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Ethiopia's Right to Environmental Compensation from Nile Lower Riparian States

A Thesis submitted to Addis Ababa University, College of Law and Governance Studies, School of Law, in Partial Fulfillment of the Requirements for the Degree of Master of Laws (LL.M) in Public International Law

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I declare that this thesis is my original work, and it has not been presented to any other university or academic institution, and that all source of materials used for the thesis have been aknowleged.Accordingly, I present this work in partial fulfillment of requirement for the award of the LLM Degree in Public International Law at Addis Ababa University.

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ACRONYMS

AM	Adaptive Management
BNRBs	Blue Nile River Basin
BNR	Blue Nile River
CBD	Convention on Biological Diversity
CVM	Contingent Valuation Method
CFA	Cooperative Framework Agreement
CIIFAD	Cornell International Institute for Food, Agriculture, and Development
ESV	Ecological spillover value
ESS	Eco-system services
ECS	Ecological compensation standard
ECE	Economic Commission for Europe
EIA	Environmental Impact Assessment
EAC	East African Community
FAO	Food and Agricultural Organization
ICL	International Customary law
ILC	International Law Commission
IOs	International Organizations
IEL	International Environmental Law
IWL	International Environmental Law
ILC	International Law Commission
IFAD	International Fund for Agricultural Development
IUCN	International Union for Conservation of Nature
ICJ	International Court of Justice

IJC	International Joint Commission
LNRRS	Lower Nile River Riparian states
LMRB	Lancing-Mekong River Basin
MEAs	Multilateral Environmental Agreement
NBI	Nile Basin Initiative
NBC	Nile Basin Commission
NRS	Nile River States
NRBC	The Nile River Basin Commission
OAU	Organization of Africa Union
PPP	Polluters Pay principle
PES	Payment of Eco-system
PSA	The Pago por Servicios Ambientales (PSA project)
STRP	Scientific Technical Review Panel
SADC	South Africa Development Community
TBRBs	Transboundary River Basin
TFDD	Transboundary Fresh water Dispute Data Base
UNWC	United Nation Water Convention
UNECE	United Nations Economic Commission for Europe
UN	United Nations
UNSC	United Nation Security Council
UNFCCC	United Nation Frame Work Convention on Climate Change
UNEP	United Nations Environment Programme
UNCLOS	United Nations Convention on the Law of the Sea

WTO	World Trade Organization
WTC	Willingness to Compensate
WTP	Willingness to Pay
WRI	World Resources Institute

Abstract

Transboundary rivers naturally flow from upper riparian to lower riparian. Regarding this, the upper riparian countries have opportunity costs in afforestation and soil conservation to the ecosystem of the source of the river. But the lower riparian countries lack this opportunity cost in conservation of the source of the river. Regarding this, the water source of the ecosystem was not conserved and properly managed; the ecosystem degraded, and sources of water would be reduced and lost. In the Blue Nile River basins, Ethiopia is found in the upper riparian area and the main source of the river; the other two, Sudan and Egypt, are located in the lower basin. As far as these, these two countries effectively used the water for irrigation, hydropower, and home consumption more than Ethiopia. In contrast, the government of Ethiopia incurred costs for afforestation and soil conservation in the source of the ecosystem. For instance, soil conservation measures in the upper Blue Nile River basins (in Ethiopia), which are approximately equal to 5.43 million hectares, have a total cost of US$2.9 billion per year.All this action benefits Egypt and Sudan through balancing the regular flow of the Blue Nile River. Yet, this nation neither cooperates nor contributes to financing the conservation of the source of the Blue Nile River ecosystem. In this regard, the main issue to be addressed in this paper is whether Ethiopians have a legal right to claim eco-compensation from lower riparian countries (Egypt and Sudan) for eco service and cost incurred for afforestation and soil conservation of the water source of ecosystems from the perspective of international environmental law. To investigate this issue, the researcher used qualitative doctrinal research methods using primary and secondary sources of data. Furthermore, they tried to clarify concepts and information collected via data, qualitatively. Regarding this issue of eco-compensation, there is no binding international law and procedural enforcement mechanism in international environmental law and water law for Ethiopia to claim compensation from LNRSs for the opportunity cost of conservation of the source of the BNR basin. However, there is different state practice in different regions (Elbe River basin, Lancang-Mekong River, and Xin'an River Basin), and there is a general principle of international environmental law, like the sustainable development principle, related to environmental protection and opportunity cost by upper riparian states for protection of the source of the transboundary rivers. From this nation's practice and international environmental law principles, Ethiopia has legal ground to claim eco-compensation from lower riparian states (Egypt and Sudan). Based on this nation practice and international environmental law

principles, the Ethiopian government and local concerned bodies try to legally claim and diplomatically influence and initiate the lower Nile River basin state to compensate Ethiopia.

Key words:-Eco-compensation, Eco service payment, sustainable development, intergenerational equity, Transboundary River, Ecosystem, Degradation, Soil erosion, Afforestation.

Chapter One

1.1 Introduction

There are currently 310 TBRB in the globe, including 150 different nations and regions, according to the Transboundary Freshwater Dispute Database (TBFDD).[1] The rivalry among TBRB nations for the use of water resources has become more intense as a result of the growth of international society and economy, the complexity of political interactions, and the worldwide depletion of fresh water resources.[2] Furthermore, the disparity between the use of water resources and the preservation of the natural resource causes a conflict between the interests of upstream and downstream nations.[3] The growth and use of transboundary water resources by the upstream nations are constrained due to the mobility and geographic features of the rivers.[4] While the downstream nations receive more benefits, upper riparian stream nations expend more effort maintaining technological conservation.[5] Due to this reason, there is no equitable utilization and preservation of the river, which may cause conflicts between upper and lower countries.[6] Parallel to the above idea, multilateral environmental agreements (MEAs) and the environmental compensation concept have become increasingly important in international environmental management of TBRs over the years.[7] Many soft law principles that are derived from various UN declarations and resolutions and regional conventions deal with issues related to eco-compensation for eco services.[8]

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[1] Melissa, M.; Aaron,T.W(2019), *Updating the Register of International River Basins of the world*. Int.J.Water Resource. Dev., 35, 1–51.

[2] Zhao, Y.; Wu, F.-p.; Li, F.;Chen, X.-n.; Xu, X.; Shao, Z.-y, (2021) *Ecological Compensation Standard of Trans-Boundary River Basin Based on Ecological Spillover Value*: A Case Study for the Lancang–Mekong River Basin. Int. J. Environ. *Republic Health*, 18, 1251. P.2, https://doi.org/10.3390/ijerph18031251

[3] Ibid.

[4] Ibid.

[5] Ibid, P. 3.

[6] Ibid, P.1.

[7] *Liability and compensation regimes relating to environmental damage by UNEP-division of environmental policy implementation* December 2003 PP 14.

[8] Ibid,P14.

In order to maximize potential for success in TBWM future regimes, there is a need to study the various features of any liability and compensation regime, including the inclusion of compensation for restoration costs and preventive measures.[9] However, the concept of eco-compensation is not yet highly developed in the practice of IEL and IWL. It is now beyond debate that the rules of modern IWL include a requirement for all watercourse states to protect ecosystems connected to international watercourses. There is no specific duty to protect aquatic ecosystems in CIL; Tarlock cites that the duty can be derived from the principle of IEL of state responsibility for environmental harm'.[10]

Nile River is one of the longest TBRBs in the world, flowing 6650 kilometers from East Africa to the Mediterranean Sea.[11] The White Nile is 5,584 km long, and the Blue Nile covers a distance of 1,529 km.[12] Within Ethiopia, the Blue Nile is 960 km long and has an annual discharge of 55 million cubic meters, constituting the major portion of the flow of the Nile.[13] There is a large number of tributaries and headwater lakes.[14] The Blue Nile, or Abay, is the major source of the Nile River, supplying 86 percent of its volume, and originates from Lake Tana in Ethiopia, while the White Nile covers the remaining percent.[15] Lake Tana, in northwestern Ethiopia, is the main source of the Blue Nile River. [1] Major tributaries are the Abbay (Blue Nile), Tekeze (Atbara), and Baro-Akobo (Sobat), starting in the Ethiopian highlands.[16]

Egypt and Sudan do not share any percent of water but are only recipients and beneficiaries of water that flows from both headwater subsystems.[17] Egypt utilizes the water efficiently, and

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[9] Ibid P.62.

[10] Caponera, D. Tarlock and (1987), *The role of customary IWL*.In M. Ali, A.Khan, & G.Radose wich (Eds.),Water resources policy for Asia (pp. 365). London: Taylor & Francis.

[11] *Abtew & Melesse, supra note 5, at 566.*

[12] *Garretson, Albert(1967), "The Nile Basin," in Albert H. Garretson, R.D. Hayton and C.J. Olmstead (eds.), the Law of International Drainage Basins. Dobbs Ferry, New York: Oceana, , 256- 297.*

[13] Langer, William (1936), "*The Struggle for the Nile," Foreign Affairs*, 14, no.2,14 Oct.1935-July, 267.

[14] Ibid P.25-26.

[15] Haggi.E (2002),*The Cross and the River. Ethiopia, Egypt, and the Nile*. USA. Lynne Rienner, Inc.

[16] Ibid.

[17] Ibid.

Sudan is limited in its way of development.[18] But Ethiopia's current effort is to use the water for hydro power consumption.[19]

In this regard, the sources of BNRBs (Ethiopian highland) are the most important ecosystems of the BNR. This river flows from the Ethiopian highland to downstream countries (Sudan and Egypt). This source of BNRB's ecosystem gives environmental service to downstream countries. Meaning the source of rainfall in Ethiopia, highlands elevate, and then these mountains catch the precipitation of the monsoon winds of the Indian Ocean. The wind, forest, and the mountains are the main balance of rainfall and precipitation in the Ethiopian highlands.[20] However, LNRRs do not share any percent but are only recipients of waters that flow from both headwater sub-systems.[21] Additionally, the government of Ethiopia and the highland rural community protect and conserve the ecosystem through afforestation and soil conservation. These costs have been covered only by the Ethiopian government and the community from their own pockets. For instance, Ethiopia has been implementing land and water conservation programs since the 1970s to tackle environmental degradation in the BNBs and beyond. The soil conservation measures in the upper BNBs (in Ethiopia), which are approximately equal to 5.43 million hectares, have a total cost of US$ 2.9 billion per year.[22] However, the downstream countries, except benefiting from the service, do not share any conservation cost. This reality is a challenge for sustainable and equitable utilization and benefit sharing of the Blue Nile River. In all time-limiting future cooperation of countries, cause ecosystem degradation.[23] The way of covering the service of the ecosystem and the cost of environmental conservation is crucial for sustainable and equitable use

[18] *Ibid.*

[19] *Arsano,Yacob(2007),Ethiopia the Nile: Dilemmas of national and regional hydro politics, ETH Zurich, Page 25-26.*

[20] *An explanation of this unusual rain pattern can be found at Ethiopia: Drought intensifies during corn and sorghum harvest* (Relief Web)

[21] Ibid.

[22] Abonesh Tesfaye, Roy Brouwer, Pieter Van Der Zaag , Workneh Nigatu, Belay Simane, Melesse Temesgen, and Eshraga Sokrab,2016,Cost benefit analysis of soil conservation measures: thecase of Blue Nile basinhttp://www.dmu.edu.et/wp-content/uploads/2016/12/Cost-benefit-analysis-of-conservation-measures.pdf.

[23] Ibid P.30.

of the Nile resource.[24] Otherwise, it is expected to increase numerous pressures from climate change, population growth, and economic development. Competition over water is often leading to serious tensions and conflict between upper and lower riparian nations. But, if water is managed through cooperation, tolerance, and mutual respect, it can pave a safe way towards sustainable and peaceful development from every social, economic, political, cultural, and ecological angle.[25]

The paper examines that if the source of the Blue Nile River ecosystem is not conserved and properly managed, it would create scarcity and loss of water in the future. For instance, if the water source of the soil is not conserved and afforestation is continuously applied, the ecosystem becomes eroded and will become degraded. But the government of Ethiopia is enacting policies, laws, and campaigns and allocating budgets for the conservation of the source of BNRBs/Ethiopian highlands ecosystem through afforestation (planting trees). Additionally, the rural communities also traditionally conserve the ecosystem. This continuous conservation of the ecosystem for long periods of time bitterly benefits the lower riparian countries (Egypt and Sudan,) in terms of irrigation and economic development, through balancing regular rainfall on Ethiopian highlands and the flow of the Blue Nile River. However, these lower basin countries do not have any commitment for cooperation and share the cost of conservation and management of the source of BNRBs ecosystem. Rather, they raise the colonial agreements and claim that only have historical right to use the Nile water for any economic activities. In this regard, the paper analyzes international legal principles, customary laws, and conventions that support Ethiopia's have right to claim or not eco service compensation from down riparian states,(Egypt and Sudan), for rendering environmental service and for the cost incurred for the conservation of the source of the Blue Nile River ecosystem.

1.2 Statement of the Problem

The Ethiopian government has enacted policies, laws, and invested budgets for the conservation of the source of the Blue Nile River basin (Ethiopian Highlands).For afforestation (planting trees), awareness creation, community mobilizing, and soil conservation programs. Additionally,

[24] Ibid.

[25] *Water, peace and security(2010),trans boundary water cooperation United* UNGA Sixty-fourth sessionhttps://www.un.org/esa/dsd/resources/respdfs/ga-64/water/SG notes trans boundary water cooperation.pdf

the highland communities traditionally conserve this ecosystem. For instance, Ethiopia has been implementing land and water conservation programs since the 1970s to tackle environmental degradation in the BNRBs. The soil conservation measures in the upper BNRBs (in Ethiopia), which are approximately equal to 5.43 million hectares, have a total cost of US$ 2.9 billion per year.[26] As far as this, the continuous conservation of the source of the Blue Nile River ecosystem benefits the lower basin countries in terms of irrigation, hydropower consumption, and tourism. Through balancing the annual flow of the Blue Nile River to lower riparian states. But, these countries don't have any commitment to cooperation on conservation and cost-sharing on the management of the source of the East Blue Nile River basin. Regarding this, the paper examined that there are international legal principles, customary laws, and conventions that support Ethiopia's right to claim eco-compensation from LNRS, /Egypt, and Sudan /for the rendering of environmental service and cost incurred to conservation of the source of the Blue Nile River ecosystem or assesses whether or not lower riparian countries have the duty to pay eco service compensation to upper riparian states for consumption of eco service and conservation of the source of the Blue Nile River basin by upper riparian states.

1.3 Research Objectives

1.3.1 Main objective

The main objective of the thesis is to examine whether Ethiopia has the legal right to claim environmental compensation from lower Nile riparian states, Egypt and Sudan, for the rendering of eco-services and costs incurred to conserve the source of the Blue Nile River ecosystem.

1.3.2 Specific objectives

1. To explore IEL legal principles, customary laws and conventions that support eco-compensation to upper riparian states by lower riparian states, for rendering of eco service and the conservation and management of source of transboundary rivers' eco-system.

[26] Abonesh Tesfaye , Roy Brouwer , Pieter Van Der Zaag , Workneh Nigatu , Belay Simane, Melesse Temesgen, ,and Eshraga Sokrab,2016,Cost benefit analysis of soil conservation measures: the case of Blue Nile basinhttp://www.dmu.edu.et/wp-content/uploads/2016/12/Cost-benefit-analysis-of-conservation-measures.pdf.

2. To identify and analyze IEL legal principles, customary laws, and conventions that support Ethiopia's right to claim eco-compensation from LNRS (Egypt and Sudan) for the rendering of environmental service and the cost incurred to the conservation of the source of the Blue Nile River ecosystem.
3. To examine the major challenges for the implementation of eco-service or eco-compensation in the Blue Nile River Basin.

1.4 Research Questions

The core research question:- Whether or not Ethiopia has the legal right to claim environmental compensation from lower Nile riparian states, Egypt and Sudan, for rendering of eco service and the cost incurred to the conservation of the source of the Blue Nile River ecosystem.

The study would have the following specific research questions:

1.4.1 What are the IEL legal principles, customary laws, and conventions that support eco compensation for upper riparian states, for rendering of eco-services, and the cost of sources of transboundary rivers' ecosystems?

1.4.2 Does Ethiopia have the legal right to claim eco compensation from lower riparian states, Egypt and Sudan, for rendering eco service and cost incurred for the conservation of the source of the Blue Nile River ecosystem?

1.4.3 What are the challenges associated with Ethiopia's claim for eco-service compensation?

1.5 Significance of the Study

- The findings of this paper serve to address current eco compensation gaps in the Blue Nile River basin.
- It will serve as a source of information and reference for policy makers and negotiators of the Ethiopian government/advocates to claim eco compensation.
- It will promote further research on the concept on eco-compensation.
- It will contribute to the field of knowledge of IEL.
- Furthermore, it will clarify the legal right of Ethiopia.

1.6 Scope of the Study

The research is limited to assessing IEL and IWL principles, customary laws, and conventions that deal with eco compensation to upper riparian states in the TBRB system. The study evaluates the existing agreements, conventions, ICL, principles, protocols, declarations, cases, and other materials written on eco compensation. It examines the specific legal basis that supports Ethiopia's claim for eco-service compensation from the lower riparian state of the BNR basin. The thesis focuses on the East Blue Nile River basin.

1.7 Research Methodology

The research used a qualitative doctrinal research method to analyze and interpret legal rules, state practice, and cases that are relevant to the research topic. The research used both primary and secondary sources of data; primary sources, such as agreements, treaties, protocols, and declarations, are used and secondary sources, including books, journals, articles, unpublished materials, reports, newspapers, and different internet resources, are employed to conduct this research. Finally, the researcher used a qualitative approach to clarify concepts, legal rules, state practice, cases, and the information obtained via data collection..

1.8 Limitations of the Study

The research heavily depends on the availability of information regarding IEL and WL principles, customary laws, state practice, cases, and conventions on eco compensation. But access to factual information was very difficult for the researcher due to various constraints. For instance, almost all the programs were unilateral; some of the countries involved kept them confidential. And there were financial and budget constraints. The absence of literature on the issue has been another restriction.

1.9 Organization of the Study

The thesis was arranged in five chapters. The first chapter deals with introductory matters. The second chapter is looks into the theoretical and conceptual evolution of international watercourse ecosystem protection obligations. Chapter three deals with the global legal framework on environmental protection and preservation of TBRS of ecosystems. Chapter four analyzes state

responsibility in IEL, state practice of eco compensation, and the costs and benefits of BNRBs to riparian states. Chapter five discusses findings, conclusions, and recommendations

Chapter Two

International Watercourse Eco-systems Protection Obligations and Eco-compensation

2.1 Definition of Eco-compensation or Payment for Eco-System Services (PES)

Eco-compensation or Payment for Eco-System Services (PES) is a payment and incentive system that supports sustainable use of ecosystems, provides stable financing for conservation.[27] It generally refers to contractual arrangements involving direct payments between those who provide and those who benefit from ecosystem services. It refers to voluntary transactions where a service provider is paid by or on behalf of service beneficiaries for land, coastal, or marine management practices that are expected to result in continued or improved service provision.

Key international actors, such as the IUCN[28] and the UNECE,[29] have provided guidance on how such payment systems might work, with the latter explaining that 'Such financing mechanisms operate at many levels, between and within countries, from and to governments, the private sector and local communities'.[30] It is an innovative tool for rewarding eco-system managers for their sustainable management practices, which increases eco-system resilience'.[31] However, this concept is not yet highly developed in the practice of IWL. One authority notes that this area 'is still emerging and frankly not well explored by the legal scholarship'. Among the key issues remaining to be addressed by policy-makers, the basis for payments, the parties to whom payments should be made, the services for which payments should be available and the amounts to be paid.[32] Similarly, Rieu-Clarke and Spray caution that 'pitfalls may be identified when considering the linkages between ESS, law and transboundary freshwater and recognize 'the need for further research through case studies at the transboundary basin levels'.[33] Having regard

[27] Asian Development Bank (ADB) (2010), An Eco-Compensation Policy Framework for the People's Republic of China: Challenges and Opportunities.

[28] IUCN PAY (2006), *Establishing Payments for Watershed Services*, Gland: IUCN.

[29] UNECE (2009), *Guidance on Water and Adaptation to Climate Chang* Geneva: UNECE.

[30] Ibid.

[31] Ibid.

[32] Benjamin, Antonio Herman (2013), *Payment for ESS*. Potchefstroom Electronic Law Journal.16/2, 2-5.

[33] Rieu-Clarke, A. and Spray, C. (2013), *ESS and IWL: Towards a More Effective Determination and Implementation of Equity*, P.12-65.

to existing experience of benefit-sharing arrangements, Paisley readily concedes that 'the identification of these benefits can be difficult, and precise calculations complex'.[34] Despite the availability of a wide variety of possible modes of cooperation arranged along a continuum of benefit-sharing, ranging from unilateral action through coordination and collaboration to joint action,[35] commentators agree that 'in most cases, benefit sharing will require some sort of redistribution or compensation, which will be highly situation specific'.[36] Eco-compensation in lieu of ecological benefits in the context of enhanced cooperation over shared international water resources, Sadoff and Grey characterize the potential benefits to be shared as falling into four categories: environmental, economic, political and catalytic.[37] Similarly, in a later comprehensive study of the practice of benefit-sharing, Phillips et al identify three specific categories of benefits, i.e. those arising in the security sphere, in the economic sphere and in the environmental sphere. As regards the environmental sphere, they point out that 'a strong case can be made for the maintenance of some form of eco-system integrity, either to sustain essential ecological goods and services on which human livelihoods are dependent, or to enable those eco-systems to function as sinks in a sustainable manner'.[38] As noted above, Tarlock and Wouters highlight three challenges presented by what they regard as a shift in emphasis in recent years, intended to 'temper unilateral use', from quantum allocation of water to the sharing of benefits among riparian States, including unequal bargaining power among states; the premature "sale" of

[34] Paisley Richard (2002), *Adversaries into Partners: IWL and the Equitable Sharing of Downstream Benefits*. Melbourne Journal of IL, 3, 280-300.

[35] Sadoff, C.W. and Grey, D. (2005), *Cooperation on International Rivers: A Continuum for Securing and Sharing Benefits.* Water International, 30/4, 420-427.

[36] Sadoff, C.W. and Grey (2005), Co*operation on International Rivers: A Continuum for Securing and Sharing Benefits.* Water International,30/4, 420-427, Tarlock, A.D. and Wouters (2007), P.*Are Shared benefits of International Waters and Equitable Apportionment*? *Colorado Journal of IEL and Policy*, 18/3, 523-536, Paisley, R. *Adversaries into Partners: IWL and the Equitable Sharing of Downstream Benefits* (2002).Melbourne Journal of International Law, 3, 280-300.

[37] Sadoff, C.W. and Grey, D. (2005), *Cooperation on International Rivers: A Continuum for Securing and Sharing Benefits.* Water International,30/4, 420-427, Phillips, D., Daoudy, M., McCaffrey, S., Öjendal, J. and Turton, A. (2006),*Trans-boundary Water Cooperation as a Tool for Conflict Prevention and for Broader Benefit-sharing.* Stockholm: Ministry of Foreign Affairs Sweden.

[38] Phillips, D., Daoudy, M., McCaffrey, S. Öjendal, J. and Turton (2006), A.*Trans-boundary Water Cooperation as a Tool for Conflict Prevention and for Broader Benefit-sharing.* Stockholm: Ministry of Foreign Affairs Sweden.

future use options and the increased risk of aquatic eco-system degradation'.[39] Both the Columbia basin and the Amu and Syr Darya basins have resulted in environmental disasters of one kind or another. Tarlock and Wouters note that benefit-sharing appears to achieve the inter-State consensus required to facilitate the development of hydropower projects.[40] However, where the benefit to be optimized, and in lieu of which compensation would be owed to an upstream state, is that of ecological integrity, or the ESS accruing from a functioning riverine eco-system, such problems could be avoided or significantly ameliorated.

Nevertheless, there is no legal impediment preventing co-riparian states from adopting a more expansive and eco-centric view of the shared benefits accruing from development opportunities or environmental measures undertaken by an upstream State. In fact, eco-systems obligations of basin States and such an approach is rapidly emerging, for instance, obligation to maintain environmental flows (Kishenganga Arbitration). Moreover, 2005 Millennium Ecosystem Assessment, define that riparian states might consider the maintenance of a watercourse's ecological integrity of shared waters as a key aim and justification of benefit-sharing arrangements.[41] At the same time, the difficult task of crafting complex benefit-sharing is arrangements focused on eco-system protection, including arrangements to compensate the upstream States concerned, might now be more possible than before due to the sophisticated tools and methodologies emerging under the eco-systems approach to transboundary water management. Without common understanding fostered by widely accepted methodologies for identifying minimum environmental flows, evaluating ESS and calculating appropriate compensation payments for those ensuring the continued provision of such services, the inter-State agreement required for effective ecological benefit-sharing would simply not be possible.

[39] Tarlock, A.D. and Wouters, P. (2007), *Are Shared benefits of International Waters and Equitable Apportionment*? Colorado Journal of IEL and Policy, 18/3, 523-536.

[40] Ibid.

[41] Ibid.

2.1.2 Eco-system Service /ESS/

ESS is now very closely linked to the eco-systems approach to the protection of international watercourses.[42] It will be central to future benefit-sharing arrangements intended to secure the protection of watercourse eco-systems.[43] It provides a methodology for the economic and social valuation of such benefits, including non-marketable benefits of natural eco-systems. Common understanding of the value of eco-systems was greatly assisted by the 2005 Millennium Ecosystem Assessment, which provided an essential typology of four categories of ESS:[44]

-Supporting services, such as soil formation and pollination;

- Provisioning services, such as food, water supply and timber;

- Regulating services, such as climate control, flood control and water quality;

- Cultural services, such as recreational uses and spiritual values.

It plays significant role in transboundary water cooperation involving benefit-sharing. Co-riparian States must communicate and agree upon equitable measures for the utilization and protection of shared waters based upon a common understanding of their cost and benefit for each State. Generally accepted methodologies for the valuation of benefits provided by watercourse eco-systems can help to provide a common point of departure for negotiations over benefit-sharing.[45] A great deal of highly specific guidance has emerged in recent years regarding the use of the ESS concept in policy-making. This includes, for example, the World Resources Institute (WRI) guidance on methodologies for review of ESS in the context of a process of EIA[46] and the recent report by the Institute for European Environmental Policy and the Ramsar

[42] McIntyre, Owne (2014), *The Protection of Freshwater Ecosystems Revisited*: *Towards a Common Understanding of the 'Ecosystems Approach' to the Protection of transboundary Water Resources*. Review of European Community and IEL, 23/1, 88-95.

[43] Pardy, B. (2014), *the Logic of Ecosystems: Capitalism, Rights and the Law of "Ecosystem Services"*. Journal of Human Rights and the Environment, 5/2, 136-152.

[44] *Millennium Ecosystem Assessment (2005), Ecosystems and Human Well-Being*: Synthesis. Washington DC: Island Press.

[45] Sadoff, C.W. and Grey, D. (2005), Cooperation on International Rivers: A Continuum for Securing and Sharing Benefits. Water International, 30/4, 420-427.

[46] Landsberg, F., Ozment, S., Stickler, M., Henninger, N., Treweek, J., Venn, O. and Mock, G. (2011), ESS Review for Impact Assessment: Introduction and Guide to Scoping. Washington DC: World Resources Institute.

Secretariat on the economics of eco-systems and biodiversity for water and wetlands.[47] Further technical guidance has recently been issued by such bodies as the United Nations Development Programme,[48] the United Nations Environment Programme,[49] and the European Commission.[50] A 2008 report published by the Secretariat of the Convention on Biological Diversity includes an Annex I that examines in detail 'ESS by inland waters which can be affected by inappropriate water allocations and unsustainable water use'.[51] This level of interest has caused Rieu-Clarke and Spray to suggest that 'in this regard, water and wetland eco-systems are perhaps among the best studied of habitats in terms of ecosystems services, and to note further that 'this linkage between the upstream provision of services and the downstream utilization of services thus provided often water-related has now become widely recognized and can be seen to operate on very large, often transboundary scales.[52] Such ongoing elaboration of the ESS concept in the context of shared waters can only serve to clarify the value to downstream States of such services provided by international watercourse eco-systems maintained by upstream States, and can thus serve to inform negotiations over possible benefit-sharing arrangements.

2.2 General Principles of IEL Governing the Management of Trans-boundary Natural Resources

2.2.1 Principle of Equitable and Reasonable Utilization

This principle is part of CIL, and generally considered the core principle of IWL.[53] It aims to balance the uses and protection of the interests of all riparian states of a transboundary

[47] Russi, D., ten Brink, P., Farmer, A., Badura, T., Coates, D., Förster, J., Kumar, R. and Davidson, N. (2013), The Economics of Ecosystems and Biodiversity (TEEB) for Water and Wetlands. London and Brussels / Gland: IEEP / Ramsar Secretariat.

[48] Alpizar, F. and Bovarnick, A. (2013),Targeted Scenario Analysis: A new Approach to Capturing and Presenting ESS Values for Decision Making. New York: UNDP.

[49] Brander, L. (2013), Guidance Manual on Value Transfer methods for ESS. Nairobi: UNEP.

[50] European Commission (2013), Mapping and Assessment of Ecosystems and their Services. Brussels: European Union.

[51] Brels, S., Coates, D. and Loures, F. (2008), TBWRM: The Role of International Watercourse Agreements in Implementation of the CBD. Quebec: Secretariat of the CBD.

[52] Rieu-Clarke, A. and Spray, C. (2013), ESS and IWL: Towards a More Effective Determination and Implementation of Equity. 12-65.

[53] Nanda and Pring (2013), p. 35.

watercourse.[54] Each riparian state must behave in such a manner that allows equitable and reasonable use for all the others.[55] Traditionally, this principle has been understood as a primarily resource-based approach regulating the quantitative allocation of water resources between riparian states.[56] However, it does not just focus on how much of a watercourse's resources will be used, but also encompasses the manner of that use.[57] Hence, it needs to be understood as a more holistic concept that incorporates aspects of both allocation and protection of the waters.[58] In the Pulp Mills case in 2010, the ICJ confirmed that environmental protection of the river must be taken into account alongside the interests of the co-riparian states in order to achieve an equitable and reasonable utilization of a watercourse.[59]

2.2.2 Obligation to Protect International Watercourses and their Eco-systems

There is also an emerging customary obligation in IWL to protect international watercourses and their eco-systems as a whole.[60] Although this obligation has been described as new or emerging, it's essential elements are already a part of IEL.[61] From IEL flow the obligations to prevent new or potential sources of significant pollution and to control the existing pollution of an international watercourse.[62] The obligation to protect international watercourses and their eco-systems reflects progress in the scientific knowledge concerning the multi-faceted interrelationships within environmental systems.[63] Today, it is generally considered that the

[54] Ibid
[55] Ibid
[56] Ibid

[57] Ibid
[58] McCaffrey (2007a), p. 385. See for example Art. 5, para.1 *UNWC, according to which riparian states are to use and develop an international watercourse in an equitable and reasonable manner "consistent with adequate protection of the watercourse*".

[59] Nanda and Pring (2013), p. 35.

[60] McCaffrey (2007a), p. 385.See for example Art. 5, para.*1 UN Watercourses Convention, according to which riparian states are to use and develop an international watercourse in an equitable and reasonable manner "consistent with adequate protection of the watercourse".*

[61] Ibid.
[62] ICJ, Pulp Mills on the River Uruguay (Argentina v. Uruguay), Judgment, ICJ Reports 2010, p. 75, para. 177. *This case concerned the construction of pulp mills on the Uruguay River*

[63] Nollkaemper (1993), p. 70; McIntyre (2007), pp. 265–266. 79Hey (1992), pp. 305–306; Nollkaemper (1993), pp. 71–72; Bodansky (1991), pp. 413–414. See also the 1992 *Convention on the Protection and Use of transboundary*

entire eco-system of a watercourse is to be included in the efforts to protect and conserve it.[64] In the face of increasing environmental problems, there is an urgent need to integrate aspects of environmental sustainability more closely into IWL and its allocation principles.[65] Consequently, IWL is developing toward providing a framework for both river basin development and environmental management.[66] Even though the focus of IWL is still principally on the development and use of trans-boundary river basins, it has gradually begun to also incorporate the idea of eco-system protection.[67] The UN Watercourses Convention, as well as a number of recent bilateral and multilateral agreements concerning international watercourses, contains provisions on environmental protection affirming an obligation to protect international watercourses and their ecosystems.[68]This strengthened the role of environmental aspects in the management of trans boundary water resources.[69]While the Convention recognizes the protection of a watercourse as an element of its equitable and reasonable utilization,[70]environmental considerations are also included in a number of other provisions.[71]In its commentaries to the draft Article 20 on the protection and preservation of eco-systems, and Article 21 (paragraph 2) on the prevention, reduction and control of pollution, the ILC stated that the precautionary

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Watercourses and International Lakes of the UNECE Water Convention), which anchors the precautionary principle for transboundary water pollution in Art. 2, para. 5(a) in conjunction with Art. 2, paras. 1 and 2. *Convention on the Protection and Use of trans boundary Watercourses and International Lakes, Helsinki,* 17 March 1992, ILM 31 (1992), p. 1312. 80McCaffrey (2007a), p. 461.

[64] Agenda 21, Chap. 18, paras. 18.35–18.36; and UN GAOR A/RES/S-19/2, 28 June 1997, *Programme for the Further Implementation* of Agenda 21, Annex, p. 19, para. 34(a). *On ecosystem integrity in IWL*, see Tarlock (1996), pp. 199–208; Abramovitz (1996), p.

[65] Tarlock (1996), p. 186.

[66] Ibid.

[67] Ibid, pp. 182 and 196. However, these new rules essentially deal with the prevention of water pollution and thus remain incomplete. *S*ee ibid. p. 197.

[68] *For regional agreements, this depends on the regional priorities. For example, in the United Nations Economic Commission for Europe (UNECE) region, environmental protection and pollution control are of central importance, which is the reason why the focus of the 1992 UNECE Water Convention is on preventing, controlling, and reducing trans boundary impacts, in particular by monitoring water quality*. See Boisson de Chazournes (2013), pp. 123–124.

[69] Boisson de Chazournes (2013), p. 119; Birnie et al. (2009), pp. 562–563.

[70] Arts. 5 and 6(a) and (f) UNWC.

[71] Arts. 20–23 *UNWC.*

principle is applicable[72]even though those articles do not explicitly mention the principle.[73] Overall, the provisions of the UNWC on the prevention of water pollution reflect the current efforts within the international community to develop the law in the field of the protection of international watercourses and their eco-systems.[74]

2.2.3 General Obligation to Cooperate

It is generally recognized today that riparian states of a shared watercourse have a customary obligation to cooperate with each other.[75] It is essential for the optimal use and development of the watercourse as well as for its protection and preservation. It is the indispensable basis required for the effective fulfillment of the more specific procedural obligations of notification, consultation, and information, as well as required for the ongoing maintenance of an equitable use allocation.[76] In its judgment in the Gabčíkovo-Nagymaros Project case, the ICJ emphasized the interdependence of the riparian states of the Danube and their need for cooperation. The Court deemed that cooperation is needed to alleviate problems of navigation, flood control, and environmental protection.[77] A number of international agreements on watercourses also establish cooperative obligations of the respective contracting states.[78] The UNWC enshrines the "general obligation to cooperate" in its Article 8, paragraph 1, and, in paragraph 2, recognizes the importance of joint river commissions in enhancing the prospects of achieving meaningful

[72] ILC, *Draft Articles on the Law of the Non-Navigational Uses of International Watercourses and commentaries thereto adopted by the Drafting Committee on second reading*, YBILC 1994, Vol. II, Pt. 2, p. 122, para. 4.

[73] Ibid.

[74] McCaffrey (2007a), p. 449.

[75] Caponera (2007), p. 193; McCaffrey (2007a), pp. 470–471; Nollkaemper (1993), pp. 152–153 and 220; Mager (2015), p. 12; Garane (2005), p. 242; Sands et al. (2013), pp. 203–204; Egyptian publicists 'Abd al-'Āl (2010), p. 125; Maḥfūẓ Muḥammad (2009), p. 478.

[76] McCaffrey (2007a), pp. 465–466. To the same effect see Vinogradov et al. (2003), pp. 54–55.

[77] ICJ (1997), Gabčíkovo-Nagymaros Project (Hungary v. Slovakia), Judgment of 25 September 1997, ICJ Reports, pp. 18 and 20, para. 17.

[78] McCaffrey (1987), paras. 43–46, with a list of international watercourse agreements containing provisions on cooperation in Annex I, pp. 45–46

cooperation.[79] What exactly is required to comply with the obligation to cooperate depends on the specific context. For example, cooperation with co-riparian states may be required to achieve an equitable use allocation or to control pollution of river water. An example of failure to cooperate would be a systematic refusal to take into accounts the proposals or interests of co-riparian states. The failure to cooperate may constitute a wrongful act of the non-cooperating state and engage its international responsibility.[80] Both the necessity and the exemplary successes of institutionalized interstate cooperation have prompted riparian states around the world to establish numerous river commissions and other joint organizations for their cooperation in the management of shared water resources.[81] However, there is no recognized international legal obligation of riparian states to establish such institutions or to participate in them.[82]

2.2.4 Principle of Common but Differentiated Responsibility

The task of environmental protection is one that all nations face. Due to different development paths and the need to take partial responsibility for ecological damage, certain countries may be asked to bear a larger share of the conservation burden. The fundamental idea is that, in upholding justice and fulfilling their obligations under international environmental conservation treaties, states should respect their respective but common roles and powers. This concept was acknowledged in the Rio Declaration's eleventh and seventh principles. This principle consists of two parts. First, there is a shared responsibility for environmental protection at the state level.[83]

[79] Art. 8 of the UNWC are based on the draft Art. 8 prepared by the ILC. In accordance with its usual practice, the Commission did not indicate whether or to what extent it considers this provision as a codification of CIL or as the progressive development of international law. See ILC, Draft Articles on the Law of the Non-Navigational Uses of International Watercourses and commentaries thereto adopted by the Drafting Committee on second reading, YBILC 1994, Vol. II, Pt. 2, p. 105–107, paras. 1–6.

[80] McCaffrey (2007a), p. 470.

[81] For a comprehensive overview of state practice and the work of joint institutions in the management of trans boundary watercourses, see Caponera (2007), pp. 235 and 319–396; and McCaffrey (1990), paras. 2–19.

[82] Caponera (2007), p. 235.

[83] Convention for the Establishment of an Inter-American Tropical Tuna Commission, May 31, 1949, 80 U.N.T.S. 72, at pmbl.; Rasmar Convention on Wetlands, supra note 6, at pmbl.; UNESCO on Heritage, supra note 6, at pmbl.;

This implies that states should participate in international conservation initiatives. The second part is an explanation of the different state circumstances. For example, developed countries have contributed more too global warming than poor countries. Developing countries may not have as advanced damage prevention methods, nevertheless. Furthermore, rather than impeding the growth of developing nations, state environmental policies should work to promote it now and in the future. There are disparities in the acceptability of national norms and international commitments, despite the fact that every state needs to contribute to the environmental solution. For example, various countries could have different schedules for enacting national preventive measures.

2.2.5 The Principle of Sustainable Development

Sustainable development is described by the 1987 Brundtland Report as development that meets current needs without jeopardizing the ability of future generations to meet their own needs, with an emphasis on the fundamental needs of the world's poor. It supports the idea that the environment can only provide so much in the present and future. Sustainable development holds that protecting the environment should first aim to improve human well-being. International accords on sustainable development state that it consists of three things at least.

2.2.5.1 Intergenerational Equity

It is the duty of every generation to leave a wealth legacy that is equal to or greater than what they have inherited. This is known as intergenerational equity. The natural resources are entrusted to the current generation for use by future ones[84] 79 Early [85] 80 and recent[86] 81 treaties have referred to this principle.

Treaty on Exploration and Use of Space, supra note 17, at art. 1; G.A. Res. 43/53 (1988), 44/207 (1989), 45/212 (1990).

[84] E. Brown Weiss (1990), Our Rights and Obligations to Future Generations for the Environment, 84 AM. J. INT'L L. 198.

[85] International Convention for the Regulation of Whaling, Dec. 2, 1946, 161 U.N.T.S. 72, pmbl.; African Convention on the Conservation of Nature and Natural Resource, supra note 12, at pmbl.

[86] Convention on International Trade of Endangered Species of Wild Fauna and Flora, Mar. 3, 1973, 993 U.N.T.S. 243, pmbl.; U.N. Convention on Climate Change, supra note 6, at art. 3(1);U.N. Convention on Biological Diversity, supra note 6, at pmbl.

2.2.5.2 Sustainable Use of Natural Resources

The United States' declaration in 1893 of a right to guarantee the appropriate use of seals in order to prevent their extinction serves as the main source of inspiration for the concept of sustainable use of natural resources.[87] The term has been used in conservation conventions.[88] Although there have been attempts to define the concept of sustainable use of natural resources, no universally accepted definition has been established. Terms such as proper,[89] wise use,[90]judicious exploitation,[91] sound environmental management,[92] ecologically sound, and rational use[93]are used interchangeably without definitions.

2.2.5.3 Integration of Environment and Development

Sustainable development cannot be attained by considering environmental protection in isolation; it must be a part of the development process.[94] Therefore, fulfilling environmental objectives should take into account social and economic growth, and vice versa. International agencies such as the World Bank and the World Trade Organization have never placed much

[87] Bering Sea Fur Seals Fisheries Arbitration (Gr. Brit. v. U.S.), reprinted in J. MOORE., INTERNATIONAL ARBITRATIONS 755 (1893); see also Fisheries Jurisdiction (U.K. v. Ice.) 1974 I.C.J. 34-35, where the obligation to cooperate in the conservation and sustainable utilization of global commons, including living resources on the high seas, was upheld.

[88] Agreement on the Action Plan for the Environmentally Sound Management of the Common Zambezi River System, May 28, 1987, 27 I.L.M. 1109, pmbl.; U.N. Convention on Biological Diversity, supra note 6, at arts. 1. 8, 11, 12, 16-18; U.N. Convention on Climate Change, supra note 6, at art. 3(4).

[89] FAO Agreement for the Establishment of a General Fisheries Council for the Mediterranean, Sept. 24, 1949, 126 U.N.T.S. 237, art. IV(a).

[90] Convention on the Conservation of Migratory Species of Wild Animals, June 22, 1979, pmbl., 19 I.L.M. 15 (1980).

[91] Act Regarding Navigation .and Economic Co-operation between the States of the Niger Basin, Oct. 1963, pmbl., 587 U.N.T.S. 9.

[92] Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region, Mar. 24, 1983, art. 4(1), 22 I.L.M. 221.

[93] UN/ECE Convention on the Transboundary Effects of Industrial Accidents, Mar. 17, 1992, art.2(2)(b), 31 I.L.M. 1333.

[94] Rio Declaration, supra note 7, at princ. 4.

emphasis on environmental conservation, but this is starting to change.[95] From a macroeconomic perspective, the transition to sustainable development calls for the establishment of new accounting systems to evaluate national progress, for example. Environmental damage and pollution control efforts would be taken into account by the accounting system when calculating the gross national product (GNP). For example, mining extraction would suggest a decline in natural resources as well as a rise in the GNP.[96] In microeconomics, sustainable development would entail things like making the state responsible for environmental harm pay for the harm done.[97]

2.2.6 Pre-cautionary Principle

The fifteenth principle of the Rio Declaration states that delaying cost-effective steps to stop environmental degradation is unacceptable in cases when there are warnings of significant or permanent harm, regardless of the completeness of scientific knowledge. This rule represents this regulation, even if it is still being worked out.[98] The reason for shifting the burden of proof is that scientific certainty often comes too late for policymakers and legal professionals to take action to protect the environment. People may suffer and the ecology may suffer irreversibly if pollution emitted into the environment is not understood. In the past, authorities wishing to put particular preventative measures into place had to show that there was a clear risk and that the desired reaction was urgent.[99] Fortunately, the precautionary principle reversed this traditional interpretation of the burden of proof, enabling a state to take action without first requiring proof of a threat. The burden of proof may now shift, requiring countries wishing to engage in particular activities to provide evidence that their actions won't have a detrimental environmental

[95] E. Iglesias (1993), El papel de los organisms multilaterals de cooperaci6n en el desarrollo sostenible: el caso de BID, 20 REVISTA DE CIENCIAS SOCIALES IBEROAMERICANAS DE LA ASOCIACi6N DE INVESTIGACI6N Y ESPECIALIZACI6N SOBRE TEMAS IBEROAMERICANOS 147-57.

[96] See generally Statistical Office of the United Nations (1992), Draft Handbook on Integrated Environmental and Economic Accounting.

[97] This is the polluter pays principle, which implies that the polluter should bear the expenses of carrying out pollution prevention measures or paying for damage caused because the environmental costs of production were not internalized.

[98] Rio Declaration, supra note 7, at princ. 15.

[99] Convention for the Prevention of Marine Pollution from Land-Based Sources, Supra note 44, at art. 4(4).

impact.[100] Signed in 1985, the Vienna Convention for the Protection of the Ozone Layer is the first accord that supports this concept. Since then, a lot of emphasis has been paid to the cautious approach to environmental conservation.[101] Regretfully, there is no agreement on what the principle needs, and different people understand it differently. It's still unclear when inaction becomes unacceptable in the face of a lack of scientific evidence. When is it legal to require preventive action? The 1991 Bamako Convention, on the other hand, lowers the threshold at which the absence of scientific evidence prompts action by tying together the preventive and precautionary principles without requiring the likelihood of substantial harm.[102] The Convention for the Protection of the Marine Environment of the North East Atlantic, which was established in 1992, raises the bar for implementing preventative measures to beyond the mere possibility of harm.

2.2.7 Obligation Not to Cause Significant Harm

The doctrine of limited territorial sovereignty also incorporates this idea.[103] This rule states that no state in an international drainage basin may use its watercourses in a way that would seriously impair the environment or other basin states, including human health or safety, the ability to use

[100] This interpretation has been adopted in the Convention for the Protection of the Marine Environment of the North-East Atlantic, Sept. 22, 1992, 32 I.L.M. 1069, Annex II, art. 3(3)(c).Under this agreement, the parties have to report the results of scientific studies which show that any dumping operations of radioactive wastes would not result in hazards to humans, living resources, and other uses of the sea. Id.

[101] See id. at art. 2(2)(a); Convention for the Protection of the Marine Environment of the Baltic Sea Area, Apr. 1992, 30 I.L.M. (1992) (not in force); Ministerial Declaration of the International Conference on the Protection of the North Sea, Bremen, Nov. 1, 1984; Ministerial Declaration of the Second North Sea Conference, London, Nov. 25, 1987; Third North Sea Conference, The Hague, Mar. 8, 1990; Ministerial Declaration on Sustainable Development in the European Economic Community Region, Bergen, May 16, 1990; Convention on the Ban of Import into Africa and the Control of Transboundary Movement and Management of Hazardous Wastes within Africa, supra note 36, at art. 4(3)(f.

[102] According to the art. 4(3)(f) of the Bamako Convention, parties have to adopt and implement "the preventive, precautionary approach to pollution which entails, inter alia, preventing the release into the environment of substances which may cause harm to humans or the environment without waiting for scientific proof regarding such harm." Id. This formulation also links the preventive and precautionary approaches.

[103] Eckstein, G. (2002) 'Development of international water law and the UN water course convention', in A. Turton and R. Henwood (Eds), Hydro politics in the Developing World: A Southern African Perspective. South Africa: African Water Issues Research Unit, pp.82-83.

the waters for beneficial purposes, or the living things that inhabit the watercourse systems. International water and environmental law generally acknowledges this idea.[104] The definition or scope of the word "significant" and how to define "harm" as "significant harm" are still up for debate, nevertheless. The majority of contemporary international water accords, treaties, and agreements incorporate this idea.[105] These days, it is regarded as a component of customary international law.[106]Modern international environmental conventions and declarations also recognize this principle, such as the 1992 Rio Declaration on Environment and Development (Principles 2, 4, 13, 24), the 1972 Stockholm Declaration of the UN Conference on Human Environment (Principles 21, 22), and the 1992 Convention on Biological Diversity (Article 3).

[104] Khalid, A.R.M. (2004) 'The Interlinking of rivers project in India and international water law: an overview', Chinese Journal of International Law, Vol. 3, pp.11.

[105] Ibid.

[106] Eckstein, G. (2002) 'Development of international water law and the UN water course convention', in A. Turton and R. Henwood (Eds), Hydro politics in the Developing World: A Southern African Perspective. South Africa: African Water Issues Research Unit, pp.82-83.

Chapter Three

Global Legal Framework on Environmental Protection, Preservation of the Ecosystem of TBRS

3.1. Customary International Law and Treaty Law

3.1.1. UN Convention on Biological Diversity (CBD)

The CBD is an example of a biodiversity law instrument that includes a strong ecosystem-based approach and has progress the development in the wider IEL context, including freshwater law.[107] It prioritizes conservation while aiming to ensure the ongoing functionality of ecosystems. It requires that states take into account the limits of their ecosystems.[108] Along with the conservation of biodiversity itself, it has two main objectives, namely sustainable use and sharing of benefits from the use of genetic resources. The CBD embodies a more formal framing of elements of an integrated approach to natural resource management and promotion of the ecosystem approach.[109]

3.1.2 The Ramsar Convention

The Ramsar Convention makes a substantial contribution to ecosystem protection, the ecosystem approach, and ESS regarding transboundary waters.[110] The Convention concerns itself with the wise use, conservation, and protection of wetlands of global significance situated within and across national boundaries.[111]It is important for normative guidance on cooperation over 'international' wetlands, filling gaps in the biodiversity regime.[112] Wetlands are an incredibly rich source of biodiversity and are particularly crucial for ecosystem functioning.[113] The key obligations of relevance for transboundary freshwater eco-systems require State Parties to designate suitable wetlands within State Party's territory for inclusion in a list of wetlands of

[107] Lim "Environmental Law and the Ecosystem Approach: Maintaining Ecological Integrity through Consistency in Law" p. 198.

[108] Ibid.

[109] Ibid.

[110] Ramsar Convention.

[111] Ibid.

[112] Ibid.

[113] Millennium Ecosystem Assessment, Ecosystems and Human Well-Being: Synthesis (Island Press 2005).

international importance[114] where 30 percent of the total Ramsar wetlands listed are situated within international river basins.[115] Cooperation is required concerning consultation between State Parties in the case of transboundary wetlands and shared water systems, irrespective of whether or not the river basins or systems contain wetlands of international importance.[116]The provisions of the Ramsar Convention and soft law provide further detail on how to implement transboundary cooperation, especially through provisions on exchanging data,[117] institutional mechanisms (COP),[118] the Secretariat, and the Scientific Technical Review Panel. A key notion in this Convention is the 'wise use' of wetlands which is the overarching objective of the Convention. The notion of 'wise use' refers to the maintenance of wetlands ecological character, achieved through the implementation of eco-system approaches, within the context of sustainable development.[119] Through this notion of 'wise use,' it puts ecosystem approaches and ecosystem services at the heart of the regime. Like the CBD, Ramsar Convention's active Secretariat and Scientific Technical Review Panel (STRP) has produced supplementary technical guidance relevant to implementing and further developing the obligations under the Convention regarding ecosystem protection of wetlands situated in TBRBs, the ecosystem approach, and cooperation.[120] Despite being non-binding technical documents, these handbooks are nevertheless based upon formal decisions adopted by the conference of the State Parties, the substance of which reflects the Parties' subsequent practice in interpreting and implementing the Convention.[121] Ramsar COP decisions have also reinforced the synergies between an ecosystem

[114] Article 2(1) Ramsar Convention.

[115] RAMSAR CONVENTION SECRETARIAT (2010), International Cooperation: Guidelines and Other Support for International Cooperation under the Ramsar Convention on Wetlands 10.

[116] Article 5 Ramsar Convention.

[117] Ibid art 4(3).

[118] Ibid art 6(2).

[119] Ramsar Convention (2005), Resolution IX.1 Annex A, para 22.

[120] The guidance includes numerous handbooks especially on the topics of planning for Ramsar sites, on how to conserve wetlands and establish nature reserves, river basin management, water allocation and management, and international cooperation.Ramsar Convention Secretariat (2014)http://www.ramsar.org/resources/ramsar-handbooks.

[121] The normative guidance from Handbook 20 on International Cooperation is drawn from Resolution VII.19 and its Annex is particularly relevant with additional COP 10 material from Resolution X.6 and its Annex, and the substance of it thus reflects formal decisions adopted by the parties.

approach, ESS, wise use, and integrated water resources management with greater clarification than those outlined in the CBD.[122]

3.1.3 The Helsinki Convention on the Protection and Use of Trans boundary Watercourse and International Lakes 1992

The scope is wider than that of the UNWC. The notion of transboundary waters covers 'any surface or groundwater that marks, crosses, or is located on boundaries between two or more states.[123] With respect to groundwater, both 'confined' and 'unconfined' aquifers are covered by the Convention.[124] Furthermore, it accords more attention to the protection of the environment. It contains a rather wide definition of pollution to be abated with the understanding of transboundary impact.[125] These include ecologically rational management of waters and address the conservation and restoration of damaged ecosystems.[126] Additionally, the preamble defines the conservation of ecosystems and provides obligations of states.Recommending cooperation on bilateral and multilateral levels for the prevention, control, and reduction of transboundary pollution; sustainable water management; conservation of water resources; and environmental protection.[127]

Finally, Article 2(b) and (d) of the Convention clarifies the conservation and protection of eco-system as follows:

> The Parties shall, in particular, take all appropriate measures:
>
> (b) To ensure that transboundary waters are used with the aim of ecologically sound and rational water management, conservation of water resources and environmental protection;
>
> (d) To ensure conservation and, where necessary, restoration of eco-systems.

[122] Ramsar Convention (3 July 2015) Resolution XII.12, paras 2, 9 and 12 are good examples.

[123] Helsinki Convention, Art 1(1).

[124] Economic Commission for Europe, Integrated Management of Water and Related Ecosystems: Draft Guide to Implementing the Convention (31 August 2009) ECE/MP.WAT/2009/L2, para 73.

[125] Ibid.

[126] Ibid.

[127] Helsinki Convention.

3.1.4 Convention on the Law of the Non-navigational Uses of International Watercourses 1997

Part IV of the Convention on the Law of the Non-navigational Uses of International Watercourses sets out rules for the protection and conservation of ecosystems of international watercourses and their management. These provisions are new and were traditionally not part of the law on international watercourses.[128] Articles 20–23 stipulate obligations, predominantly formulated in a general manner, for environmental protection by integrating it into the water law provisions.[129] Pursuant to Article 20, watercourse states are to "individually and, where appropriate, jointly, protect and preserve the ecosystems of international watercourses". It is based on a holistic, ecosystem-oriented approach and follows the trend of development in contemporary international environmental law.[130] Additionally, it provides an obligation upon States to protect and preserve the eco-systems of an international watercourse. However, the eco-system concept was used by the International Law Commission (ILC) when they drafted the text of the Convention because it was seen to have a narrower scope to that of the environment. Eco-system was accordingly defined by the ILC as "an ecological unit consisting of living and non-living components that are interdependent and function as a community.[131] This obligation is seen as an extension of the requirement that states utilize their waters in an equitable and reasonable manner.[132] In other words, it can be said that any activity that threatens the protection and preservation of ecosystems of an international watercourse might potentially be considered inequitable and unreasonable because it threatens the long-term viability of the resource. The obligation to protect ecosystems encompasses measures relating to conservation, security, and water-related disease, as well as technical and hydrological control mechanisms, such as the regulation of flow, floods, pollution, erosion, drought, and saline intrusion.[133] Additionally, the obligation to protect includes the duty to shield ecosystems from a significant threat of harm and therefore the need to adopt a precautionary approach.[134] The ESS approach is based upon the

[128] Fitzmaurice (2001), p. 445; Brown Weiss (2007), p. 222.

[129] Boisson de Chazournes (2013), p. 31.)

[130] Nanda and Pring (2013), p. 307; Brown Weiss (2007), p. 206.

[131] UNWC-Fact-Sheet-7-Protection-and-Preservation-of-Ecosystems.pdf
[132] Ibid.
[133] Ibid.
[134] Ibid.

understanding that there are economic benefits to healthy ecosystems. In this respect, the protection and preservation of ecosystems is not only environmentally important but also economically beneficial. It is a relatively new approach in freshwater management but increasingly used by scientists in order to quantify and in turn seek to harness the economic benefits that healthy watercourse ecosystems can provide both directly and indirectly to riparian states.[135] An extension of this approach to payment for ESS involves assessing the financial value of specific ESS to economic and social development.[136] Policy mechanisms can then be developed that seek to integrate these financial values into water management strategies, including providing compensation for preserving ecosystems. Notably, the UNECE Water Convention has codified a strategy to implement this approach.[137] Ethiopia, which abstained from the vote, argued that adjusting the principles in future agreements "could undermine" the Convention. Egypt also abstained while Sudan voted in favor of the convention.

3.2 Regional Legal Framework Governing Trans Boundary River

3.2.1 UNECE Water Convention 1992

The most important successful regional water agreement, [138] on transboundary water resources.[139] Initially, it was designed as a regional framework convention for the UNECE region. However, it was amended to open it to all UN member states for accession on 6 February 2013.[140] It provides a framework for cooperation between member states to prevent and control the pollution of transboundary waters, including groundwater in the territory of contracting

[135] Ibid.
[136] Ibid.
[137] Ibid.

[138] Convention on the Protection and Use of Transboundary Watercourses and International Lakes, 17 March 1992, ILM 31 (1992), p. 1312. The Convention entered into force on 6 October 1996. It has been supplemented by two protocols, the 1999 Protocol on Water and Health and the 2003 Protocol on Civil Liability and Compensation for Damage Caused by the transboundary Effects of Industrial Accidents on Trans boundary Waters.

[139] Türk (2012), p. 1056.

[140] Arts. 25 and 26 UNECE Water Convention of 28 November 2003, UN ECE/MP.WAT/14

parties or contracting parties and third states.[141] It contains many parallels to the UNWC, in particular concerning the provisions on the principles of equitable and reasonable utilization, cooperation, and protection of watercourse ecosystems.[142] However, while the UNWC focuses on the principles for water allocation, namely equitable and reasonable utilization coupled with the no-harm rule, the former focuses on aspects of water and environmental protection.[143] Thus, when Article 2, paragraph 2(c) of the Convention lays down the principle of equitable and reasonable utilization, it simply stipulates that the state parties must take all appropriate measures "to ensure that transboundary waters are used in a reasonable and equitable way." It does not list factors for determining what an equitable and reasonable utilization is, nor does it offer any other guidance for the application of this principle. Rather, on this point the Guide to Implementing the Convention refers to the UNWC.[144] While it appears to be lagging in this respect, when it comes to the field of water and environmental protection, the UNECE Water Convention is clearly ahead of the UNWC.[145] Unlike the UNWC, the UNECE Water Convention prescribes binding minimum standards to the contracting parties for the protection and use of transboundary watercourses and lakes.[146]

3.2.2 East Africa Community Treaty, 1999

The EAC aims at widening and deepening cooperation among the partner states and other regional economic communities in, among others, political, economic, and social fields for their mutual benefit.[147] The objectives of the community, as outlined in the treaty, are, inter alia, to ensure sustainable growth and development among the partner states, promote the sustainable utilization of the natural resources of the partner states, and take measures that would effectively

[141] Art. 1,para,1 UNECE Water Convention which covers unlike the UNWC Watercourses Convention confined aquifers.

[142] Ibid.

[143] Boisson de Chazournes (2013), p. 33

[144] UNECE, Guide to Implementing the Convention, 2013, p. 24, para. 107.

[145] Ibid.

[146] The precautionary principle: Art. 2, para. 5(a); polluter-pays principle: Art. 2, para. 5(b); required standard of technology: Art. 3, para. 1(c) and Art. 13, para. 1(b) in conjunction with Annex I.

[147] East Africa Community Treaty, 1999, Art. 5.

protect the natural environment of the partner states.[148] Articles 111 and 114 of the treaty provide for joint management and utilization of natural resources within the community for the mutual benefit of the partner states. In particular, the partner states are required to take necessary measures to conserve their natural resources; cooperate in the management of their natural resources for the conservation of the ecosystems and the arrest of environmental degradation; and adopt common regulations for the protection of shared aquatic and terrestrial resources.[149] With regard to conservation of these transboundary resources, the actions by the community shall have the objective of ensuring sustainable utilization of natural resources like lakes, wetlands, forests, and other aquatic and terrestrial ecosystems and to jointly develop and adopt water resources conservation and management policies that ensure sustenance and preservation of ecosystems.[150] In 2003, the member states of the EAC adopted the Protocol for the Sustainable Development of Lake Victoria Basin, in the belief that there was a need for sustainable utilization of the waters in the Lake Victoria basin and to introduce an integrated approach in the management of this resource. The partner states thus sought to cooperate in the conservation and sustainable utilization of the resources of the basin.[151] Member States of the EAC have further taken cognizance of the need to ensure the protection of the resources that are shared among these countries, and in this regard they have adopted the Transboundary Environmental Assessment Guidelines for Shared Ecosystems in East Africa.[152]

3.2.3 The EAC Regional EIA Guidelines for Shared Ecosystems

The EIA Guidelines are adopted for the purpose of enabling the identification and application of environmentally sound approaches to management and ensuring the sustainability and biophysical integrity of the shared ecosystems within the East African region.[153] The guidelines play an important role in the management and conservation of the shared ecosystems, such as fresh water, forests, and protected areas, and determining transboundary environmental impacts

[148] Ibid.

[149] East Africa Community Treaty, 1999, Art. 114(1).

[150] East Africa Community Treaty, 1999, Art.111.2(c) and (d).

[151] Ibid.

[152] Ibid.

[153] EAC, 'Transboundary Environmental Assessment Guidelines for Shared Ecosystems in East Africa,' May 2005.

and the costs associated with conducting these assessments is to be met by the developer of a certain project in these areas.[154]

3.3 Agreements on the Protection and Conservation of Eco–system of Nile River Basin

3.3.1 Framework for General Co-operation" Signed Between the Arab Republic of Egypt and Ethiopia at Cairo (1993)

There is no bilateral Agreement between Ethiopia and Egypt concerning the utilization of the River Nile,[155] the only exception is the agreement that was signed between Egypt and Ethiopia in July 1993.[156] Ethiopia, which had shown a reserved attitude toward signing any agreement throughout its history, concluded an agreement with Egypt in 1993 entitled "Framework for General Cooperation".[157] In the preamble of the agreement of 1993, the two countries have underlined their "commitment" to the UN and OAU Charters and the "principles of international law" as well as to the Lagos Plan of Action.[158] Several articles of the agreement emphasize cooperation over the River Nile. In Article 4, regarding the use of the Nile waters, it provides, "The agreement resulting from these negotiations shall be based on the rules and principles of international law".[159] (Article 5) They recognize the "necessity" of conservation and protection

[154] Ibid.

[155] See generally Greg Shapland Supra at note 17 Bonaya A. Godana, Africa's shared water resources for a comprehensive treatment of treaties. The three principal colonial powers, Britain, Italy and later France played some part in concluding treaties on behalf of their former colonial territories or a strategy of sphere of influence. In 1891 Britain and Italy negotiated a protocol to demarcate their spheres of influence Art. 3 contain a provision relating to utilization of the Nile. In 1902 (Ethiopia and Britain acting for Egypt and Sudan) signed the Addis Ababa agreement. In 1929 another agreement was signed relating to the ownes falls dam between England acting for Uganda and Egypt. Most of Nile Riparian states after gaining their independence rejected these agreements. Ethiopia has also rejected the 1902 agreement as invalid for separate reasons. The only recent agreement that exits that concerns the Nile waters is the 1959 agreement between Egypt and Sudan which allocates the entire flow between the two countries. The greatest shortcoming of this particular treaty is that it was signed between two States Egypt and the Sudan only and excludes the interests of the Riparian States."

[156] "Framework for general co-operation" signed between the Arab Republic of Egypt and Ethiopia at Cairo July 1, 1993. See also encyclopedia of PIL. (Max –plank institute publication Vol. 1. P. 595 (1994)

[157] Ibid P. 595.

[158] Ibid P. 595.

[159] Ibid P. 595.

of the Nile waters and oblige themselves to consult and cooperate. Finally, the agreement provides that the two countries will "endeavor to work towards a framework for effective cooperation among countries of the Nile basin".[160]

3.3.2 Agreement on the Nile River Basin Cooperative Framework

This Agreement also addresses issues of environmental protection. Article 3, paragraph 2 of the agreement provides that sustainable development is one of the guiding principles for the use of the Nile. Furthermore, the agreement demonstrates the will to promote integrated basin management. Under Article 3, paragraph 13, Nile water is to be managed in an integrated and holistic manner that links social and economic development with the protection and conservation of natural ecosystems. This provision anchors the concept of integrated water resources management in the agreement. This is in line with recent treaty practice to increasingly include environmental aspects and corresponds to the most advanced regulations in this area.[161] Furthermore, Nile riparian states agree to undertake all appropriate measures for the protection and conservation of the Nile River Basin and its ecosystems, Article 3, paragraph 7. This principle is specified in Article 6, which consolidates the provisions of Articles 20 and 22 of the UNWC, but only to determine general protection goals:

1. Nile Basin States shall take all appropriate measures, individually and, where appropriate, jointly, to protect, conserve and, where necessary, rehabilitate the Nile River Basin and its eco-systems, in particular, by:

(a) Protecting and improving water quality within the Nile River Basin;

(b) Preventing the introduction of species, alien or new, into the Nile River System which may have effects detrimental to the eco-systems of the Nile River Basin;

(c) Protecting and conserving biological diversity within the Nile River Basin;

(d) Protecting and conserving wetlands within the Nile River Basin; and

(e) Restoring and rehabilitating the degraded natural resource base.

2. Nile Basin States shall, through the Nile River Basin Commission, take steps to harmonize their policies in relation to the provisions of this article.

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[160] Ibid P. 595.

[161] See for example at the Community level of the EU, Directive 2000/60/EG of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy (Water Framework Directive), OJ L 327, 22 December 2000, p. 1. See generally Wolfrum and Kirschner (2013), p. 12.

In view of the importance of the swamp areas of the Sudd for the total water balance of the Nile River, it is noteworthy that the parties agree in the context of environmental protection measures to protect and conserve the "wetlands within the Nile River Basin," Article 6, paragraph 1(d)..[162] This stands in contrast to the 1959 Nile Waters Agreement, which requires Sudan to drain large parts of the Sudd wetlands so as to increase the water volume of the Nile that reaches Aswan.[163]The CFA furthermore provides for environmental impact assessments and audits in Article 9, which are among the most important instruments for the implementation of environmental protection objectives. With these provisions, the CFA places an emphasis on environmental protection, unlike the previous Nile water treaties, which merely aimed to maximize water usage.[164]

Overall, however, the focus when drafting the agreement was more on the economic use of the Nile than on issues of environmental protection and water quality. The Agreement does not contain detailed rules on environmental protection. The Nile states did not decide to adopt the relevant and detailed provisions, namely Articles 20 to 26, of the UN Watercourses Convention. This corresponds to traditional state practice, which is primarily concerned with regulating the economic use of the resource in international watercourse agreements and regards environmental protection as a secondary issue.[165]However, it is not in line with the current developmental trend of IWL and modern treaty practice to increasingly include provisions on environmental protection.

Today, the question of how water resources can be preserved for sustainable long-term use is increasingly coming to the fore. Also, the environmental provisions of the UNWC were not controversial among the Nile riparian states during its negotiation. In view of the growing environmental problems throughout the Nile Basin,[166]including stronger environmental protection within the Agreement is both desirable and increasingly necessary.

[162] Burchi (2011), P. 220–221.

[163] Art. 3, para. 1, first sentence of the 1959 Nile Waters Agreement.

[164] Katz (2013), P. 1272.

[165] Wolfrum (1990), P. 321.

[166] The Nile is exposed to an increasing degradation of water quality due to pollution and other negative environmental effects, see ʻAlī Ṭāhā (2005), P. 121; Wiebe (2001), P. 736–742.

Chapter Four

States Responsibility under IEL

4.1 States Responsibility under IEL

A State's primary obligation is to pay compensation or make reparation for injuries suffered by nationals of other States.[167] In traditional international law, state responsibility constituted a classic way of dealing with violations of CIL.[168] Even though an act of a State may not be wrongful by virtue of consent,[169] force majeure or fortuitous event,[170]distress,[171] or necessity,[172] the absence of a wrongful act does not prejudge the question of compensation for damage caused by that act.[173] Currently the State may engage its international liability and compensate for damage caused by its act, regardless of the existence of a wrongful act.[174] In more ways than one, a state's international liability constitutes proof of injurious consequences independent of a wrongful act attributable to that state.[175] Reparation in international law is a consequence of breach of a primary obligation. International lawyers also depend on the scope of international protection of the environment and how that affects reparation.[176] Thus, to take the most obvious example, only if the obligation to protect other states from transboundary harm extends to harm to their environment will there be a duty to make reparation for environmental damage, however it might be defined and valued.[177] Only if there is also an obligation to protect the environment of the global commons can there be a corresponding duty to make reparation for any damage to the

[167] "IL" is defined as "those laws governing the legal relations between nations." Black's Law Dictionary 816 (6th ed. 1990).

[168] Ibid.

[169] Draft Articles on State Responsibility, art. 29, in Thirty-Second ILC Session Report, supra note 1, at 30, 33.

[170] Ibid. art. 31.

[171] Ibid. art. 32.

[172] Ibid. art. 33.

[173] Ibid. art. 35.

[174] Ibid. art. 35.

[175] Birnie and Boyle (2002), International Law and the Environment (2nd edn., Oxford.), ch. 3;.ILC, 2001 Draft Convention on Prevention of Trans boundary Harm, Rept. of the ILC. (2001) GAOR A/56/10 and for commentary see UN, Rept. of the ILC (1998) GAOR A/53/10; Special Rapporteur Rao's 1st Report (1998) UN Doc.A/CN.4/487/Add.1; 2nd Report (1999) UN Doc.A/CN.4/501; 3rd Report (2000) UN Doc.A/CN.4/510; ILC. Report of the Working Group on International Liability for Injurious Consequences Arising Out of Acts Not Prohibited by IL, in Rept. of the ILC (1996) GAOR A/5/10. Annex 1. See also Advisory Opinion on the Legality of the Threat or Use of Nuclear Weapons (1996) ICJ Reports 226, para. 29, n. 12 below.

[176] Ibid.

[177] Ibid.

environment of the commons.[178] Fortunately, although state practice and judicial precedent with regard to claims for environmental damage have been sparse, the development of IEL, including the ILC's work on transboundary harm and decisions of the international court, does suggest that there is a duty of environmental protection.[179]Most interpretations refer to an obligation to prevent transboundary harm or damage and usually assume that this must reach some threshold level of seriousness before it becomes wrongful.[180] While there is no doubt that injury to persons or property falls within the scope of this principle.[181] The difficult question is the extent to which protection of the environment or the prevention of environmental harm.[182] Both the Trail Smelter and the early civil liability conventions took a narrow view, compensating for injury to persons or property but appearing by implication to exclude wider environmental interests such as wildlife, aesthetic considerations, or the unity and diversity of ecosystems.[183] Modern civil liability conventions and protocols now recognize environmental damage as a distinct interest covered by international tort law.[184] UNSC Resolution 687, which explicitly imposes

[178] Ibid.
[179] Ibid.

[180] ILC, Working Group Report (1996), n. 6 above, 356–7, para. 23; the Trail Smelter Arbitration, (1939) 33 AJIL. 182 and (1941) 35 AJIL 684.See Read, 'The Trail Smelter Dispute' (1993) 1 CYblL 213; Rubin, 'Pollution by Analogy; The Trail Smelter Arbitration' (1971) 50 Oregon LR 259; Kirgis, 'Technological Challenge to the Shared Environment: US Practice' (1972) 66 AJlL 29010.2307/2199031; Smith (1988), State Responsibility for Pollution of the Marine Environment (Oxford.) 72 et seq.; Quentin-Baxter (1981) II YblLC, Pt 1, 108 et seq.

[181] Ibid.

[182] Rubin, n. 7 above, at 272–4. On this issue the tribunal was required to follow US law. US tort law is sometimes more generous in allowing tor ecological loss: see Commonwealth of Puerto Rico v. SS Aoe Zoe Colocotroni, 456 F.Supp. 1327 (1978); Halter and Thomas (1982), 'Recovery of Damages by States for Fish and Wildlife Losses Caused by Pollution' 10 ELQ, 5 and see below, Ch. 11. See also the definitions of pollution damage in the 1969 Convention on Civil Liability for Oil Pollution Damage, Art. 2 and the 1963 Vienna Convention on Civil Liability for Nuclear Damage, Art. 1(1)(k).

[183] Ibid.

[184] 1992 Convention on Civil Liability for Oil Pollution Damage; 1993 ECE Convention on Civil Liability for Damage Resulting from Activities Dangerous to the Environment; 1996 Convention on Civil Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea; 1997 Protocol to amend the Vienna Convention on Civil Liability for Nuclear Damage; 1999 Protocol on Liability and Compensation for Damage Resulting from the Trans boundary Movements of Hazardous Wastes and Their

international liability on Iraq for environmental damage in Kuwait, is another important, if so far unique, precedent which points in the same direction.[185] Moreover, when viewed from the perspective of international regulatory conventions, rather than liability for environmental damage, it can be seen that the older approach is outdated and inappropriate.[186] In contrast, Principle 21 of the Stockholm Declaration and Principle 2 of the Rio Declaration refer explicitly to responsibility for controlling 'damage to the environment' of other states or of areas beyond national jurisdiction,[187] as does the ICJ in its *Advisory Opinion on the Threat or Use of Nuclear Weapons*.[188] In this case the International Court took the opportunity to affirm for the first time that 'the existence of the general obligation of states to ensure that activities within their jurisdiction and control respect the environment of other states or of areas beyond national control is now part of the corpus of international law relating to the environment.'[189] It held that states have an obligation to protect the natural environment against widespread, long-term, and severe environmental damage in times of armed conflict and to refrain from methods of warfare or reprisals intended to cause such damage.[190] Similar phraseology is used in Articles 145 and 194 of the 1982 United Nations Convention on the Law of the Sea (UNCLOS), under which the obligation to protect the marine environment is articulated in broad terms. It includes measures to protect and preserve the 'ecological balance,' marine flora and fauna, and 'rare and fragile ecosystems as well as the habitat of depleted, threatened, or endangered species and other forms of marine life'.[191] Both the Ozone Convention and the Climate Change Convention likewise apply inter alia to controlling adverse effects on the composition, resilience, or productivity of

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Disposal. See generally Sandvik and Suikkari (1997), 'Harm and Reparation in International treaty Regimes: An Overview' in Wetterstein (ed.). Harm to the Environment (Oxford, 1997), 57, and below, Ch. 9.

[185] Decision 7 UN Compensation Commission Governing Council, para. 35 (1992) 31 ILM 1045; on which see infra, Ch. 7, and UNEP. Report of the Working Group of Experts on Liability and Compensation for Environmental Damage arising from Military Activities, 1996. In the Gabčíkovo-Nagymaros Case (1997) ICJ Reports paras. 49–58, the ICJ accepted that prospective environmental damage could in an appropriate case justify a plea of necessity.

[186] Birnie and Boyle (2002), IL and the Environment (2nd edn.Oxford.), Ch.3; Sands,(1995) Principles of IEL (Manchester,)190–196.

[187] Ibid P.190-196.

[188] Ibid P.190-196.

[189] ICJ Reports 226, (1996), para. 29.

[190] UNCLOS (1982), Arts. 145 and 194(5).

[191] Ibid.

natural and managed ecosystems'.[192] Studies conducted for UNEP and the ILC both concluded that the environment covers at least air, water, soil, flora, fauna, ecosystems, and their interaction, and noted that some agreements also include cultural heritage, landscape, and amenity values.[193] The most radical view, supported by a number of treaties, including the 1997 Convention on International Watercourses [1] and those referred to above, points to the need to move beyond a focus on the territory of other states in favor of an ecosystem approach, emphasizing consideration of whole systems rather than individual components.

The most radical view, supported by a number of treaties, including the 1997 Convention on International Watercourses [1] and those referred to above, points to the need to move beyond a focus on the territory of other states in favor of an ecosystem approach, emphasizing consideration of whole systems rather than individual components.[194] The Antarctic Environment Protocol is to date the largest, most comprehensive, and significant example in which an entire continent and the surrounding marine environment have been protected on such an ecosystem basis.[195] However, whether put in holistic terms, or merely in terms of its component elements, there is now substantial consensus behind the proposition that international law seeks to protect both the environment of other states and of international common spaces from harm.

4.2 Eco-compensation Under Conventional Rules of States Responsibility

Though the broad principle of State responsibility for transboundary harm, including environmental harm, has been firmly established under CIL for some 80 years now, since the

[192] 1985 Convention on the Ozone Layer. Art. 1(2); 1992 Framework Convention on Climate Change, Art. 1(1).

[193] UNEP, Report of the Working Group of Experts on Liability and Compensation for Environmental Damage Arising from Military Activities, 1996; ILC, 11th Report on International Lability for Injurious Consequences, UN Doc. A/CN.4/468 (1995). Cultural heritage and landscape are included in the 1992 ECE Convention on the transboundary Effects of Industrial Accidents and the 1993 ECE Convention on Civil Liability for Damage Resulting from Accidents Dangerous to the Environment.

[194] Brunée and Toope (1994), 'Environmental Security and Freshwater Resources: A Case for International Eco-systcm Law' 5 YblLL 41 at 55.

[195] Redgwell(1999), 'Protection of Ecosystems under IL: Lessons from Antarctica' in Boyle and Freestone (eds.), IEL and Sustainable Development (Oxford,), ch. 9; Boyle in Vidas (ed.) (2000), Protecting the Polar Marine Environment: Law and Policy fot Pollution Prevention (Cambridge,), ch. 110.1017/CBO9780511494635

celebrated decision in the *Trail Smelter Arbitration*,[196] some normative uncertainty has persisted as scholars have debated its key principles[197] and the various forms of State responsibility arising in different circumstances.[198] This uncertainty prompted the ILC to dedicate decades of research and deliberation to the topic,[199] resulting in the adoption of multiple codifications of the relevant rules,[200] each addressing different aspects of the closely interconnected preventive and curative approaches to environmental harm.[201] However, it is apparent that the 2001 Draft Articles on State Responsibility, widely regarded as the most authoritative statement on the position in CIL, adopt an essentially neutral position as regards the form of State responsibility arising in any particular situation.[202] Where Article 2

[196] Trail Smelter Arbitration (United States v Canada) (1941) 3 RIAA 1905. See further RM Bratspies and RAMiller (eds), Transboundary Harm in IL: Lessons from the Trail Smelter Arbitration (Cambridge University Press 2006). See also, Corfu Channel (United Kingdom v Albania) (Judgment) [1949] ICJ Rep 22, 4and 22; Declaration of the UN Conference on the Human Environment in 'Report of the UN Conference on the Human Environment' UN Doc A/CONF.48/14/Rev.1 (1973) (Stockholm Declaration) Principle 21; Rio Declaration on Environment and Development in 'Report of the UN Conference on Environment and Development' UN Doc A/CONF.151/26 (vol I) (12 August 1992) Annex (Rio Declaration), Principle 2; Legality of the Threat or Use of Nuclear Weapons (Advisory Opinion) [1996] ICJ Rep226 para 29; Gabčíkovo-Nagymaros Project (Hungary v Slovakia) Judgment) [1997] ICJ Rep 7 para 140; Pulp Mills on the River Uruguay (Argentina v Uruguay) (Judgment) [2010] ICJ Rep 14 (Pulp Mills) para 101.

29 J.Crawford and S.Olleson (2005),'The Continuing Debate on a UN Convention on State Responsibility' 54 International and Comparative Law Quarterly 959, 968. See further, J Crawford and S Olleson(2018), 'The Nature and Forms of International Responsibility' in MD Evans (ed), IL (5th edn, Oxford University Press) 415.

[197] RP. Barnidge (2006), 'The Due Diligence Principle under IL' 8 International Community Law Review 81, at 82–85.

[198] R.Pisillo Mazzeschi (1991), 'Forms of International Responsibility for Environmental Harm' in F Francioni and TScovazzi (eds),International Responsibility for Environmental Harm (Graham & Trotman) 15.

[199] Crawford (n 1) 2, notes that 'work on State responsibility began in the ILC in 1956'.

[200] In addition to the Draft Articles on State Responsibility (n 3), the ILC has adopted the 2001 Draft Articles on the Prevention of Harm (in ILC 'Yearbook of the ILC 2001, Volume II' UN DocA/CN.4/SER.A/2001/Add.1 (Part 2)); and the 2006 Principles on the Allocation of Loss in the Case of Transboundary Harm Arising Out of Hazardous Activities (in ILC 'Yearbook of the ILC 2006, Volume II' UN Doc A/CN.4/SER.A/2001/Add.1 (Part 2).

[201] LA Duvic-Paoli(2018),The Prevention Principle in IEL (Cambridge University Press) 331–332

[202] J.Crawford(2007), the ILCs Articles on State Responsibility: Introduction, Text and Commentaries (Cambridge University Press) 13.

defines an 'internationally wrongful act of the State' as 'conduct consisting on an act or omission that

(a) is attributable to the State under international law; and

(b) Constitutes a breach of an international obligation of the State',

The latter element refers to breach of a primary rule of international water law. As Crawford explains, if the primary rules require fault (of a particular character) or damage (of a particular kind) then they do; if not, they do not**.**[203] Thus, the form of responsibility arising depends on the primary rules breached. The relevant primary rules of IWL would include those customary or treaty rules laying down substantive obligations for States, while the secondary rules of state responsibility comprise rules establishing

(i) On what conditions a breach of a "primary rule" may be held to have occurred, and

(ii) The legal consequences of this breach'.[204]

Suggesting the practical significance of the role of State responsibility, leading commentators explain that such 'secondary rules' can also be understood as the framework for the application of these primary obligations, whatever they may be.[205] It is clearly understood in IWL practice that the applicable regime of State responsibility arises in respect of breach of the various due diligence obligations owed by a watercourse State, where due diligence may be considered as an objective and international standard of behavior,[206] yet a standard that can only be identified having due regard to the particular circumstances of each case. Barnidge confirms that 'the nature of the due diligence obligation is a matter to be resolved by the underlying primary rules,

[203] J. Crawford,(1999) 'Revising the Draft Articles on State Responsibility' 10 European Journal of International Law 435, 438.

[204] A.Cassese,(2005), IL (2nd edn, Oxford University Press) 244

[205] J.Crawford and S Olleson (2005), 'The Continuing Debate on a UN Convention on State Responsibility' International and Comparative Law Quarterly 959, 968. See further, J Crawford and Solleson (2018), 'The Nature and Forms of International Responsibility' in MD Evans (ed), International Law (5th edn, Oxford University Press) 415.

[206] R Pisillo Mazzeschi (1992), 'The Due Diligence Rule and the Nature of the International Responsibility of States' 35 German Yearbook of International Law 9(n 22) 16.

not the secondary rules of state responsibility', and might have had in mind the normative flexibility of the primary rules of IWL when explaining the position as follows. Assuming that the primary rules at issue impose a due diligence standard of conduct on the state, then the nature of the rights and interests at issue, as well as a number of other factors, will determine whether the conduct breaches the state's international obligation.[207] This reflects, for example, the inherent flexibility of the duty of prevention, or 'no-harm' rule, as applied in IWL and codified in Article 7 of the 1997 UNWC[208] and Article 2(1) of the 1992 UN Economic Commission for Europe (UNECE) Water Convention.[209] This fundamental rule appears to be subordinated to, or at least informed in its application by, the highly indeterminate cardinal principle of equitable and reasonable utilization,[210] which requires watercourse States to take account of the water-related interests of co-riparian States, having regard to a range of factors considered relevant in identifying and quantifying such interests. The commentary to the 2001 Draft Articles on State Responsibility supports the view that the normative implications of the primary rules giving rise to responsibility may be highly contextually relative, explaining that 'such standards vary from one context to another for reasons which essentially relate to the object and purpose of the treaty provision or other rule giving rise to the primary obligation'.[211] Some guidance regarding the normative content of primary rules can, however, be gleaned from the secondary rules on State responsibility. For example, it is quite clear from the Draft Articles on State Responsibility that responsibility can arise on the basis of a State's failure to act, as well as from affirmative State action. Draft Article 2 includes within the definition of an 'internationally wrongful act' of a State 'conduct consisting of an action or omission', and the ILC Commentary notes that 'cases in

[207] Barnidge (n 21) 87.

[208] Convention on the Law of the Non-navigational Uses of International Watercourses (adopted 21 May 1997, entered into force 17 August 2014) 36 ILM 700 (UNWC).

[209] Convention on the Protection and Use of TBRs and Lakes (adopted 17 March 1992, entered into force 6 October 1996) 1936 UNTS 269 (UNECE Water Convention).

[210] On the interrelationship between both rules, see, for example, A Nollkaemper (1996), 'The Contribution of the ILC to the IWL: Does It Reverse the Flight from Substance?' 27 Netherlands Yearbook of International Law 39, 54; S McCaffrey(200), The Law of Non-Navigational Watercourses: Non-Navigational Uses (Oxford University Press) 325; O McIntyre (2007), Environmental Protection of International Watercourses under International Law (Ashgate) 104–116.

[211] Draft Articles on State Responsibility (n 3) 34.

which the international responsibility of a State has been invoked on the basis of an omission are at least as numerous as those based on positive acts, and no difference in principle exists between the two'.[212] Therefore, where primary rules require a due diligence standard of State conduct, the general principles of State responsibility appear to contemplate, in addition to affirmative acts of State organs or officials, omissions relating to the acts of private legal persons. In the specific context of IEL or IWL resources law, such omissions would often involve the unreasonable failure of a watercourse State to regulate or prevent pollution of an international watercourse or aquifer by a non-State actor, or degradation of a related eco-system due to such an actor's over-abstraction of the shared international water resources. Despite such direction, however, States have generally remained reluctant to rely upon the mechanism of State responsibility to resolve transboundary water disputes and ensure compliance with the requirements of IWL. In recent decades, they have resorted to a range of alternative means of dispute resolution, though not always with great success.[213] For example, riparian States have voluntarily negotiated various *ad hoc* river restoration arrangements,[214] have established international civil liability regimes for water-related environmental damage,[215] or have resorted to compliance mechanisms established under international water agreements[216] or multilateral environmental agreements.[217]It seems

[212] Ibid P.35.

[213] McIntyre (n 10) P.358–367.

[214] Protocol Additional to the Convention for the Protection of the Rhine from Pollution by Chlorides (adopted25 September 1991, entered into force 1 November 1994) 1840 UNTS 423.See JG Lammers, 'The Rhine:Legal Aspects of the Management of a Transboundary River' in WD Verwey (ed), Nature Management and Sustainable Development (IOS Press 1989) 440, 444.

[215] Protocol on Civil Liability and Compensation for Damage caused by the Transboundary Effects of Industrial Accidents on Trans boundary Waters (adopted 21 May 2003, not yet in force)<https://www.unece.org/fileadmin/DAM/env/civil-liability/documents/protocol_e.pdf>.See P Daskalopoulou-Livada, 'The Protocol on Civil Liability and Compensation for Damage Caused by the Transboundary Effects of Industrial Accidents on Transboundary Waters' (2003) 4 Environmental Liability 131.

[216]UNECEWaterConventionImplementationCommittee<https://www.unece.org/env/water/implementation_committee.html>.

[217]BaselConventionImplementationandComplianceCommittee<http://www.basel.int/TheConvention/ImplementationComplianceCommittee/Overview/tabid/2868/Default.aspx>.See A Shibata, 'The Basel Compliance Mechanism' (2003) 12 Review of European Community and IEL 183.

likely that such reluctance is at least partly due to the contextual relevance and resulting normative uncertainty of due diligence standards imposed under IWL.[218]

4.3 Ecological Era of Environmental Compensation and State Responsibility

In recent years, ecosystems protection obligations have risen to considerable prominence within the overall edifice of IEL and IWL,[219] so much so that the so-called 'eco-system approach' has emerged to provide a management framework for holistic, adaptive and integrative stewardship of the entire complex of ecological and socio-ecological elements and relationships required to maintain the integrity of water course-related eco-systems, and thus to preserve the services provided thereby.[220] In his excellent study of the origins and evolution of the 'eco-system approach', De Lucia examines its many articulations employed across a range of environmental sectors and notes, having particular regard to the eco-systems protection obligations contained in Article 20 of the UNWC, that within the context of freshwater law, the 'eco-system approach' is rather more centrally linked to the substantive elaboration of primary obligations of protection and preservation of watercourse eco-systems, in this respect significantly expanding the obligations of States vis-à-vis the traditional transboundary harm rule.[221]Similarly, in respect of the other key substantive obligation of IWL, a 2008 report published by the secretariat of the CBD notes the close linkages between an 'equitable and sustainable allocation and management of' water resources and the maintenance of the 'ecological function of freshwater eco-systems'.[222] It is clear, therefore, that the continuing detailed elaboration of ecosystems obligations offers, in situations involving environmental damage, a measure of the normative clarity required basing a finding of State responsibility on breach of the primary rules of IWL.[223] Along with the conservation of biodiversity itself, the Convention has two other main objectives its sustainable use, and the sharing of benefits from

[218] Ibid P.183.

[219] For a recent detailed account of the emergence and development of ecosystems obligations in IWL, see O McIntyre, 'Protection and Preservation of Freshwater Ecosystems (Articles 20-23)' in Boissonde Chazournes et al (n 9) 193.

[220] Ibid.

[221] V De Lucia (2019), The 'Ecosystem Approach' in IEL: Genealogy and Biopolitics (Routledge) P. 68.

[222] S Brels, D Coates and F Loures (2008), Transboundary Water Resources Management: The Role of International Watercourse Agreements in Implementation of the CBD (CBD Secretariat) 5. See De Lucia (n 109) 62.

[223] ILA First Report (n 102) 29, citing the ITLOS Advisory Opinion (n 100) para 117.

the use of genetic resources.[224] The ILA Study Group on Due Diligence points out that 'the content of the obligation of due diligence may also change in line with scientific and technological advances', [225] which brings to mind the growing emphasis evident in the practice of IWL on the preservation of international watercourse eco-systems,[226] along with the emergence of sophisticated new methodologies informing the normative implications of such obligations.[227] Notable among such advances, improved understanding of the technical parameters for assessing minimum environmental flows in a shared watercourse[228] has permitted judicial recognition of a corresponding legal obligation to maintain a minimum environmental flow regime.[229] Similarly, the rapidly evolving and increasingly important ESS concept,[230] and related assessment methodologies,[231] which focus on natural services furnished by functioning riverine eco-systems 'on which the well-being of people and their livelihoods depend',[232] provide nascent means for the economic and social valuation of natural ecosystems.[233] This

[224] Ibid.
[225] Ibid.

[226]V De Lucia (2018), 'A Critical Interrogation of the Relation between the Ecosystem Approach and ESS' 27 Review of European, Comparative and IEL 104.

[227] McIntyre (n 13); McIntyre (n 107).

[228] M Pchalek and I Grzegrzólka (2017), 'Legal Aspects of the Application of the Method of Estimating Environmental Flows in the Protection of Riparian Ecosystems Dependent on Waters' Environmental Liability 208; N LeRoy Poff, RE Tharma and AH Arthington(2017), 'Evolution of Environmental Flows Assessment Science, Principles and Methodologies' in AC Horne et al (eds), Water for the Environment: From Policy and Science to Implementation and Management (Academic Press) 203; A Beaton and A Bradford (2013), 'Demonstration of a Methodology for setting Ecological Flow and Water Level Targets' Canadian Water Resources Journal 296; M Dyson, G Bergkamp and J Scanlon, Flow(2003),The Essentials of Environmental Flows (IUCN); J Scanlon and A Iza (2003),'International Legal Foundations for Environmental Flows', 14 Yearbook of IEL 81.

[229] Kishenganga Arbitration (n 105).

[230] Millennium Ecosystem Assessment, Ecosystems and Human Well-being: Synthesis (Island Press 2005).

[231] M Drechsler (2020), Ecological-Economic Modeling for Biodiversity Conservation (Cambridge University Press); D Russi et,al (2013),The Economics of Ecosystems and Biodiversity (TEEB) for Water and Wetlands (Institute for European Environmental Policy and Ramsar Convention Secretariat).

[232] Ramsar COP (2005), 'Resolution IX.3, Engagement of the Ramsar Convention on Wetlands in Ongoing Multilateral Processes Dealing with Water' 1, para 3.

[233]A Rieu-Clarke and C Spray (2013), 'Ecosystem Services and IWL: Towards a More Effective Determination and Implementation of Equity' 16 Potchefstroom Electronic Law Journal 12.

main issue of this paper focus on ESS concept specifically of the upper riparian states have right to claim environmental damage from lower riparian states. For example, the World Resources Institute has produced an influential report on methodologies for consideration of ESS in the context of impact assessment processes,[234] while the Ramsar Convention Secretariat and the Institute for European Environmental Policy have described structured means by which policy makers can take account of the economic value of aquatic eco-systems.[235] In his study of the eco-system approach, De Lucia observes that 'more recently, the articulation of the "eco-system approach" in freshwater law has become more technical and methodological, thanks to the increasing linkage with the framework of ESS'.[236] Such methodologies have the potential to provide watercourse States with common understanding of the implications in terms of costs and benefits for each State of measures for the utilization and protection of shared watercourse eco-systems, there by aiding effective inter-State cooperation.[237] At the same time, they can serve to clarify the precise normative implications of the primary rules of IWL, at least as regards the prevention of ecological harm and the equitable sharing of benefits derived from watercourse-related eco-systems.[238] By so doing, these methodologies can facilitate a finding of breach of such primary rules, and corresponding evaluation of marketable and non-marketable benefits of international watercourses, within any determination of State responsibility for transboundary harm.[239] Commentators have long noted the scope for determining analogous liability under national tort law systems for deprivation of ESS, at least where the result is to cause significant economic damage to others.[240] Thus, technical methodologies for identifying and quantifying watercourse eco-system-related benefits facilitate effective inclusion of ecological damage within the rubric of transboundary harm, as has long been intended in IWL.[241] Quite apart from the problem of uncertain due diligence standards, the emergence of detailed methodological guidance supporting each element of the eco-system approach can assist a court in identifying

[234] F.Landsberg et, al, (2011), 'Ecosystem Services Review for Impact Assessment: Introduction and Guide to Scoping' (World Resources Institute 2011).

[235] Russi et al (n 119).

[236] De Lucia (n 109) 68.

[237] JB Ruhl (2005), 'Toward a Common Law of Ecosystem Services' 18 St. Thomas Law Review 1, 1.

[238] Ibid.

[239] Ibid.

[240] Ibid.

[241] Pulp Mills (n 20) Joint Dissenting Opinion of Judges Al-Khasawneh and Simma, para 3 (110).

and evaluating the highly complex evidence involved in assessing transboundary water-related harm.[242] The scientific and technical complexity of the evidence presented to the Court was a highly controversial issue in the *Pulp Mills case*, prompting two of the ICJ judges to argue in a joint dissenting opinion that the adjudication of disputes in which the assessment of scientific questions by experts is indispensable, as is the case here, requires an interweaving of legal process with knowledge and expertise that can only be drawn from experts properly trained to evaluate the increasingly complex nature of the facts put before the Court.[243] It stands to reason that greater clarity regarding the most widely accepted means of assessing minimum environmental flows or regarding the nature and significance of particular ESS could only assist tribunals in conducting a state of the art review of the complex evidence involved.[244] Such developments are already informing the reasoning of international courts and tribunals. Increased scientific and technical understanding of eco-systems functioning, and of the utility and value of the services provided there by, can thus inform the normative nature and implications of the primary rules of international water law, making their breach more likely to provide a sound basis for State responsibility.[245] Of even greater significance for the purposes of State responsibility in this field, the ICJ has recently given emphatic endorsement to the concept of watercourse eco-systems, whilst also recognizing the beneficial value to States of watercourse-related.[246] The Court determined for the first time that 'damage to the environment, and the consequent impairment or loss of the ability of the environment to provide goods and services, is compensable under international law'.[247] It then proceeded to assign a monetary value in compensation for the impairment of four specific classes of ecosystem services, as established on the facts of the case.[248] More generally, the Court had identified a total of 22 classes of watercourse-related ESS during the course of the dispute.[249]

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[242] Ibid.
[243] Ibid.
[244] Ibid.
[245] Ibid.
[246] Ibid.
[247] Certain Activities Carried Out by Nicaragua in the Border Area (Costa Rica v Nicaragua) Compensation Owed by the Republic of Nicaragua to the Republic of Costa Rica (2018), (2 February) <https://www.icj-cij.org/files/case-related/150/150-20180202-JUD-01-00-EN.pdf> para 42 (emphasis added).
[248] Ibid P.75–87.
[249] Ibid.

4.4 States Practice of Eco-compensation

4.4.1 Lancang-Mekong River

An important transboundary river in Asia is the Lancang-Mekong River. It starts in the Qinghai-Tibet Plateau of China and passes through Vietnam, Myanmar, Laos, Thailand, and Cambodia.[1] The basin measures 8.10 × 105 km², with the following proportions for China, Myanmar, Laos, Thailand, Cambodia, and Vietnam: 20.59%, 2.59%, 26.51%, 22.44%, 19.85%, and 8.02%. [250] In addition to having a wealth of water and electricity resources, the region receives enough rainfall during the rainy season.[1] China, Myanmar, Laos, Thailand, Cambodia, and Vietnam have average annual precipitation rates of 1.517 m/a, 1.747 m/a, 1.649 m/a, 1.733 m/a, 1.379 m/a, and 1.828 m/a, respectively.[251]

Thailand, Cambodia, Vietnam, China, Laos, and Myanmar had the highest CESV of BCs in the LMRB, ranked lowest. Vietnam and Thailand are two nations that use ecological services in excess, putting the basin's water resources' natural environment in jeopardy and making them unstable. Ecological services are provided by China, Laos, Myanmar, and Cambodia.[1] In comparison to the other three nations, which have good water resources and hence extremely safe water resources, Cambodia uses more water resources in the basin than do Laos, China, and Myanmar all together.[252] This suggests that the situation of water resources in the basin is slightly risky.[253]

The lower half of the basin is occupied by Vietnam and Thailand, who must contribute more financially to ecological compensation and conservation programs.[254] The other two nations must pay US $46.913 billion and US $1.699 billion, respectively, based on their actual willingness to pay; Thailand is required to pay the largest amount of actual compensation. TBRB's ecological

[250] Ibid.

[251] Ibid.

[252] Ibid.

[253] Ibid.

[254] Ibid.

compensation involves a number of interests, which makes the actual working process more difficult.[255]

4.4.2 Elbe River Basin

The horizontal fiscal transfer is the most important component of Germany's ecological compensation in watersheds, which has been implemented throughout Europe since its founding.[256] The most well-known case in point is the environmental management of the Elbe River. The Elbe River is one of the largest river basins in Europe that crosses national boundaries. It has major ecological and economic advantages as well. The river basin spans 148,000 km², of which 65.54% is in Germany, 33.68% is in the Czech Republic, and the remaining tiny areas are in Poland (0.16%) and Austria (0.62%).[257] Given that the majority of the Elbe Rivers originate in Germany, the aquatic ecology of the Elbe is considered to be of utmost importance to the country. However, because the governments of Germany and the Czech Republic, the two main rivers that flow through the Elbe, failed to regulate the river, the ecological degradation of the river escalated in the 1980s. Together, Germany and the Czech Republic founded a cooperative upstream and downstream organization in the 1990s with the goal of preserving the ecosystem's integrity and the river basin's environmental management. The Czech economy was lagging behind Germany's, and funding for watershed management was nonexistent.[258]

The two governments engaged in several rounds of discussions as a result of these causes, and an agreement was eventually struck in the late 1800s. When the International Committee for the Protection of the Elbe River in Magdeburg signed the Convention of the International Committee for the Protection of the Elbe Agreement on October 8, 1900, Elbe co-regulation got underway.

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[255] Ibid.

[256] International Commission for the Protection of the Elbe River (ICPER), (2016), the Elbe River and Its Basin. International Commission for the Protection of the ElbeRiver.https://www.ikse-mkol.org/fileadmin/media/userupload/E/06Publikationen/08IKSE_Flyer/2016_ICPERFlyer_The_Elbe_River_Basin.pdf

[257] Ibid.

[258]Zhu, G. (2010), the Connotation of Ecological Compensation and the Establishment of Compensation Mechanism in the Water Source Area of South-North Water Diversion Central Line. Forestry Economics, 9, 89–93. https://doi.org/10.13843/j.cnki.lyjj.2010.09.002.

Based on the agreement, the parties established their objectives, rights, and responsibilities, among other things. The basis for all of the content is enhancing the ecological value of the Elbe riparian zone. The Czech government received direct assistance of DM 9 million from the German government to support the building of sewage treatment facilities in the nation.[259]

In the Elbe River basin, this payment represents the best illustration of horizontal cash transfers for ecological compensation. Thanks to German support, the Czech government has been increasingly involved in protecting the Elbe River basin's natural integrity.[260] Although Germany has employed a variety of funding-raising strategies, horizontal financial transfer is still a crucial step in the transfer procedure. Thus, having readily available funds and using fair accounting procedures are crucial to ecological compensation along the Elbe River in Germany and the Czech Republic.[261] The availability of funds is mostly the result of horizontal financial transfers and other market-based instruments that guarantee the adequacy of ecological compensation funds in the Elbe River. Germany and the Czech Republic negotiated and came to an agreement about accounting fairness. To guarantee that the interests of both parties are satisfied, strict procedures are then followed, including criteria and computation methods. In order to improve water quality and encourage sustainable development, Germany and the Czech Republic agreed to execute horizontal financial transfers for cross-watershed ecological compensation in the Elbe River. Ultimately, they are also successful in counteracting the growing economic divides throughout regions. This is an example of successful transnational river basin cooperation governance, as opposed to the more difficult-to-compare trans-provincial river basin governance.[262]

[259] Ibid.
[260] Ibid.
[261] Zhu, D. (2016), "Holistic Governance": Implementation Experience and Insights of Foreign Ecological Compensation Policies. Ecological Economics, 32(11), 175–178.https://doi.org/CNKI:SUN:STJJ.0.2016-11-036.
[262] Yang, Y. (2023), Cross-watershed horizontal ecological compensation system: Comparative examples from ChinaandGermany(TPGCapstoneProject,LingnanUniversity,HongKong).Retrievedfromhttps://commons.ln.edu.hk/soc605_stdwork/18 , 11-12.

4.4.3 Xin'an River Basin

China's first pilot project for an interprovincial trans-basin horizontal ecological compensation scheme is located in the Xin'an River Basin. China's first interprovincial watershed ecological compensating approach pilot project was chosen in 2007 for the Xin'an River.[263] The ecological compensation underwent gestation from 2004 to 2009. Anhui Province will get 300 million Yuan in free ecological reparations from the central government.[264]The compensation funds are made up of Zhejiang, Anhui, and central financial funds.[265]The provinces of Zhejiang and Anhui each contribute 100 million Yuan. Beginning in January, Huangshan City and Chun'an County collaborated to monitor the cross-provincial cross-section.[266] The four components that comprise the assessment index are total nitrogen, ammonia nitrogen, permanganate index, and total phosphorus. In the Xin'an River Basin, ecological compensation is the term used to describe a monetary transaction involving both the federal and local governments.[267] Ecological rehabilitation, sewage treatment, and environmental preservation are the three main goals of the compensation payments. The benefit of this specific funding compensation is immediately apparent.[268]

4.5 Ethiopian Cost of Environmental conservation vs. Benefit of lower riparian states from Blue Nile River

The costs and advantages of soil and water conservation methods, including soil bund, stone bund, and fanya juu in Ethiopia's highlands, are the main emphasis of this review.[269]The data was collected on a face to face interview with 500 households who reported to have implemented

[263] Yu, Hang, Chen Chen, and ChaoFeng Shao (2023),"Spatial and temporal changes in ecosystem service driven by ecological compensation in the Xin'an River Basin, China. “Ecological Indicators 146): 109798.

[264] Ibid.

[265] Ibid.

[266] Ibid.

[267] Ibid.

[268]Ibid.

[269] Abonesh Tesfaye , Roy Brouwer1 , Pieter Van Der Zaag , Workneh Nigatu , Belay Simane, Melesse Temesgen, ,and Eshraga Sokrab,(2016),Cost benefit analysis of soil conservation measures: the case of Blue Nile basinhttp://www.dmu.edu.et/wp-content/uploads/2016/12/Cost-benefit-analysis-of-conservation-measures.pdf.

soil conservation measures mainly soil bund, stone bund and fanya juu[270]on their plots of land in the past five years (2004-2008).[271] Using a random sampling technique, the survey was carried out in July 2009 in the three woredas of the Gedeb watershed: Gozamn, Machakel, and Senan. Labor, equipment, and lost crop yield are among the factors used to estimate the onsite costs of soil conservation.[272] The current labor market price in each area was used to estimate the cost of labor for the three soil and water conservation techniques.[273] The area's slope determines the amount of crop output lost; the steeper the slope, the smaller the bund spacing and the larger the percentage of land occupied by the measures.[274] The three localities are situated at varying slope gradients; on average, Gozamn and Machakel are between 8 and 15 percent slope gradient, whereas Senan is between 15 and 50 percent.[275] Crop loss is computed using the premise that, on a per hectare basis, bunds occupy 15% of the land in Senan and 8% of the land in Machakel and Gozamn.[276] According to farmers, the cost of equipment is the sum of money spent on a shovel, which is required for the installation and upkeep of soil conservation measures.[277] Given that shovels are also used for other farm tasks, only 50% of the cost is included in the calculations as an equipment cos.[278] Fertilizer, seed, and land tax are among the production expenses, both with and without soil and water conservation.[279]

For the Gedeb watershed in the upper Blue Nile basin, the average cost of soil conservation measures per hectare was determined in the previous section. The total cost of the three measures

[270] these are widely used conservation measures in the area

[271] Abonesh Tesfaye , Roy Brouwer1 , Pieter Van Der Zaag , Workneh Nigatu , Belay Simane, Melesse Temesgen, ,and Eshraga Sokrab(2016),Cost benefit analysis of soil conservation measures: the case of Blue Nile basinhttp://www.dmu.edu.et/wp-content/uploads/2016/12/Cost-benefit-analysis-of-conservation-measures.pdf.

[272] Ibid.

[273] Ibid.

[274] Ibid.

[275] Ibid.

[276] Ibid.

[277] Ibid.

[278] Ibid.

[279] Ibid.

was, on average, US$79/ha/year.[280] The shadow wage rate is taken into account when estimating the costs of the interventions for the entire upper Blue Nile basin.[281] According to Araya and Adjaye (1999), the economic price, also known as the opportunity cost of labor, is computed by assuming that the average number of days that farmers work on the farm is 99 and that there are 180 days in the off-peak season. This yields a factor of 0.55.[282] The shadow wage rate is US$ 1 per day when this factor is applied to the market wage rate. Therefore, it is projected that the average cost of the measure for the adjusted labor price is US$ 39/ha/year.[283] Multiplying this average cost by the area of cultivated land which is vulnerable to soil erosion in the basin, 1.08 million[284] hectare yields a total cost of US$ 42.12 million/year. The expense must be spread out over time and discounted because it is an investment.[285] Thus, using a social discount rate of 8% and a 20-year time horizon to assess the cost of soil conservation, the annual accumulation amount after 20 years comes to US$ 842.24 million, and discounting yields a total cost of US$ 180.73 million.[286]

The cost of erosion serves as a stand-in for the benefit when estimating the onsite benefit of soil conservation measures. According to some research, the annual cost of soil erosion from Ethiopia's wheat production, per hectare, in areas with considerable soil loss, is $544 USD.[287] This estimate comes to a total cost of US$2.9 billion year when we apply it to the entire area of the upper Blue Nile basin that is vulnerable and subject to soil conservation measures, which is

[280] In this section and in the coming sections the costs and benefits are estimated using USD in order to make comparison with the offsite cost easier. One USD is equivalent to 13 Ethiopian Birr (CBE, 2010).

[281] Abonesh Tesfaye , Roy Brouwer1 , Pieter Van Der Zaag , Workneh Nigatu , Belay Simane, Melesse Temesgen, ,and Eshraga Sokrab,2016,Cost benefit analysis of soil conservation measures: the case of Blue Nile basinhttp://www.dmu.edu.et/wp-content/uploads/2016/12/Cost-benefit-analysis-of-conservation-measures.pdf.

[282] Ibid.

[283] Ibid.

[284] NBI (2007), Eastern Nile watershed management project.Transboundary analysis Abay-BlueNile sub basin. Final Report.

[285] Abonesh Tesfaye , Roy Brouwer1 , Pieter Van Der Zaag , Workneh Nigatu , Belay Simane, Melesse Temesgen, ,and Eshraga Sokrab,2016,Cost benefit analysis of soil conservation measures: the case of Blue Nile basinhttp://www.dmu.edu.et/wp-content/uploads/2016/12/Cost-benefit-analysis-of-conservation-measures.pdf.

[286] Ibid.

[287] Sertsu, S. (1999), Integrated Soil Management for Sustainable Agriculture and Food Security in Southern and Eastern Africa. Ethiopia. Proceedings of the expert consultation (FAO) Harare, Zimbabwe.

about equivalent to 5.43 million hectares.[288] Assuming a 20-year planning horizon, this annual amount adds up, and after 20 years, a total of 20 years' worth of erosion will have been stopped, resulting in onsite benefits of US$59.1 billion that year. The present value of US$ 12.7 billion, or the onsite benefit of an efficient soil erosion management program in the upper Blue Nile basin, is obtained by discounting this using a social discount rate of 8%.[289]

After calculating the entire area in the upper Blue Nile basin that is susceptible to soil conservation methods, which is roughly 5.43 million hectares, we arrive at an annual cost of US$2.9 billion.[290]

4.6 Principle of No Significant Harm Vs. Equitable and Reasonable Utilization (Argument)

The 1997 UN Convention recognizes the principle of "No Significant Harm" as the other side of the principle of "Equitable and Reasonable Utilization." Article 7 of the Convention is devoted to this principle. It states: 1. Watercourse states shall, in utilizing an international watercourse in their territories, take all appropriate measures to prevent the causing of significant harm to other watercourse states.

1. Watercourse states shall, in utilizing an international watercourse in their territories, take all appropriate measures to prevent the causing of significant harm to other water course states.

2. When significant harm nevertheless is caused by another water course state, the state whose use causes such a harm shall, in the absence of an agreement to such use, take all appropriate measures, having due regard for the provisions of article 5 and 6, in consultation with the affected state, to eliminate or mitigate such harm and when appropriate, to discuss the question of compensation.

[288] Abonesh Tesfaye , Roy Brouwer1 , Pieter Van Der Zaag , Workneh Nigatu , Belay Simane, Melesse Temesgen, ,and Eshraga Sokrab,2016,Cost benefit analysis of soil conservation measures: the case of Blue Nile basinhttp://www.dmu.edu.et/wp-content/uploads/2016/12/Cost-benefit-analysis-of-conservation-measures.pdf.

[289] Ibid.

[290] Ibid.

The "No Harm Principle" had the support of state practice as exhibited by different treaties between states, and thus it is a norm of customary international law. The principle is also an extension of the private law old maxim 'sic utere tuo ut alienam non laedas,' which prohibits the use of one's own property to inflict an injury to the property of another.[291] Joseph Dellapena argues that unless some sort of flexibility is injected into it, the tightly worded nature of the principle would sanction any meaningful developmental efforts of the upstream countries that ultimately would reduce the principle into a mere variant of the Absolute Territorial Integrity Doctrine.[292] On the other hand, Hubert H.G. Savenije and Peter Van der Zaag argued that "equitable and reasonable utilization" and "no significant harm" principles are not mutually exclusive; rather, they are two sides of the same coin to be applied concurrently.[293] The latter argument is much more convincing for the following reasons. First, the principles of "Equitable and Reasonable Utilization" and "No Significant Harm" are not arguments exclusively reserved for upstream and downstream countries, respectively. Situations where the "No Significant Harm" rule can be relied upon by an upstream riparian and the rule of Equitable and Reasonable Utilization" by the downstream riparian are not totally excluded.

In this regard, Joseph Dellapenna questions: "Would not the barring of all development in the upstream state be harm to it, just as a reduction in the quantity or quality of flow reaching the downstream state is an injury to it?"[294] Second, the question of conforming to the test of equitable and reasonable utilization cannot be sufficiently addressed without having due regard to the degree of harm that such a use may inflict on the interest of the other riparian at the other end of the tunnel. Therefore, there is an organic and logical interplay between the two principles. A riparian who complains to have suffered a 'significant harm' should establish that the harm complained of was occasioned because the other riparian has utilized the water beyond what is

[291] Dellapena .J.W,(2001), "The customary International Law of Transboundary Freshwaters"Int. J.Global Environmental Issues 265

[292] Ibid.

[293] Hubert H. G. Savenije and Pieter Vander Zaag, (2000), Conceptual Framework for Management of Shared River Basins with Special Reference to SADC and EU, 2 Water Policies 9, 24.

[294] Dellapena .J.W, (2001)"The customary International Law of Transboundary Freshwaters"1Int. J.Global Environmental Issues 279.

considered to be equitable and reasonable. This state of affairs thus implies that the test of equitability of use without having regard to the degree of harm and the test of no significant harm without having recourse to the degree of equitability would not result in a fair disposition of the dispute. Any understanding of these principles out of the context of their organic relationship would render the principles devoid of their intended meaning and significance and would bring about the egoistic principles of Absolute Territorial Sovereignty and Absolute Territorial Integrity back to the fore of a zero-sum game. However, the formidable challenge in this regard is the difficulty to concur on what constitutes "equitable and reasonable utilization" and "no significant harm." The major problem is the vulnerability of both principles to different subjective interpretations in such a way that best serves the interest of each riparian state. This is especially true in a river basin where there exists no treaty-based legal regime governing the management of the common water resource.

To get out of this circular argument, Stephen C. McCaffrey advises: The practice of using treaties to regulate the relations of states sharing freshwater resources is generally advisable and to be recommended. Treaties stabilize those relations, giving them an element of certainty and predictability that is often not present otherwise. Riparian countries may also use treaties to establish joint management institutions with powers to further facilitate their cooperation with regard to sharing uses and benefits of international water courses.[295]The other continuing debate is associated with as to which principle prevails over the other. Dellapenna claims the unanimity of international water law experts on the primacy of equitable utilization rule[296],while Stephen C.McCaffrey (Fourth Special Rapporteur for the project) held the view that the International Law has intended for the prevalence of "No harm Rule" over the rule of "Equitable Utilization".[297] However, a closer look at Art. 7, which provides for "No significant harm," suggests the primacy of equitable utilization, especially when viewed against the reading of paragraph 2 of the article,

[295] Stephen C. McCaffrey, (2003), The Need for Flexibility in Fresh Water Treaty Regimes, 27 Natural Resources Forum 156, 157.

[296] Muserref Yetim,(2002), Governing International Common Pool Resources: The International Water course of the Middle East, 4 Water Policy 305, 317.

[297] Dellapena .J.W, (2001)"The customary International Law of Transboundary Freshwaters"1Int. J.Global Environmental Issues 279.

which accommodates a sort of harm, if it is not of a significant nature. Even in the case of significant harm, the remedy to the complaining riparian is limited to having recourse to consultation with the acting state with the view to eliminate or mitigate, and where such effort fails, to consider options of compensation. Therefore, even though paragraph 1 of Art. 7 seems to categorically prohibit causing significant harm by imposing a duty of taking "all appropriate measures," paragraph 2 renders a mitigating spirit to the duty. In this regard, Stephen C. McCaffrey is of the view that when a conflict between the two principles is encountered, the principle of equitable utilization would override the no-harm principle.[298] Subjecting the examination of the harm to the provision of Art. 5 and 6, he argues, is another indication that equitable utilization is given preeminence.[299] As already discussed, watercourse states may not find a lasting and stable solution through the straightforward application of the rules of the UN Convention. The Convention is to mediate relations or conflict in the absence of a treaty-based legal regime, and because of the rocky road towards the settlement of water disputes via the application of the rules of the Convention, per se, basin states are not only recommended but also urged to sustainably settle their potential dispute through an all-paying negotiated water treaty.

[298] McCaffrey.S.C, (2003) "The Need for flexibility in Fresh water Treaty Regimes" 27 Nature Resource Forum 96-101.

[299] Ibid

Chapter Five

Findings, Conclusion and Recommendations

5.1 Findings

In contrast to national law, international law lacks a precise definition of its sources. Nonetheless, the international courts' and tribunals' statutes specify the legal sources they consult while settling cases that fall under their purview.[300] As per the provisions of Article 38 (1) of the Statute of the International Court of Justice (ICJ), the ICJ is empowered to enforce international conventions, international customs, the general principles of law acknowledged by civilized nations, judicial decisions, and the teachings of highly qualified publicists from different countries as auxiliary means for determining legal rules. General legal principles and customary norms are used as a guide for the formulation of regulations in circumstances where treaties lack important rules. Opinions about the law may also be developed through more recent legislative procedures, in addition to the sources just mentioned.

Global environmental protection is covered by the general principles of international environmental law. Many of them, being included in multilateral environmental agreements, find specific definitions for the specific international environmental system in this case. Even though a treaty's language may not express a notion clearly, it may nonetheless be crucial for its interpretation and growth.[301] Additionally, general environmental principles can express gap-filling functions and serve as a supplement to specific international environmental laws.[302]

IEL principles like the precautionary principle, common but differentiated responsibilities, sustainable development, cooperation, and intergenerational equity are all recognized by the United Nations Framework Convention on Climate Change (UNFCCC). Also, sustainable development and cooperation ("as far as possible and as appropriate") are outlined in the Convention on Biological Diversity (CBD).[303] There are opposing views to the ones expressed in this article regarding the status and content of the principles of international law, including how

[300] Ibid

[301] UN Secretary-General (2018, November 30) Gaps in international environmental law and environment-related instruments: towards a global pact for the environment (report) A/73/419*

[302] Ibid.

[303] Koester.V,(2015) Environmental principles and concepts in biodiversity treaties. In: Faure M (ed), Elgar Encyclopedia of Environmental Law. Edward Elgar Publishing, pp. 538–554 dward Elgar Publishing, pp. 509–524

customary norms and principles of international environmental law are formed and how legally legitimate they are. It is also unclear whether the IEL principles are well-established or are just beginning to gain traction. As a result, although some governments acknowledge some notions as the fundamentals of international environmental law, others would prefer to call them principles that they reject.[304] Even while some of the concepts haven't quite made it to the status of international environmental legal principles, they are starting to have an impact on how the law is developed as well as how academia is perceived both locally and internationally. For instance, the ecological proportionality concept.[305] Furthermore, as long as adaptive management (AM) is useful for preserving ecosystem services and ecosystem resilience, it may be incorporated into the development of the right to a clean and healthy environment in general. The ecosystem method, which is regarded as a tenet of international environmental law, can be used to develop regulations pertaining to AM.[306]

The general principles and rules of international environmental law that have emerged from international treaties, agreements, and customs.[307] Since these concepts are applicable to the global community for environmental conservation, protecting their generality is significant.[308] Conventional wisdom holds that one of the aforementioned sources is the source of public international law. From the previously listed sources, as well as from less conventional and legally binding sources, relatively new international environmental law is emerging. There isn't a

[304] Sands P, Peel J, Fabra A, MacKenzie R (2012) Principles of international environmental law, 3rd edn. Cambridge University Press

[305] Winter G (2018) Substitution: from alternatives to ecological proportionality. In: Krämer L, Orlando E (eds), Principles of Environmental Law. Edward Elgar Publishing, pp. 234–250

[306] Morgera.E (2015), the ecosystem approach and the precautionary principle. In: Faure M (ed), Elgar Encyclopedia of Environmental Law. Edward Elgar Publishing, pp. 70–80.

[307] For the difference between general principles of law and general principles of international law, the latter discussed in here. See M. Virally, the Sources of International Law, in MANUAL OF PUBLIC INTERNATIONAL LAW 143 (1968). General principles of international environmental law may refer to rules of customary international law, to rules derived from treaties, to general principles of law as stated in article 38(I)(c) of the Statute of the International Court of Justice or to logical propositions resulting from judicial reasoning. Statute of the International Court of Justice, 1945 I.C.J. Acts & Docs. Art. 38(1).See also G. Fitzmaurice,

[308] General Principles Law, 92 HAGUE RECUEIL (1957). 2. B. CHENG, GENERAL PRINCIPLES OF LAW AS APPLIED BY INTERNATIONAL COURTS AND TRIBUNAL 376 (1953)

worldwide international agreement that outlines each nation's obligations and rights on environmental issues. However, the practices and rulings of international tribunals that have been crucial in the creation of regulations are stated in the resolutions and declarations of international organizations in charge of environmental controls, such as the Atomic Energy Agency. Different IEL principles can be identified from the several international instruments addressing environmental challenges and problems. It would be demonstrated that each has a different level of acceptability and consistency. For example, the 1987 sustainable development guidelines state that improving human welfare should be the main goal of environmental conservation initiatives. This guideline defines the concept and aim of sustainable development. The anthropocentric viewpoint holds that safeguarding natural resources and animals is essential to maintaining a higher standard of living for people.

The sustainable development principle consists of three components: 1st Intergenerational Equity: Each generation's responsibility is to leave an inheritance of wealth no less than what they themselves have inherited to future generations. The present generation holds the natural resources in trust for future generations. Early and recent treaties have referred to this principle, 2nd Sustainable Use of Natural Resources the United States: The United States' declaration in 1893 guarantees the right to the appropriate use of seals in order to prevent their extinction. Although the concept of sustainable resource use has been established, there is a lack of a universal definition. Words like environmentally sound, prudent usage, prudent exploitation, ecological soundness, and reasonable use are used interchangeably without y without definitions. And 3rd Integration of environment and development: In order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it. Therefore, when implementing environmental obligations, economic and social development should be taken into consideration, and vice versa. The integration of environment and development can be traced to the 1949 United Nations Conference on Conservation and Utilization of Resources, which recognized the need for continuous development and widespread application of the techniques of resource conservation and utilization. Regional and global treaties are also taken into consideration under this approach.

In this regard, ecological compensation, which is considered in international water agreements such as the Helsinki Rules and the Convention on the Law of the Non-Navigational Uses of International Watercourses, is an important method of alleviating water resources conflicts and protecting transboundary river ecosystems. The rules and concept contained in these conventions provide guidelines for the riparian states of transboundary Rivers to establish ecological compensation mechanisms.[309] Therefore, resolving the issues of conflict on benefit allocation and burden of ecosystem protection in transboundary river basins through negotiation has become an effective means because it clarifies the rights and obligations of both parties.[310]

Regarding the Nile River Basin, in the preamble of the Framework for General Cooperation signed between the Arab Republic of Egypt and Ethiopia at Cairo on July 1, 1993, the two countries have underlined their commitment to the UN and OAU charters and the principles of international law as well as to the Lagos Plan of Action.[311] Further, Article 4 of this agreement provides that negotiations on uses of the water shall be based on the rules and principles of international law.[312] They also recognize the necessity of conservation and protection of the Nile waters and oblige themselves to consult and cooperate. Finally, it provides that the two countries will endeavor to work towards a framework for effective cooperation among countries of the Nile basin. From this agreement, I infer that the agreement is more concerned with commitment to the principle of international law on the use of the Nile resource by both states and further recognizes the necessity of cooperation and conservation and protection of the Nile resource. However, in this agreement, except for promoting the relevance of ecosystem protection and cooperation in the Nile River basin, there are no procedural laws to implement and enforce the agreement. This clarifies that the agreement is non-binding and soft law.

Even if there is no binding treaty and agreement concerning eco compensation in the Nile River basin, there are different state practices in eco compensation for EPS and environmental protection by upper riparian states. The general principle of international environmental law is

[309] Yuan and Zhou, 2014.

[310] Ibid.

[311] Ibid.

[312] Ibid.

one of a source of international law; international environmental law is also considered a source of IEL. These are the general principles and rules of international environmental law that have emerged from international treaties, agreements, and customs. Sustainable development is one of the general principles of IEL. Different IEL agreements, treaties, customs, and state practices recognize the sustainable development principle and its three elements (sustainable use of natural resources, integration of environment and development, and intergenerational equity and duty to protection and cooperation) as general principles of international environmental law or sources of IEL. In this regard (eco compensation), payment of finance and funds by lower riparian states to upper riparian states in transboundary rivers for rendering of eco services to lower riparian states and opportunity costs to upper riparian states for protection of the source of the river basin is practiced in different regions and nations.

For instance, in Europe, Germany has been carrying out ecological compensation practice in watersheds from an early stage in the Elbe River, the largest river basin in Europe that crosses national borders. The river basin covers an area of 148,000 km², of which 65.54% is located in Germany, 33.68% in the Czech Republic, and the two smaller shares are in Austria (0.62%) and Poland (0.16%).[313] Most of the Elbe Rivers are located in Germany, so the water environment of the Elbe is said to be quite important for Germany. However, the ecological degradation of the Elbe River accelerated in the 1980s due to the negligence of the German and Czech governments. In the 1990s, Germany sought cooperation with the Czech Republic to establish a joint upstream and downstream cooperation group to protect the environmental management of the river basin and the integrity of the river ecosystem. The Czech economy lagged behind Germany and lacked financial support for watershed management. For these reasons, the two governments had multiple rounds of negotiations and reached an agreement in the late 1900s. The International Committee for the Protection of the Elbe Agreement signed the Convention of the International Committee for the Protection of the Elbe River in Magdeburg on October 8, 1900, which realized the co-regulation of the Elbe River. Based on the agreement, the parties clarified their rights and obligations, objectives, and other contents. The basis for all contents is

[313] International Commission for the Protection of the Elbe River (ICPER),(2016).The Elbe River and Its Basin. InternationalCommissionfortheProtectionoftheElbeRiver.https://www.iksemkol.org/fileadmin/media/user_upload/E/06_Publikationen/08_IKSE_Flyer/2016_ICPERFlyer_The_Elbe_River_Basin.pdf

to improve the ecological value of the Elbe riparian zone.[314]The most direct manifestation of horizontal financial transfers for ecological compensation in the Elbe River basin is the German government's direct payment of DM 9 million to the Czech government to promote the construction of sewage treatment infrastructure in the Czech Republic. With the help of German financial resources, the Czech government has become more proactive in protecting the ecology of the Elbe River basin**.**[315]

The other state practice on eco compensation is in the Lancang–Mekong River, an important trans-boundary river in Asia (on eco compensation). It originates from the Qinghai–Tibet Plateau of China and flows through Myanmar, Laos, Thailand, Cambodia, and Vietnam, with a total length of 4884 km. Among them, Thailand and Vietnam belong to the consumers of ecological services; Cambodia, Laos, China, and Myanmar are suppliers of ecological services. Thailand and Vietnam, located in the lower basin, need to pay ecological compensation funds and assume more responsibilities for the ecological protection of the basin. Based on the actual payment willingness of the two countries, it is determined that the two countries need to pay US $46.913 billion and US $1.699 billion, respectively.

The last and well-developed practice of eco compensation is in the China Republic in the Xin'an River Basin. In this basin the compensation is transferred from central government to local governments. Compensation funds consist of central, Zhejiang, and Anhui financial funds; the central government will be allocated 300 million Yuan of ecological compensation funds free of charge to Anhui Province. Anhui Province and Zhejiang Province each contribute 100 million Yuan. The compensation funds are mainly used for environmental protection, sewage treatment, and ecological restoration.

All three of these examples of states practice on eco compensation legalize and clarify the responsibility of lower riparian states to fund and finance the upper riparian states for eco

[314] International Commission for the Protection of the Elbe River (ICPER), (2015).About the ICPER. International Commission for the Protection of the Elbe River. https://www.ikse-mkol.org/en/ikse/fokus-2015

[315] Zhu, G. (2010).The Connotation of Ecological Compensation and the Establishment of Compensation Mechanism in the Water Source Area of South-North Water Diversion Central Line.Forestry Economics, 9, 89–93. https://doi.org/10.13843/j.cnki.lyjj.2010.09.002.

service, opportunity cost on protection of the source of rivers by upper riparian states and provinces.

Consequently, Ethiopia is the upper riparian state of the Blue Nile River basin. For a long period of time, it has been providing eco service to lower riparian states (Egypt and Sudan) and the soil conservation measures in the upper BNBs (in Ethiopia), which are approximately equal to 5.43 million hectares, at a total cost of US$ 2.9 billion per year.[316] Also additionally, Ethiopia incurs other environmental conservation costs in the source of BNRBs. But the lower riparian states of Egypt and Sudan, for a long time, did not assume any responsibility and burden to share and cooperate on the opportunity cost of environmental conservation of Ethiopia except claiming only to have the right to use this resource.

Regarding the above issue, sustainable development is an IEL principle and recognized as a source of an IEL; in their meaning, it considers the concept of environmental compensation. This principle also incorporates three basic elements, such as sustainable use of natural resources, integration of environment and development, intergenerational equity, and duty to protection and cooperation. All this is concerned and related to the protection of transboundary rivers and wise use of natural resources by transboundary river member states. General principles of international law are derived from common legal practices of nations; legal personality of corporations and this principle are also widely accepted in national legal systems and recognized as sources of IEL through conventions, treaties, and state practices. Art. 38(1) of the Statute of the International Court of Justice (ICJ) also recognized that the general principle of international environmental law is a source of international law. The sustainable development principle is part of the general principle of international environmental law; this principle is also recognized by different international environmental law conventions and treaties. For instance, the United Nations Framework Convention on Climate Change (UNFCCC) and Convention on Biodiversity are two of them. The principle of sustainable development incorporates three main elements in its definition, such as intergenerational equity (it concerns the present generation's duty to hold

[316] Abonesh Tesfaye, Roy Brouwer, Pieter Van Der Zaag, Workneh Nigatu, Belay Simane, Melesse Temesgen, and Eshraga Sokrab, 2016, Cost-benefit analysis of soil conservation measures: the case of Blue Nile basin http://www.dmu.edu.et/wp-content/uploads/2016/12/Cost-benefit-analysis-of-conservation-measures.pdf.

the natural resources in trust for future generations), sustainable use of natural resources (it concerns riparian states using resources properly, wise use, judicious exploitation, sound environmental management, ecologically sound, and rational use of transboundary resources), and integration of environment and development (it concerns implementing environmental obligations; economic and social development should be taken into consideration).

These IEL principles and their elements are applicable and practiced in different shared water resources in the world by different nations through multilateral and bilateral agreements. Such as in the Elbe River basin, in the Lancang–Mekong River, and in the Xin'an River Basin In these three transboundary water basins, there is an eco-compensation practice like funding and financing to upper riparian states by the lower riparian countries for eco service and opportunity cost of upper riparian states on the protection of the source river basin. Additionally, the lower riparian states also assume more responsibilities for the ecological protection of the source of the transboundary river basin. Regarding this, sustainable development principles and their three elements are part of the general principles of international environmental law and sources of international environmental law. Based on this evidence and legal justification, there is a legal basis and legal right for Ethiopia to have a claim for eco compensation from lower riparian states for the rendering of eco services to Egypt and Sudan and the cost incurred and measures taken to conserve BNRBs.

5.2 Conclusions

Ecological compensation, considered in international water agreements such as the Helsinki Rules and the Convention on the Law of the Non-Navigational Uses of International Watercourses, is an important method of alleviating water resource conflicts and protecting TBRBs ecosystems. The rules and concepts in these conventions provide guidelines for the riparian states of transboundary Rivers to establish ecological compensation mechanisms. Therefore, resolving issues of conflict on benefit allocation and the burden of ecosystem protection in transboundary river basins through negotiation has become an effective means. Because it clarifies the rights and obligations of both parties.

Regarding the Nile river basin, in the preamble of the Framework for General Co-operation signed between the Arab Republic of Egypt and Ethiopia at Cairo on July 1, 1993, the two countries have underlined their commitment to the UN and OAU charters and the principles of international law as well as to the Lagos plan of action. Further, Article 4 of this Agreement provides that negotiations on the uses of the water shall be based on the rules and principles of international law. They also recognize the necessity of conservation and protection of the Nile waters and oblige themselves to consult and cooperate. Moreover, it provides that the two countries will endeavor to work towards a framework for effective cooperation among countries of the Nile basin. From this agreement, one can infer that the agreement was more concerned with the commitment to the principle of international law on the use of the Nile resource by both states.

Furthermore, recognize the necessity of cooperation and conservation and protection of the Nile resource. However, in this agreement except for promoting the relevance of ecosystem protection and cooperation on the Nile River basin, there were no procedural laws to implement and enforce the agreement related to Eco compensation. Regarding this, the agreement was non-binding and soft law. But, currently, on Monday 8 July 2024 after the Republic of South Sudan Acceded Nile Basin Cooperative Framework Agreement (CFA), the CFA entered into force. It will enable the establishment of the Nile Basin Commission, Replacing NBI (Nile Basin Imitative), and have a wider and more elaborate mandate, power, visibility, and recognition by world water and development aid communities. Ending long academic and futile debate on Nile colonial treaties,

this forced Egypt and Sudan to join the CFA two works in the spirit of cooperation, with other riparian states in the management, sharing, development, and protection of Nile water. The newly formed Nile Basin Commission in the future has a great responsibility to Enact procedural laws on implementation of management and protection of Eco system and eco compensation.

Even if there was no binding treaty and agreement regarding eco-compensation in the Nile River basin, there are different state practices in eco-compensation related to eco service and opportunity cost on environmental protection by upper riparian states. Different IEL agreements, treaties, customs, and state practices recognize the sustainable development principle and its three elements: - Namely, 1st sustainable use of natural resources, 2nd Integration of environment and development, and 3rd Intergenerational equity and duty to protection and cooperation. In this regard (eco compensation) payment of finance and funds by lower riparian states to upper riparian states in transboundary Rivers, for rendering of eco service to lower riparian states and opportunity cost on upper riparian states, for protection of source of river basin was practiced in different region and nation.

Ethiopia, as an upper riparian state of the Blue Nile river basin, has been providing eco service or environmental service to lower riparian states (Egypt and Sudan). Ethiopia incurs environmental opportunity costs and another cost for the protection of the source of the Blue Nile river basin and tributaries. For instance, Ethiopia has been implementing land and water conservation programs since the 1970s to tackle environmental degradation in the BNBs and beyond. The soil conservation measures in the upper BNBs (in Ethiopia), which are approximately equal to 5.43 million hectares, have a total cost of US$ 2.9 billion per year without any financial return. However, the lower riparian states of Egypt and Sudan don’t assume any responsibility to compensate UNRRs and don’t cooperate on the opportunity cost of environmental protection incurred by UNRRs; however, they claim only to have a historical right to use the Nile resource.

Generally, based on this evidence and legal justification there is a legal base and legal right Ethiopia has the right to claim eco compensation from (Egypt and Sudan) for the rendering of eco service or environmental service and cost incurred to protect the source of BNRBs ecosystem and tributaries. Based on this evidence and legal justification there is a legal base and

legal right for Ethiopia to have the right to claim eco compensation for rendering of eco service to (Egypt and Sudan) and the cost incurred to protection of the source of BNRBs.

5.3 Recommendations

Based on the conclusions drawn above, the study makes the following recommendations.

- Even if there is a different non-binding soft IEL on eco compensation and has no procedural enforcement mechanism. However, there is state practice or the general principle of international environmental law on different nations on eco compensation related to environmental protection and opportunity cost to the protection of the source of TBRBs. For instance in the Elbe River basin, in Lancang–Mekong River, and Xin'an River Basin. Based on this practice and evidence, the Ethiopian government, and local concerned body try to legally and diplomatically influence and initiate the LNBRs to compensate Ethiopia for rendering of eco service and opportunity cost to the protection and conservation of source of BNRBs.
- So the Ethiopian government, local concerned bodies, and academicians ‘based on the practice of other states try to draft legal, diplomatic, and academic documents related to eco compensation on BNRBs.
- Using the new and currently forming Nile Basin Commission influences the LNRRs to compensate Ethiopia for opportunity costs incurred for ecosystem protection.
- Pressure LNRRs to cooperate on the protection and conservation of the source of the Blue Nile River basin. Further transplant and enforce the concept and practice of eco-compensation of other nations in BNRBs.
- To succeed, in this, the Ethiopian government, Diplomats, local NGOs, actors, local stakeholders, research institutions, and private sector participants must all be involved in their profession to promote (glorify, and influence)the concept of eco-compensation in BNRBs in media, books, journals, and newspapers.
- Ethiopian government tries to diplomatically influence and persuade LNRRS to pay eco-compensation and cover the cost incurred for afforestation, soil conservation, and restoration, of the source of the BNRB ecosystem in the context of the principle of sustainable development and state practice.

- Persuade LNRRs for the importance of the ESP concept (eco compensation) to their benefit. For instance, protected from desertification and land degradation they get uninterrupted water annually.
- Additionally, the Ethiopian government, local non-governmental organizations, and concerned bodies used the new Nile Basin Commission's diplomatic influence on Egypt and Sudan to sign the Treaty for Cooperation(Entebbe agreement)CFTA.
- Ethiopian government, local non-governmental organizations and concerned body need more diplomatic influence, Play great role on the new Formed Nile Basin Commission on promoting, implementing the Eco compensation and eco service approach Nile basin

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