

**INTERNATIONAL COURT OF JUSTICE**

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**CERTAIN ACTIVITIES CARRIED OUT BY NICARAGUA IN THE BORDER AREA**

**(COSTA RICA V. NICARAGUA)**

**REJOINDER OF THE REPUBLIC OF NICARAGUA**

**ON COMPENSATION**

**29 AUGUST 2017**



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## CHAPTER 1: INTRODUCTION

1.1 Pursuant to the Order of the Court dated 18 July 2017, which fixed the time limits for the filing of the Parties' Reply and Rejoinder in relation to compensation, Nicaragua respectfully submits this Rejoinder in response to Costa Rica's Reply of 8 August 2017.

1.2 Consistent with the Court's direction that the second round of written pleadings should briefly address "the sole question of the methodology adopted in the expert reports presented by the Parties in the Memorial and Counter-Memorial, respectively, on the question of compensation due in the present case," this Rejoinder consists of two Chapters, followed by Nicaragua's Submissions.

1.3 **Chapter 2**, following this Introduction, begins by refuting Costa Rica's contention that Nicaragua's valuation methodology, which follows the approach of the environmental claims panel of the United Nations Compensation Commission ("UNCC"), is outdated or has otherwise been superseded by the supposedly "new" so-called "benefits transfer" approach that Costa Rica favours. Contrary to Costa Rica's assertion, Nicaragua shows herein that the UNCC was aware of the methodology that is now favoured by Costa Rica, but chose not to apply it in light of its propensity to generate inaccurate results.

1.4 Costa Rica’s methodology has not become more reliable since the UNCC declined to use it. As the Conference of the Parties to the Convention on Biological Diversity observed in a report on valuation that it endorsed as recently as 2014, Costa Rica’s approach can be “wildly inaccurate when not used cautiously.”<sup>1</sup> For that reason, the UNCC’s methodology, which Nicaragua has adopted, continues to be accepted as international best practices for valuing environmental impacts.

1.5 The remainder of Chapter 2 demonstrates that nothing in the Reply refutes Nicaragua’s demonstration that Costa Rica’s approach to valuation suffers from numerous methodological flaws. These include, *inter alia*: Costa Rica’s claims for compensation for impairment of “soil formation/erosion control” and “natural hazards mitigation” even though these were not impacted by Nicaragua’s works; its refusal to recognize the recovery of the Disputed Area as a result of natural processes since Nicaragua’s works were completed; its improper valuation of impacts to the Disputed Area’s capacity to regulate greenhouse gases and air quality; and its claim for compensation for impacts that are erroneously said to last for 50 years.

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<sup>1</sup> Conference of the Parties to the Convention on Biological Diversity, Decision VIII/25: Incentive measures: application of tools for valuation of biodiversity and biodiversity resources and functions, UNEP/CBD/COP/DEC/VIII/25, 15 June 2006, Appendix (cited in Conference of the Parties to the Convention on Biological Diversity, Decision XII/14: Liability and redress in the context of paragraph 2 of Article 14 of the Convention, UNEP/CBD/COP/DEC/XII/14, 17 October 2014, para. 2(f)).



1.6 The flaws in Costa Rica’s approach to valuation, as set forth in the Reply, are further explained in two rebuttal expert reports annexed to this Rejoinder:

- An Expert Report co-authored by Professor Cymie Payne and Robert Unsworth, who served, respectively, as legal and technical advisors to the UNCC’s environmental claims panel, which responds to the methodological issues raised in the report that Costa Rica has presented by Fundación Neotrópica.<sup>2</sup>
- An Expert Report by Professor G. Mathias Kondolf of the University of California, Berkeley, which responds to the report that Costa Rica has presented by Professor Colin Thorne.<sup>3</sup>

1.7 The Rejoinder concludes with Nicaragua’s Submissions, to the effect that Costa Rica is entitled to no more than \$188,504 for material damages caused by the actions of Nicaragua that the Court adjudged to be wrongful.

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<sup>2</sup> Cymie R. Payne & Robert E. Unsworth, Report on Methodology for Valuing Environmental Damage Compensation (Second Report), 25 August 2017 (“Second Payne & Unsworth Report”). Nicaragua Rejoinder on Compensation (“NRC”), Annex 1.

<sup>3</sup> G. Mathias Kondolf, Response to “Review of the report by G.M. Kondolf PhD (Annex 2)” by Dr. Colin R. Thorne, 24 August 2017 (“Second Kondolf Report”). NRC, Annex 2.



## CHAPTER 2: THE METHODOLOGY FOR DETERMINING COMPENSATION

### I. Nicaragua's Valuation Methodology

2.1 As the Court recognized in its Order of 18 July 2017, the Parties, relying on their respective Expert Reports, have proposed different methodologies for valuing the compensation owed to Costa Rica for the works that Nicaragua carried out in the Disputed Area.

2.2 For Nicaragua, the proper methodology is the one that is routinely used by courts and tribunals—including the UNCC's environmental claims panel—to determine the appropriate amount of compensation owed for environmental harm. It has two components.

2.3 *First*, Costa Rica is entitled to compensation for “restoration costs.” This covers reimbursement for the costs that Costa Rica reasonably incurred while remediating the impacts of Nicaragua's works. The only remediation that Costa Rica has carried out is the construction of a dyke across the eastern 2013 caño, as recommended by the Ramsar Secretariat. No other remediation was suggested by Ramsar or is planned by Costa Rica. Costa Rica's remediation costs are thus

limited to amounts reasonably expended as part of the dyke-construction project, which are no greater than \$153,517.<sup>4</sup>

2.4 *Second*, Costa Rica is entitled to “replacement costs.” This provides compensation to replace the environmental services that either have been or may be lost prior to recovery of the impacted area. Consistent with standard valuation practice, the proper way to calculate this amount is by reference to the price that would need to be paid to preserve an equivalent area until the services provided by the impacted area have recovered. Here, that amount can be readily determined because a Costa Rican Government programme compensates landowners and communities to protect habitat at a rate of \$309/hectare/year.<sup>5</sup> Applying that rate over a 30-year period (longer than needed for the area to recover) to the 6.19 hectares that Costa Rica alleges were impacted by Nicaragua’s works results in an amount no greater than \$34,987.<sup>6</sup>

2.5 Reflecting this two-part methodology’s status as international best practices, the UNCC’s environmental claims panel employed it in compensating

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<sup>4</sup> See Nicaragua Counter-Memorial on Compensation (“NCMC”), paras. 4.36–4.38, 4.45; *see also* Cymie R. Payne & Robert E. Unsworth, Report on Environmental Damage Valuation, 26 May 2017 (“Payne & Unsworth Report (May 2017)”), p. 33, NCMC, Annex 1 (at p. 136).

<sup>5</sup> The above figures use 2017 dollars.

<sup>6</sup> See NCMC, paras. 4.41–4.44; *see also* Payne & Unsworth Report (May 2017), p. 34, NCMC, Annex 1 (at p. 137). The calculation takes the conservative step of replacing all ecological services provided by the impacted area for the entire 30 year period even though the area has already largely recovered. *See* Second Payne & Unsworth Report, pp. 6, 27 n.106. NRC, Annex 1.

Saudi Arabia for damage caused by Iraq to its coastal environment. In particular, the UNCC awarded Saudi Arabia both restoration costs and replacement costs. Restoration costs were “valued by the cost of a remediation plan tailored to the injured sites,” the purpose of which was to restore the coastal environment to its pre-injury state.<sup>7</sup> Because work to restore that environment was projected to take 25–40 years, the UNCC also awarded replacement costs to compensate Saudi Arabia for ecological services lost during that period.<sup>8</sup> The award of replacement costs was “valued by the cost of shoreline reserves that would provide additional ecological services to replace those that were lost.”<sup>9</sup>

2.6 This two-part methodology for valuing environmental impacts not only follows the approach of the UNCC, but is frequently employed by courts and tribunals in the domestic context. For instance, as explained in the Payne & Unsworth Report, the approach is integrated into United States and European Union environmental compensation regimes.<sup>10</sup>

2.7 Costa Rica’s Reply does not contest that Nicaragua’s approach is the one adopted by the UNCC, or that it is frequently used by domestic courts and

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<sup>7</sup> Payne & Unsworth Report (May 2017), p. 33, NCMC, Annex 1 (at p. 136); *see also ibid.* at p. 8, NCMC, Annex 1 (at p. 111).

<sup>8</sup> *Ibid.*, pp. 8–9, NCMC, Annex 1 (at pp. 136–37).

<sup>9</sup> *Ibid.*, p. 33, NCMC, Annex 1 (at p. 136); *see also* Second Payne & Unsworth Report, p. 16, NRC, Annex 1.

<sup>10</sup> Second Payne & Unsworth Report, pp. 1, 13. NRC, Annex 1.

tribunals. Costa Rica further accepts that this approach reflected the state-of-the-art in valuation as of the UNCC’s award of compensation in 2005, only 12 years ago.<sup>11</sup>

## II. Costa Rica’s Valuation Methodology

2.8 Notwithstanding the consensus that Nicaragua’s valuation methodology reflects best practices for determining compensation for harms caused to the environment, Costa Rica proposes that the Court use a different approach. In addition to claiming reimbursement of expenses incurred in constructing the dyke (and additional monies for certain other “restoration measures”),<sup>12</sup> Costa Rica demands nearly \$3 million (\$2,823,111.74) for the alleged “social cost” of Nicaragua’s works, *i.e.*, the loss of the estimated value of “ecosystem goods and services.”<sup>13</sup> Costa Rica derives this grossly inflated sum

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<sup>11</sup> Apart from erroneously contending that the replacement cost approach is no longer “up to date”—a claim that is refuted below—Costa Rica’s Reply makes only the barest of attempts to argue that cost estimates derived from that its habitat conservation programme should not be used to determine replacement costs. *See* CRRC, para. 2.14. As the Payne & Unsworth Report explains, none of the distinctions Costa Rica attempts to draw—for instance, that the programme was created to promote conservation, and that payments are made to private landowners—affect the suitability of using those cost estimates to determine replacement costs in the present case. Second Payne & Unsworth Report, pp. 32–33. NRC, Annex 1.

<sup>12</sup> *See* Monetary Valuation of the environmental damages arising from the construction of caños and clearing of trees and vegetation performed by the Government of Nicaragua in the Costa Rican territory on Isla Portillos, as required by the Judgment of the International Court of Justice of 16 December 2015 (“Fundación Neotrópica Report (June 2016)”), 3 June 2016, p. 61. Costa Rica Memorial on Compensation (“CRMC”), Vol. I, Annex 1.

<sup>13</sup> In particular, Costa Rica identifies six environmental services for which it claims compensation: standing timber; other raw materials; gas regulation; natural hazards mitigation; soil formation and erosion control; and biodiversity, in terms of habitat and nursery. CRMC, para. 3.16.

by making significant methodological errors, the most important of which are addressed below.

### **A. Costa Rica's Benefits Transfer Methodology**

2.9 Costa Rica accepts that the UNCC's environmental claims panel applied the valuation methodology that Nicaragua suggests should be followed here. Costa Rica also accepts that Nicaragua's approach reflected best practices in valuation when the UNCC made its compensation awards in 2005. The principal point of disagreement that divides the Parties is thus whether, since 2005, the methodology that the UNCC used for determining compensation for environmental harm has been displaced as best practices by the "benefits transfer" approach proposed by Costa Rica, which seeks to value the environmental services provided by the Disputed Area by reference to values assigned to such services in other places and in other contexts. Contrary to Costa Rica's attempts to suggest otherwise, there has been no such displacement.

2.10 There is no merit to Costa Rica's claim that "in more recent years, new methodologies have been developed," including the one that it asks the Court to employ, which "recognise the full and potentially long lasting extent of harm to the environment."<sup>14</sup> To try to substantiate that contention, Costa Rica argues:

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<sup>14</sup> Costa Rica Reply on Compensation ("CRRC"), para. 2.6.

Nicaragua relies essentially on the practice of the UNCC. This is problematic because the UNCC concluded its claims processing in 2005, i.e. the very year of publication of the main instrument bringing the “ecosystem services” approach and terminology into the mainstream – the Millennium Ecosystems Assessment. This instrument was considered favourably by the Conference of the Parties to the Convention on Biological Diversity in 2006.<sup>15</sup>

2.11 However, no such sea change in regard to determining compensation occurred with the publication of the Millennium Ecosystems Assessment (“MEA”). The MEA simply highlighted the importance and value of services that may be provided by the natural environment.<sup>16</sup> There was nothing novel in this. Indeed, the UNCC’s environmental claims panel took account of services provided by the environment and compensated claimants accordingly, using the same valuation methodology that Nicaragua has proposed here. As Payne & Unsworth explain, “the use of ecosystem services to analyze environmental harms in a remedy context was established long before 2005 and the UNCC assessed several claims that used it, making awards for some.”<sup>17</sup>

2.12 In accounting for lost environmental services in its awards of compensation, the UNCC declined to accept Costa Rica’s “benefits transfer” approach, even though asked to do so.<sup>18</sup> As explained in the Payne & Unsworth

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<sup>15</sup> *Ibid.*, para. 2.8 (citation omitted).

<sup>16</sup> Second Payne & Unsworth Report, pp. 11, 12, 16. NRC, Annex 1.

<sup>17</sup> *Ibid.*, p. 12.

<sup>18</sup> *Ibid.*, p. 14.



Report, “the UNCC reviewed and rejected the use of the benefits transfer methodology proposed by Iran” that used the same approach applied by Fundación Neotrópica in this case.<sup>19</sup> Their report further explains that the UNCC’s rejection of this approach was well-founded because the inaccuracy of benefits transfer had been clearly established.<sup>20</sup>

**i. Benefits Transfer Has Not Replaced the UNCC’s Methodology as Best Practices**

2.13 None of the reports cited by Costa Rica supports its claim that benefits transfer superseded the methodology used by the UNCC as best practices. For example, Costa Rica derives no assistance from *Decision XII/14 on Liability and redress in the context of paragraph 2 of Article 14 of the Convention*, which the Conferences of the Parties (“COP”) to the Convention on Biological Diversity adopted in 2014.<sup>21</sup> As Costa Rica observes, Decision XII/14 references a synthesis report that the Executive Secretary of the COP prepared in 2008; however, rather than endorsing the use of “benefits transfer,” it underscores the methodology’s unreliability.

2.14 In particular, the synthesis report states that while the benefits transfer approach may be a “comparatively inexpensive and fast method” for attempting to value environmental services, it “has been the *subject of*

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<sup>19</sup> *Ibid.*

<sup>20</sup> *Ibid.*

<sup>21</sup> CRRC, para. 2.10.

*considerable controversy in the economics literature, as it has often been used inappropriately.*<sup>22</sup> Significantly, the method is described as useful only for policy-making in circumstances where decision-makers may be “willing to trade quick and cheap numbers against a certain loss in accuracy, provided that minimum quality standards are met.”<sup>23</sup> This might occur where policymakers wish to obtain “at least an indication on whether the costs of proposed restoration measures are excessive when compared with the expected benefits of these measures.”<sup>24</sup> This cannot be an appropriate standard for a Court seeking to accurately calculate the compensation that is due from one State to another as a result of the former’s wrongful acts.

2.15 The limited utility of benefits transfer methodology is further confirmed by a report published in 2007 by the Secretariat of the Convention on Biological Diversity, entitled *An Exploration of Tools and Methodologies for Valuation of Biodiversity and Biological Diversity Resources and Functions*. After noting the “considerable controversy” over its use, the report observes that

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<sup>22</sup> Liability and Redress in the Context of Paragraph 2 of Article 14 of the Convention on Biological Diversity, Synthesis report on technical information relating to damage to biological diversity and approaches to valuation and restoration of damage to biological diversity, as well as information on national/domestic measures and experiences, UNEP/CBD/COP/9/20/Add.1, 20 March 2008, para. 136 (emphasis added).

<sup>23</sup> *Ibid.*

<sup>24</sup> *Ibid.*

benefits transfer might be appropriate where “decision makers request . . . quick (but not necessarily final) answers from administrators.”<sup>25</sup>

2.16 The unreliability of benefits transfer for compensation purposes is still further confirmed by another report referenced in COP Decision XII/14 that addresses “[t]ools for ecological valuation.”<sup>26</sup> There, it is warned that the methodology “[c]an be *wildly inaccurate* when not used cautiously, as many factors may still vary even when cases seem ‘similar.’”<sup>27</sup> The report observes that its use might be “applicable in cases where savings in time and costs outweigh certain loss of accuracy (e.g., rapid assessments).”<sup>28</sup> There is no suggestion that benefits transfer is an appropriate, or sufficiently accurate, method of valuation that makes it suitable for use by courts or tribunals in fixing compensation for specific ecological harms.

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<sup>25</sup> Secretariat of the Convention on Biological Diversity, *An Exploration of Tools and Methodologies for Valuation of Biodiversity and Biodiversity Resources and Functions*, CBD Technical Series No. 28, 2007, pp. 20, 21.

<sup>26</sup> Conference of the Parties to the Convention on Biological Diversity, Decision XII/14: Liability and redress in the context of paragraph 2 of Article 14 of the Convention, UNEP/CBD/COP/DEC/XII/14, 17 October 2014, para. 2(f) (citing Conference of the Parties to the Convention on Biological Diversity, Decision VIII/25: Incentive measures: application of tools for valuation of biodiversity and biodiversity resources and functions, UNEP/CBD/COP/DEC/VIII/25, 15 June 2006, Appendix).

<sup>27</sup> CBD COP Decision VIII/25, Appendix (at p. 8) (emphasis added).

<sup>28</sup> *Ibid.*

2.17 In fact, none of the COP reports described above suggest that the benefits transfer methodology is appropriate for calculating environmental damages.

**ii. Domestic Courts Do Not Use Benefits Transfer Methodology**

2.18 The Reply does not deny that domestic regimes eschew the benefits transfer approach. As Nicaragua pointed out in the Counter-Memorial, the 2016 edition of the *Federal Resources Management and Ecosystem Services Guidebook*, which was prepared with the support of the U.S. Environmental Protection Agency in coordination with numerous governmental and non-governmental stakeholders, cautions that the approach applied by Costa Rica is “expected to generate large errors or invalid estimates” as a result of “incorrect aggregation of marginal values, failure to account for spatial connections between ecosystems and their human beneficiaries and their change over time, and other generalization errors.”<sup>29</sup> The Reply offers no rebuttal.

2.19 Since Costa Rica cannot point to examples where its benefits transfer methodology has been used by the courts of other countries to value ecological damages, it invokes its own domestic practice. However, the only discussion of benefits transfer in the materials submitted with the Reply appears in

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<sup>29</sup> See NCMC, para 4.11; see also Payne & Unsworth Report (May 2017), p. 20, NCMC, Annex 1 (at p. 123) (quoting National Ecosystem Services Partnership (NESP), *Federal Resource Management and Ecosystem Services Guidebook* (2nd Ed., 2016), available at <https://nespguidebook.com> (last visited 26 May 2017)).

a letter from Costa Rican researchers who describe an ongoing “research project” that is attempting to use the approach to value ecological services that are provided by wetlands in Costa Rica.<sup>30</sup> But this project is intended to “facilitate the implementation of various policy measures such as the national wetland policy.”<sup>31</sup> It thus provides no support for using benefits transfer to calculate compensation, as Costa Rica seeks to do here.<sup>32</sup>

2.20 The Reply’s remaining discussion of Costa Rican domestic practice concerns the fact that courts in Costa Rica sometimes apply what is referred to as the “IPS Methodology,” so named because it was developed by Costa Rica’s *Instituto de Políticas para la Sostenibilidad* (Institute of Sustainable Policy). However, there is no indication that IPS Methodology would permit, much less require, the use of the benefits transfer methodology, and none of the letters from persons familiar with it indicates that the approach would be appropriate here, or that it would be accepted by Costa Rican courts in these circumstances.

### **iii. Letters from Non-Costa Ricans Included with the Reply**

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<sup>30</sup> Report by Fundación Neotrópica on the Question of the Methodology for the Assessment of Environmental Damage, 3 Aug. 2017 (“Second Fundación Neotrópica Report”), Appendix 3: Note from Dr. Moreno & Dr. Olman Segura, July 20, 2017, p. 54. CRRRC, Annex 1 (at p. 84).

<sup>31</sup> *Ibid.*, p. 55.

<sup>32</sup> Moreover, the letter’s authors agree that benefits transfer “is generally used when there are budget limitations and/or time is limited to carry out a detailed study and what is needed is a measure of benefits.” *Ibid.*

2.21 In the Counter-Memorial, Nicaragua observed that the unconventional nature of Costa Rica’s valuation methodology is underscored by Costa Rica’s exclusive reliance on a report by Fundación Neotrópica, a Costa Rican non-governmental organization, and hardly an unbiased source. The Memorial was conspicuous for the absence of any non-Costa Rican sources.<sup>33</sup> Costa Rica’s response to this deficiency in its proof is to present letters from two non-Costa Rican sources as part of its Reply. Both, however, confirm that those who endorse benefits transfer methodology to assess compensation are outside the mainstream.<sup>34</sup>

2.22 The first letter is from Joshua Farley, a professor at the University of Vermont, who urges the Court to *punish* Nicaragua for what he calls its “*criminal act*.”<sup>35</sup> In particular, Professor Farley opines that, although “[i]n Civil Court cases the goal of justice is typically to make the victim whole . . . [i]n criminal cases . . . the goal is often to deter future transgressions by penalizing the transgressor.”<sup>36</sup> He then states: “In my view, the environmental destruction in question was a criminal act, and it would be more efficient to err on the side of

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<sup>33</sup> See NCMC, para. 4.3.

<sup>34</sup> Indeed, the report by Fundación Neotrópica annexed to the Reply makes plain that its misguided approach to valuation must be understood in the context of the organization’s description of itself as having a “pioneering tradition” and a “focus[] on the application of innovative fields of work, scientific thought and research.” Second Fundación Neotrópica Report, p. 7. CRRC, Annex 1 (at p. 37).

<sup>35</sup> Second Fundación Neotrópica Report, Appendix 11: Note from Dr. Joshua Farley, 1 Aug. 2017, p. 107 (emphasis added). CRRC, Annex 1 (at p. 137).

<sup>36</sup> *Ibid.*

excessive payment rather than underpayment.”<sup>37</sup> This hardly helps Costa Rica’s case. To the contrary, it demonstrates the weakness of that case. Nicaragua has not been found guilty of any criminal acts. Nor is it the Court’s role to exact punishment. There is thus no justification for what Professor Farley himself calls the “excessive payment” sought by Costa Rica.

2.23 Costa Rica’s other letter is from an organization called “Earth Economics.”<sup>38</sup> However, since its Advisory Board includes the principal author of the Fundación Neotrópica report,<sup>39</sup> it does not constitute an independent appraisal of Fundación Neotrópica’s work. Moreover, the tenor of the report betrays the same sort of bias as that of Professor Farley: Nicaragua is again to be punished as a criminal, as if it were guilty of a “house invasion and robbery.” In any event, Earth Economics betrays a decidedly unconventional approach to valuation, going so far as to contend that Costa Rica is entitled to much *more* compensation than the nearly \$3 million it has claimed in environmental damages, and even *more* than that recommended by Fundación Neotrópica:

Many Costa Ricans were harmed by this illegal invasion and destruction of this national treasure, just as a house invasion and robbery damages the family who has been robbed. This value has

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<sup>37</sup> *Ibid.*

<sup>38</sup> Second Fundación Neotrópica Report, Appendix 6: Note from David Batker – Earth Economics, 28 July 2017, p. 69. CRRC, Annex 1 (at p. 99).

<sup>39</sup> See Earth Economics, Advisory Group (listing Bernardo Aguilar-González as an Ecosystem Valuation Toolkit Advisor), available at <http://www.eartheconomics.org/advisory-group/> (last visited 22 Aug. 2017).

not been accounted for and the Court should take into account this significant damage. Based on my experience with environmental damages, this value alone would be at least as large as or larger than the market and ecosystem service damages estimated by Neotropica.<sup>40</sup>

2.24 The rest of the correspondence appended to the Reply provides no greater help. One is a single-page letter from Professor Robert Costanza,<sup>41</sup> which is limited to responding to Nicaragua’s observation in the Counter-Memorial that a paper he co-authored did not include valuation of damages as one of the uses of environmental services valuation.<sup>42</sup> Professor Costanza concedes that his paper did not mention damages valuation among the seven different uses that it references, suggesting that it does not number among its most obvious uses.<sup>43</sup> His letter simply notes that the list “does not explicitly exclude damage valuation as one of the applications.”<sup>44</sup> Professor Costanza conspicuously does *not* endorse any aspect of Costa Rica’s proposed valuation, or otherwise suggest that there are any errors in the approach followed by Nicaragua.

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<sup>40</sup> Second Fundación Neotrópica Report, Appendix 6: Note from David Batker – Earth Economics, 28 July 2017, p. 71. CRRC, Annex 1 (at p. 101).

<sup>41</sup> Second Fundación Neotrópica Report, Appendix 1: Note from Dr. Robert Costanza, 26 July 2017, p. 49. CRRC, Annex 1 (at p. 79).

<sup>42</sup> *Ibid.*

<sup>43</sup> *Ibid.*

<sup>44</sup> Professor Costanza further states that it “can be thought of as one type of ‘policy analysis’, which is included in the list.” *Ibid.*



2.25 Costa Rica likewise derives no assistance from the page-and-a-half letter from Rudolf de Groot of Wageningen University, who appears not to have reviewed the relevant expert reports.<sup>45</sup> He only references correspondence from Costa Rica’s Deputy Minister of Foreign Affairs, and does not indicate having received, or read, either the Fundación Neotrópica or Payne & Unsworth reports.<sup>46</sup> The language Dr. de Groot quotes for his understanding of the position set out in the Payne & Unsworth Report does *not* appear there, which suggests he is relying on the Costa Rican Deputy Foreign Minister’s characterization of that Report rather than the Report itself.<sup>47</sup> Regardless, Dr. de Groot confirms the limitations of Costa Rica’s approach, which he observes is “very time and context dependent and therefore *subject to much uncertainty*.”<sup>48</sup> For that reason, he cautions that it “*should be used with care*.”<sup>49</sup>

## **B. Erroneous Assumptions Regarding “Environmental Services”**

2.26 Nicaragua showed in the Counter-Memorial that Costa Rica seeks compensation for alleged impacts to “soil formation/erosion control” and “natural

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<sup>45</sup> Second Fundación Neotrópica Report, Appendix 2: Note from Dr. Rudolf de Groot, 28 July 2017, p. 50. CRRC, Annex 1 (at p. 80).

<sup>46</sup> Further revealing his lack of familiarity with the underlying facts, he refers to “Coastal Wetlands” as a category of ecosystems that he can merely “*assume* are at stake in his dispute.” *Ibid.* (emphasis added).

<sup>47</sup> For example, Dr. de Groot’s letter purports to respond to a statement that the “ES-approach is not robust enough for calculating the costs of ecosystem loss.” *Ibid.* That quoted language does not appear in the Payne & Unsworth Report or elsewhere in the materials submitted by Nicaragua.

<sup>48</sup> *Ibid.*, p. 51 (emphasis added).

<sup>49</sup> *Ibid.* (emphasis added).

hazards mitigation,” even though there is no evidence that Nicaragua’s works have impaired either.<sup>50</sup> Costa Rica’s Reply belatedly tries to remedy its failure to present such evidence by annexing a report by Professor Colin Thorne. His report, however, does not discuss valuation methodology, as required by the Order of 18 July 2017. Indeed, Professor Thorne previously testified that he is not competent to give expert testimony on that issue when, in response to a question from the Court, he admitted: “I am not an expert in the valuation of ecological goods and services.”<sup>51</sup> It is thus unsurprising that nothing in Professor Thorne’s report substantiates Costa Rica’s claim to be entitled to nearly \$1.2 million in compensation for alleged impacts to “soil formation/erosion control” and “natural hazards mitigation.”<sup>52</sup>

**i. Alleged Impacts to “Soil Formation/Erosion Control”**

2.27 “Soil formation” and “erosion control” have well-understood definitions in the scientific literature. As Professor Kondolf explains, soil formation means “the processes by which soil is formed over time”; erosion control refers to “conditions or practices that prevent erosion or reduce its rate.”<sup>53</sup>

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<sup>50</sup> See NCMC, paras. 4.17–4.22.

<sup>51</sup> Hearing on Merits, CR 2015/3, p. 40 (Thorne).

<sup>52</sup> See Payne & Unsworth Report (May 2017), p. 32 (Exhibit 1). NCMC, Annex 1 (at p. 135).

<sup>53</sup> Second Kondolf Report, p. 1. NRC, Annex 2.

2.28 Neither the Reply nor Professor Thorne’s report disputes the facts that are most relevant to whether these services have been harmed, namely that, as expected in a tropical zone of deposition which continuously receives huge amounts of fertile sediment from upstream, the caños rapidly re-filled and are now covered with vegetation.<sup>54</sup> As such, soil formation and erosion control are simply non-issues.<sup>55</sup>

2.29 Contrary to Professor Thorne’s attempt to suggest otherwise, there is no evidence on which to conclude that the material which has re-filled the caños differs in any meaningful way from the material that was displaced by Nicaragua’s works. Professor Kondolf explains that the land on which the caños are located was “also formed through a process of alluvial deposition,” and that there is “no reason to expect the material recently deposited in the caños to be substantively different from that deposited in the past.”<sup>56</sup>

2.30 Costa Rica has presented no data or other evidence from the Disputed Area that proves there are any significant differences. This is a conspicuous omission given that Costa Rica enjoys exclusive access to the Disputed Area and maintains a monitoring station nearby.<sup>57</sup> It thus would have

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<sup>54</sup> *Ibid.*, p. 1.

<sup>55</sup> *Ibid.*, pp. 1–2.

<sup>56</sup> *Ibid.*, pp. 2–3.

<sup>57</sup> See CRMC, para. 3.29(f)–(k) (describing the construction and operation of a monitoring station near the Disputed Area, for which Costa Rica seeks compensation).

been easy for Costa Rica to sample the material that was deposited in the caños and compare its composition to material in adjacent areas. Professor Thorne himself states that one should “collect[] technical data (for example, measurements defining the properties of sediments infilling the caños),” and then analyze the data “to come to a view regarding the degree to which conditions in the areas excavated and cleared by Nicaragua have recovered.”<sup>58</sup> Costa Rica, however, has presented no such information for the Court to consider.

2.31 Nor has Costa Rica presented evidence that erosion has increased, let alone that any such increase is due to Nicaragua’s works. There is no satellite imagery or aerial photography documenting changes to the Disputed Area since the works were completed. This is another striking omission in light of the fact that Costa Rica regularly conducts overflights and obtains satellite images.<sup>59</sup>

2.32 Unable to point to evidence of impacts to “soil formation/erosion control,” as those terms are generally understood, Professor Thorne’s report focuses on “soil biology, especially microbiology.”<sup>60</sup> This, however, pertains to such services as “nutrient cycling,” “pest and disease control,” and the “regulation

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<sup>58</sup> Prof. Colin R. Thorne, Review of the report by G.M. Kondolf Phd, 28 July 2017 (“Thorne Report (July 2017)”), p. 3. CRRC, Annex 2 (at p. 167).

<sup>59</sup> See CRMC, paras. 3.24(a)–(d), 3.29(a), 3.29(l)–(m) (describing Costa Rica’s overflights of the Disputed Area and purchase of satellite imagery, for which it seeks compensation).

<sup>60</sup> Thorne Report (July 2017), pp. 9–12. CRRC, Annex 2 (at pp. 173–76).

of . . . wastes,”<sup>61</sup> which were not considered by Fundación Neotrópica in the report annexed to the Memorial as constituting “soil formation/erosion control.”<sup>62</sup> Indeed, Fundación Neotrópica *excluded* them from its valuation precisely because it lacked supporting evidence, concluding that it is “impossible to estimate the[ir] value.”<sup>63</sup> Professor Thorne does not purport to have obtained or reviewed any such evidence.

2.33 Finally, the Reply makes clear that Costa Rica’s valuation of alleged impacts to “soil formation/erosion control” is based on the cost to replace the soil that was excavated from the caños.<sup>64</sup> However, neither Costa Rica nor Ramsar has recommended that the material which currently fills the caños be removed and replaced with different material. Certainly, no such plan has been presented to the Court. There is thus no basis whatsoever for awarding Costa Rica the cost of doing so.<sup>65</sup>

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<sup>61</sup> See Second Kondolf Report, p. 2. NRC, Annex 2.

<sup>62</sup> See Fundación Neotrópica Report (Jun. 2016), Tables 3, 4, 5, 8, 9, 11. CRMC, Vol. I, Annex 1 (at pp. 103, 110–111, 113–114, 129–130, 132, 134).

<sup>63</sup> *Ibid.*, p. 46. CRMC, Vol. I, Annex 1 (at p. 132).

<sup>64</sup> See *ibid.*, p. 53 (“Regarding the ecosystem service of soil formation/erosion control, the replacement cost is used. It is calculated by multiplying the volume of soil removed . . . by the costs of [f] excavations and earth movements by cubic metre published by the Costa Rican Association of Engineers and Architects.”). CRMC, Vol. I, Annex 1 (at p. 139).

<sup>65</sup> As there is no suggestion that such replacement is necessary even once, there can be no argument that it is necessary for Costa Rica to incur the cost of such replacement every year for 50 years, which would be the effect of multiplying the replacement cost over the 50-year recovery period assumed by Fundación Neotrópica. See Second Payne & Unsworth Report, p. 21. NRC, Annex 1.

## ii. Alleged Impacts to “Natural Hazards Mitigation”

2.34 The newly submitted report by Professor Thorne likewise fails to support Costa Rica’s claim for \$184,581 in compensation for alleged impacts to the Disputed Area’s ability to mitigate natural hazards.<sup>66</sup>

2.35 Nicaragua pointed out in the Counter-Memorial that Fundación Neotrópica had not explained how the Disputed Area provides any natural hazard protection or how Nicaragua’s works could have impacted any such service.<sup>67</sup> In response, Costa Rica’s Reply relies upon Professor Thorne’s report, which asserts—without support—that the Disputed Area has become more vulnerable to coastal flooding, saltwater intrusion, and coastal erosion.<sup>68</sup>

2.36 Professor Thorne presents no evidence of this. Instead, he points to a December 2010 report by Ramsar.<sup>69</sup> But that report was prepared *before* the caño had refilled and at a time when there was concern—however unfounded—that the entire San Juan River could be re-routed through it.<sup>70</sup> Other than Ramsar’s later recommendation that a dyke be installed in the eastern 2013 caño, Ramsar has never suggested that any measures be taken to protect against an

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<sup>66</sup> Fundación Neotrópica Report (June 2016), Table 3. CRMC, Vol. I, Annex 1 (at p. 103).

<sup>67</sup> NCMC, paras. 4.21–4.22.

<sup>68</sup> CRRC, para. 2.22.

<sup>69</sup> See Thorne Report (July 2017), pp. 12–13. CRRC, Annex 2 (at p. 176–177).

<sup>70</sup> Ramsar Advisory Mission No. 69, Report: North-eastern Caribbean Wetland of International Importance (Humedal Caribe Noreste), Costa Rica (Dec. 2010). Costa Rica Memorial, Vol. IV, Annex 147 (at pp. 83–136).

increased risk of coastal flooding or saltwater intrusion. In any event, the “low” risk associated with the 2013 caño was fully mitigated by the dyke.<sup>71</sup>

2.37 Nor is there any evidence that Nicaragua’s works have made the Disputed Area more vulnerable to coastal erosion. To the contrary, Professor Thorne’s report confirms that coastal erosion in this area is a larger historical process that has been ongoing for many years.<sup>72</sup> As Professor Kondolf explains, the historical evidence demonstrates that the power of the Caribbean Sea to erode the land “is stronger than local variations in vegetation, roots, particle size, and other factors.”<sup>73</sup>

2.38 Nothing suggests that Nicaragua’s works, which have already been undone by nature, have weakened the landscape in ways that meaningfully impact this larger process. None of the satellite imagery indicates that the pattern of coastal erosion has changed over the last seven years, including after a major hurricane struck the area in November 2016.<sup>74</sup> Tellingly, Ramsar has not recommended that any action be undertaken to protect the Disputed Area against an increased risk of coastal erosion due to Nicaragua’s works.

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<sup>71</sup> See Ramsar Advisory Mission No. 77, Report: Wetland of International Importance Caribe Noreste, Costa Rica (Aug. 2014), pp. 18–20. Attachment CR-5 to Letter from Costa Rica (S. Ugalde) to the International Court of Justice (P. Couvreur), reference ECRPB-090-14 with attachments, 22 August 2014. CRMC, Vol. II, Annex 22 (at pp. 374–376).

<sup>72</sup> See Thorne Report (July 2017), p. 15 (citing pp. I-4–I-29 of his first report). CRRC, Annex 2 (at p. 179).

<sup>73</sup> Second Kondolf Report, p. 4. NRC, Annex 2.

<sup>74</sup> *Ibid.*, p. 4.

2.39 Finally, even if, *quod non*, Nicaragua's works had impaired the Disputed Area's capacity to withstand natural disasters, Costa Rica's valuation of the loss of that putative service is based entirely on the transfer of a value from a study in Thailand that tried to quantify the costs of constructing an engineered breakwall to replace lost hazard mitigation services due to the destruction of coastal mangroves.<sup>75</sup> Conspicuously, Professor Thorne does *not* endorse Fundación Neotrópica's transfer of those Thailand-specific values to the present case, and the Reply otherwise provides no basis for doing so. In particular, there is no evidence that construction of any infrastructure is necessary to protect the Disputed Area from natural hazards as a result of Nicaragua's activities, or what such construction would entail or cost in the context of the particular physical and socio-economic circumstances of the Disputed Area. Costa Rica has presented no such plans, and offered no indication that it actually considers new infrastructure necessary, or that it has any intention of building it.

### **iii. Improper Valuation of "Gas Regulation/Air Quality Services"**

2.40 The Reply comes nowhere close to supporting Costa Rica's claim for \$937,509 in compensation for an alleged impact on the Disputed Area's ability

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<sup>75</sup> See Fundación Neotrópica, Explanatory Addenda to the Monetary Valuation Report, 8 December 2016, p. 6. CRMC, Vol. I, Annex 2 (at p. 166); *see also* Second Fundación Neotrópica Report, p. 37. CRRC, Annex 1 (at p. 67); Second Payne & Unsworth Report, p. 20. NRC, Annex 1.



to regulate gas and air quality through “air purification” and “the balancing of greenhouse gases.”<sup>76</sup>

2.41 In the Counter-Memorial, Nicaragua showed that these benefits are distributed across the entire world, such that, insofar as they may have been impacted, Costa Rica is entitled only to its miniscule share of the global total.<sup>77</sup> In response, the Reply simply asserts that “[t]he fact that some of the lost ecosystem services might have been enjoyed by the citizens of other countries is irrelevant to Nicaragua’s liability to provide compensation to Costa Rica.”<sup>78</sup> Costa Rica thus argues that it is entitled to compensation for harm allegedly suffered by third-States, which is contrary to the principle of the law of State responsibility that compensation must offset “the damage suffered *by the injured State* as a result of the breach.”<sup>79</sup> Damage suffered by others is simply not compensable to Costa Rica. And Costa Rica has not offered evidence of any specific harm caused to itself.

2.42 The Reply does not dispute that, as shown in the Counter-Memorial, in determining the putative value of gas regulation services provided

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<sup>76</sup> Fundación Neotrópica Report (June 2016), p. 18. CRMC, Vol. I, Annex 1 (at p. 104).

<sup>77</sup> NCMC, para. 4.26.

<sup>78</sup> CRRC, para. 2.23.

<sup>79</sup> Draft Articles on Responsibility of States for Internationally Wrongful Acts, with commentaries, *Yearbook of the International Law Commission*, Vol. II, Part 2 (2001) (“ARSIWA”), Art. 36, cmt. 4 (emphasis added); *see also* NCMC, Chapter 3.

by the Disputed Area, Fundación Neotrópica selected the highest value from the literature it reviewed (\$14,955 per hectare), which it obtained from a non-peer reviewed Costa Rican master's thesis, while disregarding lower values reported in other studies.<sup>80</sup>

2.43 Nor does the Reply contest the fact that this is a *stock* value, *i.e.*, the total value of all carbon sequestered in a hectare. It therefore reflects the maximum damage to gas regulation and air quality services that could theoretically occur if every molecule of carbon was released into the atmosphere.<sup>81</sup> Since this can only be released once, it is absurd for Costa Rica to apply that value every year for 50 years because, once released, the carbon can never be released again.<sup>82</sup> The Reply makes no attempt to respond to this incontrovertible fact, which accounts for more than 95% of Costa Rica's valuation of gas regulation/air quality services.<sup>83</sup>

#### **iv. The Erroneous Assumption That All Impacts Will Last for 50 Years**

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<sup>80</sup> NCMC, para. 4.24.

<sup>81</sup> *Ibid.*, para. 4.25.

<sup>82</sup> *Ibid.*, para. 4.31.

<sup>83</sup> Fundación Neotrópica's first year total for these services is \$43,641.24. *See* Fundación Neotrópica Report (June 2016), p. 60 Table 14. CRMC, Vol. I, Annex 1 (at p. 146). This is only 4.7% of the total "gas regulation/air quality" service value of \$937,509 ultimately claimed. *See* Payne & Unsworth Report (May 2017), p. 32 Exhibit 1. NCMC, Annex 1 (at p. 135). *See also* NCMC, para. 4.29; Second Payne & Unsworth Report, p. 21. NRC, Annex 1.

2.44 The methodological errors described above are compounded by Costa Rica’s insistence that it is entitled to compensation for lost environmental services for no fewer than 50 years.

2.45 For example, where Costa Rica demands \$462,490 for felled trees, this figure assumes that the same trees were felled each year for 50 years.<sup>84</sup> That is an impossibility since timber can only be harvested once.

2.46 Costa Rica’s Reply tries to deny making that assumption because the trees were located in an area where the harvesting of timber is prohibited.<sup>85</sup> But even if that accurately describes the restrictions on logging, it is irrelevant to the assumption made in Costa Rica’s valuation. Indeed, Costa Rica uses “stumpage prices” to value the trees—a measure predicated on the trees in question being felled—which it applies to each tree every year for 50 years.<sup>86</sup> As the Payne & Unsworth Report observes, “there is no basis in economics, finance, or accounting to sum the[se] values” in this manner.<sup>87</sup>

2.47 The Reply’s attempt to defend its asserted 50-year recovery period more generally fails just as badly. Costa Rica bases that claim on the assertion that 50 years is the “documented term for minimum recovery of the ecosystem’s

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<sup>84</sup> NCMC, para. 4.29.

<sup>85</sup> CRRC, para. 2.24(a).

<sup>86</sup> *Ibid.*

<sup>87</sup> Second Payne & Unsworth Report, p. 23. NRC, Annex 1.

ability to provide the ecosystem services lost.”<sup>88</sup> This is incorrect for at least three reasons.

2.48 *First*, as the Reply makes clear, the asserted 50-year recovery period is predicated on the assumption that felled trees had an average age of 115 years, a contention based on data collected at the site of the 2010 caño, as reported in Annexes 145 and 154 of Costa Rica’s Memorial on the Merits.<sup>89</sup> These data, however, cannot be used to determine the average tree-age. In particular:

- Only trees with diameters greater than 10 cm were considered, which significantly inflates the average age of the trees.<sup>90</sup>
- Growth rates were applied that are “probably less than half the correct growth rate (thus yielding tree ages that are too old),” further inflating the trees’ average age.<sup>91</sup>
- The reports that Costa Rica relies upon claim tree ages that are older than Professor Thorne’s estimate of the age of the land itself, which is impossible.<sup>92</sup>
- Even if the data from the site of the 2010 caño were reliable, there is no basis for applying values derived from that data to the site of the 2013 caño.<sup>93</sup> As Professor Thorne explained in April 2015: “The nature of the ground and the vegetation through which the

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<sup>88</sup> Fundación Neotrópica Report (Jun. 2016), p. 59. CRMC, Vol. I, Annex 1 (at p. 145).

<sup>89</sup> CRRC, para. 2.24(a).

<sup>90</sup> Report of G. Mathias Kondolf, PhD: Review of Costa Rica’s Claims for Compensation in the Río San Juan Delta (May 2017) (“Kondolf Report (May 2017)”), p. 5. NCMC, Annex 2 (at p. 159).

<sup>91</sup> *Ibid.*

<sup>92</sup> *Ibid.*, p. 5 n.10. NCMC, Annex 2 (at p. 159).

<sup>93</sup> *Ibid.*, p. 6 & n.11; *see also* NCMC, para. 4.30 n.167.

first caño was cut . . . differed from that of the second and third caños, which are much further north and on land which is much younger” and “did not have the mature trees” measured in 2010.<sup>94</sup>

Costa Rica’s Reply fails to respond to any of these flaws, even though each was identified in the Counter-Memorial and the expert reports annexed thereto.<sup>95</sup>

2.49 *Second*, the Reply presents no data concerning the Disputed Area’s recovery. This failure is particularly noteworthy since Costa Rica has exclusive access to the location. In his report annexed to the Reply, Professor Thorne describes the data that “a rigorous environmental scientist” would collect to measure recovery, including data regarding “key variables (such as tree height)” that could be analyzed “to come to a view regarding the degree to which conditions in the areas excavated and cleared by Nicaragua have recovered.”<sup>96</sup> Thus, according to its own expert, Costa Rica should have collected and presented evidence of this nature to support its claimed recovery period. Costa Rica’s failure to do so undermines its claim.

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<sup>94</sup> Hearing on Merits, CR 2015/3, p. 42 (Thorne); *see also* NCMC, para. 2.12.

<sup>95</sup> For its part, Fundación Neotrópica offers only the unsupported assertion that it has “reliable data on the element that will take longer to recover: the trees.” *Second Fundación Neotrópica Report*, p. 35. CRRC, Annex 1 (at p. 65). That claim, however, as explained above, is baseless. Moreover, Fundación Neotrópica more broadly continues to uncritically accept Costa Rica’s reports submitted during the merits phase of this case as established fact, despite the fact that those reports have been debunked by Nicaragua’s experts. *See ibid.* p. 29. CRRC, Annex 1 (at p. 59).

<sup>96</sup> Thorne Report (July 2017), p. 3, 23. CRRC, Annex 2 (at pp. 167, 187). The steps Dr. Thorne calls for also include “accurate measurements of tree heights (old and new) in the field . . . using a surveying tape and inclinometer – a simple but effective methodology” and “a quadrat survey to count and identify colonizing vegetation, allowing direct comparisons to be made with vegetation assemblages in adjacent areas that were not cleared by Nicaragua.” *Ibid.*, p. 23. CRRC, Annex 2 (at p. 187).

2.50 *Third*, the literature that Professor Thorne cites in lieu of data from the Disputed Area relates exclusively to the time necessary for impacted forest resources to recover biodiversity-related services.<sup>97</sup> But only 1.5% of Costa Rica’s valuation relates to biodiversity.<sup>98</sup> The Reply provides no cogent explanation for why the 50-year recovery period should be applied to any other service for which compensation is claimed. Indeed, the other services, such as the provision of “raw materials,” *i.e.*, shrubs and other vegetation that could be used by human communities, take nowhere near 50 years to recover.<sup>99</sup>

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2.51 In sum, nothing in the Reply undermines the conclusion that the proper methodology for determining the amount of compensation owed to Costa Rica for the environmental impacts of Nicaragua’s works in the Disputed Area is the same as was used by the UNCC’s environmental claims panel, namely to award: (1) costs reasonably incurred in constructing the dyke across the eastern 2013 caño; and (2) the cost of securing protection for 30 years of an equivalent area of habitat, using the price for doing so established by Costa Rica’s habitat conservation programme.

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<sup>97</sup> Thorne Report (July 2017), pp. 16–23. CRRC, Annex 2 (at pp. 180–187).

<sup>98</sup> *See* Payne & Unsworth Report (May 2017), p. 32 Exhibit 1. NCMC, Annex 1 (at p. 135). Fundación Neotrópica’s \$40,730 value for “Habitat and nursery (biodiversity)” is 1.44% of their \$2,823,112 total.

<sup>99</sup> Kondolf Report (May 2017), p. 6, NCMC, Annex 2 (at p. 160); *see also* Second Kondolf Report, pp. 5–6. NRC, Annex 2.

## **SUBMISSIONS**

For the reasons given herein, the Republic of Nicaragua requests the Court to adjudge and declare that the Republic of Costa Rica is not entitled to more than \$188,504 for material damages caused by the actions of Nicaragua in the Disputed Area that the Court adjudged unlawful.

The Hague, 29 August 2017

Carlos J. Argüello-Gómez

Agent of the Republic of Nicaragua





## **CERTIFICATION**

I have the honour to certify that this Rejoinder and the documents annexed are true copies and conform to the original documents.

The Hague, 29 August 2017

Carlos J. Argüello-Gómez

Agent of the Republic of Nicaragua



**CERTAIN ACTIVITIES CARRIED OUT BY NICARAGUA  
IN THE BORDER AREA**

**(COSTA RICA V. NICARAGUA)**

**REJOINDER OF THE REPUBLIC OF NICARAGUA  
ON COMPENSATION**

**Annexes**



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