

NOTE

MANAGING SCARCE WATER IN THE FACE OF GLOBAL CLIMATE CHANGE: PREVENTING CONFLICT IN THE HORN OF AFRICA

I. INTRODUCTION

Scientists predict that global climate change will alter the planet in significant ways. Weather patterns will change, causing drought in some areas and increased precipitation leading to devastating flooding in others.¹ The United Nations, a significant number of governments, and many non-governmental organizations (“NGOs”) have recognized the threat climate change poses to the planet and our ecosystems, however both mitigation efforts and adaptation strategies have been slow to materialize.² The effects of climate change on water access and supplies are of particular concern because, even without climate change-related stresses, access to clean water presents a significant challenge.³ The U.N. Human Rights Committee recognized the right to safe and clean drinking water and sanitation in 2002, however this concept was only recently accepted by the U.N. General Assembly.⁴ In 2001, the international community adopted the Millennium Development Goals, setting forth targets to improve access to clean drinking water and sanitation by 2015.⁵ However, with less than five years remaining before

1. Sumudu Atapattu, *Global Climate Change: Can Human Rights (and Human Beings) Survive This Onslaught?*, 20 COLO. J. INT’L ENVTL. L. & POL’Y 35, 52 (2008).

2. See *id.* at 60-64; see, e.g., U.N. ENVTL. PROG. [UNEP], FROM CONFLICT TO PEACEBUILDING: THE ROLE OF NATURAL RESOURCES AND THE ENVIRONMENT, at 28-29, U.N. Doc. DEP/1079/GE (2009) [hereinafter FROM CONFLICT TO PEACEBUILDING]; UNEP, FACING THE FACTS: ASSESSING THE VULNERABILITY OF AFRICA’S WATER RESOURCES TO ENVIRONMENTAL CHANGE, at 2, U.N. Doc. UNEP/DEWA/RS.05-2 (2005) [hereinafter FACING THE FACTS].

3. See Colleen P. Graffy, *Water, Water, Everywhere, Nor Any Drop to Drink: The Urgency of Transnational Solutions to International Riparian Disputes*, 10 GEO. INT’L ENVTL. L. REV. 399, 402-03 (1998).

4. G.A. Res. 64/292, at 2-3, U.N. Doc. A/RES/64/292 (Aug. 3, 2010).

5. See G.A. Res. 55/2, at ¶ 23, U.N. Doc. A/RES/55/2 (Sept. 18, 2000); U.N. DEP’T ECON. & SOC. AFFAIRS [DESA], THE MILLENNIUM DEVELOPMENT GOALS REPORT, at 58-62 (2010), available at [http://www.un.org/millenniumgoals/pdf/MDG%20Report%202010%20En%20r15%](http://www.un.org/millenniumgoals/pdf/MDG%20Report%202010%20En%20r15%20.pdf)

the deadline, there is little evidence that much progress has been made in the Horn of Africa.⁶

Each year, approximately 1.8 million children in Africa die of preventable waterborne diseases caused by poor sanitation.⁷ Scholars have recognized that as populations grow and resources become more scarce due to overpopulation, overuse, and climate change, the potential for conflict over natural resources, including water, dramatically increases.⁸ Today, on average, Americans consume 578 liters of water per person per day, the United Kingdom 334 liters per person per day, Asia 85 liters per person per day, and Africa only 47 liters per person per day.⁹ To ensure basic health, between 50 and 100 liters of water per person per day are needed.¹⁰ The lowest amount to sustain life is 25 liters per person per day, however this is insufficient to meet the requirements of basic hygiene and human health.¹¹ Currently, approximately 884 million people lack access to safe water worldwide and over 2.6 billion do not have sufficient access to basic sanitation.¹² Even without taking into account the expected effects of climate change, current population growth and water use will strain the available water resources beyond their limits by 2025.¹³

Africa is expected to be the region hardest hit by the effects of climate change.¹⁴ The continent is expected to experience reductions in agricultural productivity resulting in food insecurity, particularly

20-low%20res%2020100615%20-.pdf.

6. DESA, *supra* note 5, at 58-61; Atapattu, *supra* note 1, at 51.

7. Atapattu, *supra* note 1, at 51.

8. FROM CONFLICT TO PEACEBUILDING, *supra* note 2, at 8.

9. Chad A. West, *For Body, Soul, or Wealth: The Distinction, Evolution, and Policy Implications of a Water Ethic*, 26 STAN. ENVTL. L.J. 201, 211 (2007).

10. U.N. Human Rights Council, *Report of the United Nations High Commissioner for Human Rights on the Scope and Content of the Relevant Human Rights Obligations Related to Equitable Access to Safe Drinking Water and Sanitation Under International Human Rights Instruments*, ¶ 15, U.N. Doc. A/HRC/6/3 (Aug. 16, 2007) [hereinafter *High Commissioner Report*].

11. *Id.*

12. G.A. Res. 64/292, *supra* note 4, at 2.

13. Michel Boko et al., *Africa*, in INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE [IPCC], CONTRIBUTION OF WORKING GROUP II TO THE FOURTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE 444 (2007), available at http://www.ipcc.ch/publications_and_data/ar4/wg2/en/ch9.html.

14. *Id.* at 791; U.N. Framework Convention on Climate Change [UNFCCC], *Physical and Socio-Economic Trends in Climate-Related Risks and Extreme Events, and Their Implications for Sustainable Development*, ¶ 60, FCCC/TP/2008/3 (Nov. 20, 2008) [hereinafter UNFCCC, *Physical and Socio-Economic Trends*]; UNFCCC, *Background Paper on Impacts, Vulnerability, and Adaptation to Climate Change in Africa*, ¶ 77 (Sept. 23, 2006) [hereinafter UNFCCC, *Background Paper*].

regarding subsistence agriculture, increased water stress, and increased risks to human health.¹⁵ Kenya, Ethiopia, and Somalia are expected to experience the most severe water shortages by 2025.¹⁶ Each country has experienced serious drought several times in the last century, most recently in 2006.¹⁷ Kenya, Ethiopia, and Somalia share three river basins¹⁸ among them, however no formal international agreements exist to address the management and governance, allocation, development, environmental protection, monitoring, enforcement, or conflict resolution concerning these water resources.¹⁹

In Eastern Africa, the Juba-Shebelle²⁰ and Lake Turkana/Great Rift Valley basins are critical water sources for Ethiopia, Somalia, and Kenya.²¹ The Juba and Shebelle rivers flow from the Ethiopian

15. Boko et al., *supra* note 13, at 791; UNFCCC, CLIMATE CHANGE: IMPACTS, VULNERABILITIES, AND ADAPTATION IN DEVELOPING COUNTRIES 18 (2007), <http://unfccc.int/resource/docs/publications/impacts.pdf> [hereinafter UNFCCC, CLIMATE CHANGE]; UNFCCC, *Physical and Socio-Economic Trends*, *supra* note 14, at 16.

16. FACING THE FACTS, *supra* note 2, at 20.

17. *Id.* at 19; see UNFCCC, *Background Paper*, *supra* note 14, at 17; AQUASTAT, *FAO's Information System on Water and Agriculture*, U.N. FOOD AND AGRICULTURE ORGANIZATION [FAO], <http://www.fao.org/nr/water/aquastat/main/index.stm> (last visited Jan. 27, 2011) [hereinafter FAO, *Water and Agriculture*]; *Drought-Affected Farmers and Pastoralists in Ethiopia Face Severe Food Crisis*, FAO NEWSROOM, Feb. 15, 2006, <http://www.fao.org/newsroom/en/news/2006/1000232.html> [hereinafter *Drought-Affected Farmers*]; *Ethiopia*, CIA WORLD FACTBOOK, <https://www.cia.gov/library/publications/the-world-factbook/geos/et.html> (last visited Jan. 27, 2011); *Kenya*, CIA WORLD FACTBOOK, <https://www.cia.gov/library/publications/the-world-factbook/geos/ke.html> (last visited Jan. 27, 2011); *Somalia*, CIA WORLD FACTBOOK, <https://www.cia.gov/library/publications/the-world-factbook/geos/so.html> (last visited Jan. 27, 2011).

18. A river basin is the “area that contributes hydrologically (including both surface[] and groundwater) to a first order stream, which, in turn, is defined by its outlet to the ocean or to a terminal (closed) lake or inland sea” and includes lakes and shallow, unconfined groundwater units. Aaron T. Wolf, *Shared Waters: Conflict and Cooperation*, 32 ANN. REV. ENVTL. RESOURCES 241, 245 (2007). When a river basin crosses the political boundaries of more than one country, it takes on an international, or transboundary, character. *Id.* A watercourse is “a system of surface waters and groundwaters constituting by virtue of their physical relationship a unitary whole and normally flowing into a common terminus” and is deemed international when parts of a watercourse are located in different States. Convention on the Law of the Non-Navigational Uses of International Watercourses, G.A. Res. 51/229, art. 2, U.N. GAOR, 51st Sess., Supp. No. 49, U.N. Doc. A/51/869, at 3 (May 21, 1997) [hereinafter U.N. Watercourses Convention].

19. See Jonathan Lautze & Mark Giordano, *Transboundary Water Law in Africa: Development, Nature, and Geography*, 45 NAT. RESOURCES J. 1053, 1068 (2005); FAO, *Water and Agriculture*, *supra* note 17.

20. Scholars often separate the Juba-Shebelle basin into two separate basins: the Juba basin and the Shebelle basin because at times, the Shebelle River dries up near the mouth of the Juba River. In addition, the spelling of the basin varies depending on the language used. As such, Juba also appears as Jubba and Shebelle also appears as Shabelle.

21. See FACING THE FACTS, *supra* note 2, at 17; UNEP, KENYA: ATLAS OF OUR CHANGING

highlands into Somalia, supplying water to Somalia's most fertile region, including to the capital, Mogadishu.²² The Omo River flows from Ethiopia and terminates in Lake Turkana, which Ethiopia shares with Kenya.²³ The people who live in these areas depend heavily upon these waters, however no agreements between any of the three countries exist to define and safeguard their rights.²⁴ This lack of international cooperation or formal agreement poses the risk of conflict over water resources in the event of future drought, population increase, or climate change. While environmental factors are seldom the only cause of international conflict, depleted resources or conflicting interpretations of rights often contribute to conflict when combined with ethnicity, poor economic conditions, and regional political tensions.²⁵

This Note evaluates the necessity and feasibility of transboundary water agreements in the Juba-Shebelle and Lake Turkana basins. Part II examines the current state of water in the Juba-Shebelle and Lake Turkana river basin areas. Part III assesses the potential future problems to the region threatened by drought, population increase, and global climate change. Part IV compares various theories of international law pertaining to water law as a model to move forward. Finally, Part V proposes the next steps for the region in implementing transboundary water agreements, given current political and climate considerations. This Note concludes that transboundary water institutions should first be established to gather data and information, develop appropriate planning and management strategies for each basin, and build necessary confidence between nations. Once such organizations are established and functioning well, formal treaties should be entered into to safeguard the resources of each riparian country.

II. CURRENT STATE OF WATER

Most rain in Eastern Africa is from the monsoon system, but rainfall varies greatly from year to year and also region to region.²⁶ The Lake Turkana/Great Rift Valley basin, an internal drainage system,

ENVIRONMENT 76, 78 (2009) [hereinafter KENYA: ATLAS]; FAO, *Water and Agriculture*, *supra* note 17.

22. See FACING THE FACTS, *supra* note 2, at 18, fig.3.8; FAO, *Water and Agriculture*, *supra* note 17.

23. See FAO, *Water and Agriculture*, *supra* note 17.

24. See *supra* text accompanying notes 18-19.

25. FROM CONFLICT TO PEACEBUILDING, *supra* note 2, at 8.

26. See FACING THE FACTS, *supra* note 2, at 18; FAO, *Water and Agriculture*, *supra* note 17.

provides the main surface water drainage system in Eastern Africa.²⁷ The water in the eastern region of the valley drains into the Indian Ocean, while the remainder flows eventually to the Nile River, draining into the Mediterranean Sea.²⁸ Low rainfall over time has resulted in low water levels in rivers, aquifers, and reservoirs and has altered the water available for individual, industrial, and irrigation use.²⁹

Due to varied annual rainfall, periodic drought, and predicted temperature increase, freshwater resources in Africa are beginning to disappear.³⁰ Ethiopia, Somalia, and Kenya already experience very high risk of drought because of erratic precipitation in the region.³¹ Some predict that mean surface temperature in Africa could increase by two to six degrees by 2100.³² An increase in mean surface temperature coupled with periodic droughts and varied precipitation will cause increased evaporation of surface freshwater resources, forcing further exploitation of groundwater resources.³³ In addition, population in the region is increasing rapidly.³⁴ In fact, the population in the region in 2030 is projected to be 511 million, a 98% increase from the current levels.³⁵ Considering the ever-present risk of drought and the rapid population growth in the region, already scarce water resources will become even more so.

A. Water Use and Consumption

In Ethiopia, Somalia, and Kenya, agriculture is the primary water-consuming sector, with municipal water use measuring much lower in annual averages.³⁶ In each country, agriculture is either the most common or second most common occupation and poverty levels in

27. FACING THE FACTS, *supra* note 2, at 19.

28. *Id.*

29. *Id.* at 18.

30. *Id.* at 17; see UNFCCC, *Background Paper*, *supra* note 14, at 20, 22; FAO, *Water and Agriculture*, *supra* note 17.

31. FAO, *Water and Agriculture*, *supra* note 17.

32. See, e.g., UNFCCC, *Background Paper*, *supra* note 14, at 19.

33. *Id.* at 22.

34. FACING THE FACTS, *supra* note 2, at 17, 19; UNFCCC, *Background Paper*, *supra* note 14, at 6; see *Ethiopia*, *supra* note 17; *Kenya*, *supra* note 17; *Somalia*, *supra* note 17.

35. See U.N. DEP'T OF ECON. & SOC. AFFAIRS [ESA], WORLD URBANIZATION PROSPECTS: THE 2007 REVISION, 104-05, U.N. Doc. ESA/P/WP/205 (2008) [hereinafter WORLD URBANIZATION PROSPECTS].

36. See UNFCCC, *Physical and Socio-Economic Trends*, *supra* note 14, at ¶ 92; FAO, *Water and Agriculture*, *supra* note 17.

Ethiopia, Somalia, and Kenya are 44%, 43%, and 53%, respectively.³⁷ Because of their reliance on the agricultural industry, each country exhibits significant food insecurity with portions of the population relying on famine relief in good harvest years and even more in years of drought.³⁸ Drought in each country has taken thousands of lives and has taken a significant toll on livestock populations and crop yields.³⁹

In Ethiopia, only about 22% of the population has access to improved drinking water sources, ranging from 81% in the urban areas to only 11% in the rural areas.⁴⁰ Furthermore, sanitation coverage⁴¹ averages only 6% in Ethiopia, with coverage of 19% in urban areas and only 4% in rural areas.⁴² Similarly, in Somalia, it is estimated that only 33% of the population has access to safe water and 51% have sanitation coverage.⁴³ In Kenya, 62% of the population has access to safe water, ranging from 89% in urban areas to 46% in rural areas, and 48% of the population has sanitation coverage.⁴⁴ Without concrete plans and the necessary funding to increase sanitation and bring safe drinking water to greater portions of the population, unsustainable population growth will mean more people will not have access to safe drinking water, get sick, and potentially die from preventable waterborne diseases.

B. Water Regulation

In Ethiopia, water resources are regulated and developed by the Ministry of Water Resources in conjunction with the Awash Basin Water Resources Management Agency, the Ministry of Agriculture, and the Environmental Protection Authority, and regional and sub-national institutions, including NGOs.⁴⁵ Some formal Water Users Associations have been established in Ethiopia, but the country has no institution that

37. FAO, *Water and Agriculture*, *supra* note 17.

38. See UNFCCC, *Physical and Socio-Economic Trends*, *supra* note 14, at ¶¶ 93-94; FAO, *Water and Agriculture*, *supra* note 17; Somalia, *supra* note 17.

39. FAO, *Water and Agriculture*, *supra* note 17.

40. *Id.* Safe drinking water is defined as “water that does not represent any significant risk to health over a lifetime of consumption and that is free of microbial pathogens, chemical[,] and radiological substances.” *High Commissioner Report*, *supra* note 10, at ¶ 17.

41. International human rights instruments do not provide consistent or adequate definitions of “sanitation” and further guidance is needed to establish a minimum standard. *High Commissioner Report*, *supra* note 10, at ¶¶ 18, 21, 67.

42. FAO, *Water and Agriculture*, *supra* note 17.

43. *Id.*

44. *Id.*

45. *Id.*; see ETH. MINISTRY OF WATER RES., <http://www.mowr.gov.et> (last visited Jan. 27, 2011).

is directly involved in water management in smallholder-irrigated agriculture, leaving the sector virtually unregulated.⁴⁶ Funding for water resources is envisaged according to a multi-sector cost-sharing program that has not yet been realized.⁴⁷ As such, Ethiopia lacks sufficient investment capital in water quality research and development.⁴⁸ While the country focuses on water quality improvement, water quality standards and limits do not exist.⁴⁹ Furthermore, though goals have been set to achieve universal access to water by 2016, a specific, concrete plan to improve access to potable water in rural areas is not clear and it is not apparent what progress, if any, has occurred in furtherance of this goal.⁵⁰

In Somalia, water rights are not allocated and charged in a consistent manner, despite the creation of canal committees and water use associations in some areas.⁵¹ Canal committees have better maintained schemes where there are small irrigation systems with hand-dug canals.⁵² In contrast, large-scale irrigation schemes had been maintained by governments that no longer exist.⁵³ As such, these schemes are not adequately maintained by the present, transitional government that came to power in early 2009.⁵⁴ Given the current political turmoil, water management is left to local communities or to the semi-autonomous regional governments, leaving no cohesive national water management system or strategy.⁵⁵ Compounding the already weak management is the fact that often people cultivating the land have no previous experience or training in proper irrigation techniques, thus they are likely to overuse what little water is available.⁵⁶ In addition, uniform constitutional and legal rules governing social or economic behavior do not exist.⁵⁷ In most of the rural regions, people abide by traditional Somali law (xeer) and Islamic Sharia law.⁵⁸ Ownership of land and

46. FAO, *Water and Agriculture*, *supra* note 17.

47. *Id.*

48. See ETH. MINISTRY OF WATER RES., *supra* note 45.

49. *Id.*

50. FAO, *Water and Agriculture*, *supra* note 17.

51. *Id.*

52. *Id.*

53. *Id.*

54. *Id.*; *Somalia*, *supra* note 17.

55. FAO, *Water and Agriculture*, *supra* note 17. This internal inconsistency and lack of cooperation, in turn, undermines any effort to better manage Somalia's shared water resources with her neighbors.

56. *Id.*

57. See *Somalia*, *supra* note 17.

58. FAO, *Water and Agriculture*, *supra* note 17; *Somalia*, *supra* note 17.

water is based on the territory associated with each clan and is treated as public property, although appropriation and permitting is allowed.⁵⁹

In Kenya, the Ministry of Water and Irrigation is responsible for water management and development.⁶⁰ Kenya has taken great strides in recent years to reform and improve its water management system, but the availability of potable water and sanitation remain substandard.⁶¹ Because water demand exceeds the water resources available in Kenya, Kenya's policies and legislation for water management are inadequate to serve its population absent concrete agreements between Kenya, Ethiopia, and Somalia for the management and mutually beneficial development of their shared waters.⁶²

Each country in the region experiences similar issues with regard to the management of their water resources, both for individual and agricultural use: decentralized, fragmented, overlapping, or nonexistent authority over the allocation, development, and maintenance of water resources. Domestic legal systems are inadequate to mandate authority, ensure compliance, and provide accountability.

C. Existing Transboundary Water Agreements

Presently, there are no existing agreements between any of the three countries concerning water resource allocation, development, sanitization, or pollution.⁶³ The lack of such agreements leaves open the risk for unilateral development along a watercourse within a country's own territory—such as the construction of a large-scale dam—that will impact downstream riparians.⁶⁴ For example, Ethiopia is presently planning to build a dam on the Omo River, which provides approximately 80% of Lake Turkana's water and is shared by Ethiopia and Kenya.⁶⁵ Many fear that this dam, called the Gibe III, will so severely disrupt the flow of water to Lake Turkana that its operation will destroy the lives of the 300,000 people who depend on the lake's waters

59. FAO, *Water and Agriculture*, *supra* note 17.

60. *See About Us*, KENYA MINISTRY OF WATER AND IRRIGATION, <http://www.water.go.ke/> (last visited Jan. 27, 2011).

61. FAO, *Water and Agriculture*, *supra* note 17.

62. *See id.*

63. *See supra* text accompanying notes 18-19.

64. Wolf, *supra* note 18, at 248.

65. Mwaura Samora, *Africa: Future Wars Could Be Fought over Lakes, Rivers*, DAILY NATION, Jan. 21, 2010, <http://allafrica.com/stories/201001210878.html>; *Web Campaign Against Ethiopia Dam*, BBC NEWS, Mar. 23, 2010, <http://news.bbc.co.uk/2/hi/africa/8582682.stm>.

for their survival.⁶⁶ Without agreements concerning water resources, such unilateral projects risk becoming a flashpoint which can create or raise tensions between countries and increase instability.⁶⁷ In addition, the lack of any agreement on the management and allocation of water resources carries the serious risk of conflict when the resource becomes scarcer in the future.⁶⁸

D. Current Problems with Water

The present issues with water in the region are indicative of those that will be seen in the future when climate change exacerbates the limited availability of water.⁶⁹ Overpopulation, deforestation, aridity and desertification, lack of physical access, lack of sanitation, and overreliance on existing water sources are all factors that will complicate the availability of the resource in the future if steps are not immediately taken to curtail such issues.

1. Overpopulation

With Ethiopia, Somalia, and Kenya exhibiting birth rates above a sustainable level (3.2%,⁷⁰ 2.8%,⁷¹ and 2.7%,⁷² respectively), the population in this region will continue to expand, further diminishing the availability of already insufficient water and food resources.⁷³ Eastern Africa has shown one of the highest population growth rates in the world, which is projected to continue from 2000 to 2030.⁷⁴ Population in the region has increased from 65 million people in 1950 to 257 million in 2000 and is projected to further increase to 511 million by 2030.⁷⁵ While the population is increasing at a dramatic rate, water resources are not.⁷⁶ With no change, this unsustainable growth will further stress the already scarce water resources in the region.

66. Samora, *supra* note 65; *Web Campaign Against Ethiopia Dam*, *supra* note 65.

67. Wolf, *supra* note 18, at 248.

68. *See id.* at 252-53.

69. UNFCCC, *Background Paper*, *supra* note 14, at ¶ 77.

70. *Ethiopia*, *supra* note 17.

71. *Somalia*, *supra* note 17.

72. *Kenya*, *supra* note 17.

73. *See* Wolf, *supra* note 18, at 242.

74. WORLD URBANIZATION PROSPECTS, *supra* note 35, at 134-35.

75. *Id.* at 104-05.

76. UNFCCC, *Background Paper*, *supra* note 14, at ¶ 79; Graffy, *supra* note 3, at 404 (noting that the “demand for water . . . doubles every twenty-one years”).

Water demand will also increase due to growing urban populations resulting from population growth and rural-to-urban migration.⁷⁷ In fact, Eastern Africa has exhibited the second highest urbanization rate in the world and is projected to exhibit the highest worldwide urbanization rate in the future.⁷⁸ Population in urban areas has increased from 3 million people in 1950 to 53 million in 2000 and is projected to grow to 172 million in 2030.⁷⁹ Populations have expanded in these few humid areas, which has resulted in overuse of natural resources, deforestation, biodiversity loss, and strained water resources.⁸⁰ The increase of rural-to-urban migration has led to increased conflicts over the allocation of water in urban centers, as they lack the appropriate infrastructure to deal with large, unplanned influxes of people.⁸¹ Population expansion in urban areas will cause an increase in disease and a decrease in safe drinking water because of already insufficient water sanitation rates.⁸²

2. Deforestation, Aridity, and Desertification

Urban and agricultural expansion has caused serious deforestation in the region. Approximately 47 million hectares of forest were lost in Africa in the 1980s, and by 1995, 19 million more were destroyed.⁸³ Such deforestation has altered rainfall rates, the rate of evaporation, soil moisture, and temperature conditions.⁸⁴ Deforestation not only affects the absorption of carbon dioxide, it destroys the natural catchment areas that protect water quality, prevent flooding, and that are essential to healthy watersheds.⁸⁵

Eastern Africa is particularly prone to drought conditions and the area has experienced at least one drought each decade for the past forty years.⁸⁶ The Food and Agriculture Organization of the United Nations

77. FACING THE FACTS, *supra* note 2, at 20; U.N. EDUC., SCIENTIFIC, & CULTURAL ORG. [UNESCO], UNITED NATIONS WORLD WATER DEVELOPMENT REPORT 3: WATER IN A CHANGING WORLD 32 (2009) [hereinafter WORLD WATER DEVELOPMENT REPORT 3], <http://www.unesco.org/water/wwap/wwdr/wwdr3/tableofcontents.shtml>.

78. WORLD URBANIZATION PROSPECTS, *supra* note 35, at 114-23.

79. *Id.* at 84-85.

80. FACING THE FACTS, *supra* note 2, at 19.

81. See WORLD WATER DEVELOPMENT REPORT 3, *supra* note 77, at 32; OLI BROWN, INT'L ORG. FOR MIGRATION, MIGRATION AND CLIMATE CHANGE 32 (2008); UNFCCC, *Background Paper*, *supra* note 14, at ¶ 17; Boko et al., *supra* note 13, at 441.

82. BROWN, *supra* note 81, at 32; Boko et al., *supra* note 13, at 441.

83. FACING THE FACTS, *supra* note 2, at 19.

84. *Id.*

85. See OLI BROWN ET AL., INT'L INST. FOR SUSTAINABLE DEVELOPMENT, NATURAL DISASTERS AND RESOURCE RIGHTS: BUILDING RESILIENCE, REBUILDING LIVES 10 (2006).

86. FACING THE FACTS, *supra* note 2, at 19; FAO, *Water and Agriculture*, *supra* note 17. The

has noted “evidence of increasing climatic instability in the region in terms of increasing frequency and intensity of drought.”⁸⁷ Increasing frequency and intensity of droughts in the area, coupled with deforestation, poor agricultural practices, overstocking of livestock, and reclaiming wetlands for agricultural use, are contributing to desertification in the region.⁸⁸ Desertification causes poverty by leaving little, if any, available land for crop cultivation and grazing cattle.⁸⁹ As a result, in areas with commercialized water schemes, people are unable to pay for water when their land has left them destitute.⁹⁰ Rural-to-urban migration often results as people seek wages, thus placing further strain on water resources in urban areas.⁹¹

3. Lack of Access and Lack of Sanitation

In Eastern Africa, less than 62% of the population has access to safe water, with that of Ethiopia and Somalia amounting to less than 40%, and sanitation coverage ranges from 6 to 51% of the population.⁹² Absent any change, these percentages will only decrease as the population grows, and the region is subjected to increased drought and desertification in the future.⁹³ Low sanitation rates are attributable to a lack of education on proper sanitation practices and also the practical fact that many communities must physically carry water long distances to their homes and cannot afford soap.⁹⁴ Tina Rosenberg wrote in *National Geographic*: “Persuading people to use their water for washing is far more difficult when that water is carried up a mountain. And yet sanitation and hygiene matter—proper hand washing alone can cut diarrheal diseases by some 45 percent.”⁹⁵

region experienced serious droughts in 1973/74, 1984/85, 1987, 1992/94, 1999/2000, and 2006. FACING THE FACTS, *supra* note 2, at 19; *Drought-Affected Farmers*, *supra* note 17.

87. FACING THE FACTS, *supra* note 2, at 19.

88. *Id.*

89. UNFCCC, *Background Paper*, *supra* note 14, at ¶ 48.

90. See Atapattu, *supra* note 1, at 52-53, 61.

91. WORLD WATER DEVELOPMENT REPORT 3, *supra* note 77, at 32; UNFCCC, PHYSICAL AND SOCIO-ECONOMIC TRENDS, *supra* note 14, at ¶ 102; Boko et al., *supra* note 13, at 441, 452.

92. FACING THE FACTS, *supra* note 2, at 20; FAO, *Water and Agriculture*, *supra* note 17. The level of access to safe water is consistent with the rates measured by the WHO and UNICEF during the period of 1990–1996, indicating no significant change by 2005.

93. FACING THE FACTS, *supra* note 2, at 20; Tina Rosenberg, *The Burden of Thirst*, NAT'L GEOGRAPHIC MAG., Apr. 2010, at 106.

94. Rosenberg, *supra* note 93, at 103.

95. *Id.*

In many communities, women must walk for miles to fetch the day's water, sometimes over very rough terrain.⁹⁶ Villages lack running water, and wells and pumps many times do not exist nearby.⁹⁷ Some communities have benefitted from development efforts, but often these projects are not adequately funded and maintained to ensure their continued use.⁹⁸ Many development initiatives, whether provided by the government or NGOs, fall into disrepair once those who build them leave.⁹⁹ The problem is especially acute in rural areas because, often, "technology is used that can't be repaired locally, or spare parts are available only in the capital. But other reasons are achingly trivial: The villagers can't raise money for a three-dollar part or don't trust anyone to make the purchase with their pooled funds."¹⁰⁰ For example, between 30% and 40% of rural water development projects in Ethiopia are non-functional due to financing shortages and lack of fuel, materials, and spare parts.¹⁰¹ Improved access to water would allow women to spend more time doing other household chores, raising children, and helping with agricultural work.¹⁰² Furthermore, improved sanitation would prevent the spread of waterborne diseases, saving families the costs associated with health care and time away from their work to be in the hospital.¹⁰³ As it stands, however, time and money are both wasted fetching dirty, contaminated water.

4. Overreliance on Existing Water Sources

With no alternative, the people of Eastern Africa rely heavily on the few water sources that are available. For example, the Lake Turkana basin is an endoreic system—it flows into a low-lying inland area, rather than into the ocean—and the area has become a critically important point in the region in terms of economic potential.¹⁰⁴ The volumes of water provided by endoreic systems are usually not very large, but local populations rely on the resources so heavily that sources such as Lake

96. *Id.* at 102; *see* BROWN, *supra* note 81, at 17.

97. *See* Rosenberg, *supra* note 93, at 106.

98. *See, e.g., id.*

99. WORLD WATER DEVELOPMENT REPORT 3, *supra* note 77, at 58; Rosenberg, *supra* note 93, at 106.

100. Rosenberg, *supra* note 93, at 106.

101. WORLD WATER DEVELOPMENT REPORT 3, *supra* note 77, at 58.

102. *See* Rosenberg, *supra* note 93, at 106.

103. *Id.*

104. UNEP, HYDROLOGICAL VULNERABILITY AND RESILIENCE ALONG INTERNATIONAL WATERS: AFRICA 19 (2005).

Turkana become disproportionately significant.¹⁰⁵ If water flow to the region becomes disrupted or significantly altered, the loss of the resource could be detrimental for the population that relies so heavily upon it, presenting significant risk for the people of the Lake Turkana region.

The Omo River flows into Lake Turkana almost entirely within Ethiopian territory.¹⁰⁶ Over the last forty years, however, the southernmost part of the delta is increasingly becoming within Kenyan territory, indicating that the lake is shrinking.¹⁰⁷ Decreased rainfall, increased upstream diversion of water, and increased evaporation due to higher temperatures are the most likely reasons for the reduction in the lake's water levels.¹⁰⁸ In response, the Dassanech people, traditional inhabitants of the delta, have moved south with the lake's waterline.¹⁰⁹ In the fall of 2006, however, severe flooding on this new land killed approximately one hundred Dassanech and destroyed houses, crops, and infrastructure.¹¹⁰

As noted above, no agreements exist between Kenya and Ethiopia to manage the Omo River and Lake Turkana waters. Kenya has adopted a new water act and subscribed to the Desertification and Ramsar Conventions, promoting the management and protection of the lake's water resources; Ethiopia, however, has adopted only the Desertification Convention.¹¹¹ Although Kenya's actions have worked to promote the protection of the lake, as a practical matter, they are insufficient to adequately manage this transboundary resource without the cooperation of Ethiopia.¹¹²

III. FUTURE PROBLEMS PRESENTED BY GLOBAL CLIMATE CHANGE

Unchanged, the region's current population growth rates, deforestation levels, lack of access to safe water, and overreliance on

105. *Id.*

106. KENYA: ATLAS, *supra* note 21, at 80.

107. *Id.* at 80-81 & accompanying images.

108. *Id.*

109. *See id.* at 81.

110. *Id.*

111. *See Chapter XXVII: Environment: 10. United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa*, U.N. TREATY COLLECTIONS, <http://treaties.un.org/Pages/Treaties.aspx?id=27&subid=A&lang=en> (last visited Jan. 27, 2011); *Convention on Wetlands of International Importance Especially as Waterfowl*, UNESCO, http://portal.unesco.org/la/convention_p.asp?language=E&KO=15398 (last visited Jan. 27, 2011); FAO, *Water and Agriculture*, *supra* note 17.

112. *See* KENYA: ATLAS, *supra* note 21, at ¶ 62.

already strained water sources will result in an untenable situation. Global climate change will only make circumstances worse, as temperatures will rise, evaporation levels will increase, and rainfall will become more erratic.¹¹³ Without regional cooperation, Kenya, Ethiopia, and Somalia risk losing what scarce water supply they have and the health and safety of their people.

A. *Decline in Water Access and Food Supply*

The Eastern African region is especially vulnerable to climate change and variation. This is evidenced by the devastation caused by the many droughts the region has experienced. Civil war and natural disasters have only worsened the fact that Somalia, in particular, has not experienced food security in over twenty years.¹¹⁴ Approximately 70% of the country is undernourished, one of the world's highest figures, and hundreds of thousands of people have died as a result of droughts and flooding in just the last twenty years.¹¹⁵ Tens of thousands of hectares of crops and farmland have been destroyed by these extreme conditions and up to 40% of cattle and 10 to 15% of goats and sheep in Ethiopia and Somalia were lost in 2002 alone due to shortages of water and fodder.¹¹⁶ In addition, the El Niño phenomenon and erratic weather conditions that hit the Eastern African region in 1997 also negatively affected food production.¹¹⁷

As population levels continue to increase, access to food and water supplies will become further strained. Global climate change will only exacerbate the situation. As temperatures rise, evaporation rates will increase and more water will be needed for agricultural use, significantly reducing the water available for domestic use.¹¹⁸ Erratic weather conditions, including drought at some times and excessive rainfall at others, will cause food shortages by either drying crops up or flooding them.¹¹⁹

113. See UNFCCC, *Background Paper*, *supra* note 14, at 19.

114. FAO, *Water and Agriculture*, *supra* note 17.

115. *Id.*

116. *Id.*

117. FACING THE FACTS, *supra* note 2, at 20.

118. See UNFCCC, *Physical and Socio-Economic Trends*, *supra* note 14, at ¶ 74; UNFCCC, CLIMATE CHANGE, *supra* note 15, at 18; UNFCCC, *Background Paper*, *supra* note 14, at ¶ 48.

119. BROWN, *supra* note 81, at 16.

B. Increase in Natural Disasters

Preserving natural resources strengthens communities' defenses against and limits the impact of natural disasters, for example by stabilizing soil to reduce the likelihood or impact of landslides.¹²⁰ Natural resources also increase resilience by providing people with the necessary resources they need for survival, to help people cope with, and recover from, natural disasters.¹²¹ Scholars have warned of the potential for increased natural disasters due to global climate change.¹²² The damage done by such disasters is exacerbated by deforestation and over-cultivation of land.¹²³ As trees are cut down, the land loses its natural defenses against high winds, floods, and soil erosion.¹²⁴ Without appropriate agreement and regulation concerning deforestation and over-cultivation, the region risks an increased rate of natural disasters, including drought and flooding, and more devastating effects from them.¹²⁵ Regional collaboration will ensure better environmental management, infrastructure, and maintenance of precious resources and will better protect the countries against the effects of natural disasters when they occur.¹²⁶

C. Potential for Human Conflict

Scarce or damaged natural resources, water in particular, present the potential for human conflict by contributing to the outbreak of conflict, by sustaining conflict, and by undermining the peacemaking process.¹²⁷ Basins most at risk of conflict are those that exhibit:

- high population density (> 100 people/sq km),

120. BROWN ET AL., *supra* note 85, at 4.

121. *Id.*

122. *See, e.g.*, BROWN, *supra* note 81, at 16.

123. BROWN ET AL., *supra* note 85, at 10; FACING THE FACTS, *supra* note 2, at 19.

124. *See* BROWN ET AL., *supra* note 85, at 4.

125. *See id.* at 10-11.

126. *See* Wolf, *supra* note 18, at 251-52.

127. FROM CONFLICT TO PEACEBUILDING, *supra* note 2, at 8; UNFCCC, *Background Paper*, *supra* note 14, at ¶ 114; Graffy, *supra* note 3, at 407. While water has historically been a unifier, the possibility always exists that people will resort to violence if water resources are significantly depleted. 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. 409, 430 (2009). *But see* James Kraska, *Sustainable Development Is Security: The Role of Transboundary River Agreements as a Confidence Building Measure (CBM) in South Asia*, 28 YALE J. INT'L L. 465, 488 (2003) (asserting that water scarcity has presented an opportunity to engender cooperation by teaching communities how to effectively share the resource).

- low per capita GDP (< \$765/person—1998 World Bank lowest income country definition),
- overall unfriendly relations (BAR Scale < -1.0),
- politically active minority groups that might lead to internationalization,
- politically active minority groups that might lead to internationalization,
- proposed large dams or other water development projects, and
- limited or no freshwater treaties.¹²⁸

Conflicts over natural resources, including land, water, wildlife, and forests, have contributed to the outbreak of conflict in many parts of the world. For example, in 2004, dozens died and even more were injured when violence broke out along the border of Somalia and Ethiopia.¹²⁹ The fighting soon spread to areas near the Indian Ocean with militiamen using anti-tank weapons and heavy machine guns mounted on pickup trucks.¹³⁰ It was reported that two groups of the Habr Gedir sub-clan of the Hawiye clan likely began the conflict over pastoral land and water wells.¹³¹ Such conflicts are often compounded by natural disasters, including drought and flooding, which can lead to migration or violent conflict.¹³²

Natural resources work to sustain conflict when the resources are used as currency or as a weapon in the conflict.¹³³ In the past, water wells have been deliberately polluted in conflict situations. For example, during the Gulf War in 1991, millions of tons of crude oil were discharged into Kuwaiti waterways after oil fields were systematically set on fire, contaminating significant quantities of water.¹³⁴

Natural resources also play a significant role in the peacemaking process. Studies have shown that conflicts that are associated with natural resources are twice as likely to relapse into conflict in the first five years after a ceasefire.¹³⁵ Even so, natural resources are rarely addressed during the peacemaking process and are usually set aside to be

128. Shira Yoffe et al., *Conflict and Cooperation over International Freshwater Resources: Indicators of Basins at Risk*, 39 J. AM. WATER RESOURCES ASS'N 1109, 1121 (2003).

129. 'Dozens Dead' in Somalia Clashes, BBC NEWS, Dec. 6, 2004, <http://news.bbc.co.uk/2/hi/africa/4073063.stm>.

130. *Id.*

131. *Id.*

132. FROM CONFLICT TO PEACEBUILDING, *supra* note 2, at 8, 11.

133. *Id.* at 11.

134. *Id.* at 15.

135. *Id.* at 19.

dealt with at a later time.¹³⁶ “[M]eeting humanitarian needs, demobilization, disarmament and reintegration, supporting elections, restoring order and the rule of law, and opening the economy to foreign investment” usually take precedence over natural resources, despite their strong correlation with the nature of many conflicts.¹³⁷ Taking into account the characteristics that brought on the conflict—as well as the circumstances that prolonged it and the nature of the peace agreement—is critical to whether a society rife with conflict will be able to maintain a lasting peace.¹³⁸ Delineating water rights and conflict resolution mechanisms is critical to preventing and peacefully resolving such conflict as was seen, for example, along the Somali-Ethiopian border in 2004.¹³⁹

D. Potential for Increased Human Migration

Diminished resources in a region can, and often do, prompt human migration to better situated areas.¹⁴⁰ Over the course of history, humans have systematically settled and resettled according to changes in the climate and availability of natural resources.¹⁴¹ The first large gatherings of people in cities were driven by environmental concerns, primarily access to natural resources, including water.¹⁴² As such, there is no evidence to suggest that this propensity will not continue in the future.

Migration is typically a last resort when natural resources, such as water, are insufficient to meet human needs and leadership is unable to assist.¹⁴³ Today, migration occurs in response to natural resource shortages on a typically temporary basis. For example, studies have been conducted in western Sudan that show the typical migration scheme: a rural family sends an older male relative to Khartoum to seek paid work and send remittances to the family to tide it over through a drought.¹⁴⁴ This serves to alleviate the pressure on local resources and supplement the family’s income.¹⁴⁵ Such rural-to-urban migration does provide

136. *Id.*

137. *Id.*

138. *Id.*; see Yoffe et al., *supra* note 128, at 1118.

139. See ‘Dozens Dead’ in Somalia Clashes, *supra* note 129.

140. BROWN, *supra* note 81, at 19.

141. See *id.* at 21.

142. See *id.*

143. *Id.* at 22; FROM CONFLICT TO PEACEBUILDING, *supra* note 2, at 15; Eckstein, *supra* note 127, at 426.

144. BROWN, *supra* note 81, at 21.

145. *Id.*

access to the cash economy rather than relying on subsistence farming, however the effects of this migration take a large toll on urban areas.¹⁴⁶ Urban areas, though large by nature, are ill equipped to cope with rapid and unplanned migration.¹⁴⁷ They often lack the infrastructure to deal with the influx of a large group of people.¹⁴⁸ In addition, high concentrations of people make diseases more likely to spread and healthcare and education services are often limited.¹⁴⁹

The U.N. Security Council considers large-scale population displacement to be a threat to international peace and security.¹⁵⁰ Forced migrants place pressure on urban infrastructure and resources, hinder economic growth, increase the risk of conflict, and lead the migrants to worse health and education, thereby hindering overall development.¹⁵¹ Particularly in fragile areas of the world, like Eastern Africa, increased migration will strain States' resources so much that the increased pressure has the potential to turn currently stable States into failed States.¹⁵² This is already a threat in Africa, particularly in Somalia where the transitional government lacks the authority and resources to adequately govern the country's water.¹⁵³ In Somalia as of 2007, the country counted about 1.1 million internally displaced persons.¹⁵⁴ Displaced populations bring ethnic groups that previously lived apart into close vicinities and put these groups in competition with each other for the same resources.¹⁵⁵ In poverty-stricken, poorly governed areas with easy access to small arms, such situations "can easily turn violent."¹⁵⁶

In order to avoid these potentially devastating effects, Kenya, Ethiopia, and Somalia must cooperate to manage and develop their shared water resources in a sustainable and mutually beneficial way. On its own, Eastern Africa cannot reverse the effects of global climate change. However, with proper collaboration in the region, Kenya, Ethiopia, and Somalia can position themselves to better adapt to the risks presented by climate change and rapid population increase.

146. *Id.* at 32.

147. See BROWN, *supra* note 81, at 32; UNFCCC, *Background Paper*, *supra* note 14, at ¶ 17.

148. BROWN, *supra* note 81, at 32.

149. *Id.*

150. *Id.* at 33.

151. *Id.* at 32.

152. *Id.* at 33.

153. FAO, *Water and Agriculture*, *supra* note 17.

154. *Somalia*, *supra* note 17.

155. BROWN, *supra* note 81, at 33.

156. *Id.*

IV. CURRENT LEGAL FRAMEWORK

The foregoing analysis thus demonstrates that it is imperative to collaborate and devise transboundary agreements to protect and improve water supply security in these areas. Such cooperation will also help Ethiopia, Somalia, and Kenya avoid a variety of ills likely to be exacerbated by climate change, including decline in water access and food supply, more harmful effects from natural disasters, human migration, and conflict. In order to devise a strategy to move forward with transboundary watercourse agreements between Ethiopia, Somalia, and Kenya, it is necessary to examine the current international laws that govern such agreements. Several international water law theories are available and are typically used as “gap fillers” when treaties, regional agreement, or custom do not exist.¹⁵⁷ While these can assist in determining the state of the current watercourse law applicable to the Lake Turkana and Juba-Shebelle basins, such theories may also be useful in shaping future negotiations pertaining to the basins.

A. *Absolute Sovereignty and Permanent Sovereignty*

Absolute sovereignty is a theory of an immutable right that posits that “any use of [a] watercourse must be permitted and that no customary international law can bind the nation.”¹⁵⁸ Similarly, permanent sovereignty over natural resources is the inalienable right of each nation to freely and fully exercise authority over and dispose of its resources, but is limited eventually by customary international law or peremptory norms.¹⁵⁹ Permanent sovereignty allows liability to attach only when a country has breached its treaty obligations or if the International Court of Justice (“ICJ”) renders an opinion against it based on established international law, thus creating a “rebuttable and reviewable presumption that nations can exploit their resources to the

157. The acceptance of any of the given theories, however, is highly dependant upon domestic law, policy, and political interests. Valerie Knobelsdorf, Note, *The Nile Waters Agreements: Imposition and Impacts of a Transboundary Legal System*, 44 COLUM. J. TRANSNAT'L L. 622, 637 (2006).

158. Shashank Upadhye, *The International Watercourse: An Exploitable Resource for the Developing Nation Under International Law?*, 8 CARDOZO J. INT'L & COMP. L. 61, 69 (2000); see Takele Soboka Bulto, *Between Ambivalence and Necessity: Occlusions on the Path Toward a Basin-Wide Treaty in the Nile Basin*, 20 COLO. J. INT'L ENVTL. L. & POL'Y 291, 302-03 (2009) (“The theory of absolute sovereignty follows from the assumption that a state is the master of all persons, things, and circumstances occurring in its territory.”).

159. Upadhye, *supra* note 158, at 67, 69-70.

fullest extent possible.”¹⁶⁰ Support for both the absolute sovereignty and permanent sovereignty theories is minimal, and the theory of absolute sovereignty has now been almost completely abandoned.¹⁶¹

Nevertheless, both theories continue to retain a few proponents. Some have argued that developing nations should retain the right to exploit their resources completely, in particular their watercourses, within the confines of established international law.¹⁶² Indeed, there is evidence that some developing nations continue to favor this theory.¹⁶³ In the context of the Nile River basin treaty regime, Ethiopia seems to favor the absolute sovereignty approach,¹⁶⁴ but this stance must be viewed in light of the existing Agreement for the Full Utilization of the Nile Waters (“Nile Waters Treaty”), to which Ethiopia is not a party.¹⁶⁵ Under the existing Nile Waters Treaty, signed between Egypt and Sudan in 1959, Egypt and Sudan agreed to annual allocation amounts and set forth the principle that no upstream riparians may conduct any project or extract any amount of water that would disrupt the allocations enumerated in the treaty.¹⁶⁶ By allocating nearly all of the Nile waters to Egypt and Sudan and agreeing to present a unified view in any negotiations regarding other riparians’ claims to the resource, Egypt and Sudan have thus restricted the remaining seven riparian countries, including Ethiopia, in their use of waters that flow into the Nile system, forcing them to obtain permission for and submit to technical oversight and working supervision on any project they wish to develop upstream.¹⁶⁷ Having been continuously restricted in its own domestic water use by other states, it is no surprise that Ethiopia favors an absolute sovereignty approach with regard to its waters that flow into the Nile system. It seems as though Ethiopia has followed this principle with regard to other watercourses originating within its boundaries.¹⁶⁸

160. *Id.* at 70.

161. Bulto, *supra* note 158, at 304.

162. Upadhye, *supra* note 158, at 68-69.

163. Bulto, *supra* note 158, at 304.

164. Knobelsdorf, *supra* note 157, at 638; *see* Bulto, *supra* note 158, at 303-04.

165. Agreement for the Full Utilization of the Nile Waters, U.A.E.-Sudan, art. V.1, Nov. 8, 1959, 6519 U.N.T.S. 63 [hereinafter Nile Waters Treaty]; Knobelsdorf, *supra* note 157, at 630.

166. Nile Waters Treaty, *supra* note 165, 6519 U.N.T.S. at 72.

167. Knobelsdorf, *supra* note 157, at 630; *see also* Bulto, *supra* note 158, at 303, 305-06 (discussing Egypt’s and Sudan’s interest in maintaining the status quo and preventing upper riparians from undertaking water development projects that would affect the Nile’s flow to downstream States); Christina M. Carroll, Note, *Past and Future Legal Framework of the Nile River Basin*, 12 GEO. INT’L ENVTL. L. REV. 269, 290 (1999) (discussing Egypt’s preference for the river to flow uninterrupted).

168. Bulto, *supra* note 158, at 303.

B. Equitable Use Theory

The equitable use theory “seeks to ensure that all basin states access a reasonable and equitable amount of the shared waters. It also imposes a duty upon all riparian states to use the resource in an equitable and reasonable manner,” but this does not necessarily mean equal shares by volume.¹⁶⁹ The 1966 Helsinki Rules on the Uses of the Waters of International Rivers (“Helsinki Rules”), established by the International Law Association (“ILA”), adhere to this principle, identifying eleven factors for determining equitable use of international water basins:

1. [T]he geography of the basin, including in particular the extent of the drainage area in the territory of each basin State;
2. [T]he hydrology of the basin, including in particular the contribution of water by each basin State;
3. [T]he climate affecting the basin;
4. [T]he past utilization of the waters of the basin, including in particular existing utilization;
5. [T]he economic and social needs of each basin State;
6. [T]he population dependent on the waters of the basin in each basin State;
7. [T]he comparative costs of alternative means of satisfying the economic and social needs of each basin State;
8. [T]he availability of other resources;
9. [T]he avoidance of unnecessary waste in the utilization of waters of the basin;
10. [T]he practicability of compensation to one or more of the co-basin States as a means of adjusting conflicts among uses; and
11. [T]he degree to which the needs of a basin State may be satisfied, without causing substantial injury to a co-basin State.¹⁷⁰

The 1997 Convention on the Law of the Non-navigational Uses of International Watercourses (“U.N. Watercourses Convention”) reiterates the importance of equitable and reasonable utilization and sets forth the following factors to determine equitable and reasonable utilization:

1. Geographic, hydrographic, hydrological, climatic, ecological[,] and other factors of a natural character;
2. The social and economic needs of the watercourse States concerned;

169. *Id.* at 308.

170. INT’L LAW ASS’N [ILA], *Uses of the Waters of International Rivers*, art. V, 52 INT’L L. ASS’N REP. CONF. 447 (1966) [hereinafter *Helsinki Rules*].

3. The population dependent on the watercourse in each watercourse State;
4. The effects of the use or uses of the watercourses in one watercourse State on other watercourse States;
5. Existing and potential uses of the watercourse;
6. Conservation, protection, development[,] and economy of use of the water resources of the watercourse and the costs of measures taken to that effect;
7. The availability of alternatives, of comparable value, to a particular planned or existing use.¹⁷¹

While the factors to be taken into consideration in determining equitable and reasonable utilization of international river basin waters are fairly consistent between the Helsinki Rules and the U.N. Watercourses Convention, both provide little practical guidance in determining how to move forward when different factors conflict or how the importance of the various factors should be determined and weighed against each other.¹⁷² Furthermore, the U.N. Watercourses Convention is not yet in force, as it has not received the requisite number of ratifications.¹⁷³ Nevertheless, both the ICJ and its predecessor, the Permanent International Court of Justice, while stopping short of declaring equitable use to be customary international law, have endorsed the equitable use principle in both the Territorial Jurisdiction of the International Commission of the River Oder in 1929¹⁷⁴ and the Case Concerning the Gabčíkovo-Nagymaros Project in 1998.¹⁷⁵ While ICJ

171. U.N. Watercourses Convention, *supra* note 18, at art. 6.

172. Jonathan Lautze & Mark Giordano, *Equity in Transboundary Water Law: Valuable Paradigm or Merely Semantics?*, 17 *COLO. J. INT'L ENVTL. L. & POL'Y* 89, 93-94 (2006). "[B]ecause the ILA is an unofficial organization its resolutions are not legally binding unless adopted in conventions, treaties (either bilateral or multilateral), or unless the principles are followed as *opinio juris*." Upadhye, *supra* note 158, at 73.

173. *Chapter XXVII: Environment: 12. Convention on the Law of the Non-Navigational Uses of International Waters*, U.N. TREATY COLLECTIONS, http://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-12&chapter=27&lang=en (last visited Jan. 27, 2011).

174. "[The] community of interest in a navigable river becomes the basis of a common legal right, the essential features of which are the perfect equality of all riparian States in the user of the whole course of the river and the exclusion of any preferential privilege of any one riparian State in relation to the others." Territorial Jurisdiction of the Int'l Comm'n of the River Oder, (U.K. v. Pol.), 1929 P.C.I.J. (ser. A) No. 23, at 27 (Sept. 10).

175.

Modern development of international law has strengthened this principle for non-navigational uses of international watercourses as well, as evidenced by the adoption of the Convention of 21 May 1997 on the Law of the Non-Navigational Uses of International Watercourses by the United Nations General Assembly. . . .

decisions are not binding on later cases, the principles established in their decisions tend to influence later decision-making by the court as well as other international dispute resolution bodies.¹⁷⁶ In addition, there is strong evidence that water allocation agreements drafted according to the equitable and reasonable use principles actually are more equitable than agreements drafted under different principles.¹⁷⁷

C. Customary International Law and Historical Rights

Customary international law is created by “widespread, consistent general practice of States[] and . . . acceptance of this practice from a sense of legal obligation (*opinio juris*).”¹⁷⁸ Some scholars argue that the equitable use theory does not qualify as customary international law because there has been no express statement by authorities that customary international environmental law exists.¹⁷⁹ However, it is clear that, while the principle may not yet have risen to the level of customary international law, the equitable and reasonable use principle is by far the most popular theory for international water use.¹⁸⁰ Equitable and reasonable utilization, the duty of cooperation, and dispute prevention, resolution, and compliance have consistently appeared in treaty law, ministerial declarations, judicial and arbitral decisions, and the recommendations of international legal organizations—evidencing their status as elements of customary international law.¹⁸¹

The historical rights principle allows a nation the right to use waters that they currently or have historically used.¹⁸² International watercourse law seems to support the historical rights principle, but only to the extent

The Court considers that Czechoslovakia, by unilaterally assuming control of a shared resource, and thereby depriving Hungary of its right to an equitable and reasonable share of the natural resources of the Danube—with the continuing effects of the diversion of these waters on the ecology of the riparian area . . . —failed to respect the proportionality which is required by international law.

Gabčíkovo-Nagymaros Project (Hung. v. Slov.), 1997 I.C.J. 7, ¶ 85 (1998).

176. Knobelsdorf, *supra* note 157, at 641.

177. “Equity agreements allocate water more proportionately to runoff, land area, and population contribution than nonequity agreements.” Lautze & Giordano, *supra* note 172, at 110.

178. Upadhye, *supra* note 158, at 68; *see also* Anna Schulz, *Creating a Legal Framework for Good Transboundary Water Governance in the Zambezi and Incomati River Basins*, 19 GEO. INT’L ENVTL. L. REV. 117, 138 (2007) (“[S]tates applying the principle must believe that their actions are ‘rendered obligatory by the existence of a rule of law requiring it.’”).

179. *See, e.g.*, Upadhye, *supra* note 158, at 83.

180. Bulto, *supra* note 158, at 310; Upadhye, *supra* note 158, at 72.

181. Bulto, *supra* note 158, at 310-11; Schultz, *supra* note 178, at 162.

182. Knobelsdorf, *supra* note 157, at 639.

of upholding equitable and reasonable historical uses.¹⁸³ The Helsinki Rules and the U.N. Watercourses Convention both support historical use of water, as long as that use is reasonable as balanced against the interests of other riparian States under the equitable use doctrine.¹⁸⁴ The Helsinki Rules state that “[a]n existing reasonable use may continue in operation unless the factors justifying its continuance are outweighed by other factors leading to the conclusion that it be modified or terminated so as to accommodate a competing incompatible use.”¹⁸⁵ Any agreement based on historical use would, thus, be limited by historical inequity and the possibility of allocating waters in a more equitable and reasonable way.

Kenya, Ethiopia, and Somalia have governed their water resources among themselves on the basis of historical use and local custom.¹⁸⁶ In determining an appropriate framework to facilitate their relations moving forward, as articulated by the Helsinki Rules, it is not necessary to fully abandon such historical use.¹⁸⁷ However, the countries should also look to mutually equitable and reasonable use and allocation of the Juba-Shebelle and Lake Turkana basin waters while taking into account historical use and custom.

V. THE WAY FORWARD

To help avoid conflict, migration, depleted or inequitable use of water resources, and more devastating effects from natural disasters, Kenya, Ethiopia, and Somalia must take appropriate steps toward genuine cooperation over the Juba-Shebelle and Lake Turkana basins. The current situation of domestic apportionment and unilateral development in each basin not only adversely affects the resources available to other riparian countries, it risks creating further rifts between the countries with regard to water resources and all other international matters. As such, taking purposeful steps toward international cooperation and the eventual creation of a transboundary water agreement is in the best interest of all riparian countries. By establishing a transboundary water institution, gathering data, identifying issues, and developing planning and management strategies,

183. *Id.* at 640.

184. *See* U.N. Watercourses Convention, *supra* note 18, at art. 6; Knobelsdorf, *supra* note 157, at 640.

185. *Helsinki Rules*, *supra* note 170, at art. 8.

186. *See supra* text accompanying notes 18-19.

187. *See* U.N. Watercourses Convention, *supra* note 18, at arts. 3.1–2.

the countries can begin to work together with the aim of entering into a formal agreement addressing the use and allocation, risk management, and governance of both basins.

A. *Establishment of Transboundary Water Institutions*

Several established conventions, such as the African Convention on the Conservation of Nature and Natural Resources and the U.N. Watercourses Convention, recommend the establishment of joint commissions or institutions to facilitate joint management of shared resources.¹⁸⁸ Article 8.2 of the U.N. Watercourses Convention strongly encourages cooperation, stating “[i]n determining the manner of such cooperation, watercourse states may consider the establishment of joint mechanisms or commissions, as deemed necessary by them, to facilitate cooperation on relevant measures and procedures in the light of experience gained through cooperation in existing joint mechanisms and commissions in various regions.”¹⁸⁹ The drafters of these and many other conventions, as well as many scholars, have recognized that the “[c]reation of institutions to oversee joint management and cooperation within shared watercourses is fundamental because it facilitates participation by basin states; promotes effectiveness, efficiency, accountability, and increased information exchange; and assists in the development of a strategic vision and consensus orientation for the individual basins.”¹⁹⁰ In fact, many other basins in Africa have benefitted from the creation of joint institutions and can be looked to as models for the creation of such commissions for the Juba-Shebelle and Lake Turkana basins.¹⁹¹

By working together to develop short- and long-term strategies and exchange information, the countries will institute positive relations with the objective of maximizing mutual benefits and cooperating to

188. *Id.* art. 8.2.

189. *Id.*; see also African Convention on the Conservation of Nature and Natural Resources, art. XIV, Sept. 15, 1968, 1001 U.N.T.S. 3 (calling for cooperation among contracting States in conserving natural resources in accordance with the treaty).

190. Schulz, *supra* note 178, at 153. The institutions must be endowed with sufficient authority, flexibility, and financial resources in order to be successful, however. Eckstein, *supra* note 127, at 443.

191. For example, both the Congo and Niger River Commissions control technical data, plans and projects, and research and development for their respective basins. The Senegal River Basin Management Organization has established a series of committees, a panel to resolve conflicts between riparian countries, and a joint cost sharing plan for projects agreed upon by all riparian nations wherein all parties contribute to the cost of a project. See Upadhye, *supra* note 158, at 100.

collectively solve the problems anticipated from global climate change.¹⁹² Unless and until parties have the underlying stability and infrastructure to implement the mandates of a binding treaty, such an agreement should not be an immediate option. Such is the case concerning a potential transboundary water treaty between Somalia, Kenya, and Ethiopia covering the Juba-Shebelle river basin. At present, Somalia has a barely functioning, transitional government and no formal legal system.¹⁹³ The country is rife with civil conflict and violence and fractured by the self-declared Republic of Somaliland in northwestern Somalia and the semi-autonomous State of Puntland in northeastern Somalia.¹⁹⁴ Given Somalia's instability and tense political relations with Ethiopia, if the countries begin to cooperate and build confidence with an informal arrangement, such as a watercourse institution, moving forward to a more formal, binding agreement may be easier to achieve, provided that tangible benefits are yielded from the institution. A transboundary water institution, modeled after a body such as the established Nile Basin Initiative which includes all the Nile basin riparian countries, would allow all parties to cooperate in a diplomatic setting to assess the present water situation and determine the needs and rights of each party before significant environmental harm occurs.¹⁹⁵ Such an institution could serve the more permanent function of monitoring the water resources and enforcing the provisions of a treaty in the future. In addition, such an institution would also enable the aid of third-party organizations which would be able to provide technical, scientific, legal, and mediation support.

The establishment of a transboundary water institution for the Lake Turkana region would be a positive and prudent first step in the treaty-making process for Kenya and Ethiopia. Before a formal treaty is negotiated and signed pertaining to the Lake Turkana basin, a transboundary water institution would serve the mutually beneficial

192. Eckstein, *supra* note 127, at 440. Cooperation also serves the purpose of sharing financial burdens, research, preventative measures, development, and emergency response. *Id.* at 442.

193. *Somalia*, *supra* note 17.

194. *Id.*

195. Graffy, *supra* note 3, at 412; Knobelsdorf, *supra* note 157, at 644-45. Such a "soft law" arrangement would be beneficial if the parties are "reluctant to commit to a binding agreement either because scientific evidence is not conclusive or because the economic costs are uncertain or too great." Graffy, *supra* note 3, at 416. This type of agreement could eventually rise to the level of custom or "hard law." *Id.*; see also Martin Koppel, *The Effectiveness of Soft Law: First Insights from Comparing Legally Binding Agreements with Flexible Action Programs*, 21 GEO. INT'L ENVTL. L. REV. 821, 827-30 (2009) (discussing the Rhine Chemical Convention, a treaty formed to govern the Rhine River which runs through nine European countries).

purpose of gathering current water data, identifying rights, and determining needs-based allocations. This information could be used as a starting point in negotiating provisions of a treaty covering the Lake Turkana basin and serve the purpose of continued cooperation and cost-sharing between the countries once a formal treaty is in place.

B. Data Gathering and Problem Identification

Once institutions are in place pertaining to the two basins, each commission can begin gathering the appropriate data and identifying any problems with the current method of managing the countries' water resources. It is critical in such analysis that each institution consider not only the watercourse in isolation, but instead as an integral part of peacebuilding and ongoing cooperation between the countries.¹⁹⁶ In gathering data and assessing potential issues, the commission delegates should adhere to accepted hydrogeological standards as well as take into account present water utilization, the demographics of each basin, and the countries' domestic water, property, religious,¹⁹⁷ and tribal laws. Due consideration should also be given to health and sanitation concerns, as such issues are vital to developing equitable and safe watercourse solutions.¹⁹⁸ The institutions' mandate should include: the delineation of transboundary water sources, including groundwater sources; investigation of any additional groundwater sources;

196. FROM CONFLICT TO PEACEBUILDING, *supra* note 2, at 19. Ensuring scientific data is shared between the parties can also be instrumental in transforming any political conflicts into easier-to-solve technical ones. Graffy, *supra* note 3, at 430; *see also* Eckstein, *supra* note 127, at 448-51 (describing the benefits of data and information exchange between basin sharing states).

197. The population of Somalia is nearly all Sunni Muslim, while the population of Kenya is 78% Christian and 10% Muslim. The population of Ethiopia is approximately 60% Christian and 33% Muslim. *See Somalia*, *supra* note 17; *Kenya*, *supra* note 17; *Ethiopia*, *supra* note 17. "Morally . . . Muslims cannot sell water as an economic good, which creates a problem for free-market environmentalists who believe that environmental management should be left to the free markets." West, *supra* note 9, at 209-10.

198.

Recent studies in Ethiopia using community-based incidence surveys revealed a 7.3-fold increase of malaria incidence associated with the presence of microdams. The study sites were all at altitudes where malaria transmission is seasonal (in association with the rains). The increase was more pronounced for dams below 1,900 metres of altitude, and less above that altitude. In addition, observed trends in incidence suggest that dams increase the established pattern of transmission throughout the year, which leads to greatly increased levels of malaria at the end of the transmission season.

UNESCO, WATER FOR PEOPLE WATER FOR LIFE: UNITED NATIONS WORLD WATER DEVELOPMENT REPORT 107 (2003) [hereinafter WORLD WATER DEVELOPMENT REPORT], http://www.unesco.org/water/wwap/wwdr/wwdr1/table_contents/index.shtml.

identification and creation of potential environmental protection zones; quantity and quality monitoring; and exchange of information between riparian countries.¹⁹⁹ The measuring of available water and levels of current usage are particularly important to ensuring the accurate and equitable allocation of water in a future treaty and to avoid conflict over these issues.²⁰⁰

Recognizing the potential limitations in financial and technical resources of Kenya, Somalia, and Ethiopia, the data gathering and problem identification stage would be an opportune time to draw upon the resources of a third party if the countries find that they do not have the means or the capacity to exercise such data gathering and oversight.²⁰¹ The countries could enlist the assistance of one or several international organizations or NGOs or devise a process in which each country selects certain experts both from the countries involved and from the outside, who would be able to provide the legal, economic, and hydrogeological assistance necessary.²⁰² Such involvement would be

199. See, e.g., Alistair Rieu-Clarke & Geoffrey Gooch, *Governing the Tributaries of the Mekong—The Contribution of International Law and Institutions to Enhancing Equitable Cooperation over the Sesan*, 22 PAC. MCGEORGE GLOBAL BUS. & DEV. L.J. 193, 216-17 (2010) (discussing how the Mekong River Commission allocates responsibilities for governing the Mekong River). Even if the countries decided to stop short of committing to a binding treaty, their agreement to share information and data, effectively monitoring each other, increases confidence between them, despite disagreement on substantive issues. Kraska, *supra* note 127, at 491, 497.

The U.N. Watercourses Convention recognizes that, like participation and cooperation, the exchange of data and information is necessary for good governance. Not only does it promote trust between basin states by increasing accountability, it reinforces the potential efficacy as well as the application of the principle of equitable and reasonable use. The Convention requires basin states to regularly exchange information related to the shared watercourse. In addition, Article 9.2 allows states to request information that is not currently available while providing compensation to the state procuring the data. Schulz, *supra* note 178, at 154 (footnotes omitted).

200. The most conflictive events, which included extensive military acts, that were recorded in the Basins at Risk database concerned quantity and infrastructure over water resources. Yoffe et al., *supra* note 128, at 1112.

201. Continued assistance is provided in many parts of the world, including in other African countries, such as the Democratic Republic of Congo:

The authorities do not have the means or the capacity to exercise oversight of the [water] sector, and this lack of control has left the door open to abuse, fraud and illegal exploitation. The government will hence need continued support from the international community to monitor the environment, control natural resource extraction, and build governance and enforcement capacity.

FROM CONFLICT TO PEACEBUILDING, *supra* note 2, at 20.

202. See Fadia Daibes, *A Progressive Multidisciplinary Approach for Resolving the Palestinian-Israeli Conflict over the Shared Transboundary Groundwater: What Lessons Learned from International Law?*, 8 U. DENV. WATER L. REV. 93, 133 (2004); Philip Baumgarten, Note, *Israel's Transboundary Water Disputes*, 30 J. LAND RESOURCES & ENVTL. L. 179, 185 (2010);

useful to ensuring the procurement of reliable and complete data and information, especially when riparians lack the resources necessary to implement such a data gathering institute on their own.²⁰³

C. *Planning and Management Strategy Development*

Once all the relevant data has been gathered and potential issues have been identified, the institution must carefully develop strategies for the management, ongoing monitoring, and development planning of both basins. In such strategy development, Kenya, Somalia, and Ethiopia must take an integrated water resources management approach for the Juba-Shebelle and Lake Turkana basins. Many different sectors within a country affect or have authority over water.²⁰⁴ Each must be taken into consideration when developing strategies for the use, allocation, risk management, and governance of each basin.

1. Use and Allocation

As explained above, equitable and reasonable utilization has emerged as the most favored approach for allocation of shared watercourses. Article 5 of the U.N. Watercourses Convention states:

Watercourse States shall in their respective territories utilize an international watercourse in an equitable and reasonable manner. In

Carroll, *supra* note 167, at 298.

203. Carroll, *supra* note 167, at 298, 300.

204. See UNFCCC, CLIMATE CHANGE, *supra* note 15, at 30 (describing the benefits of integrated approaches for the management of water basins, river basins, and coastal zones). In the agricultural sector, for example, governments and wealthy investors have been leasing/purchasing land in Ethiopia for agricultural development. One investigation

estimates that up to 50m hectares of land—an area more than double the size of the UK—has been acquired in the last few years or is in the process of being negotiated by governments and wealthy investors working with state subsidies. The data used was collected by Grain, the International Institute for Environment and Development, the International Land Coalition, ActionAid and other non-governmental groups

. . . .
In many areas the deals have led to evictions, civil unrest and complaints of ‘land grabbing.’

. . . .
By turning to Africa to grow its staple crops, Saudi Arabia is not just acquiring Africa’s land but is securing itself the equivalent of hundreds of millions of gallons of scarce water a year. Water, says the UN, will be the defining resource of the next 100 years.

John Vidal, *How Food and Water Drive New Foreign Land Grab in Africa*, THE OBSERVER (U.K.), Mar. 7, 2010, at 28. These foreign investments could further strain water resources or could turn out to be a tool for development. See *id.*

particular, an international watercourse shall be used and developed by watercourse States with a view to attaining optimal and sustainable utilization thereof and benefits therefrom, taking into account the interests of the watercourse States concerned, consistent with adequate protection of the watercourse.²⁰⁵

Indeed, a study of watercourse treaties in Africa revealed that since 1990, approximately half of the treaties created contain concrete criteria for allocation of the basins' resources.²⁰⁶ The concept of equity was featured in the majority of the treaties and sustainability was incorporated into many as well.²⁰⁷ While a needs-based approach to water allocation may be feasible,²⁰⁸ a different strategy may be to move forward based on the benefits expected to be derived from the basins' resources.²⁰⁹ This approach would allow the countries to move away from viewing water as a commodity to be divided according to needs or rights and move forward viewing water as a regional benefit.²¹⁰

Another consideration to be taken into account is local participation. Instead of taking a top-down approach with professional experts in the government and the private sector, moving toward a bottom-up approach incorporating local experience and knowledge would promote self-reliance and empowerment of local people.²¹¹ In addition, local participation can be key to resolving future conflicts.²¹²

205. U.N. Watercourses Convention, *supra* note 18, at art. 5.

206. Lautze & Giordano, *supra* note 19, at 1066-67.

207. *Id.*

208. A needs-based approach allows riparians to utilize their share as they please, bound only by their quota and, presumably, the obligation to cause no significant harm to other riparians. Bulto, *supra* note 158, at 312. "Peter Gleick stated that present urban water uses suggest an appropriate [quota] level might be between 75 and 150 cubic meters per person per year (cm/person/year)." Daibes, *supra* note 202, at 136.

209. Wolf, *supra* note 18, at 251. A shared benefits approach encourages riparians to put the resource to the most mutually beneficial use. Under such a scheme, some riparians may see less water allocated, but would be compensated monetarily for allowing other States to use an increased share. Bulto, *supra* note 158, at 312; *see also* A. Dan Tarlock & Patricia Wouters, *Are Shared Benefits of International Waters an Equitable Apportionment?*, 18 *COLO. J. INT'L ENVTL. L. & POL'Y* 523 (2007) (discussing the shared benefits model in theory and practice, as well as in comparison to the shared use model).

210. *See* Wolf, *supra* note 18, at 251.

211. WORLD WATER DEVELOPMENT REPORT, *supra* note 198, at 378; UNFCCC, CLIMATE CHANGE, *supra* note 15, at 34; Knobelsdorf, *supra* note 157, at 646. "[A]pproaches that emphasize a bottom-up approach, recognizing local coping strategies and indigenous knowledge and technologies, hold the most promise, as these will more easily add to local adaptive capacities." UNFCCC, *Background Paper*, *supra* note 14, at ¶ 38.

212. WORLD WATER DEVELOPMENT REPORT, *supra* note 198, at 378.

2. Risk Management

Closely linked to water use and allocation is the management of risks associated with the basins. In addition to developing strategies for normal future use, the joint institutions should work to develop concrete plans to deal with risks such as natural disasters when they arise. In particular, each basin commission should establish strategies to cope with the periodic, yet severe, droughts that hit the region.²¹³ This could include devising projects to reserve water over time to be released in times of drought emergency.

Strategies should also be developed to address the poor sanitation experienced by many of each country's citizens. Such a strategy could include: moving away from unprotected wells and springs and the use of service or bucket latrines, public latrines, and latrines with an open pit, to the incorporation of protected wells and spring water, rainwater collection, public standpipes, and household connections and the use of pour-flush or ventilated improved pit latrines, and connection to public sewer or septic systems.²¹⁴ Plans of this nature would serve to minimize the risks posed to each country's citizens in the event of drought and by preventable waterborne diseases.

3. Governance

Each institution must also determine the manner in which each basin is to be governed moving forward. Four key characteristics of good governance are: "(1) rule of law and institutional frameworks, (2) participation, (3) accountability, and (4) efficacy."²¹⁵ In creating a framework for the future governance of the Juba-Shebelle and Lake Turkana basins, the joint institutions should adhere to the concepts of equitable and reasonable utilization, a duty of cooperation, and fair and

213. FACING THE FACTS, *supra* note 2, at 19; FAO, *Water and Agriculture*, *supra* note 17; *Ethiopia*, *supra* note 17; *Kenya*, *supra* note 17; *Somalia*, *supra* note 17; see UNFCCC, *Physical and Socio-Economic Trends*, *supra* note 14, at ¶¶ 82-83.

214. WORLD WATER DEVELOPMENT REPORT, *supra* note 198, at 113 tbl.5.4.

215. Schulz, *supra* note 178, at 131.

The World Bank, in its seminal work *Governance and Development*, outlines three distinct components necessary for good governance: 1) accountability, 2) legal framework, and 3) information and transparency. The Asian Development Bank (ADB) introduced four keys to good governance in 1995: 1) accountability, 2) participation, 3) predictability, and 4) transparency and information. In 1997 the United Nations Development Program (UNDP) added: 5) rule of law, 6) responsiveness, 7) consensus orientation, 8) equity, 9) effectiveness and efficiency, and 10) strategic vision.

Id. at 134.

effective dispute resolution.²¹⁶ As with gathering data and information, the institution should take due regard of the countries' domestic water, property, religious, and tribal laws since many countries and local communities in the region govern their water outside of a formalized legal system, most notably Somalia.²¹⁷ This will ensure a framework for governance that takes into account the various legal systems and customs, thus ensuring appropriate strategies that adhere to or allow for the existing legal systems and customs to operate.²¹⁸

Furthermore, in addition to the transboundary institutions taking into account domestic governance considerations, it is necessary for each of the countries to address the following domestic issues that will impact the efficacy of a transboundary treaty regime:

- Absence of or conflicting water rights legislation;
- Lack of effective mechanisms for intersectoral dialogue;
- Lack of economic incentives;
- Fragmentation of water management and administration;
- Lack of mechanisms for the participation of the community or other stakeholders;
- The role of women in water management;
- The effects of vested interest;
- The absence of water quantity and quality standards; and
- The absence of mechanisms for coordination and conflict resolution.²¹⁹

In order for an agreement to be successful, each issue must be addressed by riparian governments to better ensure domestic compliance.

To effectively govern the watercourses, it is also critical that procedural mechanisms are put in place to weigh the various factors of reasonable and equitable utilization. Without such a system, allocation remains ambiguous and the system will cease to work properly.²²⁰ Both

216. *See id.* at 168-74.

217. WORLD WATER DEVELOPMENT REPORT 3, *supra* note 77, at 52-53; *Somalia*, *supra* note 17.

218. *Id.* at 53.

[W]hile legal pluralism may translate into confusing and sometimes conflicting claims to a resource, they also provide a certain amount of flexibility in managing natural resources—particularly during times of stress or crisis. While statutory frameworks may provide a basis for managing water resources or rangelands in some countries, communities may turn to customary frameworks during droughts or other disasters, as they may provide safety nets based on reciprocal exchange between social groups.

BROWN ET AL., *supra* note 85, at 6-7.

219. WORLD WATER DEVELOPMENT REPORT, *supra* note 198, at 372 Box 15.1.

220. Schulz, *supra* note 178, at 181.

basins would require a process that emphasizes clarity and transparency for determining equitable and reasonable use, which will, in turn, engender legitimacy and compliance.²²¹ Procedures of this nature would also work to discourage unilateral basin modifications and harmful alterations to the rivers.²²² In addition, such “clear, predictable[,] and equitably allocated resource rights help poor and marginalized communities increase their resilience to natural disasters.”²²³

D. *Development of Transboundary Water Treaties*

Treaties between the riparian countries of the Juba-Shebelle and Lake Turkana basins are vital to the region given the threats posed by global climate change, population growth, and periodic drought.²²⁴ Without formal agreements delineating each nation’s rights, there is a strong risk of confusion and conflict over scarce water resources that are only becoming more scarce.²²⁵ In addition, such a process of working together to form an agreement over a resource as critical as water will build trust and cooperation between the countries that will help to facilitate better relations and prevent conflict in the future.²²⁶

In crafting transboundary watercourse treaties for the Juba-Shebelle and Lake Turkana basins, the parties may choose to do so under the auspices of the U.N. Watercourses Convention. This would provide the parties with an equitable and reasonable use framework which would take into account the social and economic needs of each party.²²⁷ The U.N. Watercourses Convention framework would also encourage cooperation and information sharing, the obligation to not cause harm, prior notification, prevention, reduction, and control of pollution, management and regulation, and settlement of disputes through the institution, a third party, or the ICJ.²²⁸

221. *Id.*

222. See Wolf, *supra* note 18, at 255-56.

223. BROWN ET AL., *supra* note 85, at 8.

224. See UNFCCC, *Background Paper*, *supra* note 14, at ¶ 48; *supra* Part II.

225. See UNFCCC, *Background Paper*, *supra* note 14, at ¶ 147; Lautze & Giordano, *supra* note 19, at 1073.

226. “By committing to an international river . . . agreement, a nation accepts restrictions on its freedom of action in exchange for increased confidence of its neighbors and an increase in the transparency of their actions.” Kraska, *supra* note 127, at 473. “[A]verage water relations between dyads in the three years before a treaty was signed were somewhat more conflictive than in general. Nonetheless, once a freshwater treaty was signed, cooperation increased and, over time, additional treaties were often signed.” Yoffe et al., *supra* note 128, at 1118.

227. See *supra* Part IV.B.

228. U.N. Watercourse Convention, *supra* note 18, at arts. 7–9, 12, 21, 24, 25, 33.

The parties, through the planning and management strategy development phase, should examine the experiences of other, similar basins in coming to agreement.²²⁹ In drafting a treaty between the countries, each should ensure the following key elements are addressed:

- participation of all riparian states;
- ethical principals;
- integrated management;
- effective governance, including ensuring appropriate domestic legislative frameworks exist to carry out the treaty mandates;
- sustainable development;
- adequate financing;
- equitable distribution and allocation;
- large-scale water storage;
- transparency;
- environmental protection;
- concrete enforcement mechanisms; and dispute resolution.²³⁰

In order to allow for the necessary flexibility in a transboundary watercourse agreement between the countries, one solution may be to structure a series of temporary allocations into the agreement, so that as development projects, such as dams, are completed, the parties are able to easily shift to new allocation regimes as new information becomes available or circumstances change.²³¹ Another solution may be to provide greater allocation to one state in exchange for its commitment to finance other projects, drawing upon the shared benefits doctrine.²³² In addition, the parties could arrange the joint funding of development projects through the joint institution which would already be charged

If the parties cannot reach agreement over a dispute by negotiation requested by one of them, then they may jointly seek the good offices of, or request mediation or conciliation by, a third party. They may also avail themselves of any joint watercourse institutions that they may have established or agree to submit the dispute to arbitration or the ICJ.

Graffy, *supra* note 3, at 413 (footnote omitted).

229. See generally Bryan A. Green, *The Guarani Aquifer & International Groundwater Law: Advancing Towards a Legal Framework for the Management of a Transboundary Aquifer*, 13 U. DENV. WATER L. REV. 361 (2010) (discussing the management and use of the Guarani Aquifer system shared by Argentina, Uruguay, Brazil, and Paraguay); A. Dan Tarlock, *Possible Lessons from a Comparison of the Restoration of the Danube and Colorado Deltas*, 19 PAC. MCGEORGE GLOBAL BUS. & DEV. L.J. 61 (2006) (discussing past strategies and proposed strategies for managing the Danube Delta shared by Romania and the Ukraine and the Colorado Delta shared by the United States and Mexico).

230. See Eckstein, *supra* note 127, at 453; Kraska, *supra* note 127, at 485; Lautze & Giordano, *supra* note 19, at 1068; Carroll, *supra* note 167, at 300.

with the management and monitoring of the basin. While many international donors provide funds that are meant to catalyze development projects, the parties will need to ensure that funding is available for ongoing maintenance and support.²³³ This could be accomplished through fixed budgetary allocations or through the rights/finance solution stated above.²³⁴

VI. CONCLUSION

While the costs of creating such institutions and funding the data collection and strategy development for each basin will be high, the costs of inaction are far greater. Kenya, Ethiopia, and Somalia all face grave risk of depleted water resources, severe effects from natural disasters, increased human migration, and violent conflict as populations increase and the climate changes. As one scholar wrote, “[w]ater act[s] as both an irritant and a unifier. As an irritant, water can make good relations bad and bad relations worse. Despite the complexity, however, international waters can act as a unifier in basins with relatively strong institutions.”²³⁵ Despite non-cooperation and sometimes even conflict between the countries in Eastern Africa, it is possible for Kenya, Ethiopia, and Somalia to work together to allocate and manage their shared water resources.

The region’s water problems cannot be solved by each country working on its own. While each may take steps internally in the spirit of environmental protection, sustainable development, and equitable distribution, both the Juba-Shebelle and Lake Turkana basins cross political boundaries.²³⁶ Thus, what one riparian does, the other can feel. Water resources are interconnected and so too should be those who manage them.

By establishing transboundary water institutions, gathering data, identifying issues, and developing planning and management strategies, Kenya, Ethiopia, and Somalia can begin to work together with the aim of entering into formal agreements addressing the use and allocation, risk

231. See Tarlock, *supra* note 229, at 69, 75; Carroll, *supra* note 167, at 302.

232. Carroll, *supra* note 167, at 303.

233. See WORLD WATER DEVELOPMENT REPORT 3, *supra* note 77, at 57.

234. “The Permanent Indus Commission, established between India and Pakistan in 1960, has jurisdiction over disputes concerning the Indus River and coordinates the parties’ water development policies. A noteworthy feature is that the World Bank is a party to the treaty which monitors how the loans are distributed.” Upadhye, *supra* note 158, at 100.

235. Wolf, *supra* note 18, at 261.

236. See *supra* text accompanying notes 22-23.

management, and governance of both basins. Such agreements will serve to not only provide concrete delineations of each party's rights and needs, but to also engender deeper trust and greater cooperation between the countries in Eastern Africa.

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