in the Marcellus shale also improved during the quarter, from 16.5 days to 15.5 days.

- Anadarko is utilizing on-site water flowback filtration and recycling to minimize water usage and to reduce water-hauling and disposal costs. The company has also decreased automation and pad-facility costs through supply-chain management, saving up to $300,000 per pad site.

GULF OF MEXICO

During the 2nd quarter, the Gulf of Mexico region reported average sales volumes of approximately 100,000 BOE/d, which included scheduled downtime for maintenance and well work across the region. Anadarko's exploration success continued with discoveries at Raptor, Yucatan, Phobos and a successful sidetrack appraisal well at Coronado during the quarter. The company also had significant development activity during the quarter, including the sanction of the Heidelberg project and development drilling at Lucius, Constitution, Ticonderoga and Marco Polo.

SALES VOLUMES*

	2Q13 Oil MBbl/d	2Q13 NGLs MBbl/d	2Q13 Gas MMcf/d	2Q12 Oil MBbl/d	2Q12 NGLs MBbl/d	2Q12 Gas MMcf/d
Total	46	6	280	65	9	357

*Includes the impact of weather-related downtime

DEVELOPMENT

LUCIUS:

Keathley Canyon 874/875/918/919 (APC WI 27.8%)

- During the quarter, the KC919-6 well in the Lucius field encountered approximately 600 net feet of oil pay in the Pliocene with all sands full to base. The Miocene sands were not targeted in this well, as they will be produced in an offset well. Additionally, completion activities at the KC875-3 development well are expected to begin during the 3rd quarter. First production remains on schedule for the 2nd half of 2014.

- The Lucius spar fabrication is complete, and the hull was successfully delivered to Gulf of Mexico during the 2nd quarter. The topsides facilities, which are being constructed in Ingleside, Texas, are 64% complete.

HEIDELBERG:

Green Canyon 859/860/903/904/948 (APC WI 31.5%)

- On April 8, Anadarko closed the previously announced carried-interest agreement with Marubeni Oil and Gas, USA. Anadarko transferred a 12.75% WI in the Heidelberg project in exchange for a carry on nearly all of Anadarko's expected future development capital, up to $860 million. This transaction values Anadarko's current 31.5% working interest at more than $2.1 billion.

- During the 2nd quarter, the partnership fully sanctioned the Heidelberg project, and fabrication of both the hull and topside are under way. The 80,000 BOPD Lucius look-a-like facility is approximately 20% complete and expected to be on line in 2016.

Lucius spar being transported to the Gulf of Mexico

CAESAR/TONGA:

Green Canyon 683/726/727/770 (APC WI 33.75%)

- Mechanical issues occurred during the completion of the GC727-2 well and the company is sidetracking around the obstruction. As a result, first production from the well was delayed from early in the 3rd quarter of 2013 until year end. A planned workover was also deferred as a result of the sidetrack.

CONSTITUTION/TICONDEROGA:

Green Canyon 679/680 (APC WI 100%)

- At Constitution, a platform rig successfully sidetracked and completed an infield development well, which is expected to be brought on line in the 3rd quarter.

Green Canyon 768 (APC WI 50%)

- Drilling and completion operations are ongoing at Ticonderoga GC768-4. The well will be tied back to the Constitution spar and is expected to be producing by the end of 3rd quarter.

MARCO POLO:

Green Canyon 608 (APC WI 100%)

- At Marco Polo, Anadarko successfully sidetracked and completed two infield development wells. One well was brought on line during the 2nd quarter, and the second well is expected to begin producing in the 3rd quarter.

INDEPENDENCE HUB:

- Independence Hub averaged 256 MMcf/d of gross production (203 MMcf/d net) during the 2nd quarter.

GULF OF MEXICO

EXPLORATION / APPRAISAL

RAPTOR:

DeSoto Canyon 535 (APC WI 50%)

- A discovery was made at Anadarko's Raptor prospect in Desoto Canyon block 535. The well was drilled to a total depth of 22,135 feet in approximately 8,200 feet of water and encountered approximately 150 net feet of high-quality oil pay. Anadarko is evaluating results of the initial well and a subsequent sidetrack.

YUCATAN:

Walker Ridge 95 (APC WI 15%)

- During the quarter, the Yucatan exploration well encountered more than 120 net feet of high-quality oil pay in Lower Tertiary-aged reservoirs. The well was drilled more than three miles south and syncline separated from the Anadarko-operated Shenandoah-2 discovery. The Yucatan well was drilled to a total depth of 32,250 feet in approximately 5,800 feet of water. Additional appraisal drilling is anticipated in 2014.

PHOBOS:

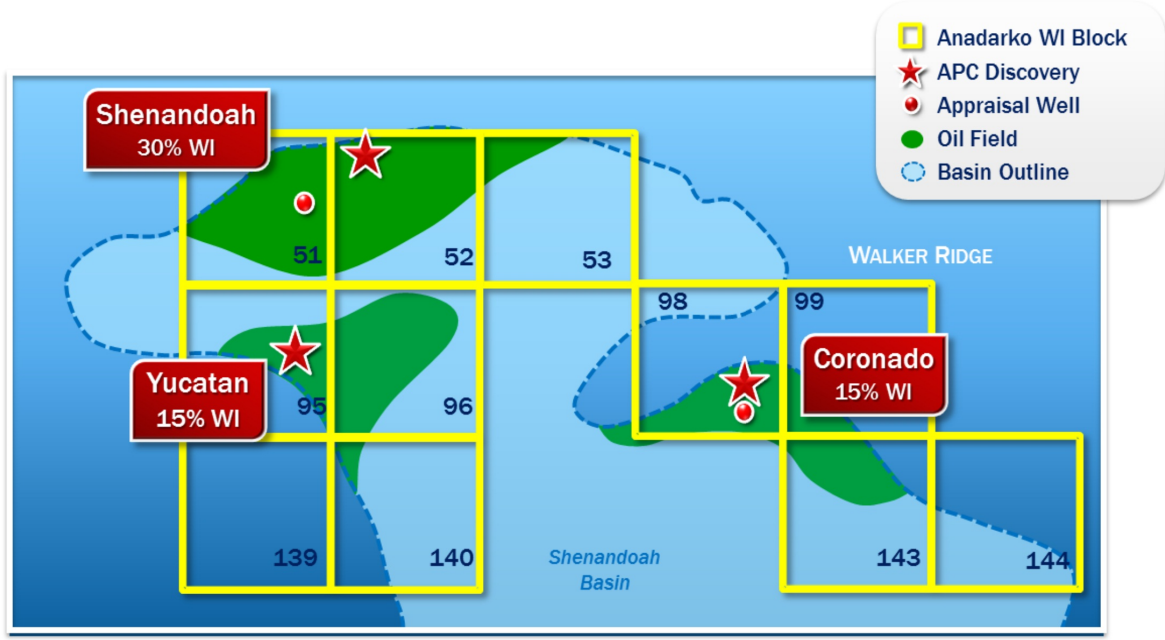
Sigsbee Escarpment 39 (APC WI 30%)

- The previously announced Phobos-1 discovery well encountered approximately 250 net feet of high-quality oil pay in Lower Tertiary-aged reservoirs. The discovery is located approximately 11 miles south of Anadarko's Lucius development. Additional appraisal drilling is anticipated in 2014.

CORONADO:

Walker Ridge 98 (APC WI 15%)

- During the 2nd quarter, the operator completed a sidetrack of the Coronado-1 discovery well to define the down-dip extent of the accumulation. The previously announced Coronado-1 well found 400 net feet of high-quality, oil pay in Lower Tertiary reservoirs. Additional appraisal activity is anticipated in late 2013.



INTERNATIONAL & FRONTIER

Jubilee FPSO, Ghana

Anadarko made significant progress in advancing three international mega projects during the quarter. At the El Merk project in Algeria, production from the first oil train continued to increase, and the second oil train is being commissioned. In Ghana, the government approved the Plan of Development for the TEN complex. In Mozambique, Anadarko continued to advance the Plan of Development for its Prosperidade field. Also during the quarter, the company made significant natural gas discoveries at Orca and Espadarte, just west of the Prosperidade field.

	SALES VOLUMES		CAPITAL INVESTMENTS
	2Q13 Oil MBbl/d	2Q12 Oil MBbl/d	2Q13 $MM
Alaska	12	14	25
*Algeria**	43	59	30
Brazil	0	0	46
*China**	9	17	15
*Ghana/W. Africa**	19	9	81
Mozambique	0	0	100
Other	0	0	61
Total	**83**	**99**	**358**

**Quarterly sales volumes are influenced by size, timing and scheduling of tanker liftings.*

INTERNATIONAL & FRONTIER

DEVELOPMENT

ALASKA:

- Gross production from the Colville River Unit averaged approximately 64,100 BOPD during the 2nd quarter.

ALGERIA:

- In Algeria, gross production for the quarter averaged approximately 298,000 BOPD. During the quarter, Anadarko achieved a milestone of 1.7 billion barrels cumulative gross production from the Hassi Berkine South (HBNS) and Ourhoud facilities.

- At El Merk, the first oil train continued to increase production throughout the quarter, and the second oil train is being commissioned. El Merk remains on schedule to ramp toward a net rate of approximately 30,000 Bbl/d around the end of the 2013.

CHINA:

- Gross production for the quarter was approximately 32,300 BOPD. The field is expected to average 32,000 to 35,000 BOPD for the remainder of 2013 as 9 new wells are brought on line from the current drilling campaign.

GHANA:

- During the 2nd quarter, Jubilee field gross production averaged approximately 106,000 BOPD. The operator is working to expand the gas handling capacity at the production facility to allow for increased oil production, which is expected in late 2013.

- Also during the 2nd quarter, the Plan of Development for the TEN (Tweneboa, Enyenra and Ntomme) project received full approval from the Ghanaian Ministry for Energy. The operator is progressing the final contracts, which are expected to be awarded in the 3rd quarter. The project will utilize an 80,000 BOPD FPSO, with first oil expected in 2016.

MOZAMBIQUE:

Offshore Area 1 (APC WI 36.5%, operator)

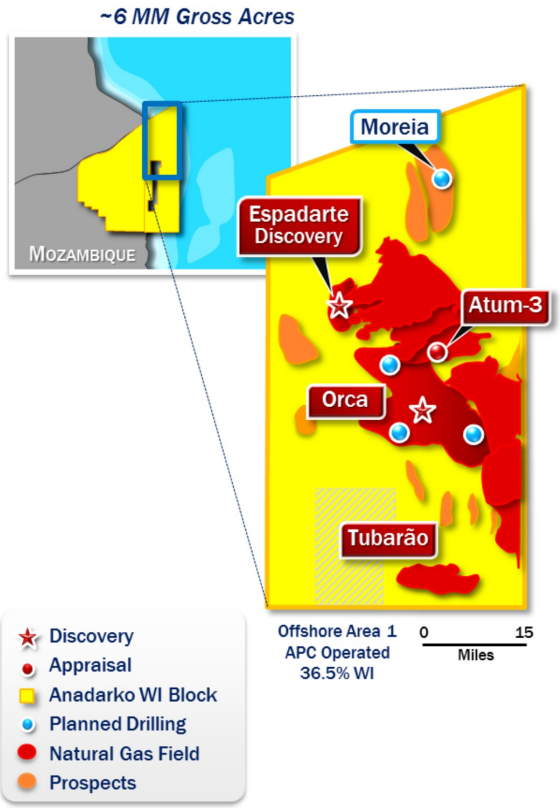
- Anadarko and Eni, operators of Offshore Areas 1 and 4 respectively, are progressing the Plan of Development for the Prosperidade field, which is expected to be submitted to the government by the end of 2013.

EXPLORATION

MOZAMBIQUE:

Offshore Area 1 (APC WI 36.5%, operator)

- The Espadarte-1 exploration well targeted an exploration play in the Miocene and the up-dip extent of Oligocene-aged reservoirs found at the Golfinho/Atum fields. The well encountered approximately 50 net feet of natural gas pay in Miocene reservoirs and 230 net feet of natural gas pay in Oligocene reservoirs. Pressure data indicate the Oligocene sands are in static communication with the Golfinho/Atum reservoirs, confirming this as a northwest extension of the field. Additional appraisal wells are now planned to fully evaluate the northern and up-dip extent of the Golfinho/Atum Field.



- Subsequent to quarter close, the Atum-3 well encountered approximately 230 net feet of natural gas pay and established gas-water contact for the greater Golfinho field. This down-dip, appraisal well confirmed both separation from the Prosperidade field and that the accumulation lies entirely within Offshore Area 1.

- Anadarko drilled a discovery at the Orca prospect during the quarter. The well encountered approximately 190 net feet of natural gas pay in a single Paleocene sand reservoir. Additional appraisal wells are planned for later in 2013.

- The Linguado prospect in northern Offshore Area 1 reached total depth during the quarter and was plugged and abandoned. The well encountered thick, well-developed sands in the Miocene target, which were water-bearing.

KENYA:

Blocks L-5,L-7,L-11A,L-11B,L-12 (APC WI 45%, operator)

- Drilling continues in Anadarko's offshore Kenya Block L-11B at the Kiboko prospect. Currently, the well is drilling toward planned total depth. The well will test multiple Cretaceous sands in the outboard portion of the Lamu Basin.

CÔTE D'IVOIRE:

Block CI-103 (APC WI 65%)

- The Calao exploration well encountered a thin gas condensate pay section that was determined to be non-commercial after a sidetrack well was drilled. The next well to be drilled on the block will be an appraisal to the Paon discovery, which is planned for the 4th quarter of 2013.

BRAZIL:

Block BM-C-30 (APC WI 30%, operator), BM-C-32 (APC WI 33%)

- Anadarko is currently drilling the Wahoo-5 appraisal well at BM-C-30. The operator of BM-C-32 is currently drilling the Itaipu-3 appraisal well and unitization discussions are ongoing.

SOUTH AFRICA:

Blocks 5/6, 7 (APC WI 80%, operator)

- A 6,000 kilometer 2D seismic program and high-resolution bathymetry survey were completed in the 1st quarter. The data are being mapped to better understand the basin geology and formulate a 3D seismic program to be acquired in 2014.

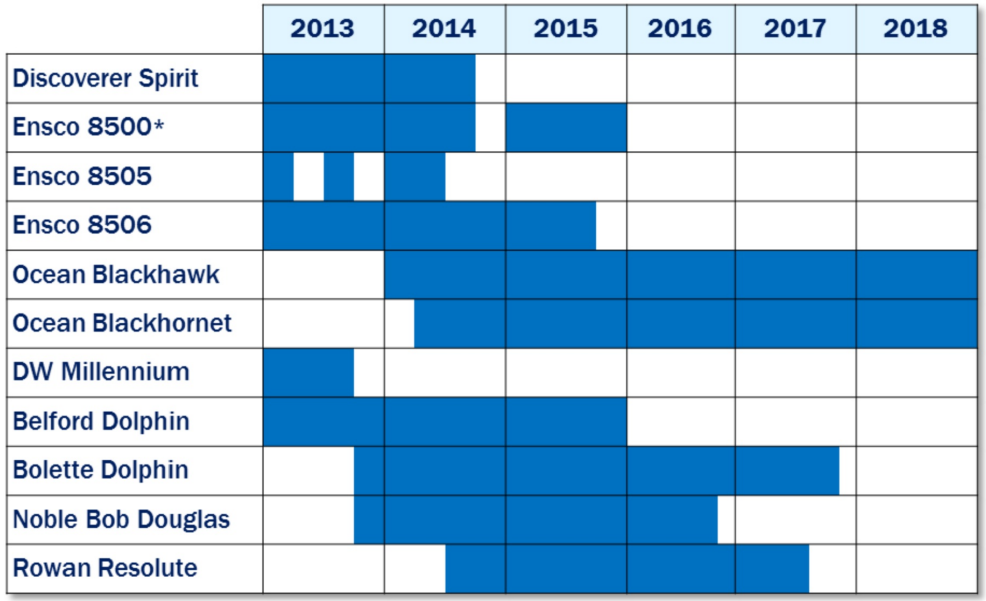
COLOMBIA:

Block COL 2 (APC 100% WI) and Blocks COL 5, Fuerte Norte, Fuerte Sur, Purple Angel, URA 4 (APC 50% WI)

- Existing 2D and 3D seismic data are being reprocessed and the acquisition of ~5,500 square kilometers of new 3D is contracted for the second half of 2013. The existing and new 3D data will be interpreted to develop a multi-well drilling program, scheduled to begin in late 2014.

DEEPWATER RIG SCHEDULE

- During the quarter, Anadarko entered into a three-year contract with Rowan Companies, plc., for the Rowan Resolute at an effective day rate approximately $607,000, including mobilization fees. The drillship is expected to be delivered at the end of the 2nd quarter of 2014 and to operate in the U.S. Gulf of Mexico, starting in the late 3rd quarter 2014.



Note: Excludes Spot Market Rigs

**Assumes the exercise of option periods under the contract*

Deepwater Millennium

Annex 116

Deloitte, "Kenya", in The Deloitte Guide to Oil and Gas in East Africa: Uniquely Structured (2014)

Deloitte.

The Deloitte Guide to Oil and Gas in East Africa

Uniquely structured

2014 Edition

2 Kenya

2.1 Overview

Kenya is a former British colony which became independent in 1963. Its first president, the charismatic Jomo Kenyatta, led the country from 1963 to his death in 1978. His successor, Daniel arap Moi left power in 2002 after 24 years in office, a period marked by major corruption scandals. Kenya's transition to stable, democratic government has been somewhat erratic, with continuing allegations of corruption. The 2007 election was followed by widespread violence resulting in the deaths of around 1,500. Following the unrest, a peace deal was brokered by former UN secretary general, Kofi Annan which resulted in the formation of a coalition between the main political parties. Kenyans voted in a national referendum to approve a new constitution in August 2010 which entailed the creation of a bicameral assembly and the abolition of the post of prime minister. As part of the new constitution, 47 counties each with a governor and county assembly have been established. Kenya held a peaceful general election in March 2013 and elected a new President – Uhuru Kenyatta (son of the first president) with William Ruto as his deputy. Devolution to county governments has proved to be difficult but is progressing. Kenya's economy remains energy starved with restricted access to electricity.

Source: PetroView®

2.2 Key facts

Population: 44 million (July 2013 estimate)
Median age: 18.9 years
Currency (code): Kenya shilling (KES)
Exchange rate at February 2014: KES 86.3 = US$ 1 (Central Bank of Kenya)
Exchange controls: none, but banks must report foreign exchange transactions on excess of US $ 10,000.
GDP (purchasing power parity): US$79.9 billion (2013 estimate)
GDP per head of population: US$ 1,800 (2013 estimate)
GDP growth: 5.1% (2013 estimate)
Principal industries: small-scale consumer goods, agricultural products, horticulture, oil refining; aluminium, steel, lead; cement, commercial ship repair, and tourism
Official languages: English, Kiswahili
Unemployment rate: 40% (2008 estimate)
Hydrocarbon production: nil
Petroleum production usage: 82,000 barrels per day equivalent (2011 estimate)
Legal system: mixed legal system of English common law, Islamic law, and customary law.
Head of State: President Uhuru Kenyatta
Head of Government: Uhuru Kenyatta
Transparency International corruption perception index 2013: 27 (placed 136)

Sources:

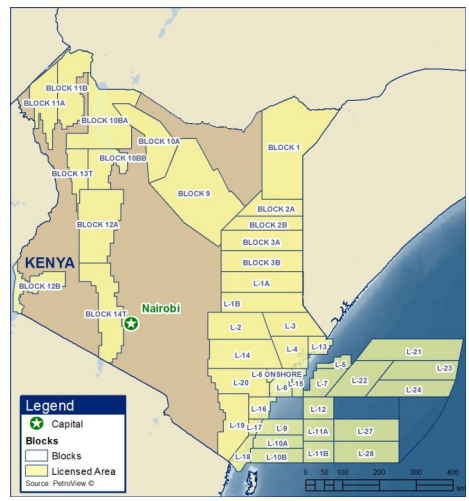
- BBC country profile (http://www.bbc.co.uk/news/world-africa-13681341);
- CIA World Factbook (https://www.cia.gov/library/publications/the-world-factbook/geos/ke.html);
- Transparency International (http://cpi.transparency.org/cpi2013/results/)

2.3 Industry overview

Kenya has 4 prospective sedimentary basins: Anza, Lamu, Mandera and the Tertiary Rift. The Lamu basin extends offshore.

Kenya has no proven commercial hydrocarbon discoveries at the time of writing. BP and Shell carried out exploration work in the 1950s with the first exploration well being drilled in 1960. Over the past 50 years many other oil and gas companies have tried their luck onshore and offshore, including Exxon, Total, Chevron, Woodside and CNOOC. Of 33 wells drilled in the country prior to 2012, 16 showed signs of hydrocarbons, but none were considered commercial. Only 4 had been drilled offshore prior to 2012 and of these only 1 (in Block L5, drilled by Woodside in 2007) was in deep water. Following recent successes in Mozambique and Tanzania, offshore exploration has become the flavor of the moment and industry confidence was boosted in 2012 by the announcement that Apache's Mbawa-1 well (Block L8) had encountered gas. Extensive activity is expected over the next 2 years, with drilling planned by Afren (Block L17/18), Anadarko (Block L12), BG Group (Blocks L10A and L10B) and FAR (Block L6).

Onshore drilling by CNOOC during 2009 in Block 9 (Anza Basin) proved unsuccessful, despite high hopes and reports of gas finds. Tullow Oil farmed into 6 blocks in the Turkana Rift Basin in late 2010 (5 in Kenya and one block in Ethiopia). The geology of this area is similar to that in the Albertine Graben of Uganda and a well drilled in 1992 by Shell found evidence of waxy crude similar to that in the Ugandan arm of the Rift Valley. On 26 March, 2012, Tullow announced an oil discovery in Block 10BB. A further discovery of oil in Block 13T was announced in November 2012 and drilling in the area continues at the time of writing with a total of 7 discoveries out of 7 wells drilled and estimates of 600 million barrels of oil in place. Kenya's blocks are currently licensed as follows:



Source: PetroView®

Operator	Block	Consortium partners
ADAMANTINE ENERGY	BLOCK 11B	BOWLEVEN PLC
AFREN	L-18	-
	L-17	-
	BLOCK 1	TAIPAN RESOURCES INC
AFRICA OIL	BLOCK 9	MARATHON OIL
ANADARKO	L-11B	TOTAL, GOVERNMENT - KENYA, PTTEP
	L-12	TOTAL, GOVERNMENT - KENYA, PTTEP
	L-11A	TOTAL, GOVERNMENT - KENYA, PTTEP
	L-7	TOTAL, GOVERNMENT - KENYA, PTTEP
	L-5	TOTAL, GOVERNMENT - KENYA, PTTEP
A-Z PETROLEUM	L-1A	-
	L-3	-
BG GROUP	L-10B	PREMIER OIL, PANCONTINENTAL, PTTEP
	L-10A	PTTEP, PANCONTINENTAL
CAMAC	L-16	GOVERNMENT - KENYA
	L-1B	GOVERNMENT - KENYA
	L-27	GOVERNMENT - KENYA
	L-28	GOVERNMENT - KENYA
CESPA	BLOCK 11A	EHRC ENERGY, GOVERNMENT - KENYA
EDGO GROUP	L-14	QATAR FIRST INVESTMENTS

Source: PetroView®

Operator	Block	Consortium partners
ENI	L-21	-
	L-23	-
	L-24	-
FAR LTD	L-6	PANCONTINENTAL OIL
	L-6 ONSHORE	MILIO INTERNATIONAL, PANCONTINENTAL OIL
IMARA ENERGY CORP.	L-2	-
MIDWAY RESOURCES	L-4	SWISS OIL COMPANY, NOCK
	L-13	SWISS OIL COMPANY, NOCK
MILIO INTERNATIONAL	L-20	PACIFIC SEABOARD
NOCK	BLOCK 14T	-
OPHIR ENERGY	L-9	FAR LTD, GOVERNMENT - KENYA, VANOIL ENERGY
	L-15	GOVERNMENT - KENYA
PANCONTINENTAL	L-8*	-
PREMIER OIL	BLOCK 2B	TAIPAN RESOURCES INC
RIFT ENERGY CORP	L-19	-
SIMBA ENERGY INC	BLOCK 2A	-
TOTAL	L-22	-
TULLOW OIL	BLOCK 10BA	AFRICA OIL
	BLOCK 10A	AFRICA OIL, AFREN PLC
	BLOCK 10BB	AFRICA OIL
	BLOCK 13T	AFRICA OIL, NOCK
	BLOCK 12B	SWALA ENERGY
	BLOCK 12A	AFRICA OIL , MARATHON OIL, NOCK
VANOIL	BLOCK 3B	-
	BLOCK 3A	-

*Pancontinental is reapplying for the L-8 license after operator APACHE left the block.

Source: PetroView®

Kenya is home to the region's only operating refinery although in the recent past there have been differences between the government and the private sector owners which has resulted in a temporary shutdown. The nameplate capacity of the Mombasa refinery, operated on a tolling basis by Kenya Petroleum Refinery Limited (KPRL), is 80,000 barrels per day. In 2009 Essar acquired a 50% interest in KPRL from a consortium of BP, Shell and Chevron. The remainder is owned by the Kenyan government. At that point it was announced that Essar would invest USD 400 – 450 million in a significant upgrade. This project appears to be stalled at the time of writing.

Sources:

- National Oil Corporation of Kenya website (http://www.nockenya.co.ke/)
- A Dash for Gas (and Oil…) in East Africa (Citigroup Global Markets, 4 July 2011)
- Tullow Oil website (http://www.tullowoil.com/)
- Essar website (http://www.essar.com/)
- KPRL website (http://www.kprl.co.ke/)

2.4 Regulatory environment

The Petroleum (Exploration and Production) Act (cap 308), last revised in 2012, is the fundamental law governing upstream activities in Kenya. This vests ownership of hydrocarbons in the hands of the Kenyan government and grants significant powers over the sector to the Cabinet Secretary in the Ministry of Energy and Petroleum. Day to day responsibility for the sector lies with the Petroleum Energy Department of the Ministry.

The Act envisages upstream activities being conducted via a state oil company established for that purpose or through contractors under a petroleum agreement or "in any such other manner as may be necessary or appropriate" (section 4 (3) (b)). The Minister is empowered to sign petroleum agreements on behalf of Kenya and is required to make a model agreement available to potential contractors: this can be downloaded from the website of the state oil company (the National Oil Corporation of Kenya Ltd (NOCK) - see http://www.nockenya.co.ke/).

The Act is brief and provides little detail, particularly on questions relating to development and production activities. There are a couple of points worth noting:

- Where petroleum operations are carried out onshore, the Act provides the contractor with right of access to private land at 48 hours' notice subject to various conditions.
- A contractor is required to give preference to locally available goods and services, but there is no definition of what "locally available" means and no specific percentage of local content is prescribed.

NOCK was established in the 1980s to spearhead exploration on behalf of the Kenyan government. This remains a key role, but since 1997 it has also built up a retail business and today controls around 5% of the retail market for petroleum products in Kenya.

Key features of the current model production sharing contract include:

- Negotiation of an initial exploration period with the possibility to extend this twice.
- An agreed percentage of the contract area is to be surrendered at the end of each exploration period.
- In the event of a commercial development the total contract duration is negotiable.
- Surface fees are provided for but are negotiable.
- Annual contributions to the Ministry of Energy training fund.
- The PSC does not provide for bonus payments or royalties.
- A cost recovery cap per period is envisaged but the amount of this is also negotiable.
- Capital costs are subject to recovery at a rate of 20% per annum (straight-line).
- The sharing of profit oil is based solely on production volumes with the maximum state share achieved when production exceeds 100,000 barrels per day. The state share may be taken in cash or in kind.
- Separate rules for sharing gas production are not provided.
- The state's share of profit oil is inclusive of income tax (see below for more detail).
- The model provides for an additional allocation of profit oil to the state, triggered when the oil price exceeds a specified threshold.
- In the event of a development, the government has a right to participate directly or via its designee (presumably this would be NOCK). The percentage share to be transferred is subject for negotiation. The PSC envisages that this will not entail reimbursement of costs up to the adoption of the development plan, but the government or its designee will be obliged to fund the respective share of costs thereafter, no carry arrangement being envisaged.
- The contractor is obliged to supply the domestic market out of its share of production in accordance with instructions from the Minister. This will be at market price.
- The contractor and its subcontractors will be entitled to import goods and equipment for petroleum operations free from customs duties.

- The PSC is subordinate to the laws of Kenya and it is not envisaged that it will be given force of law itself (e.g. by gazetting). In the event of a change in laws or regulations that impacts the economic benefits of a party to the PSC, it is provided that the parties "shall agree to make the necessary adjustments" to restore the status quo.
- In the event of dispute arbitration is provided for under UNCITRAL rules. This is to take place in Nairobi.
- The accounting procedure specifies the use of US dollars.

The government is currently working on its policy framework for natural resources (which is expected to be published during the course of 2014) as well as on a draft Energy Bill.

Sources:

- National Oil Corporation of Kenya website (http://www.nockenya.co.ke/)
- Website of the Kenya Ministry of Energy (http://www.energy.go.ke/)
- The Petroleum (Exploration and Production) Act, Chapter 308, 1986
- The Petroleum (Exploration and Production) Regulation

2.5 Taxation of oil and gas projects

The responsibility for administering taxes in Kenya rests with the Kenya Revenue Authority ("KRA"). The tax year is the calendar year for natural persons, and the financial year which ends in June for all other persons.

Kenya resident companies and branches of foreign legal entities are taxed on all income accruing in or derived from Kenya. The calculation of profits is based on the IFRS financial statements. The rate for resident companies is 30% and for branches is 37.5%. There is no branch profits tax or branch remittance tax. Dividends paid by a resident company to a non-resident shareholder are usually subject to withholding tax at a rate of 10%. Capital gains are generally not taxed in Kenya (whilst there is capital gains tax legislation this has been suspended since 1985). Losses incurred may be offset in the year in which incurred and any of the 4 following years.

Income tax on employment income is generally collected via withholding at source under "pay as you earn" (PAYE). The marginal rate is 30% and additionally employers are required to collect certain social security contributions.

As noted above, the Kenyan model PSC provides that income tax (including tax on dividends paid) imposed on the contractor will be allocated from the government's share of production. The PSC does not provide detailed rules for calculating the implied gross-up or guidance on how the allocation is to be carried out if the company has more than one PSA or other activities.

The Kenya Income Tax Act contains a specific schedule (the Ninth) which deals with the taxation of upstream activities and includes a special regime for subcontractors. At the time of writing, we understand that these rules are under review but it is not clear what changes may be made or when they might be introduced. The rules are clearly drafted and deal with most routine situations likely to be encountered during the exploration phase. They have not been tested through development and production, of course.

Key points addressed in the schedule which apply to petroleum companies are as follows:

- There are specific and detailed rules for determining the value of sales for tax purposes together with specific transfer pricing rules. These mirror the provisions of the model PSC.
- Capital expenditure is depreciated for tax purposes at a rate of 20% per annum (straight-line) commencing in the year the asset is brought into use or the year in which production commences whichever is later. Operating costs (including G&G and intangible drilling) are fully deductible in the year incurred.
- There are also specific thin capitalization rules for petroleum companies. These apply to both branches and residents. Interest expenses are restricted if the loan amount or interest rate exceeds an arm's length amount. No specific debt: equity ratio is prescribed (unlike the general thin capitalization rules which impose a maximum debt: equity ratio of 3:1).
- Petroleum companies are permitted to carry back losses arising in the final year of production for up to 3 years. No carry back is permitted under general tax rules.
- Any gain arising on the disposal of a PSC interest will be taxed as income (the suspension of tax on capital gains is therefore not a benefit to petroleum companies). The gain is the difference between proceeds and capital expenditure that has not yet been depreciated for tax purposes. The rules are silent on what happens in the case of a loss. In the case of a partial disposal the KRA may apportion the tax basis between the part sold and the part retained.
- In the event a disposal wholly or partly in exchange for the undertaking of a work obligation the value of the work obligation is excluded from the calculation of the gain.
- Amendments to the Income Tax Act introduced at the end of 2012 introduced an additional withholding tax on direct and indirect transfers of PSC interests. The rate is 10% of the value of total consideration in the case of transactions with residents and 20% in other cases. Before the Finance Act 2013, this was a final tax. However, the Finance Act 2013 amended this position such that the withholding tax deducted will be an advance tax effective 1 January 2014.

- On a disposal the assignee is permitted to tax depreciate the full consideration (i.e. a step-up in basis is permitted).
- The schedule does not provide for ring fencing of individual PSCs for tax purposes, so theoretically a petroleum company should pool all income and expenditures for purposes of calculating income tax. This is likely to cause difficulty in practice as the model PSC allocates income tax out of the government share of production and logically the mechanism for doing so can only operate on in individual PSC basis.

As mentioned above, the Ninth Schedule also deals with the taxation of "petroleum service subcontractors". The definition restricts the scope to non-resident companies which contract directly with a petroleum company, i.e. it excludes a resident entity and also any lower tier subcontractors. The rules created a simplified tax regime for companies which are within the scope:

- They are subject to tax at the non-resident rate (37.5%) on a deemed profit of 15%.
- The resulting tax (5.625%) is to be withheld by the petroleum company and is a final tax.
- The base for calculating the tax excludes costs reimbursed by the petroleum company (including mobilization and demobilization costs).
- The rules only apply to activities within Kenya and its exclusive economic zone.

For activities undertaken by lower tier subcontractors, or services otherwise outside the scope of these special rules other rates of withholding tax may be applicable, depending on the specific fact pattern.

In addition to income tax on companies, Kenya operates a VAT system along conventional lines. The standard VAT rate is 16% but exports are generally zero-rated. Imports of goods and services normally trigger a VAT liability. The model PSC provides an exemption from VAT and customs duty on imports of goods by contractors and subcontractors. The new Kenyan VAT Act which came into effect on 2 September 2013 also provides for exemption from VAT in respect of supplies, excluding motor vehicles, imported or purchased for direct and exclusive use in oil prospecting or exploration, by a company granted a prospecting or exploration license in accordance with the provisions of Petroleum (Exploration and Production) Act (Cap. 308) upon recommendation by the Cabinet Secretary responsible for energy.

General Law also provides an exemption from customs duty on equipment imported for purposes of exploration and development activities. This mirrors the exemption provided in the PSC, though it does not apply to subcontractors.

In addition to the above, the Finance Act 2013 introduced a Railway Development Levy (RDL) under Section 117A of the Customs and Excise Act, which will be imposed on all goods imported for use in Kenya. The levy will be at the rate of 1.5% of the customs value of the goods (i.e. Cost, Insurance and Freight for sea shipments and Cost and Insurance for air freight), and shall be payable by the importer at the time of clearing the goods.

The effective date of this amendment was 1 July, 2013. The Kenya Oil & Gas Association sought exemption on the basis that the Production Sharing Contracts signed by the oil companies exempt them from any such levies. This application was denied on the basis that there is no legal provision allowing for exemption. The Association is currently engaging the Treasury with a view to resolving this. However, the National Treasury is yet to formally comment.

Sources:

- Kenya Income Tax Act
- Kenya VAT Act
- Customs and Excise Act
- East African Community Customs Management Act

Annex 117

Total S.A., *Factbook 2014* (2014)

Factbook 2014

TOTAL
COMMITTED TO BETTER ENERGY

SUMMARY

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Abbreviations

b:	barrel
cf:	cubic feet
/d:	per day
/y:	per year
€:	euro
$ and/or dollar:	U.S. dollar
t:	metric ton
boe:	barrel of oil equivalent
kboe/d:	thousand boe/d
kb/d:	thousand barrel/d
Btu:	British thermal unit
M:	million
B:	billion
MW:	megawatt
MWp:	megawatt peak (direct current)
TWh:	terawatt hour
AMF:	French Financial Markets Authority
API:	American Petroleum Institute
ERMI:	*European Refining Margin Indicator*. ERMI is an indicator intended to represent the margin after variable costs for a hypothetical complex refinery located around Rotterdam in Northern Europe. The indicator margin may not be representative of the actual margins achieved by TOTAL in any period because of TOTAL's particular refinery configurations, product mix effects or other company-specific operating conditions.
FEED:	Front-End Engineering and Design
FPSO:	Floating Production Storage and Offloading
IFRS:	International Financial Reporting Standards
LNG:	liquefied natural gas
LPG:	liquefied petroleum gas
ROE	Return on Equity
ROACE:	Return on Average Capital Employed
SEC:	United States Securities and Exchange Commission
SAGD:	Steam Assisted Gravity Drainage

Conversion table

1 boe = 1 barrel of crude oil = approx. 5,400 cf of gas(1) in 2014
1 b/d = approx. 50 t/y
1 t = approx. 7.5 b (for a gravity of 37° API)
1 Bm^3/y = approx. 0.1 Bcf/d
1 m^3 = approx. 35.3 cf
1 t of LNG = approx. 48 kcf of gas
1 Mt/y of LNG = approx. 131 Mcf/d

(1) This ratio is calculated based on the actual average equivalent energy content of TOTAL's natural gas reserves and is subject to change.

DEMOCRATIC REPUBLIC OF THE CONGO

In the Lake Albert region, the Block III (66.66%, operator) exploration license was granted in 2012 for an initial three-year period. As a result of the security situation in the eastern part of the country in 2012, the license was extended for one year. The prospecting program is limited to the northern portion of the license, which is outside the Virunga park.

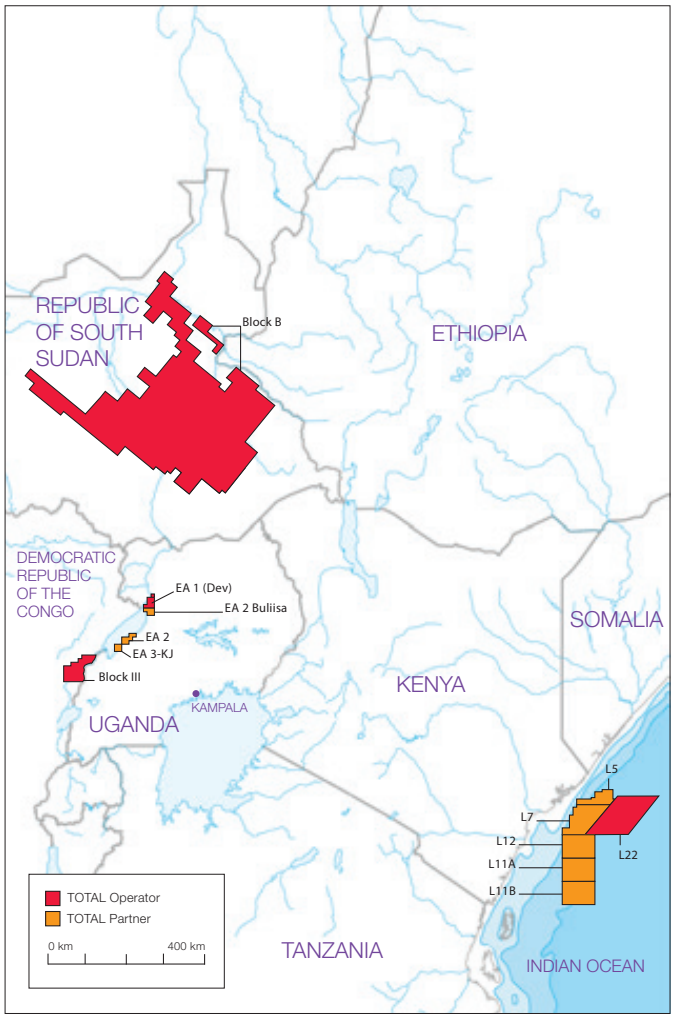
REPUBLIC OF SOUTH SUDAN

TOTAL is negotiating a new contract with the authorities that would enable it to resume exploration activities in part of Block B. Since the independence of the Republic of South Sudan in 2011, TOTAL is no longer present in Sudan.

UGANDA

TOTAL has been active since 2012 in Uganda and the Group holds a 33.33% interest in the EA-1, EA-1A and EA-2 licenses as well as the Kingfisher license, located in the Lake Albert region. TOTAL is the operator of the EA-1 and EA-1A licenses and a partner on the other licenses.

- On the EA-1 license, a campaign of wells, production tests and a 3D seismic survey were carried out between 2012 and mid-2014. As of year-end 2014, five development plans had been submitted to the authorities: Ngiri (submitted in December 2013), Jobi-Rii (submitted in June 2014) and Mpyo, Gunya and Jobi East (submitted in December 2014).
- The EA-1A license expired in February 2013 following a campaign of five exploration wells that resulted in one discovery (Lyec). With the exception of the area relating to this discovery, the license has been relinquished to the authorities.
- On the EA-2 license, a campaign of wells and production tests that began in 2012 was completed in 2014. Two development plans were submitted to the authorities in June 2013 (Kasamene and Wahrindi fields, as well as those of Kigogole, Ngege, Ngara and Nsoga).
- The development plan for the Kingfisher field, which is located on the EA-3 production license, was approved by the authorities in September 2013.
- The Kanywataba license expired in 2012 and was relinquished to the authorities.



KENYA

TOTAL has interests on the offshore L5 and L7 licenses (40%) and the L11a, L11b and L12 licenses (30% after selling 10% of the stake in December 2014) and is the operator of the L22 license (70%) located in the Lamu delta in water depths ranging from 1,000 m to 3,500 m.

In 2013, two exploration wells were drilled in Blocks L7 and L11b.

On the offshore L22 license, seabed core drilling operations were carried out in early 2014 and a 3D seismic survey was carried out, benefitting from synergies with the adjacent blocks.

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Annex 118

Chris Lo, "Offshore Kenya: keeping up the neighbors", *Offshore Technology Market & Customer Insight* (13 Jan. 2014)

Offshore Kenya: keeping up with the neighbours

13 January 2014 Chris Lo

Oil and gas exploration companies have flocked to the Kenyan coast after major discoveries in nearby Tanzania and Mozambique. But do Kenyan waters hold the same resource potential as the country's neighbours? Preliminary exploration work has been mildly disappointing, but there is still time for the Lamu Basin region to prove itself.

Kenya might be the largest economy in East Africa, but in some respects it lags significantly behind its neighbours. Agriculture and tourism to the country's wildlife reserves provide a driving force behind Kenyan growth, but the dominance of these sectors makes the country vulnerable to poor harvests or shifting tourism trends, as well as leaving much of its population living in poverty.

The Kenyan Government, both before and after the March 2013 elections that brought President Uhura Kenyatta to power, has been working to develop a more diverse base for economic growth, throwing its support behind the country's burgeoning manufacturing and financial services sectors.

The exploitation of natural resources is another important area that could create sustainable growth and lasting benefits for Kenya's people. It's also an area in which Kenya is playing catch-up with nearby countries such as Mozambique and Tanzania, which both have increasingly mature mining industries and are currently hosting significant hydrocarbon discoveries, both on and offshore. Recent offshore gas discoveries in the two countries reportedly total around 100 trillion cubic feet.

Meanwhile, Kenya remains a completely unproven oil and gas destination, regardless of the impressive finds being made further south of Africa's east coast. A January 2013 Deloitte report on East African oil and gas potential summed up the slight disappointment that has met exploration efforts in the country.

"Kenya is playing catch-up with nearby countries such as Mozambique and Tanzania."

"Over the past 50 years, many other oil and gas companies have tried their luck onshore and offshore, including Exxon, Total, Chevron, Woodside and CNOOC," the report states. "Of 33 wells drilled in the country prior to 2012, 16 showed signs of hydrocarbons, but none were considered commercial. Only four had been drilled offshore prior to 2012 and of these only one (in Block L5, drilled by Woodside in 2007) was in deepwater."

Exploration in the Lamu Basin

However, the Deloitte report acknowledges the 'hotspot' status that has been granted to East Africa and its coastal waters after the successes seen in Tanzania and Mozambique. The report notes that 'offshore exploration has become [the] flavour of the moment' and that 'extensive activity' from the industry is expected in Kenya over the next two years.

Kenyan offshore blocks have certainly

"The L6 area has potential to contain approximately 3.7 billion barrels of oil or 10.2 trillion cubic feet of gas."

attracted significant attention from a wide range of energy companies, large and small, over the last few years. With only one of the four prospective sedimentary basins in Kenya extending offshore (the Anza, Mandera and Tertiary Rift basins are all onshore, while the Lamu Basin runs beneath Kenyan waters), the country's onshore O&G potential has understandably been the greatest focus of industry interest and media speculation, especially in the wake of Tullow Oil's fifth consecutive oil discovery since beginning exploratory drilling in Turkana County in 2012.

Nevertheless, Kenya's offshore potential, lent legitimacy by major discoveries further south, has drawn significant investment from companies looking to survey explore the Lamu basin for oil and gas. For the many companies with a stake in the 15-odd blocks off Kenya's east coast, including the likes of Eni, Anadarko, Total, Camac Energy and BG Group, early indications were encouraging.

Australian company Pancontinental, which owns a 40% stake in the L6 block in partnership with operator and 60% stakeholder Far Ltd, was certainly confident in a trading statement released in February 2013.

"The L6 area has potential to contain approximately 3.7 billion barrels of oil or 10.2 trillion cubic feet of gas prospective resources on a gross, un-risked, best-estimate basis according to an assessment by operator FAR Limited," the statement estimated, based on 2D and 3D seismic surveys in the region.

Destined to disappoint?

Despite the sustained investment the oil and gas industry is making offshore Kenya, so far the region's potential remains unrealised. In an offshore area thought to be the next frontier of East African oil and gas, it is discouraging for industry and investors that exploratory drilling has not yielded more impressive finds.

Though the offshore drilling work being carried out by most explorers is still in the early stages, several companies have already started to scale back their presence in the area after only non-commercial discoveries. In October 2013, US-based Apache Corporation relinquished its 50% stake in the L8 block it had been developing with Pancontinental and Tullow Oil, saying the quantities of gas it had found were not commercially viable.

"We determined that other areas in our worldwide portfolio provided better opportunities for future capital investments," Bob Dye, Apache's senior vice-president of corporate affairs told Reuters.

British oil firm Premier Oil followed suit in December, when it announced that after an exploration review, it was withdrawing from Block L10A, relinquishing its 20% stake in the license. Premier still has a 25% share in the neighbouring Block L10B, which it will continue to explore leading up to a 'drill or drop' decision in mid-2014.

"Whilst we remain committed to exploration in Kenya, we continue to focus our resources on projects that meet our internal corporate investment metrics and to high-grade our exploration portfolio accordingly," said Premier CEO Simon Lockett.

"Several companies have already begun to scale back their presence in the area."

In fact, the best news that Kenya's offshore explorers seem to be able to muster at the moment is that the area's potential remains high, even if no breakthroughs have been made yet. Anadarko announced in April 2013 that it had not found commercial quantities of oil at its Kubwa well in the L7 block, but remained upbeat about future prospects.

"We are very encouraged with our first test of Kenya's previously unexplored deepwater basin, in which mudlog and well-site evaluation of core data indicates the presence of a working petroleum system with reservoir-quality sands," said Anadarko's senior vice-president for worldwide exploration Bob Daniels. "The Kubwa well tested multiple play concepts and provided useful data regarding the prospectivity of our six-million-acre position offshore Kenya."

Meanwhile, Pancontinental might have given Apache Corp executives reason for a slight amount of regret when it made a modest discovery of gas in the L8 block in December, but even so, the company had to add

the caveat that the well would only be viable if combined with other wells in the area, continuing the uncertainty.

"The well on its own may not currently be commercially viable, but could be when aggregated with other gas discoveries which may occur in the L8 or nearby blocks," said Pancontinental's finance director Ernest Myers.

Is Kenya's offshore resource potential destined to disappoint? The exploration of a relatively unmapped region is a protracted process, and it's still too early to know if the companies that have already bowed out of the area were jumping the gun. But with ten new exploration wells expected to be drilled in the country every year for the next three to five years, 40% of which will be offshore, according to National Oil Corporation of Kenya chief executive Sumayya Hassan-Athmani, it won't be too long before the fate Kenya's embryonic offshore industry is put beyond doubt.

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The East African offshore oil and gas industry is about to become one of the world's biggest energy frontiers.

Annex 119

Eduard Gismatullin, "Tullow Finds More Kenyan Oil to Boost East Africa Exports", *Bloomberg Business* (15 Jan. 2014)

BloombergBusiness

Tullow Finds More Kenyan Oil to Boost East Africa Exports

by Eduard Gismatullin
January 15, 2014 — 12:15 PM EST

Jan. 15 (Bloomberg) -- Tullow Oil Plc made two new discoveries in Kenya, boosting prospects for turning East Africa's largest economy into an oil exporter.

The U.K. oil explorer doubled its Kenyan resource estimates to more than 600 million barrels after the Amosing and Ewoi wells found crude, Tullow said today in a statement. The company, which plans more than 20 wells in northern Kenya over the next two years, said it had started preliminary design work on a pipeline to an export terminal.

"Kenya is one of our core and key areas going forward," Tullow Chief Executive Officer Aidan Heavey said in a phone interview. "We are also starting discussions with the government now on the development plans."

Kenya may become East Africa's first oil exporter as soon as 2016 as Tullow and its partner Africa Oil Corp. continue to explore the Lokichar Basin in the north of country. Tullow, which works with France's Total SA and China's Cnooc Ltd. to develop fields in neighboring Uganda, has plans to combine oil exports from the two countries through one pipeline network.

The Amosing well drilling results "significantly" exceeded expectations in Block 10BB, Africa Oil said in a separate statement. The companies agreed to relinquish their license to Block 10A, where the Paipai well discovered gas last year.

'Very Remote'

"It's very remote, we really have enough to do with a lot of basins," Heavey said. "We are going to concentrate on the oil basins."

Tullow's blocks in northern Kenya may be found to hold more than 1 billion barrels of oil resources as drilling continues, the company's exploration chief, Angus McCoss, said in today's statement.

“Tullow’s exploration in Kenya continues to deliver,” Oswald Clint, an analyst at Sanford C. Bernstein & Co. in London, wrote in an e-mailed report. “Perhaps more excitingly, this year we expect to see three completely undrilled East African basins targeted from Tullow’s onshore acreage in Kenya and Ethiopia.”

Tullow also reported today a $730 million exploration charge mostly because of unsuccessful wells off French Guiana, Mozambique and Norway.

The shares rose 0.8 percent to 863 pence in London. Africa Oil climbed 3.1 percent to 58.5 kronor in Stockholm.

Tullow, which operates Ghana’s largest oil field, expects to produce 79,000 barrels to 85,000 barrels a day this year after output rose 6.3 percent to 84,200 barrels of oil equivalent a day last year.

Last-year revenue rose 11 percent to $2.6 billion from a year earlier. Investments in projects will jump 22 percent to $2.2 billion this year, London-based Tullow said today.

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To contact the editor responsible for this story: Will Kennedy at wkennedy3@bloomberg.net

Annex 120

Nina Rach, "Kenyan explorers look deeper offshore", *oedigital.com* (1 July 2014)

Kenyan explorers look deeper offshore

Written by Nina Rach

Tuesday, 01 July 2014 00:00

Offshore East Africa is among the newest frontier exploration regions, with results of wildcats eagerly awaited. The area still lacks infra- structure to support meaningful development and logistics remain a challenge to all comers. The activity has spread beyond the shores of Kenya, Tanzania, Mozambique, reaching Madagascar, the Comoros, and the Seychelles.

All of Kenya's offshore blocks are in the Lamu basin, which formed during the separation of Madagascar from Africa and has Middle to Late Jurassic source rocks. The exploration focused in the Lamu basin follows a successful trend from Mozambique and Tanzania. Small independent operators are surrounded by majors, leading to interesting industry partnerships and strategic opportunities for companies large and small.

BG Group used Odfjell's Deepsea Metro I drillship for the Sunbird-1 in Block L10A this year. Photo from BG Group.

Years of activity

In 1964, BP and Shell drilled the onshore Dodori-1 well to 4311m TD very close to the coast. The well reached Campanian rocks in the late Cretaceous section, with oil and gas shows in Tertiary and Cretaceous. This well flowed at 3.1mcf/d.

In 1971, BP and Shell drilled the Pate-1 well south of the Dodori well, in the L5 area, to 4188m TD, reaching Eocene sediments with gas shows. It flowed at 12.7mcf/d.

In the same year, they drilled the Kipini well to the south, close to the coast in the nearby L-6 area, to 3663m TD. It reached the Campanian section, with fluorescence and gas shows in Tertiary and Cretaceous section.

In 1978, France's Total drilled the offshore Simba-1 well to 3604m TD, with wet gas shows (C1-C5) in the Tertiary.

In 1982, a consortium of Cities Services, Marathon and Union drilled the offshore Maridadi-1 well to 4198m TD with gas shows in the Tertiary, and in 1985, drilled the offshore Kofia-1 well to 3629m TD, with oil and gas shows.

A Lamu basin study 1991- 1995 led Kenya to subdivide the Lamu embayment (both onshore and offshore) into 10 exploration blocks and then add two more after 2001.

Between 2000-2002, seven production sharing agreements were signed for offshore Lamu basin blocks L5, L6, L7, L8, L9, L10, and L11. In 2003, Australia's Woodside Petroleum acquired 7884 km of 2D seismic data covering the seven licensed blocks as well as Block L12. Woodside then drilled the deepest offshore well in 2006.

Anadarko acquired 5000 line-km of 2D seismic

reef at 1583.7m subsea. It became Kenya's first offshore oil discovery, confirmed in June 2014.

What's ahead

Several major international oil companies—BG Group, Tullow, Total, ENI, and Anadarko—have aggressively pursued prospects off Kenya, and operators appear more willing to drill commercial- sized oil prospects now that source rocks and oil-generation timing has been proven.

Will Anadarko drill again off Kenya? Perth-based Pancontinental Oil & Gas NL said in a June 2014 presentation that it would potentially re-enter Kenya offshore Block L8 in the second half of this year. The Kenyan government also granted the company a 12-month extension for the initial exploration period of the L10B license area. Ophir Energy, which holds a 90% inter- est in Block L9, had said it would drill a well in 3Q 2014, but in a June 2014 investor presentation, announced that it was pushed to 1H 2015. This may be related to the farm-out to FAR of 30%, subject to government approval. The prospect has P50 reserves of 190MMboe gross and 171 MMboe net.

FAR anticipates drilling a well in Block L6 at the end of 1Q 2015.

Afrin (EAX) is preparing to drill two wells in 2015 in Blocks L17/L18.

Ultra-deepwater Block L26 is not currently under license. Edgo Energy, the exploration unit of Jordan's Edgo, and joint venture partner Qatar First Bank relinquished the block in January 2013. Mazen Masri, managing director of Edgo, cited the technical and monetary challenges of drilling in water depths beyond 1500m, and also mentioned that the block is subject to a maritime border dispute, claimed by both Kenya and Somalia.

Kenya offshore interests

Blocks with planned drilling are shaded

Offshore Block	Acreage	Ownership	Status
L4	7510sq km	Zarara Oil & Gas Ltd. 75%, SOHI Gas 25%	Predominantly onshore block
L5	8735sq km	Anadarko 50% Total 40%, PTTEP 10%	Territory partially claimed by Somalia
L6	5010sq km (3134sq km offshore)	FAR Ltd. 60% Pancontinental 40% (offshore shares)	Undrilled, shallow water coastal block. Ophir farmout to Miko International.
L7	6944sq km	Anadarko 50% Total 40%, PTTEP 10%	Kubwa well, May 2013 – oil shows
L8	5123sq km	Apache 50% Origin Energy 20% Pancontinental 15% Tullow Oil 15%	Mbawa-1 gas discovery, Sept. 2012
L9	5100sq km	Ophir Energy 90% FAR Ltd. 10% (will increase to 30% subject to gov't approval)	Simba-1 well drilled 1978. Will drill a DW well in H1 2015. WD to 1400m.
L10A	4962sq km	BG Group 50% PTTEP 31.25% Pancontinental 18.75%	Sunbird-1 oil, gas discovery, March 2014, 723m WD.
L10B	5585sq km	BG Group 45% Pancontinental 20% PTTEP 15%	
L11A	5009sq km	Anadarko 50% Total 40%, PTTEP 10%	
L11B	4963sq km	Anadarko 50% Total 40%, PTTEP 10%	Kiboko well P&A Sept. 2013
L12		Anadarko 50% Total 40%, PTTEP 10%	
L13	3000sq km	Zarara Oil & Gas Ltd. 75%, SOHI Gas 25%	Territory claimed by Somalia
L15	2331sq km		Kofia-1 well drilled in 1985. Relinquished by Ophir Energy in 2013.
L16	5027sq km	Camac Energy Gov't Kenya	
L17	1259sq km	Afren/EAX	
L18	3583sq km	Afren/EAX	
L21		ENI	Territory claimed by Somalia
L22	10,000+sq km	Total	Territory claimed by Somalia
L23		ENI	Territory claimed by Somalia
L24		ENI	Territory claimed by Somalia
L25			Territory claimed by Somalia
L26		OPEN (Edgo Energy, Qatar First Investment Bank)	Territory claimed by Somalia
L27		CAMAC Energy Gov't Kenya	
L28		CAMAC Energy Gov't Kenya	

NOCK

The National Oil Corp. of Kenya Ltd. (NOCK) is a state-owned company that was established in April 1981 to spearhead exploration.

A new Petroleum (Exploration & Production) Act was enacted in 1984, and revised in 1986, when royalties were replaced with production sharing con- tracts. Through 2012, most of Kenya's PSCs gave NOCK a 10% stake in production, raised to 25% in 2013, along with higher fees and new capital gains tax rules. Kenya's first competitive licensing round has been postponed to at least

4Q 2014, and GlobalData's sub-Saharan upstream analyst John Sisa said in May that the delay could benefit the country if additional discoveries are made in the interim.

Logistics

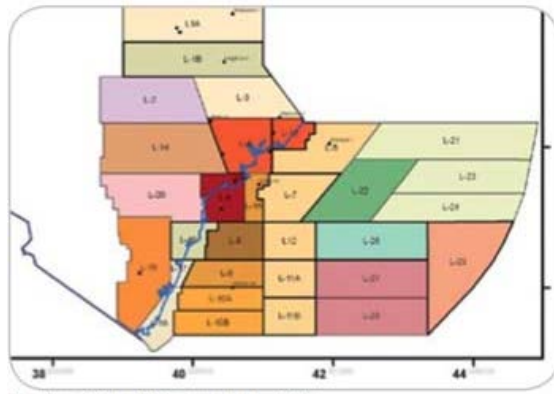
Adequate ports and docking facilities are still in short supply along the East African coast. The different types of vessels needed to support a robust exploration program require supply and repair

data over offshore blocks L5, L7, L12, L11A and L11B, fol- lowed by 3D seismic.

By December 2009, Origin Energy acquired 900sq km of 3D seismic over Block L8, using M/V Seisquest to tow eight streamers, 5100m long.

Afren, through its subsidiary EAX, acquired 460km of shallow-water and transition-zone 2D seismic over Blocks L17 and L18, completed in October 2010.

In 2011-2012, Ophir Energy acquired Dominion Petroleum for £118m (US$186million).



Kenya's coastal and offshore exploration blocks

In November 2011, BG began acquiring 3D seismic data in license areas L10A and L10B, followed by a 2D seismic sur- vey over the western area of the blocks (the Sunbird area).

In January 2012, Afren (EAX) completed acquisition of 1207km of 2D data in the deeper water portions of Blocks L17 and L18. In December 2012, it completed acquisition of 1006sq km of 3D data (in lieu of a well commitment), and the 3D was processed by July 2013.

In June 2012, Total signed a PSC for 100% of offshore license Block L22, with water depths of 2000m to 3500m. The first phase of exploration is 3D seismic acquisition.

In July 2012, PTT E&P Thailand agreed to a $1.93billion acquisition of Cove Energy, which had interests in several blocks offshore Kenya.

In 2012, Fugro-Geoteam AS completed the Kifaru 3D seismic survey including 778sq km over Block L6 for FAR Ltd. and Pancontinental. Fugro's Geo Caribbean seismic vessel stopped in Cape Town in May 2012.

Discoveries

Working oil and gas systems were only recently proven offshore Kenya, beginning with the Mbawa-1 well on the western side of Block L8. The well reached 2553m in September 2012 and encountered 51.8m net gas pay in porous Cretaceous sandstones. It was then drilled further to 3275m TD. Apache Corp. operates the license (50%) on behalf of partners Origin Energy (20%), Pancontinental (15%), and Tullow (15%). Apache's Exploration Director Angus McCoss said at the time: "A gas discovery on prognosis in the shallowest objective at Mbawa-1 is an encouraging start to our East African transform margin exploration campaign." However, the find was not commercial, although Apache said it would keep the option to re-enter the well open.

In April 2013, Anadarko announced that its Kubwa well in Block L7 was not commercial. The company's Senior Vice President for worldwide exploration Bob Daniels said, "The Kubwa well tested multiple play concepts and provided useful data regarding the prospectivity of our six-million-acre position offshore Kenya."

In October 2013, Apache relinquished its 50% stake in the L8 block, saying that gas volumes were not commercially viable.

Likewise, in December 2013, Britain's Premier Oil announced that it was with- drawing from Block L10A and relinquishing its 20% stake in the license. However, Premier retained its 25% share in neighboring Block L10B.

Pancontinental announced a small gas discovery in Block L8 in December. Pancontinental's finance director Ernest Myers said, "The well on its own may not currently be commercially viable, but could be when aggregated with other gas discoveries which may occur in the L8 or nearby blocks." On 6 January 2014, Pancontinental and BG spud the Sunbird-1 well with the Deepsea Metro-I drillship in 723m water depth, Block L10A, and drilled to 2850m, penetrating the top of the Sunbird Miocene

yards and berthing options.

The Kenya Ports Authority manages the Port of Mombasa, named Africa's fifth largest for container shipping in 2013, based on increased traffic after capacity expansion. In January, incoming KPA Chairman Danson Mungatana expressed his support for the development of small ports program and said the new commissioning of the standard gauge railway line would "revamp the transport sector and...support port efficiency."

Kenya is boosting existing port facilities with the construction of a $3.5billion Lamu port.

The Kenya Maritime Authority (KMA) was set up in June 2004 to provide regulatory oversight of the Kenyan marine industry. KMA implements international maritime conventions and promotes safety, security, maritime training, search and rescue, pollution prevention and the preservation of the marine environment. KMA's mandate, as stipulated in Kenya's KMA Act 2006, is "to regulate coordinate and oversee maritime affairs."

Roads connecting ports, airports, and other supply routes need to be bolstered to support the heavy loads, as well as move personnel.

The oil and gas industry along with emerging sectors of the economy and a growing middle class have boosted civil aviation needs in the region. The country's main airport is Jomo Kenyatta International (Nairobi), and there are smaller airports at Wilson, Mombasa, Eldoret, and Kisumu.

Bobby Bryan, Delta Airlines commer- cial manager for East Africa and West Africa, told the Discover Global Markets Conference in May that airports, aircraft, adequate fuel supplies and staff are nec- essary to service vessels and crews. Delta has an office in Nairobi and opened one in Dar es Salaam a year ago. It partners with KLM and Kenya Airways.

In a January 2013 report, Deloitte & Touche described Kenya's economy as "energy starved" and that may hamper rapid infrastructure development.

Security

Securing infrastructure, operations and personnel safety is a primary consideration. Given Kenya's proximity to Somalia and shared, but porous, maritime border, critical infrastructure – electric, gas, telecoms, transportation, water and food supplies – supporting the offshore industry may be a constant target.

Increasingly frequent terrorist attacks, some of which the Kenya National Disaster Operation Centre attributes to Somali militant groups, may negatively influence investment investments and possibly forestall exploration activity in Kenya.

Earlier this year, bomb and grenade attacks in Nairobi and the coastal city of Mombasa led the UK, US, France and Australia to issue travel warnings. As this issue goes to press, Somali militants attacked hotels and killed dozens in Mpeketoni, a coastal town in Kenya's Lamu County, another blow towards destabilizing the tourist economy.

With evolving threats, Kenyan govern- ment efforts to protect people and critical infrastructure must evolve as well, or the country risks losing petroleum investment.

The East Africa Oil & Gas Summit (EAOGS) will take place in Nairobi this October, and we'll see what a few months more will bring.

Published in OE: 2014 / July

Tagged under Kenya Africa offshore BG Group Odfjell Anadarko exploration east africa

Annex 121

World Bank, *Press Release: Kenya: New World Bank project will support country efforts to better manage oil and gas developments and revenues to invest in lasting growth and development* (24 July 2014)

PRESS RELEASE

Kenya: New World Bank project will support country efforts to better manage oil and gas developments and revenues to invest in lasting growth and development

July 24, 2014

WASHINGTON, July 24, 2014—The World Bank's Board of Executive Directors today approved US$50 million for the Government of Kenya to strengthen its capacity to manage the oil and gas sector and the distribution of its revenues to create sustainable growth across all areas of the country's economy.

With the recent discovery of oil, the International Development Association (IDA)* credit for the **Kenya Petroleum Technical Assistance Project (KEPTAP)** will focus on development measures to generate more private investment in the country's oil and gas industry, boost more efficient production, manage the impacts, allocate higher government oil and gas revenues for development priorities, and increase collaboration between the these extractives sectors and the domestic economy.

"The Government of Kenya acknowledges that the development of a successful petroleum sector is never about petroleum alone, but also about managing its impacts for sustainable development"," **said Diarietou Gaye, the World Bank's Country Director for Kenya.** *"The World Bank supports the government's efforts to streamline the petroleum sector to increase efficiency of decision-making related to policy formation, planning, investments, and private sector participation,"*

Successful implementation of the project will pave the way for economic growth and enhanced well-being for the people of Kenya, contributing to poverty reduction and shared prosperity. Transparency and good governance in oil contracts and revenue will be ensured through stronger collaboration between the national and county governments hosting the new petroleum resources and also with civil society organizations, private sector and local communities in these areas.

In order to help stimulate economic growth in Kenya, the project will promote petroleum activities to contribute to fiscal and foreign exchange revenues. It will also support entrepreneurial activities by improving the investment climate for the private sector and enhancing the oil and gas legal and institutional framework.

In addition the project will support the drafting of key policy and planning documents as well as capacity building among existing government institutions and clarification of their roles and responsibilities. There is significant emphasis on training so government staff is well equipped to deliver the expected outcomes. The project will also increase vocational training capacity for the oil and gas sector of Kenya therefore increasing the availability of trained staff to the private sector.

"The project supports effective government management of the oil and gas industry through capacity building, technical assistance, training programs, and the development of a legal and institutional

framework," **said Alexander Huurdeman, the World Bank Task Team Leader for the project.** *"We are excited for its implementation and the potential to create sustainable impacts for Kenya, including the development of a petroleum industry, improved transport infrastructure, expanded power supply, job creation, and positive economic benefits from strategic investment of the revenues generated.*

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PRESS RELEASE NO:
2015/045/AFR

Annex 122

John Gachiri, "National Oil, American firm finish survey of Lamu oil blocks", *Business Daily* (2 Dec. 2014)

BUSINESS DAILY

MONEY MARKETS

National Oil, American firm finish survey of Lamu oil blocks

Sumayya Hassan-Athmani, CEO National Oil Corporation of Kenya. Photo/FILE Nation Media Group

IN SUMMARY

- The survey has been going on for three months.
- The Energy ministry and National Oil also stand to recover some of the exploration costs by selling the data to other companies.

National Oil Corporation of Kenya and Schlumberger, a Houston-based firm, have finished carrying out seismic surveys on the Lamu offshore blocks with a view to estimating how much oil and gas Kenya's coastline may have.

The survey has been going on for three months.

National Oil chief executive Sumayya Hassan-Athmani said the data on blocks L21 to L28 will enable the Energy ministry and National Oil to draft better contracts with potential explorers.

"The availability and interpretation of such data by Kenya broadens and deepens the understanding of the offshore potential, which is necessary prior to negotiating an agreement with oil companies or operator," said Ms Hassan-Athmani.

National Oil contracted Schlumberger in April and the decision was made to jointly do the seismic surveys to share costs in the risky venture.

"The benefit of such an approach is that the costs of the survey are shared between the companies involved. This has the effect of reducing the exploration costs not only for companies but also for the government since such costs are recoverable if petroleum is discovered," said Ms Hassan-Athmani.

The Energy ministry and National Oil also stand to recover some of the exploration costs by selling the data to other companies.

Camac Energy, a US firm that is prospecting for oil on blocks L27 and L28, had earlier said it had acquired seismic data on the offshore blocks from Schlumberger.

"Further, Camac Energy acquired 2D seismic covering offshore Blocks L27 and L28 in March 2014. These survey results are currently being processed by WesternGeco, a division of Schlumberger," said the firm in September when it gave an update.

The data will then determine if additional work such as drilling will begin.

Camac has set aside Sh3 billion for drilling on its blocks, which also include L1B and L16 in Garissa County.

While most of the exploration work has been on the onshore blocks, catalysed by Tullow Oil which has struck a series of successful wells on its

northern Kenya blocks, there is growing interest in offshore blocks.

Tullow so far has drilled 11 wells out of which eight have been fruitful.

The UK firm plans to drill another eight by the end of 2015 but in the meantime it said that some locals will lose out on jobs as some of the activities are coming to an end.

But other people will be hired in the new areas where it plans to explore.

The firm employs between 2,000 and 2,500 employees in any given month.

Back to **Business Daily: National Oil, American firm finish survey of Lamu oil blocks**

Annex 123

IHS Inc., EDIN Database, *Kenya: Contracts Block L24* (2015)

IHS EDIN Database
Kenya: Contracts - Block L24

Contract Type	Production Sharing Cont	
Rights Type	Exploration/Production	
Award Date	02 October 2012	
Expiry Date	?	
Group Name	ENI	
Operator Name	Eni SpA	
Contract Status	Surface Exploration/Drilling	
Stage Numb	1	2
Start Date	2-Jul-2012	2-Oct-2012
End Date	2-Oct-2012	
Contract Stage Events	Contract Signature	Official Award
Contract Sqkm	10025.38	10025.38
Pct Of Original Area Remaining	100	100
Onshore Sqkm		
Shelf Sqkm		
Deep Water Sqkm	10025.38	10025.38

Annex 124

IHS Inc., EDIN Database, *Kenya: Contracts Block L26* (2015)

IHS EDIN Database
Kenya: Contracts - Block L26

Contract Type	Production Sharing Cont		
Rights Type	Exploration/Production		
Award Date	October 2012		
Expiry Date	28 January 2013		
Group Name	LAMU OG		
Operator Name	Lamu Oil and Gas Ltd		
Contract Status	Surface Exploration/Drilling		Expired/ Relinquished
Stage Numb	1	2	3
Start Date	5-Jul-2012	Oct-2012	28-Jan-2013
End Date	Oct-2012	28-Jan-2013	28-Jan-2013
Contract Stage Events	Contract Signature	Official Award	Relinquish-ment
Contract Sqkm	13063.92	13063.92	13063.92
Pct Of Original Area Remaining	100	100	100
Onshore Sqkm			
Shelf Sqkm			
Deep Water Sqkm	13063.92	13063.92	13063.92

Annex 125

Elayne Wangalwa, "World Bank approves US$50 million for Kenya's oil and gas sector", *CNBC Africa* (12 Feb. 2015)

World Bank approves US$50million for Kenya's oil and gas sector

Elayne Wangalwa

Last Updated: 12 February 2015|16:10 GMT

The World Bank has pledged to help Kenya strengthen its capacity to manage its oil and gas industry.

The bank approved 50 million US dollars for the Kenyan government to help the country with the distribution of its revenues to create a sustainable growth across all areas of the nation's economy.

"The government of Kenya acknowledges that the development of a successful petroleum sector is never about petroleum alone, but also about managing its impacts for sustainable development. The World Bank supports the government's efforts to streamline the petroleum sector to increase efficiency of decision-making related to policy formation, planning, investments, and private sector participation," Diarietou Gaye, the World Bank's Country Director for Kenya said.

This grant will see the East African country address challenges in the sector like uncertain regulatory framework, corruption and poor physical infrastructure. The bank is seeking to boost efficient production, manage the impacts, allocate higher government oil and gas revenues for development priorities, among others.

(READ MORE: **Future of the oil & gas boom of East Africa**)

Kenya's oil and gas discoveries have already registered an impressive record of a 60 per cent success rate. Nine out of 15 were discovery wells. The government is shelving proposals to have local content inclusions into the country's energy and mining bill by coming up with a legislation on local content before August 2015.

However, according to a recent report by, PwC on Africa Oil and Gas, delays in passing the Mining Bill, and the resulting regulatory uncertainty, could see the country lose billions of shillings in lost investment.

Kenya's oil and gas industry is nascent, and the World Bank's International Development Association, which helps poor countries by giving zero-interest loans and grants, will assist the Kenya Petroleum Technical Assistance Project (KEPTAP) focus on development measures to attract more private investment in the country's oil and gas sector.

(READ MORE: **Kenya's oil and gas sector shows impressive performance**)

Alexander Huurdeman, the World Bank Task Team Leader for the project said, "We are excited for its implementation and the potential to create sustainable impacts for Kenya, including the development of a petroleum industry, improved transport infrastructure, expanded power supply, job creation, and positive economic benefits from strategic investment of the revenues generated."

Annex 126

"Anadarko to Drill Play-Opening Deepwater Well in Kenya", *Oil & News Kenya* (3 Mar. 2015)

I. ANADARKO TO DRILL PLAY-OPENING DEEPWATER WELL IN KENYA

- March 3, 2015
- in Top News

Anadarko says it expects to drill its play-opening exploration deepwater well in Kenya in 2015 as part of nine to 12 deepwater exploration/appraisal wells planned for 2015 in various licenses including Colombia and Gulf of Mexico.

Anadarko which operates offshore blocks L5, L7, L12, L11A and L11B will be drilling any of the undrilled blocks having tasted of tough luck in the Kenya's part of the Indian Ocean.

Anadarko which operates the L7 Block with a 50-percent working interest has had an unlucky run in offshore Kenya after it struck non-commercial oil shows at the Kubwa well in early 2013.

The Kubwa well however confirmed a working hydrocarbon system within reservoir quality sands.

Co-venturers in the L-07 Block included Total E&P Kenya B.V. (40 percent) and PTT Exploration & Production Plc (10 percent).

"During 2015, we are confident in our ability to leverage our deep, high-quality portfolio of opportunities, strong balance sheet and efficient capital allocation to preserve value and maintain flexibility," said Anadarko Chairman, President and CEO Al Walker.

The start of exploration in East Africa comes even as the company announced it was reducing spending by about 33 percent this year in light of low crude oil prices with plans to cut U.S. onshore rig activity by 40 percent and defer about 125 onshore well completions in the Wattenberg field in Colorado, the Eagle Ford shale and Permian Basin in Texas.

Other than acreage in Kenya in East Africa Anadarko also has interest in Mozambique where it has discovered large volumes of natural gas and is continuing to progress its LNG project.

Annex 127

Tullow Oil plc, *Kenya exploration and appraisal update* (11 Mar. 2015)

TLW 372.60GBp 6.40p (1.75%) MARKET CAP (£b) 3.40

Kenya exploration and appraisal update

Published on: 11 MARCH 2015

Tullow Oil plc (Tullow) provides an update on exploration and appraisal activities in onshore Kenya Block 10BB, 13T and Block 10BA.

ENGOMO-1 EXPLORATION WELL

The Engomo-1 exploration well in Block 10BA was drilled to a total depth of 2,353 metres utilising the SMP-106 rig. The well encountered interbedded sandstones, siltstones and claystones but no significant oil or gas shows were encountered and the well has been plugged and abandoned. Engomo-1 was the first well drilled in the large North Turkana Basin and is located west of Lake Turkana where numerous naturally occurring oil slicks and seeps have been observed. Analysis is being focused on high-grading the remaining prospectivity in the basin. The SMP-106 rig will now be demobilized.

SOUTH LOKICHAR BASIN APPRAISAL ACTIVITY

Tullow is continuing its extensive exploration and appraisal programme in the South Lokichar Basin in Blocks 10BB and 13T, which has the joint objectives of proving reservoir quality and defining the resource estimates to ultimately progress the development of the discovered resources.

The SMP-5 rig recently installed well completions in Amosing-1 and Amosing-2A in preparation for an Extended Well Test (“EWT”) of the field and the rig has now been released. The EWT involves test production and injection to provide dynamic flow characterisation of the Amosing stacked oil reservoirs. Both wells have been completed in five zones with hydraulically controlled selective completions that permit independent tests of selected intervals without well intervention. Initial rig-less clean-up testing has been concluded on both wells with excellent results. The Amosing-1 well flowed at a combined maximum rate of 5,600 bopd from five zones and the Amosing-2A well flowed at a combined maximum rate of 6,000 bopd from four zones, the fifth zone being in the aquifer. Both wells demonstrated high quality reservoir sands and flowed 31 to 38o API dry oil under natural flow. Pressure data during the initial clean-up flows shows connectivity between the two completed wells in the upper three zones with further production testing required to test connectivity in the lower two zones. These findings support the static pressure data which indicated connectivity between the Amosing-1, 2, 2A and 3 wells in multiple zones. The Amosing EWT forward programme is to conduct longer-term oil flow and water injection tests, commencing mid-March with results expected in the second quarter of this year.

The PR Marriott 46 rig recently drilled the Ngamia-7 appraisal well to a final depth of 2,914 metres. The well was drilled to test the Ngamia oil field's eastern flank and was located 1,800 metres north-east of Ngamia-1 and 1,300 metres east of Ngamia-3. The well encountered up to 132 metres of net oil pay and has expanded the proven extent of the field. The well has now been suspended for future use. Static pressure data from the Ngamia-1, 3, 5, 6 and 7 wells supports connectivity between the wells at multiple reservoir horizons which will be tested with the planned Ngamia EWT.

Planning is also under way to conduct an EWT of the Ngamia field. The PR Marriott 46 rig, which is currently drilling the Amosing-4 well with a result expected in April, will mobilize back to the Ngamia field to drill and complete the Ngamia-8 well which will be the main producer for the EWT. Additionally, two of the existing suspended Ngamia wells will be completed as EWT wells. Initial flow testing of the Ngamia EWT wells is expected to commence around mid-year.

The Weatherford 804 rig is currently drilling the Ekales-2 appraisal well to test an eastern fault block on the structure and also test a deeper exploration objective within the Lokhone shale source rock that has tested oil elsewhere in the basin. The well is currently at a depth of 2,817 meters and has drilled through the primary objective and encountered 50 to 70 metres of potential net oil pay. Final results from the well should be available in April. Following completion of this well, the Weatherford 804 rig will be released.

Finally, the 3D seismic survey data set over along the western basin bounding fault discoveries has been processed and is being interpreted. These data already indicate significantly improved structural and stratigraphic definition and additional prospectivity not evident on the 2D seismic.

Tullow Operates Blocks 10BB, 13T and 10BA with 50% equity and is partnered by Africa Oil Corporation, also with 50%.

COMMENTING TODAY, ANGUS MCCOSS, EXPLORATION DIRECTOR, SAID:

“Whilst we would have hoped for basin opening success in the North Turkana Basin’s first wildcat well, Engomo-1, we still have a vast amount of undrilled acreage with identified prospects and leads providing significant remaining exploration potential.

“There is further good news from our appraisal programme in Northern Kenya where the Ngamia-7 well has successfully tested and extended the eastern flank area of the oil field. This result, and the promising initial flows from the Amosing oil field extended well test, give us further confidence in the size and scale of our two cornerstone fields for the development of the South Lokichar Basin. The results to date from Ekales-2 are also very encouraging and we are very pleased with the results from the 3D seismic survey which reveals there is important additional prospectivity in this exciting new oil province.”

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NOTES TO EDITORS

Tullow is a leading independent oil & gas, exploration and production group, quoted on the London, Irish and Ghanaian stock exchanges (symbol: TLW). The Group has interests in over 130 exploration and production licences across 22 countries which are managed as three regional business units: West & North Africa, South & East Africa and Europe, South America and Asia.

Annex 128

African Development Bank, Information Centre for the Extractives Sector (ICES), "Oil & Gas", *available at* http://ices.or.ke/sectors/oil-gas/ (last accessed 22 May 2015)

ices
INFORMATION CENTRE FOR THE EXTRACTIVES SECTOR

Inform • Connect • Transform

Oil & Gas

Of all the elements of the extractives industry in Kenya, oil is the most significant in terms of the size and value of deposits, and therefore its ability to contribute to Kenya's growth and development.

1. State of the Sector

Exploration for oil and gas in Kenya began in the 1950s, with the first well drilled in 1960. Shell and Kenol drilled ten wells in the Lamu basin but didn't find oil in commercially viable quantities. Subsequently, exploration continued at a low level, with only 33 wells drilled by 2012, none of which indicated commercially attractive quantities of oil or gas.

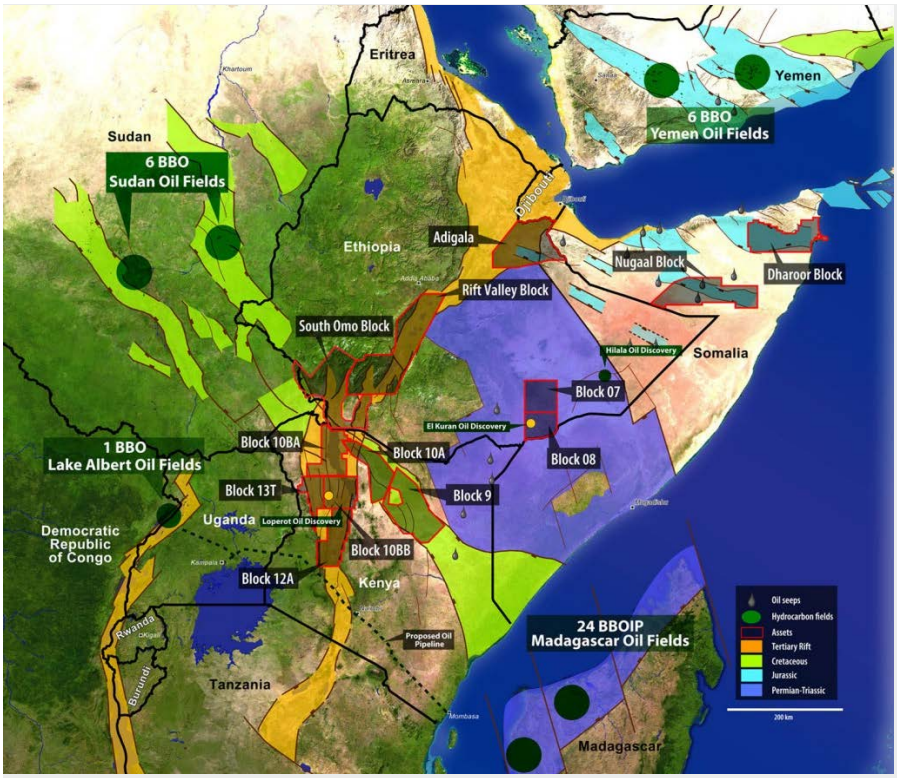
However, interest in Kenya increased after the discovery of large deposits of oil and gas in Mozambique, Uganda and Tanzania. In 2012, Tullow Oil, in partnership with Africa Oil and Marathon Oil began drilling in Turkana (in the Tertiary Rift Basin), and announced a discovery of an estimated 300 million barrels of oil. After drilling further exploration wells, Tullow announced in early 2014 that it had now identified c600 million barrels of oil.

As of September 2014, Ngamia area was reported to have the largest potential of 660 million barrels, followed by Amosing with 231, Agete well with 163 while Twiga has 142.

It is anticipated that reserves in the Tertiary Rift Basin will continue to rise after further exploration in the region has taken place – the Tertiary basin has 7 sub-basins (Lake Turkana, Lokichar, Lokitipi, Kerio South, Suguta Valley, Nyanza Trough and Magadi Trough. Exploration in the Mandera region is likely to result in further dramatic increases in the oil reserves. Africa Oil estimates that Lokichar and Mandera basins have a total of 2.9billion barrels of oil as of September 2014.

With oil currently priced at around $100 per barrel, Kenya's oil wealth is at present an estimated $290 billion.

It is not yet clear whether exploration in the Lamu basin (on and offshore) will result in significant gas finds, as in the case of Mozambique. However, the general trend is that from being a shadow on the global oil map, East Africa has in the past few years emerged as one of the hottest new regions, with Kenya destined to take its place among neighbouring countries.



2. Governance of the Sector

The legal framework for oil and gas in Kenya is currently the Petroleum (Exploration and Production) Act (1986). However, a draft Energy Policy and draft Energy Bill have been prepared and will replace the existing framework in due course.

The Ministry of Energy and Petroleum (MOEP) oversees both upstream oil and gas, downstream petroleum, electric power (including renewable energy and geothermal), as well as the coal sector. Coal and natural gas are a major part of MOEP's plans to increase power generation from the current 1,660MW to 5,000MW by 2016.

In addition, there are two inter-ministerial bodies that oversee the oil and gas sector. The "Inter-Ministerial Committee on the Policy and Legal Framework for Geology, Mining and Minerals" has the Ministry of Finance as its lead agency.

The National Fossil Fuels Advisory Committee (NAFFAC) is the licensing review body for oil and gas in Kenya. NAFFAC is led by the MOEP and includes NOCK, the Attorney General, NEMA, the Kenya Revenue Authority, the Ministry of Finance and the Petroleum Institute of East Africa (PIEA) as members.

3. Main Actors in the Sector

Tullow Oil is the most significant international oil company operating in Kenya in terms of acreage and market capitalization. Tullow holds the largest market value among Kenya's small oil players, at around $9.5 billion, followed by the two Canadian companies Africa Oil, with $2.5 billion, and Taipan Resources, with $23 million. Other companies involved in Kenya's upstream oil and gas sector at the moment are FAR, Afren, Marathon Oil, Total, Anadarko and PTTEP.

The National Oil Corporation of Kenya (NOCK) is the state-owned national oil company, which sits under Ministry of Energy. NOCK has historically focused on the downstream retail sector, but has a strategic focus on developing its mid and upstream reach. NOCK has had an exploration licence (Block 14T) since 2010.

The Petroleum Institute of East Africa (PIEA) was formed in 1999 and has until recently been the main professional body

for the oil industry in the region. PIEA includes the School of Petroleum Studies under its banner.

More recently, the Kenya Oil and Gas Association (KOGA) has been set up to focus on supporting private sector interests specifically in the upstream sector.

In terms of civil society, the Community Action for Nature Conservation (CANCO) has been involved in and pioneered oil and gas community, stakeholder engagement and advocacy since 2009. The Kenya Civil Society Platform on Oil and Gas has also recently been formed to support awareness and advocacy among civil society organisations and community groups in oil-affected regions.

4. Prospects and Issues

Tullow estimates that its production in Turkana could start as early as 2016, with the crude trucked by road and rail, though others, including the IMF, predict that more time will be needed. Flows through a planned pipeline to the coast (at Lamu) could begin by 2019. This means that revenue from the sector accruing to government could commence within the next two years.

There are a variety of issues and concerns that the rapid development of the oil sector in Kenya raises, such as:

- **Local content:** How can local companies benefit from supporting the sector, ensuring that "extractives enclaves" are avoided?
- **Community development:** How can some of the finite revenues from oil and gas be used to stimulate sustainable development?
- **Conflict prevention:** How does Kenya avoid oil production leading to conflict, as has happened elsewhere?
- **Environmental safeguarding:** How best can Kenya avoid pollution through oil spills, pipeline damage and gas flaring?
- **Corruption:** What measures can be put in place to ensure that revenues from oil are used effectively and efficiently for the benefit of all Kenya citizens, and therefore to avoid corruption and mismanagement

FIND OUT MORE ABOUT

MINING

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Petroleum Geo-Services, "Kenya-Lamu Basin PGS MultiClient2D", *available at* http://www.pgs.com/pageFolders/241891/kenya_lamu_mc2d_a3ds_0412_std.pdf (last accessed 8 June 2015)

Kenya-Lamu Basin PGS MultiClient 2D

Harrier Explorer - Acquisition Parameters

2D Acquisition

Acquisition Mode:	Single source, single streamer

Energy Source

Shot Interval:	37.5 m
Source Type:	Bolt 1900 LLXT
Air Pressure:	2000 psi
Volume:	3090 cuin
Strings per Array:	3
String Separation:	12.5 m
Source Depth:	6 m

Streamer

Streamer Length:	8100 m
Streamer Depth:	8 m
No. of Groups:	648
Group Interval:	12.5 m
Group Length:	12.5 m

Data Recording

Record Length:	12000 ms
Sampling Rate:	2 ms
Low-cut Filter:	4.6 Hz / 6 dB per octave
Hi-cut Filter:	206 Hz / 276 dB per octave
Format:	SEGD 8048

Navigation

Positioning System:	Veripos

2D Processing Parameters

Reformat:	SEGD to PGS internal format.
Trace / Shot Edit:	Bad traces and shots zeroed.
Resample:	To 4ms, incorporating anti-alias filter.
Low Cut Filter:	2.3 - 4.6Hz
High Cut Filter	100 – 125Hz
Designature:	To Zero Phase, incorporating debubble.
System Delay:	-58ms
Navigation/Seismic Merge:	
2D Geometry:	Apply 2D geometry.
Despike	
Swell Noise Attenuation:	Using SWOOP
Swell Noise Attenuation:	Low frequency noise modelled in FK domain and subtracted from data.
Linear Noise Attenuation:	Data modelled in Tau-p domain and subtracted from data.
SRME:	Surface Related Multiple Elimination.
Velocity Analysis:	Every 1km
Radon Demultiple:	Application from Water Bottom x 2
MDA:	Multiple Diffraction Attenuation.
PSTM:	Kirchoff Pre-Stack Time Migration Including 6th order NMO.
Velocity Analysis:	Every 1km.
Radon Demultiple:	Application from Water Bottom x 2
RMO Analysis:	Automatic Residual Moveout analysis.
Mutes:	Inner and outer trace mutes.
Gain:	Residual gain.
TVF:	Band pass filter.

10/04/12

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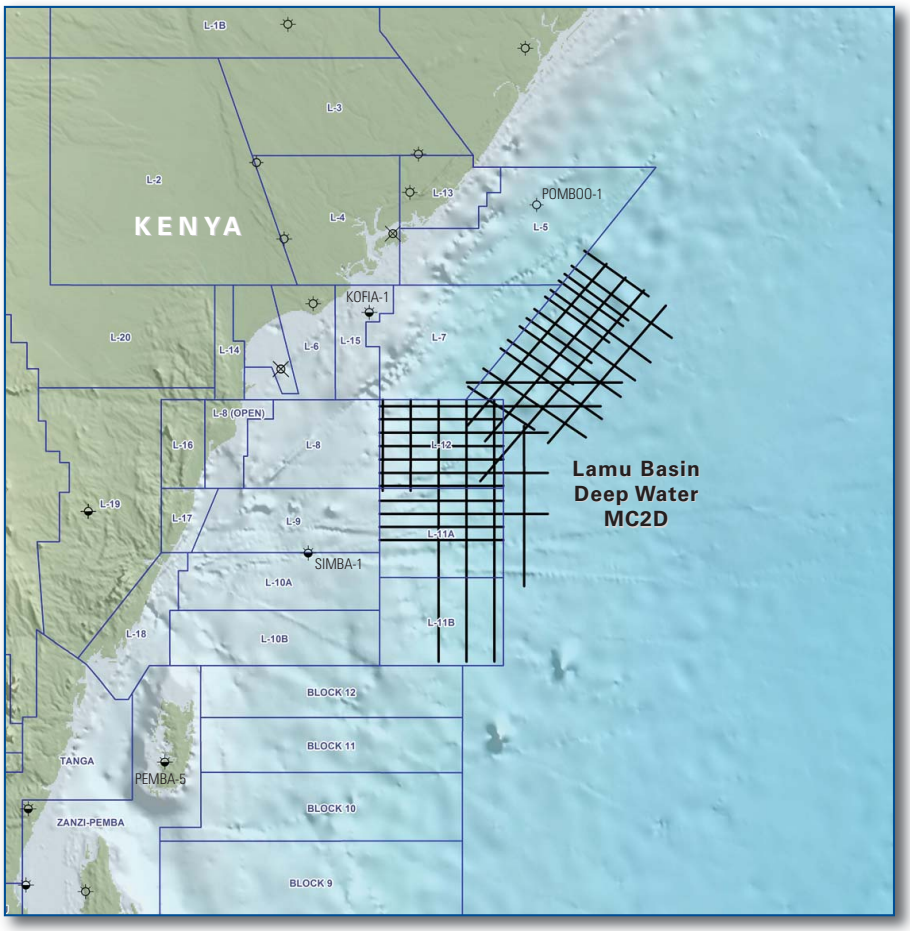
Kenya-Lamu Basin PGS MultiClient 2D

Offshore Lamu Basin: New insights on deepwater hydrocarbon prospectivity from the 2008 2D seismic data



PGS in association with the National Oil Corporation of Kenya have completed the acquisition of 3,400 km of non-exclusive 2D data in the Lamu Basin, offshore Kenya.

This dataset is the first major survey in the deepwater area of the basin and provides high quality modern imaging in an unexplored region.

It covers an area of around 27,000 sq.km in water depths up to 3,200m and was designed to highlight the untested prospectivity of this area.

National Oil

A Clearer Image
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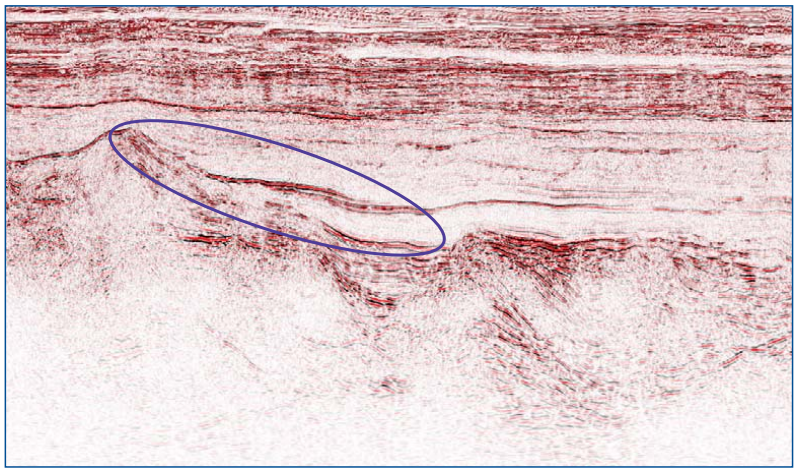
PGS

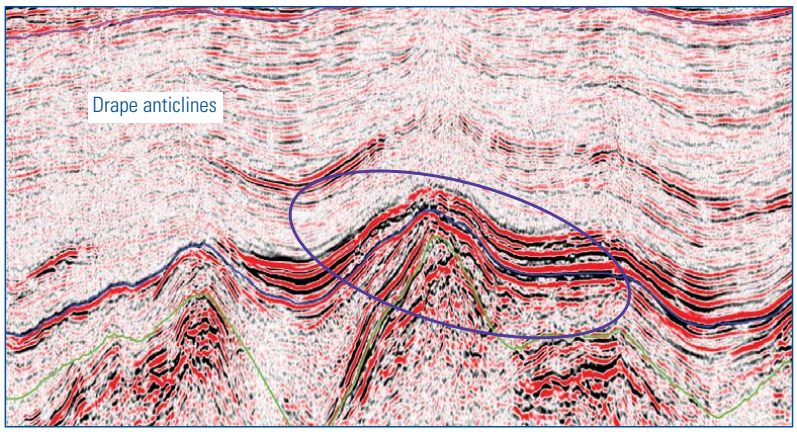
Kenya-Lamu Basin - PGS MultiClient 2D

Hydrocarbon Potential

The Lamu Basin represents part of an obliquely rifted passive margin and as such contains numerous extensional heel structures on the shelf and a related, gravity-driven, compressional toe thrust zone in the deepwater. Evidence of the oblique nature of the rifting is shown by reactivation of the extensional faults as transpressional flower structures which have a present day expression at the sea floor. A number of potential structural and stratigraphic plays have been identified in the deepwater areas where all play elements are expected to be present.

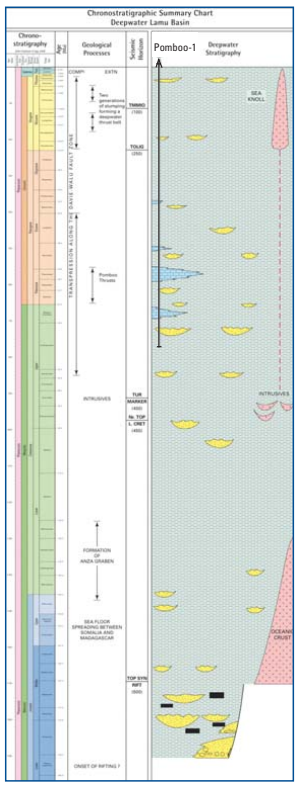


Onlap of bright sand-prone packages: Lower Cretaceous

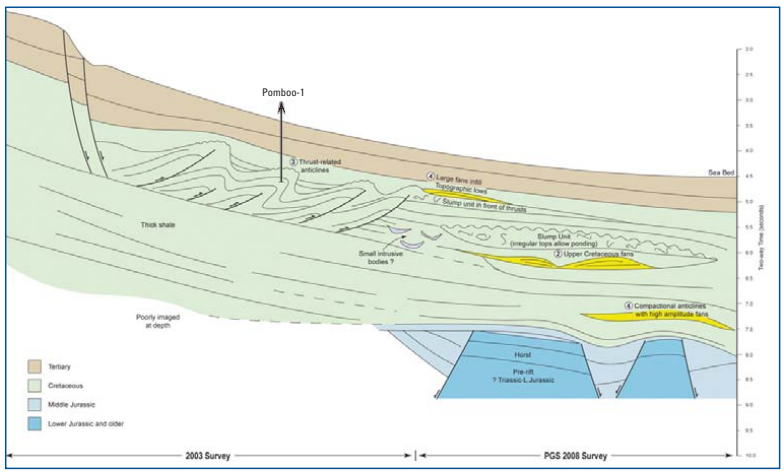


Bright potentially sand facies onlapping syn-rift/trangressional syn-rift highs

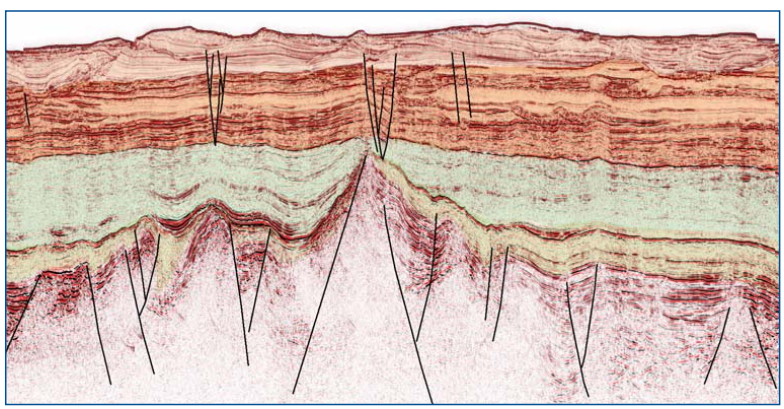
Pomboo-1 has proven the existence of Upper Cretaceous turbidite sands and high amplitude channel events can also be seen throughout this deepwater survey area. There are a number of trapping geometries evident at several levels on the deepwater lines, which remain to be tested. These include both tilted fault blocks, and compressional-related structures, along with stratigraphic plays in deepwater channels. Structures are sealed by shales, which biostratigraphic analyses show to be a deepwater facies.



Chronostratigraphic chart deepwater Lamu Basin showing Pomboo-1 well



Northern Deepwater Lamu Basin



Southern Lamu Basin: Tilted Fault Block

Annex 130

Schlumberger, "Multiclient Latest Projects: Kenya Deepwater 2D 2013 Multiclient Seismic Survey", *available at* http://www.multiclient.slb.com/en/latest-projects/africa/kenya_2d.aspx (last accessed 9 June 2015)

Multiclient Data Library

Multiclient Seismic Data Library

Latest Projects

Africa Seismic Surveys

Kenya Deepwater 2D 2013 Multiclient Seismic Survey

Tanzania Reprocessed 2D Seismic Surveys

Mozambique Seismic Survey

Angola Kwanza Basin Seismic Survey

Multiclient Latest Projects: Kenya Deepwater 2D 2013 Multiclient Seismic Survey

Overview <=""> | Data Library

While major discoveries have been made along the East African margin in recent years, the Lamu basin of Kenya remains underexplored. Covering both onshore and offshore, the Lamu basin forms part of the Kenyan passive continental margin.

Over the past few years, Schlumberger has developed several large acquisition and reprocessing projects in East Africa, including the introduction of 2D multiclient ObliQ sliding-notch broadband acquisition and imaging technique in 2013.

In Kenya, the ObliQ technique is bringing a new understanding of the deepwater offshore Lamu basin, imaging complex geological features and opening new avenues for exploration.

Available Now

Petrel E&P software platform and SEG-Y deliverables available now.

First insights into deepwater offshore geology with data covering open blocks L25, L26, L29, and L30.

Benefits

The benefits of broadband seismic technology can be seen in the clarification of impedance contrasts within the data, enabling easier differentiation of sedimentary packages that is vital in a previously unexplored and largely undrilled area. The additional low frequencies give the signal an envelope that enables lithological variations to be more easily distinguished and improves the correlation of horizons across faults. The improved low-frequency content also enables good imaging of deeper potential reservoirs.

Based on its study of the available data, Schlumberger and its partner, National Oil Corporation of Kenya (NOCK), are building a solid understanding of the basin and producing a new generation of fit-for-purpose products.

This 2D multiclient seismic survey covers the deepwater blocks offshore Kenya and provides new insights into the prospectivity of the Lamu basin. The data will be available for the upcoming licensing round.

Key facts

- Over 9,000 km of 2D broadband data acquired using the ObliQ technique, completed in March 2014.
- Tilted transverse isotropy (TTI) Kirchhoff prestack time migration (PSTM), completed in July 2014

Key highlights

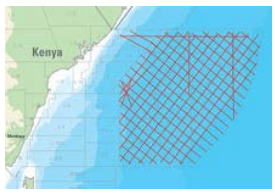
- 2D surface multiple prediction
- 2D anisotropic TTI Kirchhoff prestack time migration
- Spatially continuous velocity analysis
- Angle stacks and inversion-ready gathers
- Available initial geology report based on vintage data interpretation
- Improved resolution of complex geological features like channels, tilted blocks, and basin floor fans

Related services and products

- Marine Seismic Acquisition

Request More Information

Kenya High-Res Seismic Offers New Prospectivity Insights



View image

More than 9,000 km of high-res 2D multiclient seismic from Kenya's Deepwater Lamu basin.

1 of 3

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Seismic Acquisition

Survey Design & Modeling

Geophysical Processing & Characterization

Annex 131

Schlumberger, "Kenya Multiclient Seismic Surveys: 2D offshore data", *available at* http://www.multiclient.slb.com/africa/east-africa/kenya.aspx (last accessed 9 June 2015)

Multiclient Data Library

Multiclient Seismic Data Library

Africa

East Africa

Kenya

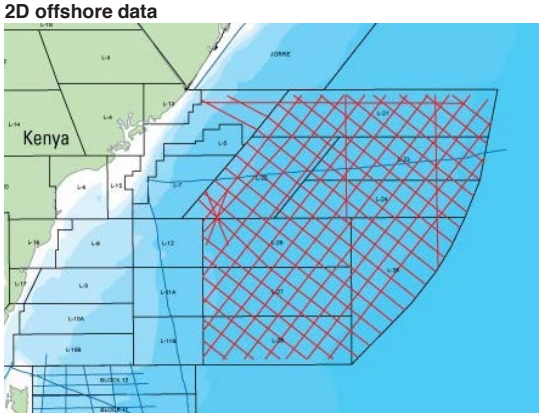
Mozambique

Somalia

Tanzania

Kenya Multiclient Seismic Surveys

2D offshore data



Our multiclient data library in Kenya contains over 10,000 km of 2D seismic data. We have extensive knowledge in this area having acquired the first multiclient seismic survey in Kenya in 1975, along with processing seismic data for this region in-house.

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Seismic Acquisition

Survey Design & Modeling

Geophysical Processing & Characterization

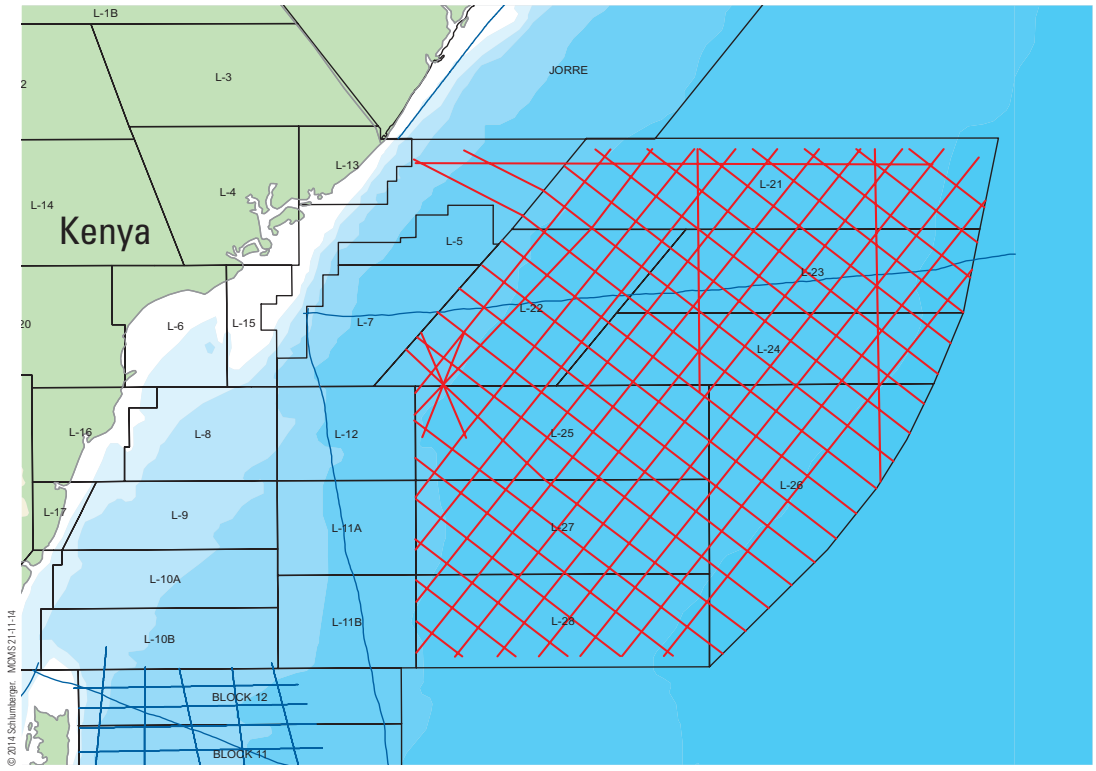
Annex 132

Schlumberger, "Kenya Multiclient Seismic Surveys Map", *available at* http://www.multiclient.slb.com/africa/east-africa/kenya.aspx (last accessed 9 June 2015)

Multiclient

Kenya

East Africa



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Annex 133

IHS Inc., EDIN Database, *Kenya: Contracts Block L-05/Block L05* (2015)

IHS EDIN Database
Kenya: Contracts - Block L-05/Block L05

Contract Type	Production Sharing Cont									
Rights Type	Explorat/Production									
Award Date	9-Oct-00									
Expiry Date	11-Jul-08									
Group Name	STAR PT		DANA 1		WOODSIDE 1		WOODSIDE 3			
Operator Name	Star Petroleum Int'l (Kenya) Ltd		Dana Petroleum (E&P) Ltd		Woodside Energy (Kenya) Pty Ltd					
Contract Status	Surface Exploration									
Stage Numb	1	2	3	4	5	6	7	8	9	10
Start Date	11-Jul-2000	9-Oct-2000	26-Apr-2001	22-Nov-2002	9-May-2003	9-Oct-2004	00-May-2005	20-Jul-2005	24-Aug-2006	28-Sep-2006
End Date	9-Oct-2000	26-Apr-2001	22-Nov-2002	9-May-2003	9-Oct-2004	00-May-2005	20-Jul-2005	24-Aug-2006	28-Sep-2006	13-Mar-2007
Contract Stage Events	Contract Signature	Official Award	Change of Operator~ New Interests	Company Acquisition	Change of Operator~ New Interests	Renewal/ Reduction	New Interests	Co Status & Name Chg	New Interests	New Interests
Contract Sqkm	11571	11571	11571	11571	11571	8648	8648	8648	8648	8648
Pct Of Original Area Remaining	100	100	100	100	100	75	75	75	75	75
Onshore Sqkm	1539	1539	1539	1539	1539					
Shelf Sqkm	2603	2603	2603	2603	2603	1236.5		1236.5	1236.5	1236.5
Deep Water Sqkm	7429	7429	7429	7429	7429	7411.5		7411.5	7411.5	7411.5

Annex 133

IHS EDIN Database
Kenya: Contracts - Block L-05/Block L05

Contract Type	Production Sharing Cont									
Rights Type	Explorat/Production									
Award Date	9-Oct-00		30-Jun-09							
Expiry Date	11-Jul-08		?							
Group Name	WOODSIDE 3		ANADARKO 1							
Operator Name	Woodside Energy (Kenya) Pty Ltd		Anadarko Petroleum Corp	Anadarko Kenya Co						
Contract Status	Surface Exploration	Expired/ Relinquished	Surf Expl/ Drilling							
Stage Numb	11	12	1	2	3	4	5	6	7	8
Start Date	13-Mar-2007	11-Jul-2008	00-Apr-2009	30-Jun-2009	13-Oct-2010	6-Oct-2011	30-Jun-2012	17-Aug-2012	5-Dec-2012	30-Jun-2014
End Date	11-Jul-2008	11-Jul-2008	30-Jun-2009	13-Oct-2010	6-Oct-2011	30-Jun-2012	17-Aug-2012	5-Dec-2012	30-Jun-2014	
Contract Stage Events	Valid Exten Granted	Expiry of Contract	Contract Signature	Official Award	New Interests	New Interests	Renewal/ Reduction	Co Shareholding Chge	Co Shareholding Chge	Renewal
Contract Sqkm	8648	8648	8735	8735	8735	8735	2352.43	2352.43	2352.43	2352.43
Pct Of Original Area Remaining	75	75	100	100	100	100	26.86	26.86	26.86	26.86
Onshore Sqkm										
Shelf Sqkm	1236.5	1236.5		1236.5	1236.5	1236.5				
Deep Water Sqkm	7411.5	7411.5	7498.5	7498.5	7498.5	7498.5	2352.43	2352.43	2352.43	2352.43

Annex 134

IHS Inc., EDIN Database, *Kenya: Contracts Block L-13* (2015)

IHS EDIN Database
Kenya: Contracts - Block L-13

Contract Type	Production Sharing Cont						
Rights Type	Exploration/Production						
Application Date	2007						
Award Date	3-Dec-2008	3-Dec-2008	3-Dec-2008	3-Dec-2008	3-Dec-2008	3-Dec-2008	3-Dec-2008
Expiry Date	?						
Group Name	SOHI DODR		ZARARA OG 2				
Operator Name	SOHI Gas-Dodori Ltd		Zarara Oil & Gas Ltd				
Contract Status	Surface Exploration/Drilling						
Stage Numb	2	3	4	5	6	7	8
Start Date	3-Sep-2008	3-Dec-2008	1-Jul-2011	3-Dec-2011	01 May 2012	3-Dec-2012	2013
End Date	3-Dec-2008	1-Jul-2011	3-Dec-2011	1-May-2012	3-Dec-2012	2013	?
Contract Stage Events	Contract Signature	Official Award	Change of Operator~ New Interests	Valid Exten Granted	Company Acquisition	Renewal	Area Change
Contract Sqkm	2905.66	2905.66	2905.66	2905.66	2905.66	2905.66	2178.45
Pct Of Original Area Remaining	100	100	100	100	100	100	74.97
Onshore Sqkm	1546.7	1546.7	1546.7	1546.7	1546.7	1546.7	1546.7
Shelf Sqkm	1315.8	1315.8	1315.8	1315.8	1315.8	1315.8	631.75
Deep Water Sqkm	43.16	43.16	43.16	43.16	43.16	43.16	

Annex 134

Annex 135

IHS Inc., EDIN Database, *Kenya: Contracts Block L21* (2015)

IHS EDIN Database
Kenya: Contracts - Block L21

Contract Type	Prod Sharing Cont	
Rights Type	Explorat/Production	
Award Date	02 October 2012	
Expiry Date	?	
Group Name	ENI	
Operator Name	Eni SpA	
Contract Status	Surf Expl/Drilling	
Stage Numb	1	2
Start Date	2-Jul-2012	2-Oct-2012
End Date	2-Oct-2012	
Contract Stage Events	Contract Signature	Official Award
Contract Sqkm	15303.21	15303.21
Pct Of Original Area Remaining	100	100
Onshore Sqkm		
Shelf Sqkm		
Deep Water Sqkm	15303.21	15303.21

Annex 136

IHS Inc., EDIN Database, *Kenya: Contracts Block L23* (2015)

IHS EDIN Database
Kenya: Contracts - Block L23

Contract Type	Production Sharing Cont	
Rights Type	Exploration/Production	
Award Date	2-Oct-12	
Expiry Date	?	
Group Name	ENI	
Operator Name	Eni SpA	
Contract Status	Surface Exploration/Drilling	
Stage Numb	1	2
Start Date	2-Jul-2012	2-Oct-2012
End Date	2-Oct-2012	
Contract Stage Events	Contract Signature	Official Award
Contract Sqkm	10305.73	10305.73
Pct Of Original Area Remaining	100	100
Onshore Sqkm		
Shelf Sqkm		
Deep Water Sqkm	10305.73	10305.73