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GOVERNING THE NILE UNDER CLIMATIC UNCERTAINTY: THE NEED FOR A CLIMATE- PROOF BASIN-WIDE TREATY

I. INTRODUCTION

Climate change is projected to have catastrophic impacts on the hydrological cycle.¹ Water availability, quantity, and demand will be affected by climate change.² Existing studies show that climate change is changing “the timing of water (when water is delivered), quantity (how much water is available) and quality of the water resources.”³ Even worse, these changes are coming at a time when the sustainability of water resources is severely strained by other non-climatic factors, such as population growth, economic development, and urbanization. All of these factors will decrease water supply or increase demand.⁴ Responding to such changes requires building flexibility and adaptability into watercourse treaties.⁵ However, the flexibility needed within these treaties to address the ramifications of climate change could impact the predictability and certainty required by water sharing States that rely on the language of a watercourse treaty.⁶ Thus, developing principles, procedures, and institutions capable of accommodating the ramifications of climate change is challenging as it requires governing uncertainty, which is at odds with the notion of legal certainty.⁷

* LL.B, LL, M, JSD/ PhD. Candidate in McGeorge School of Law. This Article is dedicated, in loving memory, to Kidane Ayalew. I am very grateful to my supervisor, Professor Stephen McCaffrey for his precious comments on the earlier version of this work. I am also grateful to Serena Wheaton and the editorial team of the University of New Mexico Natural Resources Journal for their insights and editorial support.

1. See generally NIGEL ARNELL ET AL., INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, THIRD ASSESSMENT REPORT: IMPACTS, ADAPTATION AND VENERABILITY, CH. 4, HYDROLOGY AND WATER RESOURCES (2001), <http://web.archive.org/web/20180613000247/http://www.ipcc.ch/ipccreports/tar/wg2/pdf/wg2TARchap4.pdf>.

2. See Linda L. Nash & Peter H. Glick, *Sensitivity of Streamflow and Water Supply in Colorado Basin to Climate Change*, in THE COLORADO RIVER BASIN AND GREENHOUSE EFFECT 25 (1990).

3. Tuula Honkonen, *Water Security and Climate Change: The Need for Adaptive Governance*, 20 PIONEER PEER-REVIEWED 1, 2 (2017).

4. See NIGELL W. ARNELL ET AL., INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, FIFTH ASSESSMENT REPORT, CH. 3, FRESHWATER RESOURCES 234 (2014).

5. See generally Stephen McCaffrey, *The Need for Flexibility in Freshwater Treaty Regimes*, 27 NAT. RESOURCES F. 156 (2003).

6. ALISTAIR RIEU-CLARKE ET AL., TRANSBOUNDARY WATER GOVERNANCE AND CLIMATE CHANGE ADAPTATION: INTERNATIONAL LAW, POLICY GUIDELINES AND BEST PRACTICE APPLICATION 34 (2015).

7. Honkonen, *supra* note 3, at 3; see also A. Dan Tarlock, *Four Challenges for International Water Law*, 23 TUL. ENVTL. L.J. 369, 383-84 (2009).

But still, as the law of treaties does not “ordinarily permit unilateral modification or withdrawal when such changes occur,”⁸ parties are “required to work within the framework of existing treaties to respond to changes” associated with climate change.⁹ Nevertheless, most of the existing watercourse treaties, locked in rigid rules and procedures, are unable to provide the flexibility needed to address the anticipated changes due to climate change.¹⁰ Only a few watercourse treaties possess the intrinsic capacity for dealing with the ramifications of climate change.¹¹

This article examines treaty flexibility and climate change adaptation in the context of the Nile Basin. The Nile Basin is the focus of a voluminous body of academic literature, but there are gaps in the literature regarding the legal regimes of the Nile. Political scientists have extensively studied the role of power dynamics and hydro-hegemony in their effort to determine “who gets how much [of the Nile] water, when, where and why?”¹² Peace and Security scholars have also addressed the issue of whether the Nile River will be a source of conflict or a catalyst for cooperation.¹³ Legal scholars, on the other hand, have explored *some* of the substantive issues concerning the fragmented legal regimes governing the Nile watercourse.¹⁴ Still

8. McCaffrey, *supra* note 5, at 159.

9. *Id.*

10. Joseph W. Dellapenna, *Adapting the Law of Water Management to Global Climate Change and Other Hydro-political Stresses*, 35 J. AM. WATER ASS'N 1301, 1302 (1999); McCaffrey, *supra* note 5, at 156; Greta Goldenman, *Adapting to Climate Change: A Study of International Rivers and Their Legal Arrangements*, 17 ECOLOGY L. Q. 741 (1990); A. Dan Tarlock, *How Well Can International Water Allocation Regimes Adapt to Global Climate Change*, 15 J. LAND USE & ENVTL. L. 423, 433-34 (2000); Elizabeth J. Kistin & Peter J. Ashton, *Adapting to Change on Transboundary Rivers: An Analysis of Treaty Flexibility on the Orange-Senqu River Basin*, 24 INT'L J. WATER RES. DEV. 1 (2008); see also Itay Fischhendler, *Legal and Institutional Adaptation to Climate Uncertainty: A Study of International Rivers*, 6 WATER POL'Y 1, 3 (2004).

11. Glen Hearn & Richard Kyle Paisley, *Lawyers Write Treaties, Engineers Build Dikes, Gods of Weather Ignore Both: Making Transboundary Waters Agreements Relevant, Flexible, and Resilient in a Time of Global Climate Change*, 6 GOLDEN GATE U. ENVTL. L.J. 259, 262 (2013).

12. See Melvin Woodhouse & Mark Zeitoun, *Hydro-Hegemony and International Water Law: Grappling with the Gaps of Power and Law*, 10 WATER POL'Y 103, 113 (2008); Ana Elisa Cascao & Mark Zeitoun, *Power, Hegemony and Critical Hydropolitics*, reprinted in TRANSBOUNDARY WATER MANAGEMENT: PRINCIPLES AND PRACTICE, 39 (Anton Earle et. al. eds., 2010); Rawia Tawfik, *Revisiting Hydro-hegemony from a Benefit-Sharing Perspective: The Case of the Grand Ethiopian Renaissance Dam*, 5 GERMAN DEV. INST. 1 (2015); John Waterbury, *Is the Status Quo in the Nile Basin Viable?*, 4 BROWN J. WORLD AFF. 287, 287 (1997); Ana Elisa Cascao, *Changing Power Relations in the Nile River Basin: Unilateralism vs. Cooperation?*, 2 WATER ALTERNATIVES 245, 245 (2009); YACOB ARSANO, ETHIOPIA AND THE NILE DILEMMAS OF NATIONAL AND REGIONAL HYDROPOLITICS (2007); Daniel Kendie, *Egypt and the Hydro-Politics of the Blue Nile River*, 6 NORTHEAST AFR. STUD. 141, 145-46 (1999).

13. Kristin Wiebe, *The Nile River: Potential for Conflict and Cooperation in the Face of Water Degradation*, 41 NAT. RESOURCES. J. 731 (2001); see NURIT KLIOT, WATER RESOURCES AND CONFLICT IN THE MIDDLE EAST (1994); Yehew Tsegaye Walilegne, *The Nile Basin: From Confrontation to Cooperation*, 27 DALHOUSIE L.J. 503, 505 (2004); SIMON A. MASON, FROM CONFLICT TO COOPERATION IN THE NILE BASIN (2003).

14. See GEBRE TSADIK DEGEFU, THE NILE: HISTORICAL, LEGAL AND DEVELOPMENTAL PERSPECTIVES (2003); Fasil Amdetsion, *Scrutinizing the Scorpion Problematique: Arguments in Favor of the Continued Relevance of International Law and a Multidisciplinary Approach to Resolving the Nile Dispute*, 44 TEX. INT'L L.J. 1, 16 (2008); Dereje Zeleke Mekonnen, *Between the Scylla of Water Security and Charybdis of Benefit Sharing: The Nile Basin Cooperative Framework Agreement - Failed or Just*

absent, however, is both a detailed analysis of treaty flexibility in the Nile Basin and a proposal for building a basin-wide, climate-proof treaty.

This article intends to fill both of these gaps. Part II presents the geographical and climatic setting of the Nile Basin. It then sets the background by briefly summarizing the key results from recent climate change modeling studies. Part III introduces the mechanisms that can provide flexibility in watercourse treaties; it reviews the practice of various water sharing countries and encapsulates the principal ways of building a climate-proof treaty. Part IV analyzes the legal regime governing the Nile watercourse in light of this background. This part specifically probes the 1959 Nile Treaty between Egypt and Sudan, the 2010 Cooperative Framework Agreement (CFA) and the 2015 Agreement on Declarations of Principles (DoPs) on the Grand Ethiopian Renaissance Dam (GERD) in terms of flexible allocation strategies, response to extreme events, amendment or review processes, termination clauses, and institutional responsibilities such as data gathering and decision-making. Part IV then submits that none of the existing treaties, including the CFA, provide sufficient mechanisms for addressing the possible consequences of climate change. Part V proposes a flexible basin-wide treaty capable of accommodating the ramifications of climate change. Part VI provides concluding remarks, which call upon Nile Basin States to set aside their egoistic national interests and address the ramifications of climate change by developing a basin-wide, climate-proof treaty.

II. THE NILE, GEOGRAPHY, HYDROLOGY AND THE INFLUENCE OF CLIMATE CHANGE

The Nile, considered the longest river in the world, extends 6,695 kilometers from the Ruvyironza River in Burundi, its most distant source, to the Mediterranean Sea.¹⁵ But this is only the White Nile, which is joined by the other main tributary of the river, the Blue Nile, in Khartoum, Sudan.¹⁶ The Blue Nile originates in Lake Tana, Ethiopia,¹⁷ and “makes [a] 1,000-kilometer loop through Ethiopian territory, carving a 600-meter-deep gorge through the highlands.”¹⁸ It

Teetering on the Brink?, 3 GOETTINGEN J. INT'L L. 345 (2011); Salman M.A. Salman, *The Nile Basin Cooperative Framework Agreement: A Peacefully Unfolding African Spring?*, 38 WATER INT'L 17 (2012); Tadesse Kassa Woldetsadik, *International Watercourses Law in the Nile River Basin: Three States at a Crossroads*, BRITISH Y.B. INT'L L. 193 (2013); MWANGI KIMENYI & JOHN MBAKU, GOVERNING THE NILE RIVER BASIN: THE SEARCH FOR A NEW LEGAL REGIME (2015); Salman M.A. Salman, *The Grand Ethiopian Renaissance Dam: The Road to the Declaration of Principles and the Khartoum Document*, 42 WATER INT'L 512, 515-16 (2016).

15. See Nile Basin Initiative, *The Water Resources of the Nile Basin*, in STATE OF THE RIVER NILE BASIN 27-28 (2012), <http://nileis.nilebasin.org/system/files/Nile%20SoB%20Report%20Chapter%20%20-%20Water%20resources.pdf>.

16. See STEPHEN MCCAFFREY ET AL., PUBLIC INTERNATIONAL LAW: CASES, PROBLEMS AND TEXTS 1046 (2010).

17. See STEPHEN MCCAFFREY, THE LAW OF INTERNATIONAL WATERCOURSES 258 (2nd ed. 2007); see also Nile Basin Initiative, *supra* note 15, at 28; see also HAGGAI ERLICH, THE CROSS AND THE RIVER: ETHIOPIA, EGYPT, AND THE NILE 1 (2002).

18. *Id.*

carries more water than the White Nile, but its flow varies tremendously with the seasons, whereas that of the White Nile is stable throughout the year.¹⁹

The Nile Basin covers 3.18 million square kilometers, which accounts for 10 percent of Africa.²⁰ While this makes the Basin the third largest in the world, the quantity of the freshwater carried by the river (84 billion cubic meters (BCM)) is actually very small compared with other rivers. The Nile's annual discharges constitute "a mere cup (2 per cent) of the Amazon, perhaps a glass (15 per cent) of the Mississippi, or at best a pitcher (20 per cent) of the Mekong."²¹ This relatively small amount of water is to be shared by eleven Nile Basin States²² in one of the "most water-deficient parts of the world."²³ Moreover, "the fact that the region's population is growing at 3% a year and is projected to reach 859 million in 2025 (up from 245 million in 1990) is likely to exacerbate the water scarcity in the Nile Basin area."²⁴

The Nile Basin is very diverse in terms of both climate and topographical features. "[E]xtending over 35° of latitude, from the equatorial zone to the northern subtropics, and over elevations that range from more than 4000 m to sea level . . ."²⁵ the Nile River travels through five distinct climate regions.

Downstream, Egypt and parts of Sudan have a dry, desert like climate with precipitation of less than 200 millimeters (mm) per year. Sudan and small parts of Ethiopia have a steppe climate with rainfall ranging between 200 and 400 mm a year. The precipitation from these two climatic regions does not contribute any water to the Nile. Upstream, the Nile Basin contains the tropical rainforest climate, the tropical savannah climate, and the highland (tropical) climate. These climates serve as the source of the Nile, receiving 1,400 to 1,800 mm of rainfall per year.²⁶

As the river flows from its sources, both in the Lake Victoria and Lake Tana Basins, to its mouth where it empties into the Mediterranean Sea, it passes through geographical areas where there is a decrease in the amount of precipitation and an

19. See Nile Basin Initiative, *supra* note 15, at 36. "The Blue Nile (Abay) (60 %), Atbara (Tekezze), and Sobat (Baro), contribute between 85 and 90 percent of the annual Nile flows, but the Blue Nile (Abay) can be seen to respond directly to the seasonal rain patterns, exhibiting clear dry and wet spells." White Nile, on the other hand, "contributes between 10 and 15 percent to the annual Nile discharge, but is fairly stable throughout the year." *Id.*

20. *Id.* at 27.

21. See ROBERT O. COLLINS, *THE NILE* 11 (2002).

22. See Nile Basin Initiative, *supra* note 15, at 27. Tanzania, Uganda, Rwanda, Burundi, Democratic Republic of the Congo, Kenya, Ethiopia, Eritrea, South Sudan, Sudan and Egypt are the Nile Basin States that share the Nile watercourse.

23. See Amdetsion, *supra* note 14, at 3.

24. *Id.*

25. See Jessica Barnes, *The Future of the Nile: Climate Change, Land Use, Infrastructure Management, and Treaty Negotiations in a Transboundary River Basin*, 8 WIREs CLIM. CHANGE 2 (2017).

26. See Alice Shih & Trevor Stutz, *Sink or Swim: Abrogating the Nile Treaties While Upholding the Rule of Law*, 43 ENVTL. L. REP. 10786, 10788 (2013).

increase in potential evapotranspiration.²⁷ The mean annual rainfall ranges from 1700 mm in the Ethiopian highlands to less than 25 mm in Cairo, Egypt.²⁸ The rainfall parameters of the Basin exhibit a high level of both inter-annual and inter-decadal variability.²⁹ This means that the Nile River experiences both intra- and inter-seasonal fluctuations in climatic parameters.³⁰

For a long time, the Nile Basin States have been affected by such climate variability,³¹ and recent climate change is exacerbating the vulnerability of the Basin States.³² Climate change and its ramifications on the Nile watercourse are threatening the lives and livelihoods of the people living in the basin.³³ According to scientific studies, climate change-induced problems that lie ahead for the Nile Basin States include: increase and/or decrease in river flow; increase in frequency of floods and droughts; sea level rise; increase in temperature and evaporation; changes in patterns of rainfall, runoff, and sediment yield as well as in ecosystems, vegetation cover, and crop yields; and increase in reservoir and swamp evaporation rates.³⁴

Most relevant to this article are the ramifications of climate change on the Nile water resource, and more precisely, the concerns of future rainfall, river flow, and water availability. Most studies and climate change models are commonly predicating increases in average annual temperature, leading to greater loss of water due to evaporation and adding some level of certainty to the accuracy of these projections.³⁵ There is much less certainty in projections concerning future rainfall, river flow, and water availability. Studies concerning the latter issues, find contradictory results; one result predicts floods and increased runoff,³⁶ and the other

27. See MERON TEFERI TAYE ET AL., THE LIVED EXPERIENCE OF CLIMATE CHANGE: WATER CASE STUDY ON THE NILE AND RHINE RIVER BASINS 12, 14 (2012).

28. Teferi Mekonnen, *The Blue Nile Issue: A History of Hydropolitics, 1884-1974*, 10 (2004) (unpublished M.A. thesis, Addis Ababa University); see also U.S. AGENCY FOR INT'L DEV., CLIMATE CHANGE INFORMATION FACT SHEET EGYPT 2 (2015) (estimating the annual average rainfall from 1961 to 1990 as 41.8 mm).

29. TEFERI TAYE ET AL., *supra* note 27, at 12, 14; see also ANTON EARLE ET AL., TRANSBOUNDARY WATER MANAGEMENT AND THE CLIMATE CHANGE DEBATE 117 (2015) (Climate variability as an old issue in the Nile Basin).

30. See EARLE ET AL., *supra* note 29, at 129.

31. NILE BASIN INITIATIVE, STATE OF THE RIVER NILE BASIN, CHANGE AND ITS IMPLICATIONS FOR THE NILE REGION 210 (2012), <http://nileis.nilebasin.org/system/files/Nile%20SoB%20Report%20Chapter%208%20%20Climate%20Change.pdf>.

32. *Id.*

33. See U.N. ENV'T PROGRAMME, CLIMATE CHANGE ADAPTATION CAPACITIES IN THE NILE RIVER BASIN 13 (2015), <http://wedocs.unep.org/bitstream/handle/20.500.11822/14068/Nile%20Climate%20change%20fa.pdf?sequence=1&isAllowed=y>.

34. See EARLE ET AL., *supra* note 29, at 130.

35. *Id.*; Declan Conway, *From Headwater Tributaries to International River: Observing and Adapting to Climate Variability and Change in the Nile Basin*, 15 GLOBAL ENVTL. CHANGE 99, 106 (2005); see U.N. ENV'T PROGRAMME, *supra* note 33, at 13; HEATHER COOLEY ET AL., UNDERSTANDING AND REDUCING THE RISKS OF CLIMATE CHANGE FOR TRANSBOUNDARY WATERS 19 (2009); See generally, Ungtae Kim & Jagath J. Kaluarachchi, *Climate Change Impacts on Water Resources in the Upper Blue Nile River Basin, Ethiopia*, 45 J. AM. WATER RESOURCES ASS'N 1361 (2009); Barnes, *supra* note 25, at 2-6.

36. Nigel W. Arnell, *Climate Change and Global Water Resources: SRES Emissions and Socio-economic Scenarios*, 14 GLOBAL ENVTL. CHANGE 31, 31-49 (2004); Reinhard Voss et al., *Enhanced Resolution Modelling Study on Anthropogenic Climate Change: Changes in Extremes of The*

result predicts water scarcity and possible droughts.³⁷ It seems evident that proper governance of the Nile in the face of these uncertainties demands response to two contradictory scenarios, either increase in water availability and flooding or water scarcity and drought; each of which requires opposite adaptation strategies.³⁸

Building flexible and resilient legal and institutional arrangements will no doubt be at the heart of such adaptation strategies.³⁹ If climate change reduces the available water in the Nile Basin, competition for water between riparian States would only intensify, possibly leading to conflicts over water. If the available water resources increase due to climate change, this will create a need for new legal responses to flooding. In either case, flexibility in watercourse treaties will be crucial “as water management systems struggle to adapt to the altered precipitation and flow patterns.”⁴⁰ The next part introduces the principal ways of building flexibility into watercourse treaties.

III. ADAPTING TO CLIMATE CHANGE: BUILDING FLEXIBILITY IN TREATY REGIMES

It is clear that a new paradigm of flexibility in water treaties is essential to adapt to climate change. In this part, this article relies on the works of the leading scholars in the field such as Professor and water laureate Stephen McCaffrey and Professor Itay Fischhendler, and encapsulates five mechanisms through which flexibility can be provided for in watercourse treaties.⁴¹ The five principal ways to build a climate-proof treaty are to incorporate: (1) flexible allocation strategies; (2) extreme events provisions; (3) amendment and review procedures; (4) termination clauses; and (5) River Basin Organizations (RBOs).⁴² This article will examine each mechanism below, beginning with flexible water allocation.

Hydrological Cycle 22 INT'L J. CLIMATOLOGY, 755 771-73 (2002); see also WALTINA SCHUEMANN & MANUEL SCHIFFLER, WATER IN THE MIDDLE EAST: POTENTIAL FOR CONFLICTS AND PROSPECTS FOR COOPERATION 146 (1998) (cited in Shih & Stutz, *supra* note 26, at 10789 (“Some experts estimate that the Nile’s flow will increase by as much as 30%, while others estimate a decrease of up to 78%”)).

37. Shih & Stutz, *supra* note 26, at 10789; see Conway, *supra* note 35, at 106; Vivek K. Arora & George J. Boer, *Effects of Simulated Climate Change on the Hydrology of Major River Basins*, 106(D4), J. GEOPHYSICAL RES. 3335, 3335-48 (2001); see also EARLE ET AL., *supra* note 29, at 118 (discussing scientific findings and the politicization of climate change).

38. Richard Kyle Paisley, *Why the 11 Countries that Rely on the Nile Need to Reach a River Deal Soon*, CONVERSATION (Aug. 27, 2017), <https://theconversation.com/why-the-11-countries-that-rely-on-the-nile-need-to-reach-a-river-deal-soon-75868>. It is worth mentioning that the global climate change discourse has two approaches, mitigation and adaptation, for tackling the problems of climate change. While mitigation focuses on resolving the root causes of climate change by controlling greenhouse gases (GHGs) emissions and mitigating the rise of global temperature, adaptation “accepts the projected increases and seeks to understand both the effects of global climate change and the impacts of those effects in order to adapt to them.” See Tarlock, *supra* note 10, at 423-24.

39. See also Gabriel Eckstein, *Water Scarcity, Conflict, and Security in a Climate Change World: Challenges and Opportunities for International Law and Policy*, 27 WIS. INT'L L.J. 410, 432-33 (2009); see McCaffrey, *supra* note 5, at 159; Hearn & Paisley, *supra* note 11, at 259-60; Fischhendler, *supra* note 10, at 3; Goldenman, *supra* note 10, at 741; Cooley et al., *supra* note 35, at 14; RIEU-CLARKE, *supra* note 6, at 9-11.

40. See Dellapenna, *supra* note 10, at 1302.

41. See Fischhendler, *supra* note 10, at 158; see McCaffrey, *supra* note 5, at 1.

42. See Fischhendler, *supra* note 10, at 159-60; see McCaffrey, *supra* note 5, at 3.

1. Flexible Water Allocation

Water sharing States may use flexible water allocation strategies in watercourse treaties to achieve sustainable water supply in the face of climate change. Instead of allocating shared waters based on the assumption of a fixed, and often too optimistic, perpetual water supply, or fixed allocation strategy, parties should allocate their shared water resources in accordance with the social, economic, or climatic changing conditions existing in the Basin States.⁴³ There are a couple of ways this can be achieved. A rather simple method is to enter into an agreement which requires upstream States to deliver a minimum flow to a downstream riparian State in order “to maintain human health and basic ecological functions.”⁴⁴ The other mechanism is to proportionally “allocate the water based on a percentage of the flow and time of flow, rather than a fixed or minimum amount.”⁴⁵ Although this approach “requires flexible infrastructure, effective operating rules, and regular communication and data sharing,”⁴⁶ it “allows flow regimes to respond to both wet and dry conditions.”⁴⁷

2. Response Strategy for Extreme Events

Perhaps the most common mechanism for enhancing treaty flexibility is to include special provisions in watercourse treaties that govern particular kinds of exceptional circumstances, such as droughts and floods.⁴⁸ For instance, the 1944 agreement between the United States and Mexico on the Rio Grande and Colorado Rivers has provisions governing possible problems resulting from drought.⁴⁹ The agreement allows Mexico to deliver less than the minimum quantity of water to the United States during an “extraordinary drought” for up to five years.⁵⁰ If deficiencies occur during this period, Mexico is to repay by increasing flows during the next five-year cycle.⁵¹ In case of the Colorado River, the agreement guarantees that Mexico receives a certain annual quantity of the Colorado River’s water from the United States.⁵² “In the event of extraordinary drought” though, the water allotted to Mexico is to “be reduced in the same proportion as consumptive uses in the United States are reduced.”⁵³

43. See Fischhendler, *supra* note 10, at 21.

44. See RIEU-CLARKE, *supra* note 6, at 34.

45. *Id.*

46. Heather Cooley & Peter H. Gleick, *Climate-Proofing Transboundary Water Agreements*, 56 HYDROLOGICAL SCI. J. 711, 715 (2011).

47. *Id.*

48. *Id.*; see also Fischhendler, *supra* note 10, at 5; McCaffrey, *supra* note 5, at 160; Goldenman, *supra* note 10; Eckstein, *supra* note 39, at 457; Cooley et al., *supra* note 35, at 15.

49. See Treaty between the United States of America and Mexico Respecting Utilization of the Waters of the Colorado and Tijuana Rivers and of the Rio Grande, Mex.-U.S., Feb. 3, 1944, 59 Stat. 1219, T.S. No. 994 art. 4 (1946) (entered into force Nov. 8, 1945) [hereinafter 1944 Colorado Treaty].

50. *Id.* at art. 4, ¶ b(c).

51. *Id.* at art. 4, ¶ b(d).

52. *Id.* at art. 10, ¶ a.

53. *Id.* at art. 10, ¶ b.

Floods, although posing serious risks for lower riparian States, are often ignored in the recent discourse of climate change concerning resilience and adaptability of international watercourse treaties.⁵⁴ Most international watercourses are not governed by regimes with the institutional capacity to address the problem of flooding.⁵⁵ Only a few watercourse treaties include flood management systems. Among such treaties, the Columbia River Basin Treaty stipulates that “Canada (the upstream party) will adjust its operation of hydroelectric dams to mitigate flooding in the United States.”⁵⁶ In addition, the Agreement on the Cooperation for Sustainable Development of the Mekong River Basin provides maximum river flow rates, requiring “upstream dam operations to be adjusted to meet these requirements.”⁵⁷

3. Amendment and Periodic Review

Amendment and periodic review processes give the riparian States the chance to address unforeseen circumstances, while “resynchroniz[ing] national and basin-wide strategies with new knowledge and changing circumstance.”⁵⁸ These processes are crucial for the sustainability of watercourse treaties because, through time, the hydrological and climatic conditions on which such treaties are based will change significantly.⁵⁹ This is particularly true in the era of climate change.

Several mechanisms can be used to amend watercourse treaties. In the Colorado River Basin, for instance, modifications of the 1944 Colorado Treaty are made through the “minutes” of meetings of the International Boundary and Water Commission (IBWC), a joint commission charged with the application of the Treaty and composed of an Engineer Commissioner from both parties (U.S. and Mexico).⁶⁰ The Mekong River Basin Agreement between Cambodia, Laos, Thailand, and Vietnam also allows the alteration of the Agreement through amendment proposals agreed to by all the parties.⁶¹

In addition, some international watercourse treaties have provisions dealing with periodic reviews. In the Syr Darya River Basin, for instance, the Framework Agreement requires periodic review of Agreements “on water releases, production and transit of electricity, and compensations for energy losses” and calls for the

54. See Cooley et al., *supra* note 35, at 15.

55. *Id.*

56. *Id.*; Treaty Relating to Cooperative Development of the Water Resources of the Columbia River Basin, U.S.-Can., *opened for signature* Jan. 17, 1961, 542 U.N.T.S. 244, [hereinafter *Columbia River Treaty-CRT*]. It is worth noting that flood protection is the main purpose of the CRT.

57. *Id.*

58. See Kistin & Ashton, *supra* note 10, at 6. Indeed, review process has been addressed in the Kishenganga case between Pakistan and India. The award states that after seven years from the implementation of the project either party may seek reconsideration of the tribunal’s minimum flow requirement. See *In re Indus Waters Kishenganga Arbitration* (Pak. v. India), Case No. 2011-01, Final Order, at ¶ 119 (Permanent Court of Arbitration 2013), <https://pcacases.com/web/sendAttach/48>. This was because “a degree of uncertainty is inherent in any attempt to predict environmental responses to changing conditions.” See *id.* ¶ 117.

59. Cooley et al., *supra* note 35, at 16.

60. 1944 Colorado Treaty, *supra* note 49, at art. 2, 25; see McCaffrey, *supra* note 5, at 161.

61. Agreement on Co-operation for Sustainable Development of the Mekong River Basin art. 37, Apr. 5, 1995, 34 I.L.M. 864 (1995).

conclusion of new Agreements annually.⁶² Another example is the Treaty between India and Nepal governing Mahakali River, which requires a review every ten years or “earlier as required by either party.”⁶³

4. Termination Clauses

The fourth mechanism for enhancing treaty flexibility is to simply include a termination clause in the treaty allowing any riparian State “to terminate it upon a given period of notice, e.g. six months.”⁶⁴ In the Syr Darya Basin, for instance, the Framework Agreement restricts its validity to five years,⁶⁵ allowing automatic renewal for another five years provided that no termination notice is submitted “six months in advance from any party.”⁶⁶ In so doing, the Framework Agreement provides sufficient flexibility for parties adversely affected by changed circumstances, permitting them to withdraw from what could otherwise be an oppressive treaty.⁶⁷

It is, however, to be noted that a termination clause would not always be appropriate for all types of treaties. As pointed out by McCaffrey, it would best fit only treaties that do “not involve permanent structures but provide for allocations of water . . .”⁶⁸

5. River Basin Organizations (RBOs)

Sustainable transboundary water management is inextricably linked with RBOs. Developing an institutional structure for joint management of transboundary watercourses is essential for the pragmatic application of both substantive and procedural principles governing transboundary watercourses.⁶⁹ Indeed, RBOs play a significant role in building flexibility into watercourse treaties. RBOs’ ability to adapt, amend, and extend the institutional arrangement between riparian States is at the center of developing greater resilience and adaptability to the changing environment. Of the 260 transboundary river basins, about 119 of them have water institutions.⁷⁰ While the roles and authorities of such institutions vary significantly, institutions capable of adapting to the challenges of climate change should “have a

62. See McCaffrey, *supra* note 5, at 159.

63. Treaty Between His Majesty’s Government of Nepal and the Government of India Concerning the Integrated Development of the Mahakali River Including the Sarada Barrage, Tanakpur Barrage and Pancheshwar Project, India-Nepal, art. 12, Feb. 12, 1996.

64. Agreement Between the Governments of the Republic of Kazakhstan, the Kyrgyz Republic, and the Republic of Uzbekistan on the Use of Water and Energy Resources of the Syr Darya Basin art. 12, Mar. 17, 1998. [hereinafter *Syr Darya Basin Treaty*]; see also McCaffrey, *supra* note 5, at 160.

65. *Syr Darya Basin Treaty*, *supra* note 64, at art. 12; see also McCaffrey, *supra* note 5, at 159-60.

66. *Id.*

67. *Id.*

68. *Id.* at 160.

69. See Hearn & Paisley, *supra* note 11, 274-75.

70. See Cooley & Gleick, *supra* note 46, at 2 (mentioning 260 international river basins), 6 (mentioning 106 RBO). See also Susanne Schmeier, *Opening the Black Box of River Basin Organizations*, GLOBAL WATER F. (Oct. 16, 2012) (mentioning 119 RBO), <http://www.globalwaterforum.org/2012/10/16/opening-the-black-box-of-river-basin-organizations/>.

broad scope, include all riparian nations, and have management and enforcement authority.”⁷¹ Factors that are likely to influence the resilience of the RBOs include:

[t]he membership structure of the organization, focusing on whether all riparians in the respective basin are included in joint climate change adaptation activities; the functional scope of the RBO, focusing on the degree of integration of water resources management and climate change adaptation; a decision-making mechanism that ensures the timely and efficient adoption of decisions; the existence and the well-functioning of data and information sharing mechanisms ensuring long-term cooperation; the existence and well-functioning of dispute-resolution/conflict management mechanisms allowing for solving emerging water-related collective action problems; [and] the secured availability of financial resources for climate change adaptation activities in the basin [...].⁷²

Consequentially, although mechanisms discussed in this section are by no means exhaustive, water sharing States are recommended to use these mechanisms when building climate-proofing treaties to adapt to climate change. The next part of this article specifically analyzes the legal regime governing the Nile Basin using the aforementioned five mechanisms.

IV. THE LEGAL RÉGIME GOVERNING THE NILE BASIN: ANALYSIS OF TREATY FLEXIBILITY

1. Overview of the Nile Water Agreements: A Fragmented Legal Regime

Legal and institutional frameworks are essential for efficient transboundary water management. Riparian States are often advised by scholars to regulate the use and allocation of their shared water resources through a basin-wide treaty.⁷³ This advice seems to be ignored in the Nile Basin, however. The Nile Basin has no mutually acceptable legal framework applicable to all riparian States.⁷⁴ Currently, three types of legal instruments – bilateral treaties, a multilateral agreement establishing a framework for cooperation, and a tripartite agreement on a declaration of principles – are governing the use and allocation of Nile waters.

Several bilateral treaties have been agreed to between riparian States and their colonial masters concerning the flow of the Nile waters since the end of the 19th century.⁷⁵ Of these bilateral treaties, the 1902, 1929, and 1959 Agreements are the most controversial and widely disputed treaties.⁷⁶ First, the 1902 Agreement was a bilateral treaty concluded between Great Britain, on behalf of Sudan, and Ethiopia

71. See Cooley et al., *supra* note 35, at 16.

72. See Sabine Schulze & Susanne Schmeier, *Governing Environmental Change in International River Basins the Role of River Basin Organizations*, INT’L J. BASIN MGMT. 229 (2012).

73. See McCaffrey, *supra* note 5, at 157.

74. See MCCAFFREY, *supra* note 17, at 262.

75. Amdetsion, *supra* note 14, at 19; Salman, *supra* note 14, at 18; Mekonnen, *supra* note 14, 351-55.

76. Salman, *supra* note 14, at 18-19.

to determine the boundary between Ethiopia and Sudan.⁷⁷ Although the agreement is about boundary delineation, it contains a provision relating to the waters of the Nile, in which Ethiopia undertook “not to construct or allow to be constructed, any work across the Blue Nile, Lake Tana, or the Sobat, which would *arrest* the flow of their waters into the Nile except in agreement with His Britannic Majesty’s Government of the Sudan.”⁷⁸

Second, the 1929 Nile Agreement was a bilateral treaty between Egypt and Britain, representing Sudan and its East African colonies.⁷⁹ This agreement, recognizing the historical and natural rights of Egypt, gave Egypt veto power over any construction projects along the Nile River and its tributaries.⁸⁰ It also allocated a volumetric quantity of water to each State, 48 BCM for Egypt and 4 BCM for Sudan. In so doing, it determined the amount of waters each State received, which the 1959 Agreement then used as the “established rights” of the two States.⁸¹

Third, the 1959 Agreement was a bilateral treaty between Egypt and Sudan.⁸² This agreement was meant to allocate the net benefit generated from the High Aswan Dam (HAD). Although more favorable to Sudan than the 1929 Agreement, the 1959 Agreement also allocated the bulk of the Nile’s waters, 55.5 BCM, to Egypt (66% of the 84 BCM total water flow), 18.5 BCM, (22%) to Sudan and left the remaining 10 BCM (12%) for evaporation.⁸³ It does not recognize the rights of the upstream States.

The Nile Basin Cooperative Framework Agreement (CFA) is the other important legal instrument concerning the uses and allocations the Nile watercourse. The CFA was the result of the riparian States attempt to prepare a basin-wide legal and institutional framework that would regulate the interstate utilization and management of the Nile River. The process of the CFA was started in the early 1990s and formalized in the adaption of the Nile Basin Cooperative Framework Project (Project D3) in 1995.⁸⁴ All Nile riparian States at the time, except Eritrea, participated in the project, and with financial and technical support from United

77. See Treaty on the Delimitation of the Frontier between Ethiopia and Sudan, Eth.-Gr. Brit. May 15, 1902, <http://treaties.fco.gov.uk/docs/pdf/1902/TS0016.pdf> [hereinafter 1902 Treaty].

78. See *id.* at art. 3 (emphasis added). Egypt considers itself as successor of this treaty and claims that Ethiopia should get Egypt’s consent to build any project. Ethiopia rejected this treaty, claiming that it was not ratified, and that the meaning of the word “arrest” in the Amharic (Ethiopian Language) version of the treaty does not preclude Ethiopia from using the waters. See Salman, *supra* note 14, at 18.

79. See Exchange of Notes between Her Majesty’s Government in the United Kingdom and the Egyptian Government on the Use of Waters of the Nile for Irrigation (May 1929), [hereinafter the 1929 Agreement].

80. See *id.* at art. 4(ii) (“Except with the prior consent of the Egyptian Government, no irrigation works shall be undertaken, nor electric generators installed along the Nile and its branches [. . .]”) In 1962, former British East Africa colonies, Kenya, Tanzania and Uganda, using Nyerere doctrine, declared that they were no longer bound this treaty. Yet, Egypt still claims that this treaty is valid and binding on those parties.

81. See Agreement Between the Republic of Sudan and the United Arab Republic Egypt on the Full Utilization of the Waters of the Nile, art. 1(1), Nov. 8, 1959, 453 U.N.T.S. 51 [hereinafter 1959 Agreement] (characterizing the aforementioned quantities as ‘established right of the parties).

82. See *generally id.*

83. *Id.* at 64.

84. Interview with Professor McCaffrey, Legal Consultant, Nile Cooperative Framework Project, in Sacramento, Ca. (Nov. 2017) [hereinafter Interview with Professor McCaffrey].

Nations Development Program (UNDP), the project provided for high level legal and political negotiations toward the conclusion of a basin-wide agreement. A separate but parallel track, the Nile Basin Initiative (NBI), focused on development, was supported by the World Bank beginning in 1999 and was participated in by the same nine Nile Basin States that participated in the CFA.⁸⁵

During the negotiations, the fate of the 1902, 1929, and 1959 Agreements was the subject of controversy. The upstream States believed that the purpose of the Cooperative Framework project was to produce an inclusive agreement that would replace and supersede the previous agreements. The lower riparian States – Egypt and Sudan – insisted that the new agreement must explicitly recognize the earlier treaties, referred to as “existing agreements,” and would continue to be binding against all riparian States.⁸⁶ In an attempt to address the controversy, the negotiators of the CFA introduced the new and non-legal concept of water security.⁸⁷ The principle of water security would have replaced the provision proposed to govern the relationship between CFA and the existing agreements because an agreement could not be reached on such provision.⁸⁸ The idea was that since Egypt was concerned about its water security, water security could be protected in a new provision and the relationship between the CFA and the “existing agreements” could be left to the general rules of international law.⁸⁹ However, the Nile Basin States were not able to agree on the draft provision on water security, contained in Article 14 of the draft CFA.⁹⁰ Specifically, the lower riparian States opposed Article 14 of the draft CFA which in pertinent part, provide that the Nile States “recognize the vital importance of water security to each of them . . . [and the] Nile Basin States therefore agree, in a spirit of cooperation *not to significantly affect the water security of any other Nile Basin State.*”⁹¹ The lower riparians insisted that the language should be amended to obligate all Basin States “*not to adversely affect the water security and current uses and rights of any other Nile Basin State.*”⁹² The upstream States did not accept that proposal and opened the agreement for signature on May 14, 2010.⁹³ The CFA has been signed by six upstream States and ratified by three since that date.⁹⁴ By its

85. *Id.*; see also Ana Elisa Cascão, *Use of Ambiguity in Transboundary River Basins Negotiations: The Case of the Nile River Basin*, <http://www.inweb.gr/twm4/abs/CASCAO%20Ana.pdf> (last visited Nov. 10, 2017).

86. Interview with Professor McCaffrey, *supra* note 84; see also generally Dereje Zeleke Mekonnen, *The Nile Basin Cooperative Framework Agreement Negotiations and the Adoption of a ‘Water Security’ Paradigm: Flight into Obscurity or a Logical Cul-de-sac?* 21 EUR. J. INT’L L. 421 (2010).

87. Interview with Professor McCaffrey, *supra* note 84; see also Mekonnen, *supra* note 86, at 436-40.

88. Interview with Professor McCaffrey, *supra* note 84.

89. *Id.*

90. *Id.*

91. *Id.*; see also Mekonnen, *supra* note 86, at 428

92. *Id.*

93. By opening the draft CFA for signature, the upstream State have used the document as counter-hegemonic strategy. Among others, they used the document to politically isolate the lower riparians and change the narrative that Egypt is the gift of Nile. See Mahemud Tekuya, *The Egyptian Hydro-Hegemony in the Nile Basin: The Quest for Changing the Status Quo*, J. WATER L. 14 (2018).

94. Agreement on the Nile River Basin Cooperative Framework, May 2010, <http://www.nilebasin.org/> (follow “About” tab to “CFA” hyperlink; then follow “download” hyperlink) (last visited

terms, the CFA requires six ratifications to enter into force.⁹⁵ Therefore, as it exists today, the CFA neither binds the lower riparian States nor reallocates the waters of the Nile.

After signing the CFA, Ethiopia started constructing the GERD some 20 km upstream from the border with Sudan on the Blue Nile. Egypt and Sudan initially opposed the dam alleging that it would significantly affect their interest and violate the rules regulating the Nile watercourse.⁹⁶ Considering the enormous advantages it would get from the dam, Sudan immediately changed its position and started to support the construction of the dam.⁹⁷ Gradually, after painstaking negotiations,⁹⁸ Egypt accepted the importance of the dam and the three States signed an Agreement of Declarations of Principles (DoPs) on the GERD on March 23, 2015.⁹⁹ Although the legal status of the document is debatable,¹⁰⁰ the DoPs reiterates the most fundamental principles of international water law.

Generally, it can be said that the legal regime governing the Nile watercourse consists of a number of legal instruments, none of which involves all Basin States or applies to the Basin as a whole. Despite the fragmented nature of the treaties, the following part of this article analyses the flexibility of the most prominent legal instruments, the 1959 Agreement, the CFA and DoPs, and assesses their capacity to adapt to climate change.

2. The 1959 Agreement

As the table demonstrates, the 1959 Agreement does not incorporate most of the mechanisms essential for treaty flexibility. The Agreement does not follow a proportion allocation strategy.. It also fails to address flooding and does not have provisions regarding amendment process and periodic review. Moreover, it envisages perpetual applicability and does not allow for termination by the riparian States.

April 7, 2019) [hereinafter CFA]. Ethiopia, Kenya, Uganda, Burundi, Rwanda and Tanzania have signed the Agreement, and three states Ethiopia, Tanzania and Rwanda have ratified it.

95. *Id.* at art. 43.

96. See Presentation, Salman M. A. Salman, Grand Ethiopian Renaissance Dam: Challenges and Opportunities (2011), https://iwra.org/member/congress/resource/1035_Salman_Lowther_Thurs.pdf (stating that Egypt and Sudan considered the GERD as violation of the 1902 Treaty).

97. See Tawfik, *supra* note 12, at 24.

98. See generally Salman, *supra* note 14 (for the negotiation process).

99. Agreement on Declaration of Principles between the Arab Republic of Egypt, the Federal Democratic Republic of Ethiopia and the Republic of the Sudan on the Grand Ethiopian Renaissance Dam Project, Egypt-Eth.-Sudan, Mar. 23, 2015, https://www.internationalwaterlaw.org/documents/regiona/docs/Final_Nile_Agreement_23_March_2015.pdf [hereinafter DoPs]; Salman, *supra* note 14, at 520.

100. Concerning the status of DoPs, this author anticipates three possible arguments: (1) it is a soft law and does not bind the three countries; (2) it is a hard law and should be honored in good faith; and (3) it is the declaratory principles of customary international watercourses law. For a detailed analysis of each argument, see Tekuya, *supra* note 93, at 15-17.

Flexibility Mechanisms	1959 Treaty	CFA	DoPs
Allocation	Yes, but Fixed	Equitable utilization	Equitable utilization
Extreme events I. Drought II. Flood	Yes No	Yes Yes	No No
Amendment and Review I. Amendment II. Review	No No	Yes, but too rigid No	No No
Termination Clause	No	Yes, but inappropriate	No
RBOs	Yes	Yes	No

The 1959 Agreement does not allocate any water for the upstream States. It allocates the waters of the Nile only between Egypt and Sudan. As the 1929 Agreement determined the “established rights” of the two States, the 1959 Agreement allocated only the net benefit generated from the construction of the HAD.¹⁰¹ Of the 32 BCM gross gain expected after the construction of HAD, the Agreement deducts 10 BCM for evaporation and seepage, and divides the remaining 22 BCM in 2:1 ratio in favor of Sudan or 14.5 BCM for Sudan and 7.5 BCM for Egypt.¹⁰² Then, by adding the net benefits to the established rights of each State, the Agreement allocates fixed volumetric quantity of waters between the two States, 55.5 BCM to Egypt and 18.5 BCM to Sudan. This allocation strategy is very rigid and at odd with the proportional allocation strategy discussed in Part III.

As to extreme events, the drought provision of the 1959 Agreement states that, if normal yearly quotas cannot be drawn during the low years,¹⁰³ the Permanent Joint Technical Committee (PJTC) will devise fair arrangements and submit proposals to both governments for approval.¹⁰⁴ As to the high flow years,¹⁰⁵ the

101. See 1959 Agreement, *supra* note 81, at art. II, ¶ 3-4; Goldenman, *supra* note 10, at 753-54. The net benefit is as follows:

Mean natural river supply at Aswan	84 BCM
Less over-year storage losses	-10
Egypt's Established right	-48
Sudan's Established right	-4
Total net benefit	22 BCM

102. See 1959 Agreement, *supra* note 81, at art. II, ¶ 4.

103. ‘Low years’ are years when the water flows are below the average mean natural river supply at Aswan (84 BCM).

104. See 1959 Agreement, *supra* note 81, at art. IV, ¶ 1(e).

105. ‘High years’ are years when the water flows are above the average mean natural river supply at Aswan (84 BCM).

Agreement requires the two States to divide net benefits equally.¹⁰⁶ The Agreement, like many watercourse treaties, does not provide for any flood controlling mechanism.¹⁰⁷ Yet, flooding is a real problem in the Nile Basin, and its frequency is projected to be exacerbated by climate change.¹⁰⁸

Furthermore, the 1959 Agreement provides no guidance regarding the amendment and review of its provisions. It does, however, envisage the revision of the net benefit generated from the HAD.¹⁰⁹ Both parties are allowed to revise the net benefit “at reasonable intervals to be agreed upon as from the date of the operation of the complete” HAD.¹¹⁰ Although the intended revision is important for building flexibility, it has not been pragmatically applied throughout the Basin’s history. Moreover, as the subject of revision is only “the net benefit”, but not “the established rights” of the two States, the Agreement’s ability to tackle severely diminished river flows due to climate change is questionable. Also, the Agreement does not have a termination clause and hence does not permit the riparian States to end their treaty obligations.

Indeed, the establishment of the PJTC is the most important achievement of the 1959 Agreement.¹¹¹ But, the authority given to the Committee is restricted to administrative matters like overseeing construction and storage works, including the HAD.¹¹² The PJTC has no authority to adopt, amend, or extend the existing arrangements between riparian States. Moreover, this Agreement neither provides a dispute settlement procedure nor does it give the PJTC authority to resolve regional disputes concerning the Nile watercourse. Additionally, it does not oblige Egypt and Sudan to share hydrological data.¹¹³ In a nutshell, it can be said that rigidity is the salient feature of the 1959 Agreement and that it lacks the intrinsic capacity for dealing with the ramifications of climate change.

3. The Cooperative Framework Agreement

The CFA does not use the fixed and volumetric allocations strategy, does not provide a minimum flow to the downstream States, and does not allocate the Nile waters proportionally. Instead, it uses equitable and reasonable utilization as an allocation strategy. By allowing all riparian States to use the Nile waters equitably,¹¹⁴

106. See 1959 Agreement, *supra* note 81, at art. II ¶ 4 (“But if the average yield increases, the resulting net benefit from this increase shall be divided between the two Republics, in equal shares.”).

107. Goldenman, *supra* note 10, at 754-55.

108. See U.N. ENV’T PROGRAMME, *supra* note 33, at 13-14. Compare Conway, *supra* note 35, at 106 (analyzing climate models which predict drier scenarios), with *Dam Bluster: How Climate Change Might Affect the Nile*, ECONOMIST (Aug. 3, 2017), <https://www.economist.com/news/middle-east-and-africa/21725802-egypt-ethiopia-and-sudan-will-have-learn-share-water-or-their-people-will> (analyzing a climate model which predicts wetter scenarios).

109. See 1959 Agreement, *supra* note 81, at art. II, ¶ 5.

110. *Id.*

111. *Id.*

112. *Id.* at art. IV, ¶ 1.

113. See Goldenman, *supra* note 10, at 755 (indicating how “Egypt regards its data on Nile flows and its consumption of those waters to be highly confidential matters of national security”); see generally 1959 Agreement, *supra* note 81.

114. CFA, *supra* note 94, at art. 4, ¶ 1.

the CFA illustrates the relevant factors for determining equitable and reasonable utilization of the water resource.¹¹⁵

The climate, hydrology, and other physical characteristics of the Nile River System are among the factors contained in the list of factors for determining equitable and reasonable utilization.¹¹⁶ The CFA lists “[c]onservation, protection, development and economy of use of the water resources”¹¹⁷ as factors, thus potentially providing the basis for more efficient uses as part of adaptation to decreased flows. Moreover, in recognizing that these factors, including climate, might change over time, it requires riparian States to “keep the status of their water utilization under review in light of substantial changes in relevant factors and circumstances.”¹¹⁸

The CFA does not, however, provide guidance as to how to weigh the various factors, including climate. It simply asserts that the weight to be given to each factor must be determined by comparing it to the other factors, all of which must be considered as a whole.¹¹⁹ It also empowers the Council of Ministers (COM), one of the organs of the Nile Basin Commission (NBC), to determine equitable utilization of waters in each riparian State.¹²⁰ As discussed below, while empowering the Commission is essential for treaty flexibility, the composition of the COM and the absence of specific review periods under the CFA would hinder the role of the NBC.

The CFA provides for an amendment process by setting forth procedures that States are to follow. Article 35 of the CFA sets forth two distinct rules for approving proposed amendments, one requiring consensus and another requiring a two-thirds majority vote.¹²¹ Specifically, proposals to alter Articles 1, 2, 3, 4, 5, 8, 9, 14, 23, 24, 33, and 34 can only be approved by *consensus*.¹²² All other provisions and any protocol can be amended by a *two-thirds majority vote* if States cannot reach an agreement by consensus.¹²³ However, adopting a new proposal requires *consensus*.¹²⁴

The first amendment procedure of the CFA is quite rigid because it requires *consensus*.¹²⁵ The consensus requirement appears too idealistic and does not consider the hydro-political landscape of the Basin. There are intricacies that would make it hard for the Basin States to arrive at a consensus. Some of these intricacies include

115. *Id.* at ¶ 2.

116. *Id.* at ¶ 2(a).

117. *Id.* at ¶ 2(f).

118. *Id.* at ¶ 5.

119. *Id.* at ¶ 4.

120. *Id.* at art 24, ¶ 12.

121. *Id.* at art. 36, ¶ 3.

122. *Id.*

123. *Id.*

124. *Id.* at art 34, ¶ 4.

125. *Id.* at art. 36. For insistence, due to the threats of climate change, the Nile Basin States may find it appropriate to change the allocation strategy followed in the CFA from equitable utilization (Article 4) into proportional allocation. But, because of the requirement of consensus, they may not be able to amend Article 4 of the CFA. Although consensus does not necessarily mean unanimity, it does require at least the non-objection of some Basin countries (Egypt, Sudan, and Ethiopia), giving them the opportunity to hinder the amendment process.

issues such as alarming population growth, suspicion and misunderstanding between the Basin States, high dependency on the river, coercive hegemonic policy, and emphasis on military solutions. Moreover, reaching consensus, if at all possible, requires painstakingly lengthy diplomatic negotiations. Yet, addressing rapid climate change may often require prompt responses, which in return requires building more flexibility into the amendment procedures.

Other procedural issues, such as developing new protocols and periodically reviewing existing agreements, are also important mechanisms to deal with future climatic uncertainties. Although Article 34 of CFA allows the Nile Basin States to adopt new protocols by *consensus*, no instrument shall be inconsistent with the provisions of the CFA.¹²⁶ Moreover, the CFA does not provide for periodic review. It does, however, empower one of its organs, the COM, to “review and revise . . . rules, procedures, guidelines and criteria for the implementation of the provisions of . . . “ the CFA.¹²⁷ While flexibility is implicit in this provision, the fact that the COM is not empowered to review the CFA itself and the absence of specified period within which the CFA would be reviewed could render this call for flexibility of limited value.

Concerning extreme events, the CFA has an explicit provision that includes all “steps of the [climate change] adaptation chain – prevention, preparedness, response, and recovery.”¹²⁸ In this respect, Article 12 of the CFA governing emergency situations states:

1. For the purposes of this provision, “emergency” means a situation that causes, or poses an imminent threat of causing, serious harm to Nile Basin States or other States and that results suddenly from natural causes, such as floods, landslides or earthquakes, or from human conduct, such as industrial accidents.
2. A Nile Basin State shall, without delay and by the most expeditious means available, notify other potentially affected States and competent international organizations of any emergency originating in its territory.
3. A Nile Basin State within whose territory an emergency originates shall, in cooperation with potentially affected States and, where appropriate, competent international organizations, immediately take all practicable measures necessitated by the circumstances to prevent, mitigate and eliminate harmful effects of the emergency.

126. *Id.* at art. 34 (To address the ramification of climate change, the Nile Basin States may need to renegotiate the CFA and change some of its principles by adopting a new protocol that reflect current circumstances. Article 34 forecloses this possibility by requiring such protocol to conform with the principles of the CFA).

127. *Id.* at art. 24, ¶ 11.

128. EARLE ET AL., *supra* note 29, at 143.

4. When necessary, Nile Basin States shall jointly develop contingency plans for responding to emergencies, in cooperation, where appropriate, with other potentially affected States and competent international organizations.¹²⁹

As demonstrated in this article, the CFA addresses the possible ramifications of climate change by incorporating the most recent “sophisticated global climate change discourse.”¹³⁰ The CFA is unique in underscoring that “the response to climate extreme events must be collective, and not only at [a] national level.”¹³¹

However, Article 12 of the CFA does not include flooding as an emergency situation. The CFA addresses flooding in Article 11 concerning the prevention and mitigation of harmful conditions.¹³² Article 11, in relevant part, requires Nile Basin States “to take all appropriate measures to prevent or mitigate conditions related to the Nile River System that may be harmful to other Nile Basin States . . . resulting from . . . causes, such as . . . drought or desertification.”¹³³ While this provision requires the prevention and mitigation of possible harms resulting from drought, it does not provide guidance as to how the riparian States shall use the Nile water during the time of drought. Nor does it address how the waters of the Nile would be allocated during the low years.

Examining such gaps and considering the failure of the CFA to use proportional allocation strategy, one may wonder, during the time of drought, what kind of uses, such as domestic and sanitation, irrigation, or generation of hydroelectric power, will be given priority. Another question is how riparian States will share the water deficiencies occurring during the time of drought. There is no doubt that the lack of concrete guidance regarding priorities among such uses along with the absence of a proportional allocation strategy will pose a significant challenge for the NBC to determine the equitability of the uses in each riparian State.

Concerning termination, the CFA allows the Basin States to withdraw from the Treaty any time after two years from the date of its entry into force.¹³⁴ The only requirement is that the State terminating its treaty obligation shall give written notifications to the depositary.¹³⁵ “The withdrawal shall take place upon expiry of one year after the date of its receipt by the Depositary . . .”¹³⁶

The time limit in which States can withdraw from the Treaty is very short. This abbreviated timeline would cause a fundamental funding problem with the overall CFA. One of the considerations behind the negotiations of the CFA was identifying how the agreement would provide security for international financial institutions and donor countries. Indeed, ensuring financial security would require a

129. CFA, *supra* note 94, at art. 12.

130. EARLE ET AL., *supra* note 29, at 143.

131. *See id.* at 121 (Among others, this discourse considers climate change as cross border issue, and suggest adaptation measures will be more effective when undertaken in coordination (joint measures) with the neighboring countries).

132. CFA, *supra* note 94, at art. 11.

133. *Id.*

134. *Id.* at art. 40, ¶ 1.

135. *Id.*

136. *Id.* at art. 40, ¶ 2.

great deal of certainty and predictability within the terms of the agreement. Yet, ultimately the termination clause hindered the needed certainty by enabling any riparian State to terminate its treaty obligations within a year effectively.

Ironically, it is even difficult to justify the termination clause on the ground of treaty flexibility. As indicated above, owing to the certainty and predictability required for the operation of dams and reservoirs, building flexibility through termination clause is found to be inappropriate for watercourse treaties “involv[ing] permanent structures . . .”¹³⁷ The CFA involves permanent structures, dams, and reservoirs, and is therefore unsuitable for such a termination clause.

The CFA would establish, if and when it enters into force, the NBC as a joint body for the management and sustainable development of the Nile River Basin. The NBC is comprised of five organs: (1) Conference of Heads of State and Government; (2) Council of Ministers; (3) Technical Advisory Committee; (4) Sectoral Advisory Committees and (5) Secretariat.¹³⁸

While the Conference of the Heads of State and Government is the supreme policy-making organ of the NBC,¹³⁹ the Council of Ministers (COM) is the governing body of the NBC.¹⁴⁰ The COM is empowered to make binding decisions by *consensus*.¹⁴¹ It also has a wide range of powers, which, among others, includes overseeing the implementation of the CFA;¹⁴² the power to review and reverse rules, procedures, guidelines, and criteria for the implementation of the provisions of the CFA;¹⁴³ the power to examine and decide the determination of equitable utilization in each riparian State in accordance with the factors provided under the CFA¹⁴⁴ and the power to resolve disputes between Nile Basin States on the interpretation and application of the CFA.¹⁴⁵

The COM makes its decisions based on the recommendations of the Technical Advisory Committee (TAC).¹⁴⁶ Relevant to climate change, for instance, the TAC is empowered to “advise the [COM] on technical matters relating to the use, development, protection, conservation and management of the Nile River Basin and the Nile River System, including protection from drought and floods.”¹⁴⁷ Noticeably, the functional scope of the NBC encompasses multiple issues ranging from promoting the rights and obligations of the Basin States to the development, protection, conservation, and management of the Nile River Basin and its waters. Certainly, such a wide range of authorities will enable the NBC to ensure integrated river basin management addressing various aspects like environmental protection and water allocation under one institutional umbrella. This will, in turn, give the

137. McCaffrey, *supra* note 5, at 160.

138. CFA, *supra* note 94, at art. 17.

139. *Id.* at art. 21.

140. *Id.* at art. 24, ¶ 1.

141. *Id.* at art. 23, ¶¶ 5-6.

142. *Id.* at art. 24, ¶¶ 3-4.

143. *Id.* at art. 24, ¶ 11.

144. *Id.* at art. 24, ¶ 12.

145. *Id.* at art. 24, ¶ 13, art. 33, ¶ 1 (a).

146. *Id.* at art. 26.

147. *Id.* at art. 26, ¶ 6.

NBC the potential to deal with changes in the River Basin and address the ramifications of climate change.

Moreover, as indicated above, there is much uncertainty as to future water availability in the Nile Basin and studies are projecting both flooding and water scarcity.¹⁴⁸ The CFA seems to address this very issue by empowering the TAC to propose, and submit to the COM, various strategies for adapting to the two possible ramifications of climate change: floods and drought.¹⁴⁹ Also, while determining equitable utilization, it may reduce or increase allocations in response to changing levels of precipitation or flow and consider other changing conditions.

The NBC is also empowered to control data and information management. It has the power to develop procedures through which the Nile Basin States shall regularly and readily exchange available and relevant data and information on existing measures and the condition of water resources of the Basin.¹⁵⁰ The Basin States also agree to exchange information concerning planned measures through the NBC.¹⁵¹ Concerning data management, one of its organs, the Secretariat, is tasked “to compile available data and information and coordinate . . . monitoring of information relating to the Nile Basin, including the environment, review . . . and synthesize . . . the information with a view to integrating it into basin-wide databases and establishing standards, and develop . . . mechanisms for the regular exchange of information where needed.”¹⁵²

The existence of this formal information exchange system in the CFA will bring about more resilience and adjustment to climate change by enhancing reliable recordkeeping, honest disclosures and notifications, and good faith efforts to accommodate the concerns of fellow riparian States.¹⁵³ Certainly, the sharing of data between the Basin States will “give decision makers the flexibility to continuously review strategies, policies as well as activities and change management if necessary.”¹⁵⁴ This, in turn, will boost the capacity of the NBC to conduct adaptive water management when environmental and social changes require change.

Additionally, the Commission may serve as a mediator or conciliator to settle disputes between Nile Basin States on the interpretation and application of the CFA.¹⁵⁵ It is likely that the ramifications of climate change, such as floods and droughts, will exacerbate potential disputes over water resources. Hence, the existence of clear conflict resolution mechanisms in the CFA is a highly commendable one and important for adaptive transboundary water governance.¹⁵⁶

As indicated above, the COM also has rulemaking authority. All decisions of the COM are binding on the Basin States if they are made by consensus.¹⁵⁷ Since adaptation requires prompt decisions to respond to changing conditions, the COM

148. See Shih & Stutz, *supra* note 26, at 10789.

149. See CFA, *supra* note 94, at art. 26, ¶ 6.

150. *Id.* at art. 7, ¶ 2-3.

151. *Id.* at art. 8.

152. *Id.* at art. 30, ¶ 9.

153. See Goldenman, *supra* note 10, at 801.

154. See Schulze & Schmeier, *supra* note 72, at 7.

155. See CFA, *supra* note 94, at art. 34, ¶ 1 (a).

156. See Goldenman, *supra* note 10, at 795.

157. See CFA, *supra* note 94, at art. 23, ¶¶ 5-6.

decision-making procedure, particularly the requirement of consensus, will pose significant challenges to successful adaptation. Although consensus does not necessarily mean unanimity, it does require at least the non-objection of those Nile Basin States whose interests are classified as high and very high.¹⁵⁸ This in effect will give any of them the opportunity “to obstruct the majority of actors from passing a decision,”¹⁵⁹ and thus compromise the COM’s ability “to react in a timely manner in cases of urgency such as of abrupt environmental change.”¹⁶⁰

The composition of the COM, which is comprised of the Minister for Water Affairs of each Nile Basin State,¹⁶¹ will also be a big challenge for the flexibility needed to respond to climate change. This is because the Ministers are political appointees who will advance the interests of their respective State and critical decisions need to go through time-consuming diplomatic negotiations. Yet, such “ordinary diplomatic mechanisms will be inefficient to deal with the volume of decisions that climate change will bring.”¹⁶² Reaching agreements through diplomacy has proven to be challenging in the Nile Basin and controversial decisions have rarely been taken in the Basin’s history. This trend will significantly slow down the process of adaptation to climate change. Unless the Basin States are willing to invest the NBC with authority to make at least provisional decisions, it is unlikely to build the flexibility needed to accommodate climate change successfully.¹⁶³

Membership is the other significant problem ahead for the NBC. As indicated above, Egypt and Sudan have not ratified the CFA. When the CFA enters into force, the NBC will succeed to all rights, obligations, and assets of the Nile Basin Initiative (NBI) upon the entry into force of the CFA.¹⁶⁴ If the CFA enters into force, “[w]hat will happen to the rights and obligations under the NBI of the States that are not parties (and do not plan to be parties) to the CFA?”¹⁶⁵ There is no doubt that this impedes effective adaptation since the lower riparian States are not integrated into the CFA, leaving their actions as to the utilization of the Nile waters and climate change adaptation outside the NBC. Moreover, the insufficiently developed cooperation between Egypt and upstream States, the absence of

158. See Salman, *supra* note 14, at 18 (“The stakes of Egypt, Sudan, South Sudan and Ethiopia in the Nile are classified as very high; those of Uganda as high; those Tanzania, Kenya, Burundi, and Rwanda as moderate; and those of Eritrea and Democratic Republic of Congo as low.”)

159. See Schulze & Schmeier, *supra* note 72, at 6.

160. *Id.*

161. See CFA, *supra* note 94, at art. 22.

162. See Goldenman, *supra* note 10, at 801.

163. This proposal could be considered as an erosion of the Basin States’ sovereignty. But, in its first judgment, the PCIJ said in *The Wimbledon* that entering into a treaty is not giving up sovereignty, it is an expression of sovereignty. This should be treated the same way, with regard to conferring the necessary powers on the Commission. Moreover, as responding to the ramifications of climate change requires urgent decision-making process, activating the Commission’s “dormant” authority for the limited purpose of dealing with climate emergencies is imperative.

164. See CFA, *supra* note 94, at art. 31.

165. See Salman, *supra* note 14, at 23. In relation to this, the legal consultant of the CFA project, Professor McCaffery said “the legal situation seems clear enough. How it will play out is another question. As between States that are not parties to a CFA in force, the old regime will govern their relations. Same for relations between those States and States that are parties to the CFA. It is only as between States, all of which are parties to a CFA in force that that will govern their relations.” Interview with Professor McCaffery, *supra* note 84.

commitment concerning the exchange of hydrological data, as well as the disagreement as to the filling and operation of the GERD are likely to become significant impediments to successful integration in the river basin.

4. The Declaration of Principles (DoPs)

The DoPs is a unique addition to the legal regime governing the use of the Nile watercourse. The DoPs is signed by Ethiopia, Egypt, and Sudan to govern the GERD and minimize its potential adverse effect on the lower riparian States. Like the CFA, the DoPs use equitable utilization as an allocation strategy. The DoPs does not allocate fixed volumetric water for any of the riparian States. Instead, it simply allows the three States to use “their shared water resources in their respective territories in an equitable and reasonable manner.”¹⁶⁶

The DoPs lists the factors provided in the CFA as the relevant factors to be considered in determining equitable and reasonable utilization.¹⁶⁷ However, unlike the CFA, the DoPs does not establish any organ responsible for assessing these factors and determining what amounts to equitable use in individual cases. Nor does it provide any guidance for the equitable allocation of “the shared water” during the filling and operation of the GERD. Instead, the DoPs merely recommends that the three States agree on rules concerning the first filling and operation of the GERD based on the recommendation of an International Panel of Experts.¹⁶⁸ So far, the three States have not agreed on the filling and operation of the GERD, and hence there is currently no mechanism governing how Ethiopia shall fill the GERD reservoir, and especially no mechanisms governing filling and operation during times of flood and drought. This is especially problematic because the first filling of the dam might occur during a flood or drought time as the Nile watercourse is experiencing “increase in the flow variation from year to year,”¹⁶⁹ flood in one year and drought in another. In addition, no guarantee exists on Ethiopia’s part to provide the minimum water requirement for Egypt and Sudan.

The DoPs also does not include a mechanism for dealing with extreme climate events. It says that Ethiopia *will* inform the downstream States of any unforeseen or urgent circumstances requiring adjustments in the operation of GERD.¹⁷⁰ While data and information exchange is important for adapting to climate change, the DoPs impose no obligation Ethiopia’s part to inform the downstream States concerning the operation of the GERD. Moreover, in order to address the projected ramifications of climate change, particularly flooding and drought, it is critical that “the GERD, HAD, and Sudan’s reservoirs [are] operated in coordination by Egypt, Ethiopia, and Sudan.”¹⁷¹ The DoPs does not address this matter, and

166. DoPs, *supra* note 99, at princ. IV para. 1.

167. *Id.* at para. 2, subsec. a-i.

168. *Id.* at princ. V, para. 2, subsec. a-b.

169. Kavya Balaraman, *A New Dam on the Nile Reveals Threats from Warming*, SCI. AM.: E&E NEWS (May 5, 2017), <https://www.scientificamerican.com/article/a-new-dam-on-the-nile-reveals-threats-from-warming/>.

170. DoPs, *supra* note 99, at princ. V, para. II, subsec. c.

171. INT’L, NON-PARTISAN EASTERN NILE WORKING GRP., MIT ABDUL LATIF JAMEEL WORLD WATER AND FOOD SEC. LAB, *THE GRAND ETHIOPIAN RENAISSANCE DAM: AN OPPORTUNITY FOR COLLABORATION AND SHARED BENEFITS IN THE EASTERN NILE BASIN* 3-4 (2014).

currently, there is no agreement for the coordinated operation of those dams. This type of agreement is important to make sure that the operation of the GERD will not significantly harm the lower riparian States “during the filling period or [the] periods of prolonged drought.”¹⁷²

To deal with the hardships of the projected extreme drought years, the Nile Basin States “will need to build more reservoirs and storage capacity.”¹⁷³ Given the tension the GERD has caused, one can easily imagine the problem that building additional storage may cause.¹⁷⁴ Issues such as where to build additional storage and under whose control need to be addressed to enhance the adaptive potential of the Basin. Moreover, like the CFA, the DoPs does not provide a review period. However, flexibility in the filling and operation of the dam and adapting to climate variability requires continuous and periodic review of the strategies in light of new knowledge and changing circumstances.

Generally, it can be said that the Nile Basin still requires an agreement, one which is flexible enough to adapt to climate variability, defines the minimum water requirement for the lower riparian States, and regulates the operations of the two reservoirs, the HAD and GERD, accordingly.

V. THE WAY FORWARD: TOWARDS A BASIN-WIDE CLIMATE-PROOF TREATY

As demonstrated above, the Nile Basin is highly vulnerable to the impacts of climate change. The ramifications of climate change, particularly the rising of average temperatures and uncertainty as to the availability of water, pose substantial challenges to the use and management of the Nile watercourse. Building flexibility and adaptability into a Nile treaty or developing a basin-wide climate-proof treaty is imperative to overcome these challenges. However, as indicated above, the Nile Basin does not have an all-inclusive climate proof treaty. Even the CFA lacks the flexibility needed to adapt to climate change. For the CFA to be a climate-proof treaty, its amendment is a matter of necessity. In this part, the article proposes a revised form of the CFA as a climate-proof treaty, suggesting mechanisms for building more flexibility into the agreement to accommodate climate change.

The allocation strategy followed by the CFA and the governing rule of the Nile watercourse is equitable and reasonable utilization. There is no doubt that flexibility is implicit in this principle. However, with the anticipated impacts of climate change, what is equitable today could very well be inequitable tomorrow. The CFA attempts to address this problem by empowering the COM to determine the equitable utilization of each riparian State by considering the factors provided therein. Given the COM’s composition, determining equitable utilization is likely to be highly politicized. In the COM’s attempt to arrive at consensus “national interests [would] trump equitable considerations or become disguised in a party’s weighting of factors.”¹⁷⁵ An explicit provision governing how to weight various factors, and determining priorities among uses, therefore, is extremely necessary as it will

172. *Id.* at 4.

173. See Balaraman, *supra* note 169.

174. *Id.*

175. Goldenman, *supra* note 10, at 785.

“greatly ease the process of determining an equitable utilization of a river’s waters in the event of climate-related alterations in flow.”¹⁷⁶

More specifically, since the drought provision of the CFA does not address the allocation or reallocation of the water, ensuring equitable utilization during the low years would be extremely difficult. One possible way out of this problem is to provide a minimum water quantity for lower riparian States and allow the upstream States to deliver below such quantity during drought seasons. However, given Egypt’s dependency on the Nile, this approach is unrealistic. Hence, including a percentage allocation strategy in the CFA and sharing the possible water deficiencies, and surplus, proportionally among the Basin States is imperative to build the flexibility needed to accommodate climate change successfully.

The CFA requires the riparian States to prevent and mitigate the problem of flooding. But, neither the DoPs nor the CFA provides guidance regarding the operation of dams at the time of flooding. Moreover, given the recent increase in the flow variation, specific provisions governing how Ethiopia will fill the GERD during times of flood and drought are necessary. Also, to address the problems of flooding and drought, it is imperative that an explicit provision calling for joint operations of the GERD, HAD, and Sudan’s reservoirs is included.

Furthermore, as indicated above, to deal with the hardships of the projected extreme drought years, Nile Basin States will need to build more reservoirs and storage capacity. Accordingly, specific provisions specifying the places to build additional joint storage are necessary. The recommendation is to build additional storage in the upstream States and also shift the existing ones to the upstream States in order to get net water savings due to the lower evaporation losses in these States. Moreover, flexibility in the filling and operation of the dams, and adapting to climate variability would also require continuous and periodic review of the strategies in light of new knowledge and changing circumstances.

The ramifications of climate change can be expected to necessitate the reallocation of the Nile waters. Periodic review is important to ensure equitability in the face of extreme climate uncertainty. The CFA does not provide for periodic review, and thus ensuring equitable allocation of the Nile during the extreme climate events is hardly possible. The revised form of the CFA needs to include explicit provisions concerning the adjustment and review of the Agreement in general, and in particular, regarding the equitable allocation of the Nile waters to adapt to the ramifications of climate change. Moreover, it should define what constitutes climate change and specify when adjustments would be necessary. The latter can be done by setting down “triggers” (magnitude of climate change) that would activate treaty adjustments or by merely providing specific periods when the agreement should be reviewed.¹⁷⁷

Apart from reviewing, parties also may withdraw from treaty obligations so as to free themselves from an inequitable allocation of the watercourse. The CFA allows any riparian State to withdraw from the treaty upon a one-year period of notice. While this is important for treaty flexibility, it is in strict contrast with the predictability and certainty required for the effective management of the Nile

176. *Id.*

177. *Id.* at 798.

watercourse, especially where infrastructure is involved. This provision defeats the purpose of the CFA as it compromises the security needed by the riparian States and the donor communities. The flexibility required for adapting to climate change and the certainty required for smooth operations of dams would be reconciled if a long period of notice, say 10-15 years, is required to withdraw from the treaty, while at the same time empowering the NBC to review the equitable allocation of the waters periodically. For instance, the Columbia River Treaty between Canada and the United States, which is focused on hydroelectric power production and flood protection, provides for either party to give 10 years notice of termination, but only beginning some sixty years after the Treaty's entry into force.¹⁷⁸

As per the CFA, the NBC has rulemaking authority. The requirement of consensus along with the composition of the COM will, however, cause a big challenge for the flexibility needed to respond to climate change. One way out of this problem would be reorganizing the structure and the composition of the NBC. Instead of the Conference Heads of States, the revised form of the CFA should empower the COM as the supreme policy making-organ of the NBC. Moreover, it should establish a new Technical Committee with independent authority. The Technical Committee should be composed of experts, not political appointees, and the Committee should be given all powers of the COM under the current CFA. To efficiently respond to the ramifications of climate change, the Committee should be empowered to make provisional binding decisions as to the use and management of the Nile waters, including review and amendments, and its decisions should be effective immediately until and unless disapproved within six months by the COM. Furthermore, as compliance is extremely important for the effectiveness of this kind of institutional arrangement, the Basin States political commitment to successfully follow through and implement decisions both at national and Basin level is a matter of necessity. Also, the establishment of a compliance or implementation committee that will review the Nile Basin States' compliance with their obligations under the revised CFA and the institutional arrangement proposed in this article is critical.

Membership is the other problem related to the NBC. Given the fact that the revised CFA would protect the interests of the lower riparian States, it is expected that they will join it and be members of the organ envisaged in this article. In the event any Basin State refuses to join such a revised CFA, its interest must be protected in that it should retain its membership in the NBI. Accordingly, the provision which requires the transfer of the rights and obligations of the NBI to the NBC upon the entry into force of the CFA needs to be amended or should be considered as effective between States that are parties to an in-force CFA.

VI. CONCLUSION

Governing the Nile Basin under climate uncertainty requires responding to two possible contradictory scenarios: increase in water availability or flooding and also water scarcity or drought, each of which requires adaptation strategies that are the opposite of those required of the other. Although flexible and resilient legal and institutional arrangements are at the heart of such adaptation strategies, the legal regime governing the Nile Basin lacks the flexibility needed to adapt to climate

178. *Columbia River Treaty-CRT*, *supra* note 56, at art. XIX, § 2.

change. Of the three most known legal instruments, the CFA is a big step forward for governing the Nile Basin under climatic uncertainty. However, the CFA itself lacks the intrinsic capacity for addressing the ramifications of climate change.

Among others, the CFA falls short of providing a review period and guidance as to how the Nile waters should be allocated in low times or drought seasons. These omissions, along with the need for joint operation of dams in the Basin, renders revision of the CFA imperative in order to build the flexibility needed for successful adaptation to climate change. Moreover, the CFA has some features of rigidity in its amendment and decision-making process. Given the hydro-political landscape of the Nile Basin, the rather unrealistic requirement of “consensus”, both for altering the agreement and issuing binding decisions, will significantly undermine the CFA’s ability to adapt to climate change. It will also foreclose a possible role of the NBC in building more flexibility into the Agreement. Accordingly, the need for addressing the ramifications of climate change requires the Nile Basin States to reorganize the structure and composition of the NBC in such a manner as will ensure an expedited decision-making process that is capable of responding to rapid development brought on by climate change. In addition, the Nile Basin States should empower a Commission, comprising of experts, with independent authority to make at least provisionally binding decisions.

For many years, the Nile Basin States have been using the existing fragmented legal regime to protect their narrow self-interests. But now, with the ever-increasing threats of climate change, the time seems ripe to set aside such egoistic national interests and address the ramifications of climate change by developing a basin-wide, climate-proof treaty.