Benefit sharing in international water law: a multi-disciplinary undertaking

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16. Benefit sharing in international water law: a multi-disciplinary undertaking

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I. INTRODUCTION

Water is essential to human life and humans have had to derive benefits from water resources to ensure their survival, as well as enhance their well-being, for time immemorial. The number and quality of benefits that can be derived from water resources depends upon the management of those resources by States. With more than 270 transboundary river basins that run through the territories of more than 145 countries, it is evident that optimal management of transboundary water resources is likely to involve cooperation and coordination among riparian States to leverage the ecological, social or economic basket of benefits from a given water resource.

Benefit sharing on transboundary water systems is the process of allocating the benefits derived from water uses and non-uses rather than allocating the water itself. It offers opportunities for the redistribution of costs and benefits to achieve fairness.¹ The idea of benefit sharing can be seen as closely linked to the international water law principle of equitable and reasonable utilization, as well as the duty to cooperate. Benefit sharing involves the sharing of directly and indirectly derived benefits, beyond simply sharing the quantity of water.²

Benefit sharing is premised on the idea that in a complex and interdependent world there are fewer benefits that can be achieved by unilateral action than through cooperation with other members of society or stakeholders in the same challenge or problem; and that formulas to share the benefits of cooperative behavior need to be agreed upon to achieve equity that will spur continued cooperation.

This chapter first explores the hydrologic origins of benefit sharing, as well as the way in which benefits have been classified in the literature. It then turns to

¹ Claudia Sadoff et al., SHARE – Managing Waters Across Boundaries (IUCN 2008)
evaluate the legal framing of the concept of benefit sharing. The chapter investigates how benefit sharing is reflected in international water law, particularly as an expression of the equitable and reasonable use principle. Moreover, the chapter considers the legal significance of this concept as well as its cross-disciplinary facets. The rules provided by international water law that can guide riparian States in the implementation of the concept will also be analyzed. Lastly, this chapter will zoom in on a number of case studies showing how countries have utilized benefit sharing.

II. THE CONCEPT OF BENEFIT SHARING IN ITS HYDROLOGICAL CONTEXT

The physical availability of water is one of the many benefits an accessible transboundary water system provides to riparian countries. It is a direct benefit of a hydrologic system running through or straddling a State’s territory and provides exploitable access to surface or groundwater. In addition, accessible hydrologic systems provide a wide range of other benefits that can be derived from the water flowing within. These include the hydroelectric energy that can be produced, food that can be produced using the water for irrigation, as well as other benefits from consumptive and non-consumptive uses, including navigation, recreation, drinking water supply, biodiversity and fisheries. The amount of benefit that can ultimately be derived from a hydrologic system depends to a large extent on the quality of its management and of the basin area. The quantity of available water, for instance, can be increased through good watershed management that minimizes erosion, maximizes infiltration into the ground and thus slows run-off, as well as through storage reservoirs of a size that can store and ‘transfer’ the resource from water abundant to water deficient seasons or years.\(^3\)

In a transboundary water system where water resources are shared among all riparian States, potential benefits available from the entire system cannot be maximized by one riparian alone; the optimization of available benefits requires coordination among riparian States because the shared water resources create interdependency between their territories. A downstream riparian, for example, may not be in a position to reduce sediment transport in the river without watershed management interventions undertaken by an upstream riparian. At the same time, uses by one State are likely to affect one or more of its co-riparian States either immediately – for instance in case of pollution – or over time; for example, significant abstractions that establish existing uses may foreclose future uses and development in other riparian States. The scope of benefits that

\(^3\) Sadoff and others (n 1) 21.
can be achieved for each individual State also depends on activities undertaken to minimize the negative impact of uses, including uses that may be beneficial for another riparian State.

The prospective additional benefits that can be gained through coordinated activities with a co-riparian country become the driver for cooperation on transboundary water resources management and development. Cooperation is the process by which States work together to achieve a common purpose that produces additional mutual benefits that would be unavailable to them with unilateral action alone.\(^4\) Cooperation can contribute to increasing the ‘basket of benefits’,\(^5\) which is the range of different additional benefits that become available by enlarging ‘the pie’. Countries cooperate where they can see that the benefits of collaboration outweigh the costs; these costs include the benefits of unilateral water uses a country may have to forgo to reduce the negative impact of its uses to the country it would like to cooperate with in order to realize net gains overall, including for itself. These net benefits are then shared across boundaries and among the cooperating States.

A useful illustration of the classification of benefits that can be derived from cooperative water resources management in transboundary basins has been developed by Sadoff and Grey, who distinguish between four types of benefits:

- **Category 1:** Benefits to the river focus on the ecological benefits that occur if riparian States join together to maintain a healthy aquatic environment in the river basin.
- **Category 2:** Benefits from the river describe the economic benefits that can be generated from the river. It has been argued that cooperative action will increase the benefits that can be generated from the river.
- **Category 3:** Reduction of costs because of the river looks at benefits that can be derived for instance through cooperation on flood management and reducing the likelihood and thus the costs of political conflict over the river and more generally.
- **Category 4:** Benefits beyond the river are those that occur as a follow-on effect of benefits derived from and reduction of costs because of the river; they concern forward linkages in the economy into sectors that are indirectly related to the management of transboundary water resources. These forward linkages are the result of improved relationships among riparian States. They occur, for example, where riparian States experience improvements in their political relationships due to profitable or

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\(^5\) The term ‘basket of benefits’ was coined in David Phillips et al., Transboundary Water Co-operation as a Tool for Conflict Prevention and Broader Benefit Sharing (Global Development Studies No 4, Ministry of Foreign Affairs, Sweden 2006).
successful cooperation with respect to their shared waters and subsequently seek additional cooperative relationships in other sectors of their economy, including trade, scientific cooperation and technology exchange. Benefits that occur because of these new relationships are benefits of the fourth type.  

The classification illustrates the various types of benefits that can be created along transboundary rivers. Enhanced cooperation increases the volume and amount of benefits that can be derived from a river and subsequently shared. This classification also applies to other transboundary hydrologic systems, including aquifers and lakes. When States recognize the additional benefits that can be derived from cooperation on transboundary water systems, they are more likely to cooperate in the pursuit of these additional benefits.

The benefit-sharing approach has been hailed by some as a new and innovative way to operationalize the principle of equitable and reasonable utilization, one of the cornerstone principles of international water law. The following section investigates the question of how the concept of benefit sharing is reflected in international law and the principle of equitable and reasonable use.

III. BENEFIT SHARING AND THE PRINCIPLE OF EQUITABLE AND REASONABLE USE THEREFROM

The idea of benefit sharing can be seen as closely linked to the principle of equitable and reasonable utilization. It can be viewed as a new and innovative way to operationalize the principle of equitable and reasonable utilization.

The first real codification of the principle of equitable and reasonable utilization was in the 1966 Helsinki Rules on the Use of the Waters of International Rivers (henceforth referred to as the 1966 Helsinki Rules). These rules were drawn up based on existing water treaties and State practice on the use of transboundary waters to that date. Article IV of the Helsinki Rules entitles each basin State, ‘within its territory, to a reasonable and equitable share in the beneficial uses of the waters of an international drainage basin’. The obligation to utilize transboundary watercourses in an equitable manner is accompanied

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6 Claudia Sadoff and David Grey, ‘Beyond the River: the Benefits of Cooperation on International Rivers’ (2002) 4 Water Policy 389; Sadoff and others (n 1) 23–25. It goes without saying that successful cooperation in non-water-related sectors can be the source of cooperation on transboundary waters. Often forward linkages travel both ways.

7 International Law Association (ILA), ‘Report of the Fifty-Second Conference held at Helsinki, August 14th to August 20th’ (1966) ILA 478.
by a correlative right of each basin State to an equitable share of the uses and benefits therefrom.\(^8\)

The 1997 United Nations Convention on the Law of the Non-Navigational Uses of International Watercourses (henceforth referred to as the UN Watercourses Convention) confirmed the importance of this principle as well as of other principles, such as the no-harm principle. The UN Watercourses Convention also provides States with guidance on how to effectively realize benefit-sharing arrangements. Articles 5 and 6 of the UN Watercourses Convention, which codify this principle of customary international law, provide for a duty to participate and cooperate in the use, development and protection of international watercourses. Article 5(1) states that: ‘Watercourse States shall in their respective territories utilize an international watercourse in an equitable and reasonable manner.’ The second sentence of Article 5(1) obliges watercourse States to use and develop an international watercourse ‘with a view to attaining optimal and sustainable utilization thereof and benefits therefrom…’. According to the International Law Commission (ILC), the objective to be sought therefore is the attainment of ‘maximum possible benefits for all watercourse States’.\(^9\) As much as this refers to both actions by individual States as well as to cooperative measures, such a formula anchors the benefit-sharing approach in the principle of equitable and reasonable utilization.\(^10\) States enter into agreements on benefit sharing when they expect that cooperative management and development of a hydrologic system allows them to increase (or maximize) the benefits available from the common resource and share them equitably.

What equity means in each specific basin context has to be first and foremost decided by the watercourse States concerned. In the case of unilateral development and the absence of cooperative development for optimal utilization, the various formulations of the principle of equitable and reasonable use in the

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9 ibid 97.

10 See also Stephen C McCaffrey, The Law of International Watercourses – Non-navigational Uses (2nd edn, Oxford University Press 2007) 388. ‘According to the doctrine of equitable utilization, each State has a legally protected interest in an equitable share of the uses and benefits of an international watercourse’. The Declaration of Buenos Aires adopted at the 10th Conference of the Inter-American Bar Association, held in 1957, also talks about the right to equitable use as well as benefit sharing as part of general principles applicable to every watercourse. Inter-American Bar Association, ‘Proceedings of the Tenth Conference’ (Buenos Aires, November 14–21 1957) vol I, 246–48 <www.fao.org/docrep/005/w9549e/w9549e08.htm#fn165> accessed 18 May 2016. The 2008 ILC Draft Articles on the Law of Transboundary Aquifers restate the principle in a similar way in Article 4(a), which provides that States ‘shall utilize transboundary aquifers or aquifer systems in a manner that is consistent with the equitable and reasonable accrual of benefits therefrom to the aquifer States concerned’. ILC (n 8) 89–135.
1997 UN Watercourses Convention and other documents provide guidance through non-exhaustive lists of criteria to consider. In line with the principle of the equality of rights, each State has an equal right to an equitable share of the water resources and benefits that can be derived therefrom. However, equality of rights does not mean that each State is entitled to an identical share; neither water nor benefits are divided into identical shares. State entitlements follow equity considerations that are to be based on the specific circumstances of each transboundary watercourse or aquifer system.

The origins of the principle are found at the national level. Early formulations of the principle occurred in particular in the jurisprudence of the United States Supreme Court concerning disputes between federal States with respect to consumptive use of shared watercourses. In the decisions addressing interstate disputes about water apportionment, the US Supreme Court referred to the ‘doctrine of equitable apportionment’. The case *State of Kansas v State of Colorado*, decided by the US Supreme Court in 1907, concerned, for example, irrigation benefits. Kansas sought a prohibition on diversions of the water of the Arkansas River carried out by the State of Colorado. Kansas claimed that the increase in area of irrigated fields in Colorado harmed irrigation in its western counties due to a decrease in flow volume. The decision of the Court is worth noting: while it acknowledged that ‘irrigation of Colorado has worked some detriment to the southwestern part of Kansas’, at the same time it acknowledged that the benefits derived from irrigation in Colorado outweighed these detriments. The Supreme Court held that ‘when we compare the amount of this detriment with the great benefit which has obviously resulted to the counties in Colorado, it would seem that equality of right and equity between the two states forbids any interference with the present withdrawal of water in Colorado for purposes of irrigation’. The Court based its decision on the equitable distribution of economic benefits that were derived from the river, which at that time brought economic benefits to Colorado that went far beyond the benefits that could have been and had been achieved by Kansas so far. At the same time,

11 ILC (n 8) 98; ILA (n 7) 98.
12 ILA (n 7) 487; ILC (n 8) 98.
14 McCaffrey (n 10) 385.
15 *State of Kansas v Colorado* (1907) 206 US 46–119; cited in McCaffrey (n 13) 129.
16 *State of Kansas* (n 15) 113.
17 ibid 114.
the Court made it clear that this decision was without prejudice to the right of Kansas to file a claim in the future in case their benefits (and harm) were no longer equitably distributed.\footnote{State of Kansas (n 15) ‘[…] there will come a time when Kansas may justly say that there is no longer an equitable division of benefits and may rightfully call for relief against the action of Colorado […]’.}

This decision highlights that the doctrine of equitable apportionment looks at a much wider understanding of benefits derived from water than just access and right to a certain water volume or quantity. The Court looked at the gains that can be derived from the availability of water in general. In the case of irrigation, benefits include crops, food security, socioeconomic development as well as the benefit of flow regulation that ensures regular water supply to fertile grounds or otherwise non-arable land and makes agriculture resistant to unexpected rainfall variations. At the same time, the Court acknowledged that underlying circumstances may change and did not preclude future claims by Kansas.

This and other cases as well as treaty practice constitute the basis for the formulation of the equitable and reasonable use principle in the ILA Helsinki Rules in 1966 and then in the 1997 UN Watercourses Convention. This notion of ‘beneficial use’ as referred to in Article IV of the Helsinki Rules applies in a wide sense of the term. It is not limited to efficiency and economic optimization considerations. The ILA defined ‘beneficial use’ as use that ‘must be economically or socially viable, as opposed, for example, to a diversion of waters by one State merely for the purpose of harassing another’.\footnote{ILA (n 7) 487.} It noted that a ‘beneficial use’, according to the principle of equitable utilization, ‘need not be the most productive use…nor need it utilize the most efficient methods known in order to…insure maximum utilization’.\footnote{ibid.} The ILC equally argued in 1994 that attaining ‘optimal utilization and benefits’ is not about achieving maximum and most efficient use, nor about achieving the monetarily most valuable outcomes.\footnote{ILC (n 8) 97.}

Optimum utilization is utilization that balances and integrates monetarily valuable uses and includes respect for the needs of the environment:

Watercourse States shall in their respective territories utilize an international watercourse in an equitable and reasonable manner. In particular, an international watercourse shall be used and developed by watercourse States with a view to attaining optimal and sustainable utilization thereof and benefits therefrom, taking into account the interests of the watercourse States concerned, consistent with adequate protection of the watercourse.\footnote{Convention on the Law of the Non-Navigational Uses of International Watercourses (adopted 21 May 1997, entered into force 17 August 2014) UNGA Res 51/229 (1997) UN Doc A/RES/51/229.}
Economic and social gains need to be balanced against ecosystem needs. In its 1994 commentary, the ILC puts emphasis on the concept of sustainability as one of the guiding principles for the realization of equitable and reasonable use. The spirit of aiming at sustainability is also reflected in Article 1 of the 1997 UN Watercourses Convention, which highlights the objective of achieving a balance between water uses and the protection and preservation of the watercourse itself.24

The principle of equitable and reasonable utilization adopts a wider notion of what constitutes a benefit that can be derived from the utilization of transboundary water resources. Benefits considered include financial gain, as well as maintenance of healthy hydrologic ecosystems. Moreover, the principle envisions benefits that can be derived based on and according to the capacity of individual basin States and their populations, and that occur in multiple sectors.

As can be seen, the principle of equitable utilization of transboundary waters is not limited to an understanding that merely focuses on the attribution of water quantity. This would overlook the multiplicity of possibilities to generate additional benefits with efficient water management. The principle applies with a much wider scope and looks at all forms of utilization, as well as the equitable allocation of the benefits therefrom.

IV. BENEFIT SHARING IN ACTION: AN ASSESSMENT OF TREATY AND INSTITUTIONAL PRACTICE

The utilization of benefit sharing can be traced in treaty practice. One of the most eminent examples is the negotiation of a formula on how to share benefits among the riparian States of the Senegal Basin. The legal framework for joint management was established by Mali, Mauritania and Senegal in 1972 to increase flood protection, hydropower, irrigation and navigation benefits through joint management of the flow regime.25 For this purpose, the States set up a joint management mechanism: the Organisation pour la Mise en Valeur du fleuve Sénégal (OMVS).26 Two jointly owned27 multi-purpose reservoirs, at Diama and at Manantali, were constructed in the late 1980s, after the Council

24 Article 1(1) reads as follows: ‘The present Convention applies to uses of international watercourses and of their waters for purposes other than navigation and to measures of protection, preservation and management related to the uses of those watercourses and their waters.’
of Ministers had adopted a formula (known as the ‘key’\textsuperscript{28}) for the sharing of benefits as well as the operation and maintenance costs associated with the two reservoirs. Countries receive benefits from the river (navigation, hydropower, irrigation) according to their economic interest and needs and are responsible for paying the corresponding operation and maintenance costs that are required to generate the benefits from the river. The ‘key’ is currently being renegotiated to account for all the benefits shared among all riparian countries, as new infrastructure came online and as Guinea joined the basin institutional and legal framework as a member in 2006. Another frequently cited example for benefit sharing is the 1961 Treaty relating to the Cooperative Development of the Water Resources of the Columbia River Basin.\textsuperscript{29} It regulates the sharing of benefits derived from hydropower generation and hydroelectricity trade which generate benefits from and beyond the river, as well as from flood control, which reduces the costs because of the river.

Part of the reason why States negotiate international water treaties is the appropriation and allocation of benefits. This does not mean that all water treaties are benefit-sharing agreements, such as the 1922 Convention between Russia and Finland on the utilization of border rivers with respect to navigation, timber floating and fisheries.\textsuperscript{30} This treaty acknowledges that co-riparian States benefit from the coordination of how transboundary watercourses are managed and utilized. However, it does not include a formula on how the benefits and related costs are shared. The 1922 Convention neither attributes any specific quantities of fish to either of the Parties, nor does it impose specific maintenance obligations on one or the other that may increase benefits overall. The obligation to allow the free flow of the water in Article I addresses both Contracting States equally, without specifying an obligation to act in a certain way to increase these benefits that could be available to both of them.\textsuperscript{31} In contrast, benefit-sharing treaties consider the broadening of the basket of benefits beyond what is achievable by unilateral resource development and the sharing of these benefits. There are various ways through which States have decided to share in


\textsuperscript{29} Signed by the United States and Canada in Washington, DC on 17 January 1961.


\textsuperscript{31} ibid Article I: ‘In water-courses flowing from Finland to Russia and vice versa, or situated along the common frontier between those two countries, the Contracting States undertake to leave the fairway open for the free flow of the water, for navigation by seagoing, and river craft, for timber floating, and for the migration of fish.’
the generation of and profiting from benefits to, from and beyond the river, as well as from the reduction in costs because of the river.

i. Benefits to the River

Agreements with the objective to benefit the river and, through this, generate benefits of healthy ecosystems, recreational use and water quality to the people dependent on shared water systems have become more ubiquitous since the 1970s, when the natural dissolution and filtration functions of rivers, lakes and connected ecosystems were no longer sufficient to withstand the impacts of ever-increasing industrial, agricultural and other human-based effluents.

One of the earlier frameworks drawn up to ensure that riparian States can derive mutual advantages from transboundary water resources is the legal framework governing management and development in the Great Lakes Basin shared by the United States and Canada. The basin is governed by a complex framework of treaties that dates back to the 1909 Boundary Waters Treaty and includes, among others, two treaties preventing excessive diversion of waters and the Great Lakes Water Quality Agreement. While the 1909 Treaty already includes a general obligation not to pollute the water flowing across the boundary ‘on either side to the injury of health or property on the other’, the detailed legal framework to protect water quality in the Great Lakes was developed only later. The Great Lakes Water Quality Agreement, originally concluded in 1972, was revised in 1978 and amended several times. The Parties to the agreement recognize that cooperation to achieve benefits to their shared water system by protecting, restoring and enhancing water quality of the Waters of the Great Lakes and preventing further pollution and degradation of the Great Lakes Basin Ecosystem ‘will benefit present and future generations of Canadians and Americans’. The thirteen Articles of the agreement set forth the general obligations of the Parties in respect of implementation, monitoring, reporting

33 St Lawrence River Basin Sustainable Water Resources Agreement (signed between the Governors of the eight riparian US States and the Canadian provinces of Ontario and Quebec) (13 December 2005); Great Lakes – St Lawrence River Basin Water Resources Compact (signed by the Governors of the eight US riparian States) (13 December 2005).
34 Agreement on Great Lakes Water Quality (adopted 15 April 1972) 1972 UNTS 214.
35 Agreement between the United States and Canada on Great Lakes Water Quality (adopted 22 November 1978) 1153 UNTS 188.
37 ibid Preamble and Article 2.
and consultations, including with the wider public; and the ten annexes contain issue-specific regulation such as on specific areas of concern, lake-wide management, specific pollutants and load targets, discharge from vessels and invasive species.

Another region where States reacted to the detrimental impacts of industrial overuse and over-exploitation of shared water resources with the establishment of comprehensive legal frameworks for the protection of these resources is Europe. The UN Economic Commission for Europe (UNECE), which started working on water issues already in the late 1940s with a focus on hydroelectricity development, soon turned its attention to water pollution as well. The initial concern with water pollution from vessels was soon joined by concerns over industrial and urban waste as primary causes for deteriorating water quality.38 After a series of UNECE recommendations, declarations and decisions adopted from the 1960s to the 1980s, the organization turned its attention to the development of a regional treaty after the 1989 Meeting on the Protection of the Environment of the Conference on Security and Co-operation in Europe.39 Based on the recommendation of this meeting the UNECE developed the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (henceforth UNECE Water Convention).40 The Convention’s primary objective is to mitigate the threat of adverse effects of changes in the conditions of transboundary watercourses and international lakes on the environment, economies and well-being of the member countries of the Economic Commission for Europe.41 It obliges State Parties to, inter alia, ‘take all appropriate measures to prevent, control and reduce any transboundary impact’, to ‘ensure that transboundary waters are used with the aim of ecologically sound and rational water management, conservation of water resources and environmental protection’, ‘ensure that transboundary waters are used in a reasonable and equitable way’ and to establish joint bodies for the collection, compilation and evaluation of data to identify pollution sources, elaboration of joint monitoring programs concerning water quality and quantity, and elaboration of emission limits.42

39 ibid.
41 ibid Preamble.
42 ibid Articles 2 and 9.
This regional convention proved influential in the development of further treaties in the region. Two years after the adoption of the UN Water Convention, the Convention on Cooperation for the Protection and Sustainable Use of the Danube River (henceforth, the Danube River Protection Convention) was signed by eleven of the today nineteen riparian States in Sofia on 29 June 1994. Similarly to the UNECE Water Convention, the riparian States designed this framework of cooperation to provide water quality and ecosystem conservation benefits to the river ‘taking duly into account the interests of the Danubian States in the field of water use’, thus to derive benefits from the river. Further treaties that were concluded within the framework provided by the UNECE Water Convention and with the objective of providing benefits to the river include the 1999 Convention on the Protection of the Rhine and the 2002 Framework Agreement on the Sava River. In 2000, the European Union, which counts a large number of the UNECE Member States among its membership, equally adopted a framework directive, which integrated operative provisions of seven earlier directives dealing with water quality standards and pollution control. The European Union Water Framework Directive adopts a river basin management approach to setting water quality standards both through point source pollution control as well as standard setting (ecological and chemical status) for receiving water bodies. These examples illustrate that treaties with the objective of achieving benefits for the hydrologic systems through pollution regulation and ecosystem conservation are ultimately targeting the achievement of benefits from the river for people and States dependent on the resources as their core objective. Benefits from transboundary systems, such as sustainable drinking water supply, can only be achieved if the quality of the waters and the integrity of transboundary ecosystems are protected. A number of these treaties at the same time seek to realize additional mutual benefits (beyond good water quality) the riparian States can derive from the systems. The 2002 Framework Agreement on the Sava River, for example, includes the regulation of additional benefits from the river such as navigation, coordination of use for developing the hydro-energy potential as well as the reduction of costs because of the river, through control and management of flood, drought and ice hazards among others. Further treaty

45 Framework Agreement on the Sava River (3 December 2002 in Kranjska Gora) 2366 UNTS 479.
regimes which deal with these two categories of benefits are described in the following sections.

ii. Benefits from the River

Navigation was one of the first benefits from rivers recognized in treaties. Navigation rights have been settled through treaties since the seventeenth century and were frequently included in agreements aiming to end or prevent conflict, such as the 1815 Final Act of the Congress of Vienna\(^{47}\) and the 1885 General Act of the Berlin Conference,\(^{48}\) in order to settle access to territories and markets. The importance of continuous and joint oversight to ensure the benefits of free navigation on key trade arteries was acknowledged through the creation of the first international organization, the Central Commission for Navigation on the Rhine, with the 1815 Final Act.

The 1921 Convention and Statute on the Regime of Navigable Waterways of International Concern\(^{49}\) establishes general principles as to how not only benefits but also costs of maintaining navigability are to be shared. Article 10 of the Statute on the Regime of Navigable Waterways regulates the upstream/downstream benefit of maintaining navigability of waterways; it stipulates that a riparian which is under the obligation to undertake works in order to guarantee continued navigability of the river has the right to demand from others a reasonable contribution to the costs involved.\(^{50}\) The State that creates or maintains the navigation benefit from the river to others has the right to demand a contribution for the realization of this benefit and thus share in the benefits derived by others from its actions.

In addition to navigation benefits, treaties regulating benefits from the river focus on flow regulation for hydropower development, irrigation development, and water availability and drinking water supply (as discussed above). The majority of bilateral treaties developing benefit-sharing rules on "the benefits from

\(^{47}\) Final Act of the Congress of Vienna 1815, 64 Consol TS 453–93.
\(^{48}\) General Act of the Berlin Conference on West Africa 1885, LCCN 05018407.
\(^{49}\) Convention and Statute on the Regime of Navigable Waterways of International Concern (opened for signature 20 April 1921, entry into force 31 October 1922) 7 LNTS 35.
\(^{50}\) ibid Article 10(2) provides that: 'If such navigation necessitates regular upkeep of the waterway, each of the riparian States is bound as towards the others to take such steps and to execute such works on its territory as are necessary for the purpose as quickly as possible, taking account at all times of the conditions of navigation, as well as of the economic state of the regions served by the navigable waterway. In the absence of an agreement to the contrary, any riparian State will have the right on valid reason being shown, to demand from the other riparians a reasonable contribution towards the costs of upkeep.'
the river' category are those establishing joint infrastructure. The infrastructure is put in place by co-riparian States in order to benefit from the joint or coordinated management and use of the transboundary water resources. In general, these treaties include a specific formula on how benefits are shared; in a large number of cases these are shared in equal parts. This is for instance the case for the Yacyretá, Itaipú and Iron Gates projects. The three projects concern hydropower installations on contiguous stretches of transboundary watercourses; the first two are located on the Paraná River between Argentina and Paraguay, and Brazil and Paraguay respectively, the third is located on the Danube on the border between Serbia and Romania. The treaties forming the legal basis for these projects\(^1\) distribute hydropower benefits from the river between the respective contracting parties.

The Lesotho Highlands project between South Africa and the Kingdom of Lesotho is an example where the idea of sharing both hydropower and water supply benefits was pursued. The Lesotho Highlands project is a river diversion project focusing on: (i) water delivery from the Senqu/Orange River northwards into the Vaal River and Gauteng province of South Africa and (ii) hydropower generation in Lesotho.\(^2\) Ancillary benefits made possible by the investment, such as irrigation, tourism and fisheries, accrue to the country on the territory of which they occur. In the 1986 Treaty, which forms the basis for the project, two riparians of the Senqu/Orange River Basin, South Africa and Lesotho, agree that equitable utilization of the rivers’ resources consists in diverting waters from one tributary to another. South Africa would have been able to divert this water entirely within its own territory, but this would have come at higher costs, requiring a more complex system of civil works. Gravity-driven diversion from the upper reaches of the Senqu in the Lesotho Highlands turned out to be more cost-efficient and produces additional hydropower benefits for Lesotho. The Lesotho Highlands project therefore represents what is called a win-win project for the two riparians, and also for the population of Lesotho, which derives additional fisheries, recreation and irrigation benefits from the

\(^{1}\) Equal sharing of power benefits according to the Treaty of Yacyretá (signed 3 December 1973) 1380 UNTS 80, Article XIII; Treaty between the Federative Republic of Brazil and the Republic of Paraguay concerning the Hydroelectric Utilization of the Water Resources of the Paraná River owned in Condominium by the two Countries, from and including the Salto Grande de Sete Quedas or Salto del Guairá, to the Mouth of the Iguassu River (signed 26 April 1973) 923 UNTS 92; Treaty of Itaipú (1973) Article XIII; Agreement for the Iron Gates Project (signed 30 November 1963) 512 UNTS 10, Articles 5, 6, 8, provide for equal sharing of power and navigation potential.

constructed reservoirs.53 The project has benefits from the river and to States in mind. In addition, the Lesotho Highlands project also considered maintaining benefits to the river. After an Environmental Flow Assessment, which was completed in 2000, the two contracting Parties agreed to flow releases from infrastructure that was higher than what had been required by the 1986 Treaty, in order to protect endangered species as well as the livelihoods of about 155,000 people living along the rivers flowing into South Africa.54

Other treaties that provide for infrastructure construction and management for hydropower and irrigation benefits include the 1996 Treaty concerning the Integrated Development of the Mahakali Barrage including Sardara Barrage, Tanakpur Barrage and Pancheswar Project.55 In this treaty, India and Nepal agreed to water allocation and infrastructure construction on their shared border to gain irrigation and hydropower benefits from the Mahakali River.56 The 2000 Agreement on the Use of Water Management Facilities on Intergovernmental Status on the Rivers Chu and Talas,57 agreed between the Republic of Kazakhstan and the Kyrgyz Republic, regulates the benefit and cost allocation on irrigation and hydropower infrastructure. The two rivers are shared by both countries. The benefits Kazakhstan can derive from the two rivers depend on flow regulation and operation of infrastructure that is located in Kyrgyzstan. The two countries agreed on pro-rata sharing of infrastructure operation and maintenance costs in accordance with the water volumes received by each party and established a joint commission to determine the infrastructure operation, and required operation and maintenance costs.

When States agree on treaties to derive benefits from the river other than through improving water quality by providing benefits to the river, the agreements often include cooperative development or management of infrastructure. To secure the investments made in benefit generation, the respective treaties most often include also rules on the sharing of the costs for the construction, operation and maintenance of said infrastructure. The above-mentioned 1961

53 Yu (n 28) 53.
56 ibid. The treaty further includes a clause on minimum in-stream flow requirements to maintain benefits to the river. Article 1(2) states that ‘India shall maintain a flow of not less than 10m³/sec downstream of the Sarada Barrage in the Mahakali River to maintain and preserve the river ecosystem.’
Treaty Relating to Cooperative Development of the Water Resources of the Columbia River Basin (henceforth Columbia Basin Treaty), in which the United States and Canada agreed to the construction of a series of dams as well as to joint cascade management for the purpose of deriving hydropower benefits from the river, as well as to reduce the costs of flood damage because of the river, is one such example.

iii. Benefits Resulting from the Reduction of Costs that Occur Because of the River

The benefit- and cost-sharing arrangements for flood control that are included in the treaty between the United States and Canada on the Columbia River are based on the construction of upstream reservoir storage in Canadian territory to regulate downstream flows. The hydropower infrastructure that was built in the 1930s and 1940s in the United States was not able to adequately address flood management, because it only provided limited storage. After the trigger-event of a severe flood that affected riverine communities from Trail in British Columbia down to Oregon and completely destroyed Vanport, the second largest city in Oregon in 1948, the two Parties accelerated the studies on flood management with respect to the river, which led to an agreement by the United States to pay 50 percent of the estimated value of US flood damage prevented through the construction of three hydropower and storage dams on Canadian territory. The lump sum payments Canada received are intended to pay for flood protection benefits through to September 2024. After this date, unless the treaty is terminated, Canada will continue to be obliged to provide flood control benefits, for which it will be reimbursed by the United States.

The Columbia River Treaty is an example of an agreement where riparian countries share the benefits and costs that accrue both from, as well as because of, the river. It is a standard frequently being referred to globally as an example of a benefit-sharing arrangement between riparian countries of transboundary rivers. Canadian stream flow regulation through the Columbia River

60 Both Parties can terminate the Treaty at any time on or after 16 September 2024 with ten years advance notice (Columbia Basin Treaty, art XIX).
61 The reimbursement is calculated based on lost power benefits and operating costs that accrue to Canada due to flood control operation of the dams.
Treaty infrastructure and associated agreements have enabled power trade and electricity supply benefits far beyond the river in the Pacific Northwest. The Pacific Northwest Coordination Agreement (PCNA) governs the optimization of electricity supply and coordinated hydropower production that takes advantage of regional streamflow diversity in the entire Pacific Northwest.\(^{62}\) Other treaties through which countries have sought to benefit from the reduction of costs (related to flood damage) because of the river include the above-mentioned Framework Agreement on the Sava River, the 1963 Agreement on the Iron Gates Project on the Danube\(^{63}\) and the 1989 Agreement concerning the regulations governing Lake Saimaa and the Vuoksi River concluded between Finland and the then Soviet Republic.\(^{64}\) Flood protection is equally a mandate of the international commissions established by the 1999 Rhine River Convention and the 1994 Danube Protection Convention respectively. In this case, the flood protection benefits and the reduction of the costs because of the river have been converted to partially produce benefits to the river. Both commissions are implementing flood protection plans that include the restoration of natural wetlands as natural floodplains.\(^{65}\)

Floods, ice hazards and droughts are costs that occur due to hydrologic events affecting the river. International water treaties have also been concluded to avoid costs that occur indirectly because of a river and are related to political tensions and conflict around economic benefits that may be gained from a river. A number of treaties were concluded to prevent or end conflicts that were directly or indirectly related to transboundary waters. Multiple agreements touch on the determination of boundary lines that are drawn along, within or across rivers of international lakes to avoid the costs of future conflict over territorial claims;\(^{66}\) and navigation rights have been settled to avoid costs of conflict over access to territories and markets through, for instance, the 1815 Final Act of the Congress of Vienna\(^{67}\) and the 1885 General Act of the Berlin Conference.\(^{68}\) Striking a similar vein, the 1960 Indus Waters Treaty is frequently hailed as an

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\(^{62}\) US Army Corps of Engineers and Bonneville Power Administration (n 59) 7.
\(^{63}\) Agreement for the Iron Gates Project (signed 30 November 1963) 512 UNTS 10.
\(^{64}\) Agreement between the Government of the Republic of Finland and the Government of the Union of Soviet Socialist Republics Concerning the Regulation Governing Lake Saimaa and the Vuoksi River (Helsinki, 26 October 1989) 1663 UNTS 337.
\(^{65}\) Conference of Rhine Ministers, Rhine 2020: Program on the sustainable development of the Rhine (ICPR 2001) 14.
\(^{66}\) See, for example: Treaty of Territorial Limits Between Costa Rica and Nicaragua (15 April 1858); Soviet-Afghan Treaty on Border Demarcation (16 June 1981).
\(^{67}\) Final Act of the Congress of Vienna (9 June 1815) 64 Consol TS 453.
\(^{68}\) General Act of the Berlin Conference on West Africa (26 February 1885) LCCN 05018407.
example to avoid the potential costs of conflict over water availability.\textsuperscript{69} The Treaty allocates primary use rights on the three Eastern most tributaries of the Indus Basin, the Sutlej, Beas and Ravi rivers to India and on the Chenab, Jhelum and the Indus, the so-called ‘Western Rivers’, to Pakistan. It also provided for the making available of financial resources to build the so-called ‘replacement infrastructure’ which made possible the redistribution of waters of the three Western Rivers across Pakistani territory downstream from the Sutlej, Beas and Ravi. This arrangement is an alternative solution to an agreement on operating rules for upstream regulating infrastructure, such as that agreed by Kazakhstan and the Kyrgyz Republic on the Chu-Talas Rivers, in order to ensure water flow to countries that depend on shared water resources. The benefit-sharing/reduction-of-cost arrangements on the Indus waters are supported by an effective dispute settlement mechanism, consisting of a permanent joint commission, as a platform for regular dialogue, and structured dispute settlement procedures including the involvement of third parties, agreed between the two Parties.

iv. Benefits Beyond the River

Treaties that focus on the benefit of reducing the costs because of the river stand in stark contrast to legal frameworks through which riparian States seek to pursue a panoply of benefits that can be achieved beyond the river through forward linkages into sectors that are indirectly related to the management of transboundary basins. The above-mentioned PCNA for the Columbia Basin and the 1993 Agreement on the Use of Water and Energy Resources of the Syr Darya Basin\textsuperscript{70} are limited to the forward linkages of electricity trading beyond the river. However, in at least three basins, riparian States have used the river

\textsuperscript{69} The Indus Waters Treaty (19 September 1960) 419 UNTS 125. See, for example, Iosif Kovras, \textit{Truth Recovery and Transitional Justice: Deferring Human Rights Issues} (Routledge 2014) 109: ‘A good example of delinkage of environmental issues from peace negotiations is the Indus Waters Treaty signed in 1960 between India and Pakistan, under the auspices of the World Bank. The Indus Waters Treaty secures a form of distribution of water between the two countries. This riparian cooperation untied the Kashmir dispute from the problem of water allocation and has worked quite efficiently. The treaty has become the strongest link of bilateral cooperation, and water distribution has continued, even during three waves of conflict over Kashmir’ (notes omitted). In fact, the Indus River Commission has continued to operate despite the occurrence of two wars between India and Pakistan. Similarly, the Mekong River Commission ensured cooperation between Cambodia, Laos, Thailand and Vietnam during times of hostility in the region and through the Vietnam War, and talks on the sharing of the Jordan River continued between Israel and Jordan during the war between those countries since 1955. See <www.un.org/waterforlifedecade/transboundary_waters.shtml> accessed 19 May 2016.

\textsuperscript{70} Finalized by Kazakhstan, the Kyrgyz Republic and Uzbekistan in Bishkek on 17 March 1998, and amended by a Protocol which adds Tajikistan as a Party to the Agreement on 7 May 1999 <http://ocid.nacse.org/tfdd/treaties.php> accessed 18 May 2016.
basin as a planning unit to achieve a much broader array of economic integration benefits. The Kagera Basin Organization (KBO) was established in 1977 by Burundi, Tanzania and Rwanda with a far-reaching mandate for water resources management and economic development in the basin area and with, *inter alia*, the capacity to approve projects and enter into financing agreements with international institutions. The objectives of the Organization were ‘to deal with all questions relative to the activities to be carried out in the Kagera Basin’, including typical benefits from the river such as water supply, hydro-power development and fisheries, as well as benefits beyond these. The KBO was mandated to further economic development through mining and industrial operations, including through the furnishing of waters, development of transport, communications, trade, establishment of disease and pest control, wildlife conservation and tourism, among others. In the early 1990s, the organization became defunct due to political differences in the basin. However, it was only formally dissolved in 2004 once a new mechanism, the Nile Equatorial Lakes Coordination Unit of the Nile Basin Initiative, came into existence to continue with the implementation of the original Kagera Basin Development Program and the pursuit of benefits from and beyond the river.

In Latin America, States pursued economic integration to achieve mutual benefits beyond the river in both the River Plate and the Amazon basins. The five River Plate riparians, Argentina, Bolivia, Brazil, Paraguay and Uruguay, established an Intergovernmental Coordination Committee to ‘permit the harmonious and balanced development and optimum utilization of the principal natural resources of the region’ and to promote economic development in the basin through studies, plans and works on navigation and utilization of water resources as well as on the improvement of road, rail and air interconnections to complement river transport, and electrical and telecommunications connections. Plans for cooperation further extended to establishing complementary industries and into the areas of education, health and disease control. In 1978, shortly after the KBO was established, the seven riparian countries of the Amazon Basin, as well as Suriname, which shared the Amazon rainforest with the riparian countries, agreed to the pooling of their efforts to ‘promote the harmonious development of the Amazon region, to permit an equitable

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71 Agreement for the establishment of the Organization for the Management and Development of the Kagera River Basin (Rusumo, 24 August 1977) 1089 UNTS 171.
72 ibid art 2.
74 Treaty of the River Plate Basin, Brasilia (23 April 1969) 875 UNTS 11, Preamble.
75 ibid art 1.
76 Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru and Venezuela.
distribution of the benefits’ among them. Similar to the two other basin frameworks for regional integration, the benefits considered include typical benefits to (water related ecosystem protection) and from the river (e.g. navigation), as well as multiple development benefits that become available through cooperation beyond the river. In the case of Amazon regional cooperation these were intended to include health services, the benefits of cooperative research and development, retail trade, transport and communications infrastructure, and conservation of ethnological and archaeological value. In 1998, the institutional structure of cooperation was enhanced with the establishment of the Amazon Cooperation Treaty Organization (ACTO). Today, ACTO is active beyond the river in the areas of forest management, the prevention of the illicit trade of forest products, as well as indigenous affairs, and has signed a coordination agreement with the Intergovernmental Coordination Committee of the River Plate countries.

V. ENLARGING THE BASKET OF BENEFITS THROUGH JOINT BASIN MECHANISMS

The case studies analyzed above illustrate that joint management mechanisms and basin organizations are vehicles typically used to manage the generation and distribution of benefits, in particular where multiple benefits are being shared. This has been the case in the Amazon, the River Plate and the Kagera, as well as in the Senegal Basin. At the same time, and over time, some of these institutions have also contributed to the expansion of the ‘basket of benefits’ shared between riparian States. Indeed, joint basin mechanisms have an impact in all four categories of benefits. As can be seen from the case studies, these mechanisms assist in the direct management of benefits to (Category 1), from (Category 2) and because of (Category 3) the river. For example, such benefits might include flood control, increasing the level of water in the basin, dredging, easing political tensions, or electricity generation through hydropower. The case studies also reveal that beyond these there are further benefits (Category 4) that can be optimized – indirectly – through the basin mechanisms. This enlarged

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77 Treaty for Amazonian Cooperation (Brasilia, 3 July 1978) 1202 UNTS 71, Preamble.


basket of benefits may include food security, preventing drought, joint research and development, and trade, for example.

The UNECE Water Convention Secretariat, initially concerned with providing technical assistance to contracting parties on water pollution regulation and management, has over the years expanded its support to countries in other areas. Today cooperation and benefits derived therefrom include improved dam safety in Central Asia, the management of flood risks and adaptation to climate change at the basin level. In line with this development, the activities of the two basin protection commissions on the Rhine and Danube rivers expanded their field of engagement from pollution control and monitoring to flood prevention and management, the reintroduction of fish species, and climate change adaptation planning.

Over time, treaties and basin mechanisms aimed at regulating shared water resources will only become more important as the scarcity of water becomes more acute.

VI. CONCLUSION: BENEFIT SHARING AS REFLECTED IN INTERNATIONAL WATER LAW

Achieving agreement on defined benefit-sharing rules at the basin level, rather than in the context of a specific project, is a challenging task given the multitude of benefits that are possible to, from, because of and beyond the river. In basins that are shared by more than two countries this becomes an even more complex matter. The most prevalent way by which multilateral water treaties give consideration to benefits and their distribution among riparian States is by a general recognition of the contribution of cooperation and joint activities in increasing benefits and improving living standards. The recognition of a common aim to share and equitably distribute benefits is expressed in a large number of treaties in their preambles or first articles.

The benefit-sharing concept goes beyond the principle of equitable and reasonable utilization; though this international water law principle provides useful

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guidance for benefit sharing between States. The principle of equitable and reasonable utilization, as codified in the 1997 UN Watercourses Convention, contains important elements that can be applied by States in setting up benefit-sharing rules. The list of criteria that are to be taken into account in the assessment of equitable and reasonable use provides, at the same time, a useful list of elements to be considered in the design of benefit-sharing frameworks, some of which have been applied in the Senegal River basins. The fact that Article 5 does not only refer to utilizations but also to benefits encourages countries to focus their cooperation not only on the allocation of water for specific uses, but also on the increase of benefits that can be derived from alternative water uses, thereby increasing the ‘basket of benefits’ available to them. Alternative methods of increasing the benefits that can be and have been derived from transboundary rivers, for instance in the Columbia River Basin through reservoir management, not only for flood protection but also for the optimization of energy production, become more frequent in practice. In most cases, States address more than one of the four identified benefit categories in one treaty. The benefits to, from, because of and beyond the river are interrelated. The combination of multiple benefits in one agreement allows for trade-offs and is used to ensure that all participating States receive benefits. Countries develop benefit-sharing mechanisms and institutions to increase the scale of benefits available to them, and also to prevent and settle disputes concerning competing demands on transboundary water resources.