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Policy Guidance Note on the Benefits of Transboundary Water Cooperation

Identification, Assessment and Communication

UNITED NATIONS

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Views expressed in the case studies are those of the authors and do not necessarily reflect those of the United Nations or its Member States.

All references to Internet sites and their URL addresses in this publication are as last accessed in August 2015.

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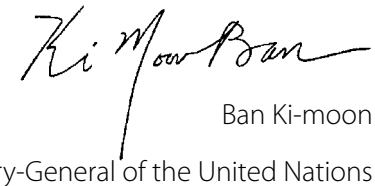
FOREWORD

Ensuring the availability of water is one of the major global challenges of our time. Climate change, population growth, urbanization and unsustainable economic development are projected to cause water problems in all countries and continents, with increased competition for scarce water resources, constraints on socioeconomic development and inequality of access. Water is thus a key element in the newly adopted 2030 Agenda for Sustainable Development.

Given the complexity and scale of the challenges, strong cooperation is needed to tackle them. And, given that most water resources cross borders, transboundary cooperation is crucial. However, fears of losing national sovereignty, misperceptions about the risks and benefits of cooperation, as well as a lack of capacity and political will can stand in the way of joint work. The United Nations Economic Commission for Europe Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention) provides rule-based solutions for strengthening cooperation and a global platform for exchanging experiences and fostering progress.

History shows that transboundary water cooperation promotes increased energy and food production, enhanced resilience to disasters and economic integration. This *Policy Guidance Note on the Benefits of Transboundary Water Cooperation: Identification, Assessment and Communication* will assist countries and other actors to reap the numerous benefits of joint action, building on experiences in transboundary basins from all over the world. It can also help to support dialogue on the benefits of collaboration, which can unlock situations where neighbourly relations have stalled and broaden and deepen ongoing cooperation.

To achieve the Sustainable Development Goals, we will need to look beyond national boundaries and short-term interests. I therefore call on Governments and other stakeholders to make use of this *Policy Guidance Note* as well as the many other tools developed under the Water Convention.



Ban Ki-moon

Secretary-General of the United Nations

PREFACE

Transboundary basins provide drinking and domestic water for about 2 billion people worldwide, support irrigation for agriculture, enable industries to function, generate electricity and conserve ecosystems. Today, these transboundary water resources are under pressure from growing populations, unsustainable development patterns and climate change impacts, making cooperation over their management vital. Nevertheless, many obstacles can prevent countries from strengthening or embracing effective joint management of transboundary waters, or can delay this process. These include differing levels of socioeconomic development and institutional capacity, diverging priorities and conflicting policies, but also an incomplete or biased perception of the benefits that could be achieved by cooperating with their neighbours.

The United Nations Economic Commission for Europe Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention) promotes cooperation on transboundary surface waters and groundwaters. Countries considering accession and Parties implementing the Convention engage in discussions on the benefits and beneficiaries of such cooperation. Considering the lack of accessible guidance on this matter, the Meeting of the Parties to the Water Convention, at its sixth session in 2012, decided to develop a policy guidance note to support countries in the assessment of the benefits of transboundary water cooperation. More than 100 experts from national authorities, academia and non-governmental, inter-governmental and international organizations collaborated to produce a comprehensive and functional guide to identifying, assessing and communicating the benefits of transboundary cooperation.

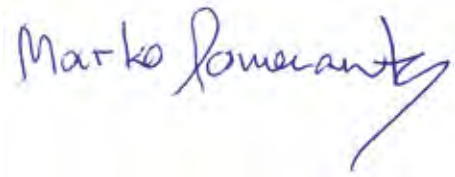
This *Policy Guidance Note on the Benefits of Transboundary Water Cooperation: Identification, Assessment and Communication* offers practical and accessible step-by-step advice for policymakers and other actors, to enable them to easily undertake benefit assessments for their country or region through a participatory process. It highlights the wide range of economic, social, environmental, governance and security benefits that effective cooperation can generate and provides direction for the assessment and communication of such opportunities. Building on the outcomes of discussions during multiple workshops, as well as inputs from case studies and experts from around the world, the guidance note is a globally-relevant tool to promote and enhance transboundary cooperation through benefit assessments and the effective communication and integration of their results into policy processes.

We believe that a benefit assessment can bring new ideas, fact-based arguments and incentives to cooperate by revealing previously overlooked benefits. It can highlight the common interests that would be served by cooperating when cooperation is weak. Even where cooperation is already in place, needs and priorities can shift over time. The assessment of existing or potential new benefits as a regular feature of cooperation can confirm the necessity for countries to cooperate and help to ensure much-needed political support and funding.

We are convinced that the joint undertaking of a benefit assessment is an excellent way to build and maintain a relationship of mutual trust and support. Joint discussions over water resources have historically been an entry point for further negotiations between riparian countries. We also believe that such benefit assessments can contribute to a reflection on possible accession to the Water Convention. We invite you to use the wisdom and guidance gathered from regions around the globe to explore the broad range of benefits of cooperation over transboundary waters in your countries.

Christian Friis Bach

Executive Secretary of the United Nations Economic Commission for Europe



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ACRONYMS AND ABBREVIATIONS

ECE United Nations Economic Commission for Europe

GEF Global Environment Facility

ISRBC International Sava River Basin Commission

IWRM Integrated Water Resources Management

NGO non-governmental organizations

OECD Organization for Economic Cooperation and Development

TDA Transboundary Diagnostic Analysis

EXECUTIVE SUMMARY

Transboundary water cooperation is necessary to manage shared waters in an integrated and sustainable way, and its development has generated different legal and institutional frameworks. Such cooperation includes information sharing, coordination, collaboration and joint action in an iterative and cyclical process.

Transboundary water cooperation has the potential to generate many significant benefits for cooperating countries, such as accelerated economic growth, increased human well-being, enhanced environmental sustainability and increased political stability. In general, the higher the level of transboundary water cooperation, the greater the benefits. But while transboundary water cooperation has been increasing, some countries are still facing difficulties in cooperating. Even those countries that cooperate frequently do it only on a limited number of issues.

Benefit assessment exercises can help countries realize the potential value of cooperation and can therefore contribute to the implementation of the cooperation requirements under international water law. Given the lack of guidance on how to undertake such exercises, at its sixth session (Rome, 28–30 November 2012), the Meeting of the Parties to the United Nations Economic Commission for Europe (ECE) Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention) mandated the development of this Policy Guidance Note on the Benefits of Transboundary Water Cooperation: Identification, Assessment and Communication (Policy Guidance Note). The text is a collaborative achievement and the result of an extended process of information gathering, reflection and consultation.

The aim of this publication is to support Governments and other actors in realizing the potential benefits of transboundary water cooperation. It does so by providing an introduction to the benefits of transboundary water cooperation and information on how to carry out a benefit assessment exercise. This includes the separate but related tasks of identification, assessment and communication of benefits. This Policy Guidance Note suggests how to approach those tasks, as well as how the assessment of benefits can be integrated into transboundary water cooperation policy processes.

Countries in the process of preparing for accession to or implementing the Water Convention tend naturally to engage in a reflection around the benefits of cooperation, which is one of the obligations under the Convention. A benefit assessment can provide arguments for cooperating to ensure the sustainable management of transboundary waters resources.

The Water Convention became a universally open legal framework in 2013. Accordingly, **this Policy Guidance Note targets a global audience, and draws on expertise and case studies from around the world**. The benefits of transboundary cooperation for both surface waters and groundwaters are outlined in this publication.

Launching a benefit assessment exercise

There are compelling reasons to undertake a benefit assessment exercise. It can provide fact-based arguments for starting up cooperation or developing stronger cooperation. It can facilitate broadening the scope of cooperation by defining a "benefit cluster". And it can help to attract financial resources to implement transboundary water cooperation solutions.

A benefit assessment exercise needs to be closely tied to a transboundary water cooperation policy process. It will contribute to progress only if its outcomes are taken into consideration for policy planning towards stronger cooperation and the realization of its potential benefits. For this to happen, some level of mutual trust is necessary and dialogue needs to be ongoing. Existing joint bodies are the natural platform for such dialogue. Therefore, if there is already a cooperation agreement with a joint body in place, a benefit assessment exercise in the framework of that body can serve to identify further opportunities and allow for a deepening of the cooperation between the parties. A situation

where countries have just begun negotiating cooperation options would also greatly benefit from a transboundary water cooperation benefit assessment. The outcomes of a benefit assessment could then feed into the process, leading to the establishment of such a formal cooperation platform. If there is no existing policy process in place at all, a rapid exercise of benefit identification and assessment, however weak, may be useful for awareness-raising and advocacy. A discussion of benefits can also usefully take place in the framework of a national level policy process to help a country decide whether engaging in or scaling-up transboundary water cooperation should be a priority.

The benefit assessment should be designed to match the needs of the transboundary water cooperation policy process, taking into account the level of trust between riparian States and the maturity of the process. The level of detail of the supporting evidence generated by the benefit assessment will need to be adapted accordingly, in order to influence policymakers. Different transboundary water cooperation policy processes will also offer different opportunities for including the results of the benefit assessment in decision-making. The characteristics of the transboundary water cooperation policy process should drive the level of ambition of the benefit assessment, the selection of methodologies, the involvement of stakeholders (policymakers, experts and beneficiaries) and the strategies for communicating the results.

Identifying the benefits of transboundary water cooperation

It is important to ensure that the scope of the assessment is broad enough to make it possible to identify a broad range of benefits. The benefits of transboundary water cooperation will vary from basin to basin according to their economic, social, environmental and geopolitical characteristics. They will also vary according to the cooperation stage. The benefits identified should then undergo a "screening" to select for assessment the most relevant and important benefits, taking into account their potential magnitude and other policy-relevant criteria.

Typology of the potential benefits of transboundary water cooperation

Origin of benefits	*Benefits for economic activities*	*Benefits beyond economic activities*
Improved water management	**Economic benefits** Expanded activity and productivity in economic sectors (aquaculture, irrigated agriculture, mining, energy generation, industrial production, nature-based tourism) Reduced cost of carrying out productive activities Reduced economic impacts of water-related hazards (floods, droughts) Increased value of property	**Social and environmental benefits** Health impacts from improved water quality and reduced risk of water-related disasters. Employment and reduced poverty impacts of the economic benefits Improved access to services (such as electricity and water supply) Improved satisfaction due to preservation of cultural resources or access to recreational opportunities. Increased ecological integrity and reduced habitat degradation and biodiversity loss Strengthened scientific knowledge on water status
Enhanced trust	**Regional economic cooperation benefits** Development of regional markets for goods, services and labour Increase in cross-border investments Development of transnational infrastructure networks	**Peace and security benefits** Strengthening of international law Increased geopolitical stability and strengthened diplomatic relations New opportunities from increased trust (joint initiatives and investments) Reduced risk and avoided cost of conflict and savings from reduced military spending Creation of a shared basin identity

Assessing the benefits of transboundary water cooperation

The nature and the level of detail of the "assessment phase" will vary according to the issues, the cooperation stage and the political will of the parties involved. The benefit assessment can be useful in informing new options, evaluating past options and informing new decisions. All benefits that pass the screening test in the identification step should undergo at least a qualitative assessment. As the types of benefits of transboundary water cooperation vary greatly, the assessment approaches will also necessarily be different. Many, but not all, benefits can undergo a quantitative assessment. Only in some cases can the monetary value of the benefits be assessed. The aim of the assessment phase is to contribute to advancing the transboundary water cooperation process, and this should guide the ambition of the assessments of individual benefits and the selection of assessment methodologies.

Matching the focus of the assessment phase to the policy needs

Stage of development of the transboundary water cooperation policy process	*Needs of the transboundary water cooperation policy process*	*Focus of the benefit assessment exercise*	*Main focus of the assessment phase*
Pre-initial stage (e.g. basins characterized by political conflict)	Establish the conditions for launching a cooperation process	Identification of mutually beneficial opportunities from shared water resources	Rapid qualitative assessment of key benefits
Initial stage (e.g. basins without international agreement or transboundary coordination body)	Launch of the cooperation process, supported by awareness raising on the need to cooperate	Identification of the full range of the benefits of cooperation	Rapid qualitative assessment of all identified benefits
Medium stage (e.g. negotiations on an agreement ongoing or basins with international agreement, but without coordination body)	Consolidation of the cooperation process through negotiations, strategic planning and the implementation of basic cooperation initiatives (e.g. information sharing)	Broad assessment of the range of benefits of cooperation (including cost of non-cooperation)	In-depth qualitative assessment of all identified benefits Include easily available quantitative and monetary estimates
Advanced stage (e.g. basins with international agreement and coordination body)	Realization of the potential benefits of cooperation through the implementation of advanced cooperation initiatives (e.g. infrastructure projects, coordinated management instruments)	Assessment of the benefits of independent national projects, joint projects, or a basin programme of measures	Carry out quantitative and monetary valuation, when justified given available resources

Communicating the benefits of transboundary water cooperation

Communication efforts are key to integrating the assessment results in the transboundary water cooperation policy process. When starting a benefit assessment exercise, it is important to consider how the results will be communicated, both for internal communication and for public information. Poorly planned or executed communication efforts are likely to be counterproductive and damage the cooperation process by increasing transaction costs and decreasing ambitions.

In developing an internal communications approach for decision-makers and stakeholders, however simple, it will be necessary to understand the possible drivers for decision-making, and therefore how the results of the benefit assessment will be fed into the policy process. It may be necessary to start by identifying the topics that stakeholders can relate to and the opportunities to influence the policy process through the types of information that can be generated by a benefit assessment. This will lead to the definition of the intended purpose and how to achieve it. When communicating with the public, it is essential to first identify target groups. Communicating the benefits of transboundary water cooperation to the public should be tailored to the audiences (environmental non-governmental organizations (NGOs), river communities, etc.) and purposes. The messages should be meaningful for the intended target groups. They should be simple and fact-based. Opportunities for using different communication channels should be considered before selecting the best way to reach the public.

Depending on the stage of the transboundary water cooperation policy process, the messages will be only forward-looking (leading to cooperation) or may be backward-looking as well (building on the results already achieved). **Communication efforts should focus on moving from perception to facts**. Successful tactics include relating the benefits of transboundary water cooperation to national priorities and programmes, packaging benefits and paying attention to timing (e.g. upcoming elections).

HOW TO USE THIS POLICY GUIDANCE NOTE

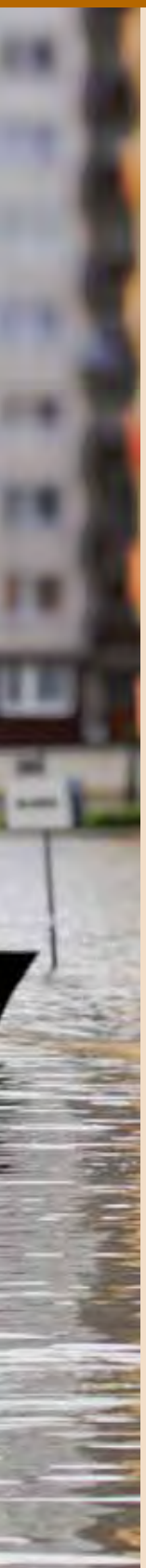
The contents of this Policy Guidance Note may be used by different readers for different purposes. Officials in ministries of water or joint bodies considering the possibility of carrying out a benefit assessment exercise may want to review the text in detail. Other readers may want to focus their attention on particular sections of the document, according to their objectives, such as:

- ***Gaining an overview of the benefits of transboundary water cooperation and the concept of a benefit assessment exercise***. Some senior officials looking for a brief introduction to these topics may want to focus only on the Executive Summary;
- ***Understanding transboundary water cooperation***. Readers that are unfamiliar with transboundary water cooperation may want to consult section D, "The basics of transboundary water cooperation", at the end of chapter 1. Materials available, for example, on the ECE website,[1] can help readers gain a deeper understanding of transboundary cooperation;
- ***Making the case for transboundary water cooperation***. Readers seeking to promote transboundary water cooperation may find the discussion of the types of benefits and the description of benefits offered in the second part of chapter 3 useful. That discussion may help some readers to structure and sharpen their arguments;
- ***Planning a benefit assessment exercise***. Readers looking to carry out a benefit assessment exercise may find chapter 2 particularly useful for planning the exercise;
- ***Carrying out a benefit assessment exercise***. Readers charged with implementing a benefit assessment exercise will want to read chapters 3 to 5, which provide more detailed guidance on how to approach the different phases of such an exercise. They should keep in mind, however, that detailed technical guidance on assessment methodologies is beyond the scope of this document.

[1] http://www.unece.org/env/water.html.

Chapter 1

Introduction



A. Aim, scope, target audience and structure

This aim of this publication is to support Governments and other actors in realizing the potential benefits of transboundary water cooperation. It does so by providing an introduction to the benefits of transboundary water cooperation and information on how to carry out a benefit assessment exercise. A benefit assessment exercise includes the separate but related tasks of identification, assessment and communication of benefits. This Guidance suggests how to approach those tasks, as well as how the assessment of benefits can be integrated into transboundary water cooperation policy processes.

Countries in the process of preparing for accession to or implementing the Water Convention tend naturally to engage in a reflection around the benefits of cooperation, which is one of the main obligations under the Convention. A benefit assessment can provide arguments for cooperating to ensure the sustainable management of transboundary waters resources. The benefits of transboundary cooperation are outlined for both surface waters and groundwaters, within a global geographical scope. The Water Convention became a universally open legal framework in 2013. Accordingly, this Policy Guidance Note targets a global audience, and draws on expertise and case studies from around the world.

This Policy Guidance Note does not, however, look at how to implement actions to ensure that the benefits of transboundary water cooperation are realized, or how to share those benefits. This Guidance should be seen as part of a broader analytical process that supports transboundary water cooperation.[2]

The primary target audience is senior officials in ministries responsible for foreign affairs, finance, economic development, environment or water, as well as joint bodies for transboundary water management. This Policy Guidance Note is also relevant for development cooperation partners and national stakeholders (including relevant business and civil society organizations).

The guidance is structured around five chapters. Chapter 1 explains why and how the Policy Guidance Note was developed, and summarizes the arguments for carrying out a benefit assessment exercise. It also provides an introduction to transboundary water cooperation. Chapter 2 offers guidance on how to approach and plan for a benefit assessment exercise. Chapter 3 examines how to approach the identification phase of a benefit assessment exercise, and describes the types of benefits of transboundary water cooperation: economic benefits; environmental and social benefits; regional economic benefits; and peace and security benefits. Chapter 4 looks at how to approach the assessment phase of a benefit assessment exercise, as well as the assessment of the four types of benefits. Chapter 5 provides guidance on how to approach the communication phase of a benefit assessment exercise.

[2] Other analytical tools include transboundary diagnostic analyses, political economy analyses, social assessment and risk assessment.

B. Why has this Policy Guidance Note been developed?

Transboundary water cooperation has the potential to generate many significant benefits for cooperating countries, such as accelerated economic growth, increased human well-being, enhanced environmental sustainability and increased political stability. In general, the higher the level of transboundary water cooperation, the greater the benefits.

While transboundary water cooperation has been increasing, some countries still face difficulties in cooperating. In most cases, countries cooperate driven by the "ethics of cooperation" enshrined in international legislation and the expectations of the international community. The strengthening of international water law with the entry into force of the United Nations Convention on the Law of the Non-Navigational Uses of International Watercourses (United Nations Watercourses Convention) and the globalization of the Water Convention should encourage additional countries to align with their main principles. At the same time, countries tend to cooperate when the net benefits of cooperation (in a wide sense) are perceived to be greater than the net benefits of non-cooperation, and when the distribution of these net benefits is perceived to be fair. Failure to cooperate is usually due to either a lack of trust between parties, or a lack of recognition of the full benefits of cooperation.

Even those countries that cooperate often do so only on narrow issues. There is scope for increasing transboundary water cooperation from quantity or quality issues to a broader set of issues, and by moving from "sharing water" (i.e. allocating water resources among riparian States) to "sharing the benefits of water" (i.e. managing water resources to achieve the maximum benefit and then allocating those benefits among riparian States, including through compensation mechanisms). There is even greater scope for increasing cooperation by moving from sharing the benefits of water to realizing the broader benefits of water cooperation. As transboundary water cooperation becomes stronger, additional options for improving the management of shared basins becomes possible, and with them additional benefits can be realized.

A benefit assessment exercise can help countries to realize the potential benefits of cooperation. A focused effort to identify the broad set of benefits of transboundary water cooperation will help to uncover previously overlooked benefits and identify opportunities. This may already strengthen the case for cooperation, including the process of possible accession to the United Nations Watercourses Convention and the ECE Water Convention. Assessing the identified benefits can further support the development or strengthening of cooperation by showing where cooperation efforts are more likely to pay off. In addition, communicating the benefits of cooperation is key to effectively influencing transboundary water cooperation policy processes. Those three elements – identification, assessment and communication – can be packaged as a benefit assessment exercise.

C. How has this Policy Guidance Note been developed?

This Policy Guidance Note is a collaborative achievement. Its development was mandated by the sixth session of the Meeting of the Parties to the Water Convention (Rome, 28–30 November 2012), as part of the 2013–2015 programme of work (see ECE/MP.WAT/37/Add.1, work area 3.2). It is the result of an extended process of information gathering, reflection and consultations. More than 100 experts from national authorities, academia and non-governmental, inter-governmental and international organizations contributed to its development, including at a series of workshops. A scoping workshop[3] took place in Amsterdam in June 2013, an expert workshop[4] to discuss case studies from around the world took place in Geneva in May 2014 and a final workshop, focusing on regional integration and geopolitical benefits[5], took place in Tallinn in January 2015. Additional consultations took place in Stockholm, Barbados, Geneva and Quebec City in September/October 2013 and May 2014.

[3] More information is available from http://www.unece.org/env/water/1st_workshop_benefits_cooperation.html.

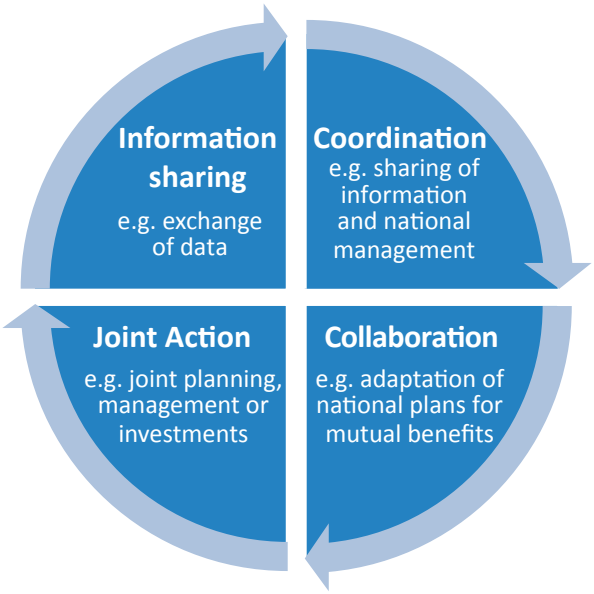
[4] More information is available from http://www.unece.org/env/water/workshop_benefits_cooperation_2014.html.

[5] More information is available from http://www.unece.org/env/water/workshop_benefits_cooperation_2015.html.

D. The basics of transboundary water cooperation

In the context of this Policy Guidance Note, transboundary water cooperation is understood as effective cooperation between two or more countries sharing a transboundary river, lake, or aquifer.[6] The concept of cooperation includes a continuum of different modes ranging from information sharing, to coordination, collaboration and joint action (see figure 1). While greater levels of cooperation can be expected to generate greater benefits for the cooperating parties, the optimal mode of cooperation will depend on numerous factors (including hydrologic characteristics, the economics of cooperative investments, the number of parties and their relationship, and the cooperation costs). Cooperation can be defined as any action or set of actions by riparian States that leads to the enhanced management or development of the transboundary water body to their mutual satisfaction. Transboundary waters are any surface waters or groundwaters that mark, cross or are located on boundaries between two or more States. Transboundary waters are not limited to a water body (e.g. a river, lake, or aquifer), but cover the catchment area of the water body.

Figure 1 The transboundary water cooperation continuum



Transboundary water cooperation is necessary to manage international waters in an integrated and sustainable way. Integrated water resources management (IWRM) promotes the coordinated development and management of water, land and related resources in order to maximize economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems. It represents an alternative to the sector-by-sector, top-down management style that dominated in the past. Implementation of IWRM requires looking at basins as a management unit, looking at water demands and impacts across sectors and encouraging the participation of all stakeholders.

Too often transboundary water cooperation is only pursued when a disaster strikes (such as major floods, droughts or pollution episodes) and **frequently the potential benefits of stronger cooperation remain unexploited**. However, while a disaster may serve as a signal to initiate joint work, transboundary water cooperation should be seen as a long-term, evolving process. It may develop from incipient stages (characterized by technical-level exchanges and political talks), to intermediate stages where agreements of limited scope (e.g. navigational uses, pollution control standards, or water allocation) are signed, and finally to advanced stages where joint action (of differing levels) is taken. The benefits of cooperation are also likely to evolve over time as cooperation opens up new options to address emerging challenges, including greater capacity to adapt to climate change. The pace of the cooperation processes will vary: some may remain with a limited scope over decades, while others may evolve more rapidly.

[6] In this Policy Guidance Note the term "transboundary basin" is used as short-hand for the basin of a transboundary river, lake, or aquifer.

Sustaining transboundary water cooperation is challenging, so understanding that there is more to gain from continuing than from withdrawing from cooperation is crucial. The ambition of the international community in terms of transboundary water cooperation has increased over time, moving from reaping "easy" benefits through win-win bilateral actions (e.g. information sharing, coordination of actions), to joint actions that make every party a winner (e.g. joint projects), to agreements that – in order to reap the largest benefits overall – may require deal-making mechanisms to make sure that all parties win. The increasing ambition of transboundary water cooperation brings increasing demands on the mechanisms that sustain cooperation. A benefit-sharing stage of transboundary water cooperation might be demanding, with challenges ranging from the lack of adequate pre-existing institutional settings where such sharing can be discussed and agreed upon, to the design and implementation of deal-making mechanisms. For the transboundary water cooperation process to be sustained, therefore, each party needs to be satisfied that what it gains from continuing to cooperate is more than what it can gain by abandoning cooperation.

The main principles of cooperation are enshrined in the United Nations Watercourses Convention and the ECE Water Convention, the most authoritative codification of the basic principles of international water law. The Conventions set concrete rules containing specific rights and duties of States in their respective behaviours and define their legal responsibilities in their conduct with each other, as well as procedures that can be invoked in managing transboundary water courses. International water law principles are therefore beneficial for countries sharing water resources, as they promote the predictability, equity and sustainability of their use through the duty not to cause harm to other riparian States in the use of international watercourses, the principle that entitles and requires each State to ensure the equitable and reasonable utilization of transboundary waters and obliges them to cooperate.

Transboundary water cooperation has generated different legal and institutional frameworks. Ideally, the legal framework governing transboundary water cooperation would be a multilateral agreement involving all riparian countries – although in practice many transboundary basins are covered

Box 1 The Water Convention

The Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention) was adopted in Helsinki in 1992 and entered into force in 1996. Most countries sharing transboundary waters in the ECE region are Parties to the Convention. The Water Convention strengthens transboundary water cooperation and measures for the ecologically sound management and protection of transboundary surface waters and groundwaters. It fosters the implementation of IWRM, in particular the basin approach. The Convention recognizes that water is a cornerstone of societies, and it therefore promotes a holistic approach to cooperation, looking at environmental, cultural, social and economic implications of water use.

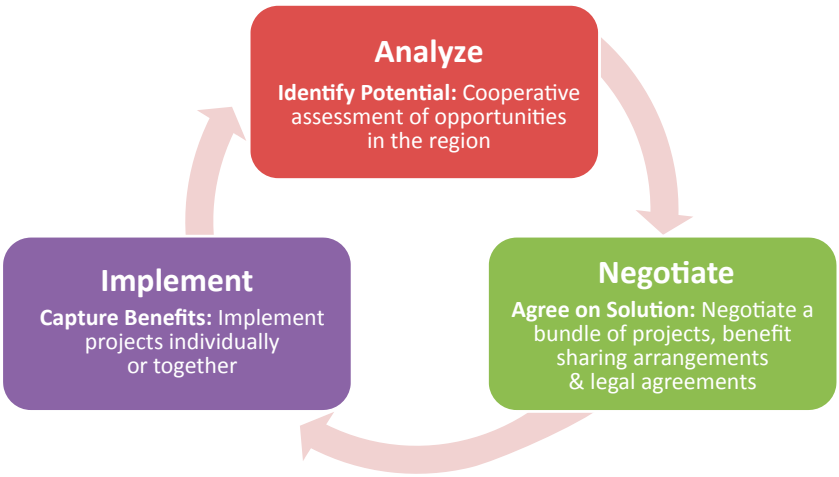
The Water Convention requires Parties to prevent, control and reduce transboundary impacts and to use transboundary waters in a reasonable and equitable way and ensure their sustainable management. Parties sharing the same transboundary waters have to cooperate by entering into specific agreements and establishing joint bodies. As a framework agreement, the Water Convention does not replace bilateral and multilateral agreements for specific basins or aquifers; instead, it fosters their establishment and implementation, as well as their further development. The Convention enshrines a balanced approach, based on equality and reciprocity, which offers benefits to and places similar demands on both upstream and downstream countries. In 2003, the Water Convention was amended to allow accession by all United Nations Member States. The amendment entered into force in 2013, turning it into a universally open legal framework for transboundary water cooperation.

The Convention, through its institutional framework, provides a permanent intergovernmental forum to discuss cooperation, share experience and identify best practices in many areas. The work of the various bodies under the Convention provides guidance on how to address emerging challenges, but also how to support bilateral and basin cooperation. This permanent platform has supported the building of trust and the identification of common solutions among States within and outside the ECE region.

by multiple bilateral agreements[7] or multilateral agreements that do not involve all relevant riparian States. The nature of the joint bodies established for managing transboundary waters varies widely in terms of their mandates, powers, composition and structures – from commissions that meet rarely and have limited powers and secretariat support, to large basin agencies with large staff and responsibilities that include the development and operation of major infrastructure. The institutional arrangements will delimit the range of benefits of transboundary water management that can be exploited, but large benefits can be exploited even from relatively modest institutional arrangements. At the same time, by providing additional information to the parties about the extent of the potential benefits, a benefit assessment exercise may be useful to progressively inform the definition of tasks of joint bodies – helping to broaden their scope and to redefine existing agreements.

Transboundary water cooperation is an iterative and self-reinforcing cyclical process, which can be understood as having three different phases (see figure 2). Phase 1 is the analysis of the opportunities for transboundary water cooperation. This is where benefit assessment is primarily located. In phase 2, cooperative solutions are negotiated. Benefit assessment can provide information to be considered in the framework of this negotiation phase. Phase 3 is the implementation of agreed cooperative solutions. This is the source of additional information to improve the benefit assessment. The benefits of transboundary cooperation are likely to evolve as enhanced cooperation opens up new options.

Figure 2 The process of transboundary water cooperation



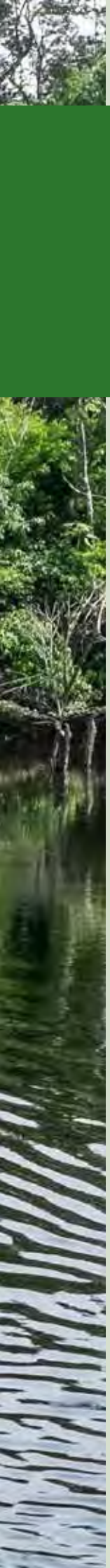
Source: Simplified, from Claudia W. Sadoff and David Grey, Cooperation on International Rivers: A Continuum for Securing and Sharing Benefits, *Water International*, vol. 30, No. 4 (December 2005), pp. 420–427.

Progress in transboundary water cooperation is influenced by domestic and external dynamics. No party (country) that engages in transboundary cooperation is a monolithic entity; rather it is a composite of domestic actors and interests. Some of those domestic actors will gain more from transboundary cooperation than others. It is important to understand the domestic distribution of the benefits and costs of transboundary water cooperation in order to identify supporters, and the need to design domestic compensation mechanisms to minimize opposition. But external factors also play a role. Two global conventions on transboundary water cooperation are now in force and this strengthening of international water legislation will foster transboundary water cooperation.

Transboundary water cooperation can in turn contribute to enhancing regional cooperation. The transboundary nature of waters shared among countries result in the necessity to establish (at least a minimum level of) communication about water-related matters. Even in the case of a higher (geo)political conflict potential, communication about water remains necessary and triggers further communication, thus contributing to building trust and representing an incentive for conflict de-escalation, stability and regional integration.

[7] Bilateral agreements are often needed in addition to basin-wide agreements.

Chapter 2



Launching a benefit assessment exercise

A. Making the case for a benefit assessment exercise

A benefit assessment exercise can provide fact-based arguments for starting up cooperation or developing stronger cooperation. Countries engage in cooperation discussions because they have a sense that they can benefit from them. Most cooperation processes are initiated around a small number of easy-to-identify benefits. A more thorough look at the potential benefits of transboundary water cooperation may help identify additional opportunities, some of which will only be generated by deepening the level of cooperation. The identification, assessment and communication of benefits will help to make the case for stronger transboundary water cooperation, even if some of the benefits may not be assessed quantitatively or even qualitatively.

A benefit assessment exercise can facilitate broadening the scope of cooperation by defining a "benefit cluster". This is the case where two or more countries share a set of different basins, and the benefits of transboundary water cooperation vary from basin to basin. Looking at the set of basins (and even beyond) as a "benefit cluster" to identify and assess the benefits of cooperation – instead of looking at single basins in isolation – may open up new opportunities for mutually beneficial cooperation (cf. for example Box 15 on negotiations over the Colorado and the Rio Grande Rivers between Mexico and the United States of America).

A benefit assessment exercise can also help to attract financial resources to implement transboundary water cooperation solutions. Realizing the benefits of cooperation will involve some type of investment, which will need to be financed. A better understanding of the potential benefits of transboundary water cooperation, including an assessment of their significance, would help to attract financial resources, whether from domestic public budgets, bilateral and multilateral development cooperation, or private sources.

Box 2 Identifying and realizing the benefits of transboundary water cooperation in a "benefit cluster" – the case of the Canton of Geneva, Switzerland and France

Between 1995 and 2006, five transboundary river agreements were signed between the Canton of Geneva and the French authorities to address challenges related to deteriorating water quality in transboundary rivers and flood protection. These agreements were of a technical and financial nature and included actions (such as wetland restoration, river restoration and water retention works) to be carried out in France (upstream) or in Switzerland (downstream) and co-financed by the two partners under the rationale that they provided benefits to both countries (habitat, recreation, improved water quality, flood prevention).

The joint approach to assessing the condition of the shared rivers, the common setting of objectives and the joint action in planning and related financial allocations at the scale of the whole transboundary basin helped to implement consistent actions, with an investment that brought greater benefits than a set of sporadic actions on both sides of the border. While the five agreements have already expired, the cooperation established continues to provide cost savings through the achievement of objectives by each party with regard to the shared waters.

Source: Marianne Gfeller, Transboundary cooperation implemented by the Canton of Geneva through transboundary river agreements, Case study (2014), Canton of Geneva, Department for Environment, Transports and Agriculture, Directorate General of Water.

Box 3 Identifying benefits to boost cooperation in the upper Pripyat River basin

The Dnieper–Bug Canal is a 196 km-long canal located in Belarus connecting the Baltic Sea basin (Bug River) and the Black Sea basin (Pripyat River). To ensure the proper functioning of the canal, Belarus was withdrawing up to 78 per cent of the upper Pripyat River flow from Ukraine during the low water season to fill the canal. On the other hand, in high water season, Ukraine used to ask to release floodwaters through the canal into Belarus. This led to tensions between the countries. Only the identification of transboundary water cooperation benefits in this region helped to achieve a compromise. Three main rules were jointly developed and approved by both Governments: (1) the drainage of Pripyat water flow into the canal should not lead to the degradation of the Pripyat river downstream; (2) a maximum volume of floodwaters which can safely be transported from Ukraine to Belarus through the canal was defined; (3) the maximum fluctuations of the level of the lakes feeding the canal were agreed in order to ensure the necessary conditions for preserving the water-related biodiversity in the canal. The joint identification of benefits enabled enhanced water cooperation between Belarus and Ukraine and the sustainable management of shared water resources in the upper Pripyat River basin.

Source: Kanstantsin Tsitou, Ministry for Natural Resources and Environmental Protection, Belarus, personal communication (2014)

B. How to approach a benefit assessment exercise

Identify the transboundary water cooperation policy process to be supported and platform for carrying out the assessment

A benefit assessment exercise needs to be closely tied to a transboundary water cooperation policy process. It will be valuable only if it contributes to informing decisions that lead to stronger cooperation and the realization of the potential benefits. For this to happen, some level of mutual trust is necessary and dialogue needs to be ongoing. If there is already a cooperation agreement with a joint body in place, the benefit assessment can serve to identify further opportunities and allow for a deepening of the cooperation between the parties. A situation where countries just begun negotiating cooperation options would also greatly benefit from a transboundary water cooperation benefit assessment. The outcomes of a benefit assessment could then feed into the process, leading to the establishment of a formal cooperation platform. If there is no existing policy process in place at all, a rapid exercise of benefits identification and assessment may be useful for awareness-raising and advocacy.

The demand of the Water Convention to cooperate by entering into basin agreements and establishing joint bodies is an important basis for involved countries to identify, assess and communicate the benefits of cooperation. Joint bodies are frequently long-term instruments. Their regular meetings and exchanges of views can serve as an important framework for the performance of a benefit assessment exercise. A discussion of benefits can also usefully take place within the framework of a national level policy process – such as the ECE National Policy Dialogues on IWRM – to help a country decide whether to engage in or scale-up transboundary water cooperation. There might also be other drivers and platforms for developing transboundary water cooperation, such as a broader political cooperation commission with a mandate on water.

Obtain a mandate to carry out a benefit assessment exercise

A benefit assessment exercise will be most effective if a mandate for carrying it out is explicitly articulated in the transboundary water cooperation policy or other political process. It is not always necessary or appropriate to carry out a stand-alone benefit assessment exercise. For example, a benefit assessment exercise could be mandated as part of a transboundary diagnostic analysis or a nexus assessment.

Design the benefit assessment exercise to match the level of maturity of the transboundary water cooperation policy process

The characteristics of the transboundary water cooperation policy process should drive the level of ambition of the benefit assessment, the selection of methodologies, the involvement of stakeholders (policymakers, experts and beneficiaries), and the strategies for communicating the results. Indeed, transboundary water cooperation policy processes can be at different levels of maturity and will therefore offer different opportunities for including the results of a benefit assessment in decision-making. Even when no formal transboundary water cooperation policy process is in place, informal talks may be regarded as early transboundary water cooperation. At the other end of the scale, a transboundary water cooperation policy process may be characterized by a well-established formal framework that includes legal agreements, institutional structures, such as joint bodies, and joint action programmes. The level of detail of the supporting evidence generated by the benefit assessment will need to be adapted to the maturity of the process, in order to influence policymakers (the benefits of cooperating to improve the water quality of a river may be obvious, whereas the benefits of a major joint investment in a hydroelectric dam may not). Table 1 describes the stages of development of a transboundary water cooperation policy process and sets out the associated needs in terms of a benefit assessment.

Table 1 Matching the benefit assessments to the policy processes

Stage of development of the transboundary water cooperation policy process	*Needs of the transboundary water cooperation policy process*	*Focus of the benefit assessment exercise*
Pre-initial stage (e.g. basins characterized by political conflict)	Establish the conditions for launching a cooperation process	Identification of mutually beneficial opportunities from shared water resources
Initial stage (e.g. basins without an international agreement or transboundary coordination body)	Launch of the cooperation process, supported by awareness-raising on the need to cooperate	Identification of the full range of the benefits of cooperation
Intermediate stage (e.g. negotiations on an agreement ongoing or basins with an international agreement, but without a transboundary coordination body)	Consolidation of the cooperation process through negotiations, strategic planning and the implementation of basic cooperation initiatives (e.g. information sharing)	Broad assessment of the range of benefits of cooperation (including cost of non-cooperation)
Advanced stage (e.g. basins with an international agreement and a transboundary coordination body)	Realization of the potential benefits of cooperation through the implementation of advanced cooperation initiatives (e.g. infrastructure projects, coordinated management instruments)	Assessment of the benefits of independent national projects, joint projects, or a basin programme of measures

Plan for a transparent, participative process to prevent a possible contestation of the results

A transparent process of benefit assessment will also help to attract stakeholders (such as local governments, civil society organizations, or recognized academics) **to contribute** to the increased technical quality and political acceptability of the benefit assessment. If the assessment is facilitated by an impartial body (such as an international organization or regional university), is broadly representative (engaging key stakeholders from the countries, including the public and the possibly affected population) and follows a transparent methodology (mixing expert and participatory approaches), then it will increase buy-in and the results will not be contested.

Ensure that the transboundary water cooperation benefit assessment is adequately funded

A transboundary water cooperation benefit assessment will incur establishment costs (to launch and establish the different elements of the process) **as well as recurrent costs** (to keep producing results). The costs will depend on the ambition of the benefit assessment. The costs should preferably be funded on a cost-sharing basis by the cooperating parties or as part of a technical programme of the joint body (if it exists). In some settings, international donors can play an important role in helping to carry out the initial assessment, and hence in building the foundations and institutional capacity for cooperation. The benefits resulting from a well-designed assessment are expected to largely outweigh the costs of undertaking the assessment and implementing related actions. For example, the cost of a study on the benefits of cooperation in flood management and the prevention measures implemented as a result will be much smaller than the benefits (financial and other) gained from such measures.

The three phases of the benefit assessment exercise

Phase 1. Identification of benefits and beneficiaries

It is important to ensure that a broad range of benefits and beneficiaries are identified. IWRM implies that all sources of water within the basin, all forms of water use, and accordingly all beneficiaries (whether direct or indirect) should be considered. The benefits of transboundary water cooperation will vary from basin to basin according to their economic, social, environmental and geopolitical characteristics. They will also vary according to the cooperation stage. For example, while for cooperation in the initial stage, it may suffice to highlight "lives and property saved thanks to improved flood management" as one of the benefits, for a very advanced level of cooperation it would be necessary to identify the detailed benefits of each measure (whether soft or hard) that are being considered. The identified benefits should undergo a "screening" to select for assessment the most relevant and important benefits, taking into account their potential magnitude and other policy-relevant criteria.

Phase 2. Assessment of benefits

The nature and the level of detail of the assessment phase will vary according to the issues, the cooperation stage and the political will of the parties involved. The benefit assessment can be useful in informing new options, but also in evaluating past options and informing new decisions. All the benefits that passed the screening test in the identification step should undergo at least a qualitative assessment. The types of benefits of transboundary water cooperation vary greatly, and thus the assessment approaches will necessarily be different. Many, but not all, benefits can undergo a quantitative assessment. Only in some cases can the monetary value of the benefits be assessed. The aim of the assessment phase is to contribute to advancing the transboundary water cooperation process, and this should guide the ambition of the assessments of individual benefits and the selection of assessment methodologies.

Phase 3. Communication of benefits

The final step is the integration of the assessment results in the transboundary water cooperation policy process through communication efforts for awareness-raising, advocacy and policy development.

Evaluate the process and outcomes of the benefit assessment and relaunch the process

Transboundary water cooperation benefit assessments are essential features of the cooperation process and part of the dialogue in cooperation platforms (such as joint bodies). They need to respond to evolving policy demands over time (e.g. feeding the dialogue that takes place in a joint body) and therefore should not be seen as one-off effort. It is important that policymakers provide their feedback on the strengths and weaknesses of the first cycle of the benefit assessment exercise before subsequent cycles are launched under the existing cooperation process.

Chapter 3

Identifying the benefits of transboundary water cooperation

A. How to approach the identification of transboundary water cooperation benefits

Prepare for an extended process

The identification of transboundary water cooperation benefits may be an extended process. In order to capture the full potential for cooperation, it is helpful to map out as many benefits as possible from the start. However, in many cases, only some benefits will be identified in a first phase of negotiations. Enhanced cooperation may then lead to further efforts to identify additional benefits, both because the parties are ready to invest in the identification process and because some potential benefits may only be apparent (or appear feasible) after the basis for cooperation has been established.

Involve a wide variety of stakeholders and experts

Different stakeholders have different knowledge and information about the different aspects and impacts of transboundary water cooperation. Thus, the inclusion of different types of stakeholders should help to ensure that benefits that may otherwise go unidentified are uncovered. While transboundary water cooperation processes are in most cases the responsibility of national authorities, it is important to include local government and other local stakeholders. A range of disciplines needs to be represented in the process of identification of benefits – ideally this would include hydrology, engineering, microeconomics, macroeconomics, sociology, anthropology, military studies and politics. An intersectoral approach to benefits identification is therefore required. It is important that the experts involved in the identification of benefits represent all the involved countries and sectors – effectively constituting a regional team.

Box 4 An assessment of the intersectoral linkages to complement a benefit assessment in the Alazani/Ganykh River Basin

Azerbaijan and Georgia share waters located within the Kura Basin. In recent years, accelerating economic development is putting the basin water resources increasingly under pressure, from driving water demands and pollution from agriculture and households, the exploitation of hydropower potential and water transfers to supply cities outside of the basin. Several initiatives have supported the identification and assessment of expected benefits from cooperative water management between Georgia and Azerbaijan, such as the United Nations Development Programme (UNDP) Global Environment Facility (GEF)-funded project "Reducing Transboundary Degradation in the Kura Ara(k)s River Basin" and the Organization for Economic Cooperation and Development (OECD) project to assess the benefits of transboundary water cooperation in the Kura River Basin (2012-2014).

In 2013, ECE launched, in close cooperation with the administrations of the riparian countries, a participatory pilot assessment of the water-food-energy-ecosystems nexus in the basin of the Alazani/Ganykh River, a tributary of the Kura. Its aim was to contribute to enhancing energy, food, water and environmental security by increasing efficiency, managing trade-offs, exploiting synergies and improving governance across sectors. The assessment found multiple linkages between the different basin resources, including some chains of indirect impacts across sectors, for example between household use of fuelwood, deforestation, erosion and sedimentation, loss of ecosystem services and degradation of the hydrological regime. These impacts in turn risk affecting negatively on infrastructure and increase exposure to flash floods. Potential solutions to increase the benefits from the basins' resources were explored, which could be achieved through more coordinated policies and actions and through transboundary cooperation. Such potential measures include: facilitating access to modern fuels (such as gas) and energy trade; introducing economic instruments; developing sustainable hydropower generation; as well as developing the agriculture and agro-industrial sector, for example by improving practices like the maintenance of irrigation infrastructure. Thus, a nexus assessment can help to improve a benefit assessment by identifying intersectoral linkages, potential solutions and untapped benefits.

Source: United Nations Economic Commission for Europe, *Reconciling resource uses in transboundary basins: assessment of the water-food-energy-ecosystems nexus* (United Nations, New York and Geneva, 2015)

Do not expect all types of benefits to be relevant in your basin

The benefits of transboundary water cooperation vary from basin to basin. The benefits of improved upstream water management depend on the structure of uses downstream – for example, two basins that are equivalent in hydrological terms will generate benefits of different types (and sizes) if one has large cities and irrigation districts downstream and the other does not. Those basins that have very different characteristics in different parts of the basins are more likely to generate greater benefits from transboundary water cooperation.[8]

Complement the identification of the benefits of cooperation with the identification of the related costs and risks

Transboundary water cooperation can generate many benefits, but it may also involve some costs and risks. These represent the flip side of the benefits and highlight the possible trade-offs of cooperation. Costs and risks may be of an economic nature – such as the cost of launching and sustaining the cooperation process and the cost of adopting measures required to generate the benefits. They may also be of a political nature – the adoption of new water management measures will benefit some stakeholders more than others and discussions about water management can generate controversies within a country or among countries. Mitigation strategies to deal with such risks and costs range from better communication to the implementation of internal compensation measures.

Identify the beneficiaries and possibly affected stakeholders, not just the benefits

Identifying the beneficiaries of transboundary water cooperation will help to inform the political processes (coalition formation) **to achieve it** and the development of possible options for compensation for stakeholders that would pay the price for possible trade-offs, whenever relevant. Stakeholders should be the centre of attention when studying different possible options in the framework of the decision-making process. This applies both at the transboundary (international) and domestic (national) levels.

[8] See Sarah A. Wheeler, University of Adelaide, *Case study on the Murray-Darling Basin*, prepared for the workshop "Counting our Gains: Sharing experiences on identifying, assessing and communicating the benefits of transboundary water cooperation", Geneva, May 2014. Available from www.unece.org/env/water/workshop_benefits_cooperation_2014.html.

Box 5 Identifying a variety of beneficiaries of an economically and environmentally sustainable Lake Peipsi area

Lake Peipsi is the largest transboundary lake in Europe, which is shared between Estonia and the Russian Federation. The 2011–2015 project "Economically and Environmentally Sustainable Lake Peipsi Area" focused on the promotion of sustainable socioeconomic and environmental development of the Lake Peipsi area, for the benefit of both countries.

The main challenges identified were the eutrophication of the lake due to poor wastewater treatment on the Russian side and the lack of harbours to receive waste generated by watercraft users and to lift ships from the water for repairs and maintenance on the Estonian side, which had an environmental impact of the lake's waters. Several actions were therefore implemented in order to improve the environmental situation. Studies assessed the need for (re)construction of wastewater treatment plants in 17 municipalities of Pskov region in the Russian part of the Lake Peipsi basin and 3 harbours were constructed in Estonia; in addition, the construction of a dock, mooring facilities for watercrafts and infrastructure for ship maintenance and reception of cargo residues and ship-generated waste were planned. Such measures, implemented in good partnership, have already contributed to the decrease of nutrient load on the Lake Peipsi basin and the improvement of the environmental situation in the basin.

The preparation phase of the project also considered the numerous potential beneficiaries of such cooperation when designing measures to be implemented. More than 1 million people (mostly local populations, summer residents and tourists) were identified as future beneficiaries of the planned improvement of the environmental situation and of the socioeconomic development of Lake Peipsi area:

- approximately 10,000 watercraft users, who sail across Lake Peipsi (including commercial fisherman, recreational fisherman and water tourists), would benefit from additional harbours, improved infrastructure of existing harbours, improved environmental situation and from the possibility to use a repair bridge for the maintenance of boats;
- more than 1,000 entrepreneurs and enterprises, which provide accommodation and catering services in the Lake Peipsi area, as well as companies that rent yachts, motorboats and windsurfing and organize package tours in the area would benefit from the enabling conditions for the development of water tourism and related businesses;
- twenty-one local residents would be employed in the harbours or slip;
- nine local municipalities (four in Estonia and five in Russia) would benefit from the constructed infrastructures;
- permanent and seasonal residents would enjoy the improved environmental conditions of the lake.

Source: Harry Liiv, Ministry of the Environment of Estonia, personal communication, 2015. More information available at: http://www.estlatrus.eu/eng/projects/1678

Identify in parallel the possible negative impact of inaction

While cooperation carries some risks and costs, **it should be remembered that failing to cooperate will also not be risk free, as it will carry the costs of inaction**. Many countries are currently suffering high costs because of absent or underdeveloped transboundary water cooperation. Human loss and economic damage from floods, the impact of which could have been reduced from stronger cooperation, are typical examples. But the whole array of economic, social, environmental and political benefits identified in the typology of the potential benefits of transboundary water cooperation (table 2) represents the true measure of the possible costs of failing to cooperate.

Box 6 Identifying crucial challenges in the Nile River Basin to prompt transboundary water cooperation

The report entitled The State of the River Nile Basin presents information on the general health of the Nile Basin in order to raise awareness of the biophysical, sociocultural and economic conditions within the basin. It highlights water hotspots and "hope spots", and observes that cooperation among the riparian States is crucial for solving the basin's multiple environmental and socioeconomic problems. By providing information both on the possible benefits of cooperation and on expected future increasing challenges related to inaction, the report, which aims to facilitate discussion, information sharing, knowledge-based decision-making and collective action at the basin-wide level, provides a framework for pressure–state–response analysis.

Source: Nile Basin Initiative, The State of the River Nile Basin, 2012. Available from http://nileis.nilebasin.org/content/state-river-nile-basin-report.

Be ready to accept uncertainty

The identification of transboundary water cooperation benefits involves levels of uncertainty. For several individual benefits, it may be unclear with the information available whether those benefits can be generated in a given basin – particularly for aquifers, given their physical characteristics. Strategies need to be developed to try to reduce that level of uncertainty, such as additional data collection, but it may not possible to eliminate it.

Box 7 Identifying priority benefits of transboundary water cooperation under uncertainty in the Dinaric Karst Aquifers

The Dinaric Karst Aquifers in South-Eastern Europe consist of several large aquifer systems spanning from Italy to Greece. Since the signing of the Stability Pact for South-Eastern Europe in 1999, numerous transboundary water cooperation activities have been undertaken, and several bilateral agreements have been designed for managing transboundary surface waters and/or hydropower developments. Cooperation on the aquifers increased in 2008 with the endorsement of the GEF-funded Dinaric Karst Transboundary Aquifer System project which aims to contribute to the equitable and sustainable use of the aquifer system by increasing scientific knowledge of the aquifers, creating a multilateral consultative body and establishing priority actions for management of the aquifers. An assessment of the downstream part of the Trebišnjica River highlighted groundwater quality as a key issue, with a potential impacts on aquifer functions including water supply, support of dependent surface ecosystems and endemic karst underground species, and recreation and tourism. However, more assessment efforts are needed, since the current lack of data at the aquifer level hampers a detailed assessment and specific conclusions, particularly regarding the economic implications of possible trade-offs that are key for decision-making, collaboration and the formulation of possible agreements.

Sources: GEF, Protection and Sustainable Use of the Dinaric Karst Transboundary Aquifer System, *Transboundary Diagnostic Analysis*, December 2013, available from http://diktas.iwlearn.org/; and International Groundwater Resources Assessment Centre, *Groundwater Economics: Significance and State of Affairs of Groundwater Economics in the Governance of Transboundary Aquifers*, 2014, available from http://www.un-igrac.org/publications/553.

B. Identifying different types of benefits

Transboundary water cooperation can potentially generate many benefits, both in terms of outcomes and as a result of the process itself. In terms of outcomes, transboundary water cooperation allows the individual parties to improve the way they manage their water resources (for example, by having better information). This will result in positive impacts in different economic sectors (for instance, increased agricultural productivity), as well as for the affected population (e.g. positive health impacts). As regards the benefits resulting from the process itself, the demands of the transboundary water cooperation process in terms of information, analysis, the establishment of cooperation mechanisms and stakeholder participation will have positive impacts for the domestic governance of water resources and may have spillover impacts on the broader domestic water governance agenda.

Transboundary water cooperation results in improved water management, which provides a large number of direct economic, social and environmental benefits. The potential direct benefits from improved water management are well known. They include benefits in terms of economic production (e.g. increased agricultural and energy production) and protection of economic assets (for example, avoiding damage to urban infrastructure from flooding). They also include social benefits, such as lives saved from water-related disasters and water pollution, and increased access to electricity and water services for

some population groups. Moreover, there are environmental benefits, including improvements in habitat conditions for many species. The direct benefits of improved water management are also likely to have second-order benefits in the economies of the involved countries – for example, they may lead to an increase in competitiveness across the economy due to lower energy prices.

Transboundary water cooperation helps to pave the way for other forms of cooperation by enhancing trust. There are a fair number of international conflicts revolving around transboundary water resources, in the same way that there are many domestic water conflicts. But in many settings, water cooperation is actually an entry point to build trust between countries. Advances in transboundary water cooperation may facilitate advances in other policy areas – most notably regional economic interdependence, and peace and security. More intense regional economic interdependence (for example, through increased trade of goods and services or cross-border investments) will produce economic benefits for all countries involved. Advances in peace and security, although not easy to identify and measure, will also provide benefits to all countries involved – ranging from the avoided economic, social and environmental impacts of conflict to budget savings from lower military spending.

Because transboundary water cooperation can generate many benefits, some of which are not very familiar to many audiences, **a typology of the potential benefits of such cooperation can be a useful tool to guide stakeholders in identifying them.** Table 2 presents such a typology of benefits, building on previous work from Claudia Sadoff and David Grey.[9] It highlights that there are two main avenues for the generation of benefits: improved water management, and enhanced trust among the cooperating parties. It also highlights that many of the benefits are related to economic activities, but that there is also a range of benefits that go beyond this. The list of examples is not exhaustive – some transboundary water cooperation processes may generate benefits that are not included below. At the same time, not all the transboundary water cooperation processes are expected to generate all the benefits listed below. The realization of benefits under the different categories identified will result in reduced vulnerability and increased resilience – itself a major benefit.

Table 2 Typology of the potential benefits of transboundary water cooperation

Origin of benefits	*Benefits for economic activities*	*Benefits beyond economic activities*
Improved water management	**Economic benefits** Expanded activity and productivity in economic sectors (aquaculture, irrigated agriculture, mining, energy generation, industrial production, nature-based tourism) Reduced cost of carrying out productive activities Reduced economic impacts of water-related hazards (floods, droughts) Increased value of property	**Social and environmental benefits** Health impacts from improved water quality and reduced risk of water-related disasters Employment and reduced poverty impacts of the economic benefits Improved access to services (such as electricity and water supply) Improved satisfaction due to preservation of cultural resources or access to recreational opportunities. Increased ecological integrity and reduced habitat degradation and biodiversity loss Strengthened scientific knowledge on water status
Enhanced trust	**Regional economic cooperation benefits** Development of regional markets for goods, services and labour Increase in cross-border investments Development of transnational infrastructure networks	**Peace and security benefits** Strengthening of international law Increased geopolitical stability and strengthened diplomatic relations New opportunities from increased trust (joint initiatives and investments) Reduced risk and avoided cost of conflict and savings from reduced military spending Creation of a shared basin identity

[9] Claudia W. Sadoff and David Grey, "Beyond the river: the benefits of cooperation on international rivers", *Water Policy*, vol. 4 (2002), pp. 389–403.

B.1. Economic benefits

Transboundary water cooperation contributes to securing current economic activity. Many economic activities require water as a key input. Examples include aquaculture, irrigated agriculture, mining, energy generation, industrial production, nature-based tourism and water-based transport. Each economic activity will have specific requirements regarding the quantity of water, the quality of water and timing. By improving water management, transboundary water cooperation can make it possible to provide more water (of the right quality and at the right time) and thus to expand economic activity and productivity in those economic sectors.

Transboundary water cooperation might also contribute to optimizing the profitability of current economic activities. Providing water (of the right quality and at the right time) for economic activities has a cost. The cost may be reflected in the price of water or it may be assumed by the public sector and financed through general tax revenues. Transboundary water cooperation, through improved water management, can reduce the cost of providing water and thus improve the profitability of economic activities (if they pay the cost) or improve the financial position of the public sector (if water is subsidized). For example, in the absence of transboundary water cooperation, some firms will have to turn to more expensive sources of water supply (e.g. because they are further away), pay a higher cost for treating raw water to the right level of quality (whether for human consumption or for economic uses), pay a higher cost for energy inputs (because cheaper hydropower may not be developed), or pay higher costs of transport for their inputs and outputs (because cheaper river transport may not be an option).

Transboundary water cooperation can also reduce the extent and economic impact of water-related hazards, which can inflict significant economic damage. In addition to their impact in terms of the loss of human lives, floods can destroy economic infrastructure that is costly to replace; damage material possessions and homes; and disrupt economic activities (for example by making it impossible to transport people and goods for days or weeks or by causing energy blackouts). Droughts can inflict major damage in rural areas (through the loss of crops and the ripple effects on agricultural-based economies) and, in some contexts, cause food shortages and increases in food prices.

Box 8 Transboundary cooperation responses to catastrophic flooding in the Elbe Basin

At the beginning of August 2002, heavy rainfall in the Ore Mountains caused disastrous floods in the Czech Republic and Germany. The water levels of the Elbe River and its tributaries increased dramatically, causing direct economic costs of around €9 billion in flood damage in Germany. This challenged the traditional system of flood protection, which was mainly dikes, and called for a more integrative approach to flood risk management. Since then, transboundary flood modelling and transboundary flood warning systems have increased the time between the prediction of a flood wave and its arrival, making it possible to mitigate the impact of the flood in terms of human lives and economic assets.

Source: Marc Teichmann and Augustin Berghöfer, *River Elbe flood regulation options with ecological benefits, Germany*, The Economics of Ecosystems and Biodiversity case study (2010). Available from http://www.teebweb.org/resources/case-studies/.

Transboundary water cooperation can generate additional economic benefits within a basin. Healthy water ecosystems provide aesthetic benefits that sometimes have hard monetary values attached to them. In particular, increased water quality can have substantial impacts on the value of riverfront properties in urban areas.

Improved water management brought about by transboundary water cooperation has additional positive economic impacts on the national economy, beyond the basin in question. These additional impacts are caused by the backward and forward linkages of basin-based economic activities with other economic activities in each of the basin countries. Backward linkages are caused by the increased demand for inputs – for example, increased agricultural production will drive up the demand for agricultural inputs and machinery. Forward linkages are caused by the increased availability of outputs that serve as inputs to sectors located elsewhere in the country – for example, major hydropower or geothermal development may reduce the cost of providing energy to industrial factories across the country.

B.2. Social and environmental benefits

Transboundary water cooperation contributes to improving health outcomes. Poor water quality and water-related disasters can have major impacts on human health through diseases (morbidity impacts) and the loss of human lives (mortality impacts). Transboundary water cooperation contributes to reducing those impacts by improving water management, both in terms of improving water quality and reducing the risks of water-related disasters.

Transboundary water cooperation also contributes to reducing poverty and creating jobs. These social benefits are generated through some of the economic impacts discussed in the previous section. Improved water management results in an increase in economic activities that create jobs and generate income for households. Depending on the specific context, these social benefits may be generated not only in the transboundary basin but also in other parts of the country.

A further social benefit of transboundary water cooperation is its contribution to improving access to basic services for populations that previously had no access to them. These benefits can be particularly important in developing countries with substantial gaps in access to basic services. The most important services are likely to be electricity and water supply. These services often have knock-on effects on issues such as educational performance (e.g. through improved school attendance rates), health (e.g. through reduced prevalence of water-borne diseases) and poverty (e.g. by freeing up time for engaging in income-generating activities).

Transboundary water cooperation also provides cultural and recreational benefits through mechanisms that are sometimes ignored – such as the preservation of cultural resources or access to recreational opportunities. While intangible, they are real benefits that people value. Improved water management made possible by transboundary water cooperation can contribute to preserving those benefits.

There is also a wide range of environmental benefits that can be generated by transboundary water cooperation. Improved ecosystem health of the water body is an important outcome of such cooperation. Many of the environmental benefits generated through improved ecosystem health are ultimately reflected in the economic and social benefits discussed previously. Improved ecological integrity, reduced habitat degradation and avoided biodiversity loss are some of the benefits that only partially show up in estimates of economic and social benefits and require specific attention. Some of these environmental benefits are felt beyond the basin concerned, since they also include the preservation of spawning grounds for marine fish species and migratory bird habitats. Aquifer-specific benefits include preventing land subsidence and saltwater intrusion.

Box 9 Environmental benefits of transboundary water cooperation on the Rhine

In 1950, France, Germany, Luxembourg, the Netherlands and Switzerland founded the forerunner to the International Commission for the Protection of the Rhine in order to analyse the pollution of the Rhine, recommend water protection measures, harmonize monitoring and analysis methods and exchange monitoring data. The Commission was established formally in 1963 and one year later a permanent secretariat was set up. After a severe pollution accident in 1969, the Governments decided to step up cooperation and in 1976 a convention on chemicals and a convention on chloride were signed. Between 1977 and 1986 water quality improved steadily. In 1986, the Sandoz accident prompted the adoption of the ambitious Rhine Action Programme with the objective of reducing discharged quantities of 40 dangerous chemicals by half within 10 years. After the disastrous floods of 1993 and 1995, the Commission was mandated to elaborate a flood action plan. Thus, between 1987 and 1999, it developed a comprehensive international water management system, integrating qualitative and quantitative aspects of surface waters and groundwater. Today, 96 per cent of the population of the Rhine Basin is connected to a wastewater treatment plant, and many big industrial plants have their own wastewater treatment plant. As a consequence, the number of animal and plant species has increased – 63 fish species now live in the Rhine and, since 2006, salmon, sea trout and eel as well as other migratory fish migrate from the North Sea as far upstream as Strasbourg. In addition, flood plains have been reactivated, Oxbow lakes have been reconnected with the Rhine and tributaries and the riverbank structures have been ecologically improved.

Source: International Commission for the Protection of the Rhine website, http://www.iksr.org/index.php?id=12&L=3.

B.3. Regional economic cooperation benefits

Regional economic cooperation can generate major economic benefits for the countries involved. Such cooperation is characterized by and leads to a number of changes in economic relations, the emergence of new economic opportunities and the generation of economic efficiencies (for example. by making it possible to take advantage of economies of scale or allowing countries to specialize in the economic activities in which they are most productive).

Transboundary water cooperation can be one facilitator of the process of regional economic cooperation, both directly and indirectly. Directly, it can contribute to such cooperation in water-related areas, such as the development of hydropower or water-based transport. Indirectly, it can contribute to regional economic interdependence by facilitating enhanced trust and providing a model for a mechanism to discuss policy issues and resolve disputes.

Box 10 Regional economic cooperation benefits in the Mekong Basin

The benefits of regional economic cooperation include the gradual opening of markets for goods, services and labour; increases in cross-border investment; and the development of transnational infrastructure networks (such as energy and transport infrastructure). The processes that generate those benefits are driven by sectoral policies, such as trade and migration policies, investment policies, or energy and transport policies. The implementation of those sectoral policies requires international negotiations and agreements that are facilitated by pre-existing good relations between riparian countries. In some cases, water-related negotiations and agreements are taken as good examples to show that international cooperation can deliver concrete benefits, and thus contribute to developing good relations and facilitating cooperation in other policy areas.

The fragmentation of regional infrastructure can be a major obstacle to growth. Where cooperation on international rivers can contribute to increased integration of infrastructure systems, development impacts can be significant. The Mekong Basin provides an interesting case. It is shared by Cambodia, China, the Lao People's Democratic Republic, Myanmar, Thailand and Viet Nam. Relationships among these riparian States have been turbulent for decades, and have been further exacerbated by superpower conflicts. Transboundary water cooperation in the Mekong Basin has proved to be an important stabilizing factor in the region, bringing substantial economic benefits – both directly, from forward linkages, and indirectly, from diminishing tensions. During conflicts between the Lao People's Democratic Republic and Thailand, for example, the Lao People's Democratic Republic has always provided hydroelectricity to Thailand, and Thailand has always paid. Similarly, Thailand has followed an explicit strategy of increasing regional stability by creating mutual dependency, and thus purchases gas from Malaysia and Myanmar and hydropower from China and the Lao People's Democratic Republic, in part because these are low-cost supplies and in part because they create ties that bind the countries in a web of mutual dependency. The updated Basin Development Strategy for 2016–2020, developed by the Mekong River Basin Commission, seeks to further strengthen regional integration by moving the countries towards more optimal basin-wide development through cooperation on joint projects and national projects of basin-wide significance. Joint projects on energy, flood protection, navigation and protection of environmental assets will enhance interdependent subregional sustainable growth.

Sources: Claudia W. Sadoff and David Grey, "Beyond the river: the benefits of cooperation on international rivers", *Water Policy*, vol. 4 (2002), pp. 389–403, available from siteresources.worldbank.org/EXTABOUTUS/Resources/BeyondtheRiver.pdf; and Anoulak Kittikhoun, Mekong River Commission Secretariat, personal communication, 2015.

B.4. Peace and security benefits

Transboundary water cooperation helps to prevent water-related conflicts and to solve existing ones, facilitating the realization of the economic, social and environmental benefits discussed above. The traditional view has been that disputes over water could lead to "water wars". But the analysis of empirical evidence has led to the conclusion that, while disputes over access to water can be a source of conflict, international relations over freshwater resources are overwhelmingly cooperative. An analysis based on a total of 1,831 events[10] connected to transboundary "basins at risk" has shown that the riparian States in fact tend to cooperate, rather than entering into conflicts. At the same time, while wars are not necessarily triggered by competition over water resources, other forms of conflict are driven by increased competition over such scarce resources – including social instability, ethnic clashes, low-intensity international conflicts and border disputes.[11]

Transboundary water cooperation has spillover effects, contributing to reduced political tensions, security and other foreign policy objectives. The Strategic Foresight Group[12] has found that nations engaged in active water cooperation do not go to war. While correlation does not imply causation, it is very suggestive that, of the 148 countries covered by their analysis, 37 are at risk of going to war over issues other than water (including land, religion, history and ideology), and they happen to be precisely the 37 countries that do not engage in active water cooperation with their neighbours. Reduced political tensions and improved security enables the realization of the regional economic interdependence benefits discussed above. The benefits of reduced political tensions and improved security also include the avoided economic and human cost of conflicts (from trade wars to military conflicts), as well as other benefits from reduced political tensions (such as savings from reduced military spending). Transboundary water cooperation contributes to these objectives by keeping dialogue avenues open, through interventions in small basins and by building basin identity. There are also cross-cutting links to other foreign policy objectives (such as achieving the human rights to water and sanitation) and the management of other risks (such as climate change impacts, food insecurity or energy insecurity). Some of these benefits accrue for the international community at large and can have spillover effects in other basins through example and precedent.

The institutional mechanisms developed through transboundary water cooperation constitute a key element for the realization of peace and security benefits. For example, in the Southern African Development Community, even when military conflicts were being waged in specific river basins, the existence of transboundary river basin organizations made it possible for cooperation to continue between water managers.

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10 Yoffe, S. and Larson, K. 2002. Basins at risk: water event database methodology. Chapter 2 in Yoffe, S. B. (ed.), *Conflict And Cooperation Over International Freshwater Resources: Indicators of Basins at Risk*. Dissertation, Department of Geosciences. Corvallis, Oregon State University. Available at www.transboundarywaters.orst.edu/research/basins_at_risk/

11 David Phillips and others, *Trans-boundary Water Co-operation as a Tool for Conflict Prevention and for Broader Benefit-sharing*, Global Development Studies No. 4 (Stockholm, Ministry for Foreign Affairs, 2006). Available from http://www.csir.co.za/websource/ptl0002/pdf_files/images/media/2006/EGDI_TBW.pdf.

12 See *Water Cooperation for a Secure World: Focus on the Middle East*. (Strategic Foresight Group Mumbai, India, 2013). Available from http://www.strategicforesight.com/publications.php#.VVwsFeHXuJU.

Box 11 Cooperation in the Sava River Basin: post-conflict cooperation and confidence building-related benefits

After political changes swept the region in the early 1990-ies, the Sava River, formerly the biggest national river in the former Yugoslavia, became an international river. The establishment of the Stability Pact for South-Eastern Europe in 1999 provided a solid basis for triggering the cooperation of stakeholders in the region and, gradually, the creation of a new approach to the water resources management in the Sava River Basin. On these grounds, the four countries of the Sava River Basin – Bosnia and Herzegovina, Federal Republic of Yugoslavia (later on Serbia and Montenegro, and then Serbia), Croatia and Slovenia, entered into a process of negotiations. Despite different and sometimes conflicting priorities, a strong political will was driving the four countries to come to an agreement on the establishment of an appropriate framework for transboundary cooperation, in order to ensure the sustainable use, protection and management of water resources in the Sava River Basin, and thus to improve the living conditions of the population in the region.

As a key outcome of the incremental approach to negotiations, the Framework Agreement on the Sava River Basin was developed and entered into force in 2004. This was the first development-oriented multilateral agreement in the post-conflict period, concluded in the region of the former Yugoslavia after the Dayton Peace Agreement and the Agreement on Succession Issues. The International Sava River Basin Commission (ISRBC) started to work for the implementation of the Framework Agreement in 2006. Since then, the Commission has been an "engine" of cooperation of the Parties toward the implementation of the Framework Agreement.

The Framework Agreement emphasizes the importance of transboundary cooperation of governments, institutions and individuals, defining the key objective and the three main goals of the cooperation: (1) establishment of an international regime of navigation on the Sava River and its navigable tributaries; (2) establishment of sustainable water management in the Sava River Basin, and (3) prevention/limitation of hazards in the basin (i.e. floods, droughts, ice, accidents) and elimination/reduction of related consequences. Since then, the ISRBC member states have significantly advanced their cooperation in all areas covered by the Framework Agreement, such as joint preparation of the Sava River Basin Management Plan and its programme of measures, exchange of hydrological and meteorological data, etc. The post-conflict management of water therefore served as a starting point for re-establishing trust and cooperation in the region. The Sava River itself was a unifying factor for the four riparian countries.

Sources: Dragana Milovanović and Dejan Komatina, *Case study on the International Sava River Basin Commission* (ISRBC, 2015); Amar Čolakhodžić et al, The Sava River Basin: Transitioning to peace in the former Yugoslavia, *Water and Post-Conflict Peacebuilding* (2014), pp. 271–296, available from http://www.environmentalpeacebuilding.org/assets/Documents/LibraryItem_000_Doc_935.pdf.

Box 12 Promoting peace and security through transboundary water cooperation mechanisms in Lake Chad

The Lake Chad Basin Commission was established in 1964 by Cameroon, Chad, Niger and Nigeria, later joined by the Central African Republic and Libya, to institutionalize the general commitment among the member countries to cooperate on water with a view to enhancing economic development. The Commission's mandate includes the promotion of regional integration, peace and security across the basin in addition to the sustainable and equitable management of the Lake Chad Basin and the preservation of its ecosystems.

The Lake Chad Basin Commission is one of the oldest basin organizations, but water management in the region faces many challenges. The lake basin has been a particularly tense region for a long time. Some of its bilateral and regional conflicts are directly related to water resources and the lake. Continued resource scarcity and poverty have, among other things, led to fragility in the lake basin and provided incentives for some parts of the population to join armed ethnic groups, warlords or terrorists, further destabilizing the region. These insecurities have been on the rise in recent years.

This is why, in 2012, the Commission decided to reactivate the Multinational Joint Security Force in the Lake Chad Basin, to revise its mandate and to extend it to all member States of the Commission to ensure security in the basin. Each country is to provide a fully equipped battalion of 700–800 soldiers. In July 2014, ministers of defence, chiefs of defence staff and heads of security and intelligence services of Commission member States agreed on the need to pool their efforts to bring a common and coordinated response to the current security challenges related to the threats posed by the terrorist group Boko Haram in the region and beyond. The Joint Security Force will be mandated to patrol the Lake Chad region and conduct military operations against arms dealers and suspected terrorists.

The case of Lake Chad clearly demonstrates the strong linkages and interdependencies between technical water resources management tasks and broader challenges of regional or even international security.

Sources: *Lake Chad Basin Commission News Magazine, Special Bologna 2014*, Issue February–July 2014, available from www.cblt.org/en/publications; and Pohl, Benjamin, etal. *The rise of hydro-diplomacy – Strengthening foreign policy for transboundary waters*, Climate Diplomacy (Adelphi, Berlin, 2014), available from http://www.adelphi.de/en/publications/dok/43509.php?pid=1927.

Box 13 Water-for-peace deals in the Teesta Basin

The Teesta Basin, shared by India and Bangladesh, is home to nearly 30 million people. The two countries discuss management of the Teesta River in the framework of the Joint River Commission, which was created in 1972 to facilitate joint efforts in the management of all 54 shared rivers. In 1983, India and Bangladesh entered into an ad hoc agreement over the Teesta, but were unable to implement it. In 2010, they reached a new draft agreement on water allocation – which was opposed by the State Government of West Bengal (India). Presently, the most vital benefit accrued from the Teesta Basin negotiations is the informal trade-off between the Indian and Bangladeshi Governments, which essentially represents a water-for-peace deal. The Indian Government, as the upper riparian State, has agreed to a water-sharing agreement during the lean season in exchange for the present Bangladeshi Government's cooperation in addressing some of India's security concerns regarding violent extremist groups operating from Bangladeshi territory. Once a treaty on the Teesta is signed, a large range of potential economic, social and environmental benefits could be unlocked. In addition, transboundary water cooperation between Bangladesh and India over the Teesta could lead to broader bilateral security that could potentially expand gradually to include Bhutan, China and Nepal.

Sources: Strategic Foresight Group, *Rivers of Peace: Restructuring India Bangladesh Relations* (2013), available from http://www.strategicforesight.com/publication_pdf/22345riversofpeace-website.pdf; and Anumita Raj, *Teesta Basin Case Study*, Strategic Foresight Group,

B.5. Governance benefits

While the benefit typology focuses on "outcome" benefits, **transboundary water cooperation processes also generate important benefits in terms of improving domestic water governance.** The most difficult barriers to achieving domestic water management objectives are not – or are not solely – of a technical or economic nature; in many countries, they relate to improving domestic water governance. Unclear or inadequate allocation of responsibilities, secretive use of information, or insufficient stakeholder engagement are among the factors that hinder faster progress towards domestic water security. A process of transboundary water cooperation can act as an important driver for improving some aspects of domestic water governance. The cooperation process will demand information about the status and trends of water resources; it will demand more transparency about how water resources are managed; and it will involve different ministries, levels of government and non-governmental stakeholders in the process. Moreover, improved engagement of the public, communities and affected stakeholders during the identification phase can enhance their buy-in in the cooperation process.[13] These water governance benefits are difficult to identify and assess, but they are as important as the outcome benefits on which the rest of this Policy Guidance Note focuses.

[13] Jonathan Fisher, *Economic and environmental benefits of transboundary water cooperation*, Background report for the Counting our Gains workshop, Geneva, May 2014. Available from http://www.unece.org/env/water/workshop_benefits_cooperation_2014.html.

Box 14 Governance benefits of transboundary water cooperation – the case of the North American Great Lakes

Formal transboundary water cooperation in the Great Lakes, shared among Canada and the United States of America, began in 1909 with the Boundary Waters Treaty. Cooperation expanded in 1972 with the Great Lakes Water Quality Agreement, signed in response to the then-growing nutrient pollution problem. The Water Quality Agreement generated environmental benefits in the form of increased water quality – with concentrations of nutrients and toxic contaminants decreasing by 60 and 90 per cent, respectively. These environmental benefits have generated economic benefits in commercial fishing, sport fishing, recreational boating and beach use.

A range of governance benefits have also been generated. These include greater cross-border cooperation between government agencies and scientists through the bi-national science advisory boards established by the Agreement; increased transparency and accountability of federal activities brought about by increased public engagement; and the emergence of strong non-governmental organizations, in response to the non-binding authority of the Agreement and the need for linkages between federal and local policy. These benefits were indirectly created through the process of environmental problem solving, but were nonetheless integral to the successful realization of environmental benefits.

Source: Jeff C. Ho, Stanford University, *Case study on the North American Great Lakes*, prepared for the Counting our Gains workshop, Geneva, May 2014. Available from http://www.unece.org/env/water/workshop_benefits_cooperation_2014.html.

Chapter 4

Assessing the benefits of transboundary water cooperation

A. How to approach the assessment of benefits

The benefits identified should undergo screening before starting the assessment phase, to select for assessment the most relevant and important benefits, taking into account their potential magnitude and other policy-relevant criteria.

Match the level of ambition of the assessment to the needs of the cooperation policy process

In planning for the benefit assessment, the information needs of the transboundary water cooperation policy process (both current and foreseeable) should be considered. At the same time, the assessment process should be flexible and opportunistic, taking advantage of emerging windows to provide input into the policy process. Transboundary water cooperation benefit assessments can have different levels of ambition. These may vary from rough-and-ready qualitative estimates to sophisticated, data-hungry and costly methodologies, such as scenarios and outlooks. Efforts to assess benefits need to be commensurate with the intended use of the results – in some cases some rough estimates will suffice, in others, high quality studies will need to be developed.

Indeed, **the level of evidence, confidence and scrutiny needed in the benefit assessment commonly[14] rises when moving through the stages of development of the transboundary water cooperation policy process**. Table 3 expands on the chapter 2 discussion (see table 1) to suggest how to match the main focus of the assessment phase to those development stages and policy needs.

Focus on the final outcomes of cooperation

Transboundary water cooperation can generate intermediate outcomes, such as sharing of information and other aspects of technical-level cooperation. It will be useful to track the progress of those intermediate outcomes to show progress in the process of transboundary water cooperation. However, the real justification for transboundary water cooperation is related to achieving policy objectives, such as economic growth, employment creation, avoidance of loss of life, or improvements in habitat quality. **Major efforts need to be made to define the outcomes sought, including the selection of indicators, in order to assess the expected benefits of cooperation during the planning phase and then evaluate the actual benefits.** In some cases, the most important outcomes of cooperation will relate to the "avoided costs of inaction", including conflict prevention. Once the key outcomes have been identified, a baseline will need to be established. When the links between intermediate and final outcomes are not clear, it may be necessary to also focus on intermediate outputs, but care should be taken to avoid double counting (for example, when one intermediate output is linked to various final outcomes). However, some limitations, such as the lack

[14] However, in some cases where cooperation is weak and mutual trust is low, a higher level of evidence may be needed to convince decision makers to engage in cooperation than if cooperation is well developed and mutual trust is high.

Table 3 Matching the focus of the assessment phase to the policy needs

Stage of development of the transboundary water cooperation policy process	*Needs of the transboundary water cooperation policy process*	*Focus of the benefit assessment exercise*	*Main focus of the assessment phase*
Pre-initial stage (e.g. basins characterized by political conflict)	Establish the conditions for launching a cooperation process	Identification of mutually beneficial opportunities from shared water resources	Rapid qualitative assessment of key benefits
Initial stage (e.g. basins without international agreement or transboundary coordination body)	Launch of the cooperation process, supported by awareness-raising on the need to cooperate	Identification of the full range of the benefits of cooperation	Rapid qualitative assessment of all identified benefits
Medium stage (e.g., negotiations on an agreement ongoing or basins with international agreement, but without coordination body)	Consolidation of the cooperation process through negotiations, strategic planning and the implementation of basic cooperation initiatives (e.g. information sharing)	Broad assessment of the range of benefits of cooperation (including cost of non-cooperation)	In-depth qualitative assessment of all identified benefits Include easily available quantitative and monetary estimates
Advanced stage (e.g. basins with international agreement and coordination body)	Realization of the potential benefits of cooperation through the implementation of advanced cooperation initiatives (e.g. infrastructure projects, coordinated management instruments)	Assessment of the benefits of independent national projects, joint projects, or a basin programme of measures	Carry out quantitative and monetary valuation, when justified given available resources

of intersectoral cooperation at the national level, can hamper the process by preventing agreement on priority outcomes of cooperation. The process of assessment of benefits should therefore been seen as a step-by-step process.

Select the right geographical and time scales

Basin-wide assessments can identify mutually beneficial opportunities that are not apparent in project-based assessments. Given that some of the benefits of transboundary water cooperation will be generated over long timescales, **a transboundary water cooperation benefit assessment should look also at the long-term benefits**.

Adopt an adaptive approach

A transboundary water cooperation benefit assessment can be thought of as a long-term process of improvement. To support it, a major collaborative long-term research programme should be preferred over short-term consultancies or competing studies. But interim results need to be produced to feed the transboundary water cooperation policy process. **As new policy needs are expressed and new benefits are identified, new benefit assessment efforts might need to be undertaken**. As discussed earlier, a transboundary water cooperation process may be able to deliver increasing benefits over time, as increasing levels of trust open new opportunities for cooperation. In addition, the estimation and valuation of transboundary water cooperation benefits is likely to contain errors (due to different causes). These errors can be picked up and corrected in the process of monitoring and evaluation, supported by the long-term research programme. Conducting the assessment jointly (see below) and using transparent methodologies will prevent those errors from fuelling conflicts.

Box 15 Jointly assessing the benefits of measures at the basin level for effective strategies to adapt to climate change in transboundary basins

Transboundary cooperation in climate change adaptation is not only necessary to prevent possible conflicts due to unilateral adaptation measures, but is also beneficial for more effective adaptation. For example, uncertainty can be reduced through the exchange of information, combining impact assessments and model results throughout the basin and thus increasing the reliability of modelling results. Transboundary cooperation in adaptation also helps to identify measures, such as flood protection infrastructure, in the basin where they can have the optimum effect, which may be in another riparian country. Transboundary cooperation thus helps to share costs and benefits of adaptation and to increase the overall efficiency and effectiveness of adaptation in a basin.

The assessment of the economic, social and environmental costs and benefits of different adaptation options should be carried out at a basin-wide level. A wide range of adaptation measures may be developed and/or identified and prioritization of measures is usually required to determine the most beneficial location in the transboundary basin and the most suitable measures. The prioritization process may be guided by various methods, ranging from systematic qualitative analysis, to semi-quantitative analysis in order to compare different attributes or parameters, to a full quantitative analysis of risks, costs and benefits.

For example, the joint Economic Commission for Europe-Organization for Security and Cooperation in Europe project entitled "Climate Change and Security in the Dniester River Basin" supported the development of the Strategic Framework for Adaptation to Climate Change for the Dniester Basin. Criteria for the participatory prioritization process for adaptation measures included the transboundary dimension, climate change adaptation benefits and potential of and dependence on water resources. During two national workshops held in the Republic of Moldova and in Ukraine, stakeholders discussed the location of vulnerable areas within the basin and potential adaptation measures using a basin-wide map without national borders. One of the measures selected focused on improving flood prevention by installing automatic water level monitoring stations in the Upper Dniester in Ukraine so that the information is quickly available to the relevant agencies downstream in the Republic of Moldova and Ukraine to make the right flood protection decisions on time. Downstream in the Republic of Moldova reforestation and measures aimed at protecting fish diversity were implemented, which are beneficial for the entire basin.

Enlarging the geographical scope of a basin agreement to cover additional related basins can help to identify mutually beneficial solutions (e.g. linking negotiations over the Colorado and the Rio Grande Rivers between Mexico and the United States of America). The need for cooperation in climate change adaptation can even be an incentive for wider cooperation in transboundary basins, as some basins have shown.

Sources: Guidance *on Water and Adaptation to Climate Change*. (United Nations publication Sales No. 09.II.E.14) and *Water and Climate Change Adaptation in Transboundary Basins: Lessons Learnt and Good Practices*. (United Nations publication Sales No, E.15.II.E.1). Available from http://www.unece.org/env/water/publications/pub.html.

Conduct it jointly

To be useful in supporting a transboundary water cooperation policy process, the benefit assessment needs to be credible and its findings accepted by the relevant parties. This is likely to require a team of experts from the different basin countries. **Before embarking on any assessment, it is essential to agree first with all parties on a pragmatic methodology**. An essential preliminary step for the assessment is to first jointly agree over the data to be used for the assessment. This is necessary to facilitate the compatibility of the findings of the benefit assessment and therefore their inclusion into governmental processes in all involved countries.

Box 16 The Danube's transnational monitoring system: harmonized data for joint planning

Since 1996, the International Commission for the Protection of the Danube River coordinates a transnational water quality monitoring system, the TransNational Monitoring Network. This system was originally conceived to support the implementation of the Convention on Cooperation for the Protection and Sustainable Use of the River Danube, but in 2007 it was revised to meet the requirements of the European Union Water Framework Directive.[15] Its main objective is to provide an overview of long-term changes in surface water and (where necessary) groundwater status in a basin-wide context, paying particular attention to the transboundary pollution load. It comprises surveillance monitoring, operational monitoring and investigative monitoring. Products of this monitoring system include annual statistical yearbooks on water quality parameters, inputs to the Danube River Basin Management Plan on the chemical and ecological status of surface water bodies and the chemical and quantitative status of groundwater bodies (every six years). Another important element of TransNational Monitoring Network are the Joint Danube Surveys, which are joint river monitoring expeditions of international teams of scientists carried out every six years to harmonize methodologies; fill information gaps on the Danube biology, hydromorphology, microbiology and chemistry; test new methods; and check the impacts of new chemical substances. The key outcome of the Network is a harmonized and quality-controlled database providing a comprehensive overview and information on long-term trends of the water quality in the international river basin.

Source: International Commission for the Protection of the Danube River, http://www.icpdr.org/main/activities-projects/tnmn-transnational-monitoring-network.

Involve different stakeholders, including local communities

Ideally, the assessment results will be accepted not just by the parties at the national level, but also by the different stakeholders within each country, including policymakers, experts and beneficiaries. This will increase the stakeholders' feeling of ownership and enhance dissemination of the results, and the implementation of actions, eventually enabling the realization of benefits. This is particularly true for local communities, which will be the beneficiaries of many of the economic, social and environmental benefits generated in the basin. In some cases, benefit assessment will have an exploratory nature and rough-and-ready assessments will not have the capacity to engage local communities deeply due to lack of resources. But **participatory approaches should generally be used to improve the quality of the results of the assessment exercise** by involving local communities. This is also likely to have positive impacts in terms of gaining local support for promoting transboundary water cooperation solutions.

Favour integrated assessments

Given the large range of the potential benefits of transboundary water cooperation, it will be necessary to adopt different approaches to assessing different types of benefits. Nevertheless, **a common framework for integrating the different benefits will be invaluable to support the decision-making process** when considering trade-offs.

[15] Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy.

Box 17 Integrated assessments: the Inter-SEDE model

The study entitled "Trans-boundary Water Cooperation as a Tool for Conflict Prevention and for Broader Benefit-sharing" presents one of the rare efforts to assess the benefits of transboundary water cooperation in an integrated manner. The assessment framework considers three types of benefits: economic development, security benefits and environmental benefits. A model (Inter-SEDE) was developed to assess the relative importance of each type of benefit, based on 23 indicators (9 for security, 9 for economic development, 5 for environment), some quantitative and some descriptive. For each indicator, a score can be developed by a ranking and banding procedure. In applying the model to the Jordan, Kagera and Mekong Basins, data was collected for the 23 indicators for 21 countries. For each indicator, the 21 countries are ranked, then grouped in bands, and then assigned a score from 1 to 5 according to the band to which they belong. To assess the relative importance of the benefits in a given transboundary basin, an overall score is derived for each type of benefit by combining the scores all the riparian countries for all the indicators related to that particular type of benefit. This methodology reveals how different types of benefits are of different relevance in different basins, but also for different countries within the same basin.

Basin/ country	*Poverty-related indicators*					*Development potential*				*Total*
	GDP per capita	*Population below poverty line*	*Life expectancy at birth*	*Infant mortality rate*	*Literacy rate*	*Energy use per capita*	*Agriculture as % of GDP*	*Industry as % of GDP*	*Water availability/ use*	
The Jordan River										
Israel	1	1	1	1	1	1	1	2	1	**10**
Jordan	3	3	1	2	1	2	1	3	1	**17**
Lebanon	2	2	1	2	2	2	2	4	3	**20**
State of Palestine	5	5	1	2	3	3	1	3	1	**24**
Syria	3	2	2	3	2	2	3	3	3	**23**
Average	2.8	2.8	1.2	2.0	1.8	2.0	1.6	3.0	1.8	**18.8**
The Kagera River										
Burundi	5	5	5	4	5	5	4	4	2	**39**
Rwanda	4	5	5	5	4	5	4	4	2	**38**
United Republic of Tanzania	5	3	5	5	3	5	4	4	3	**37**
Uganda	4	3	4	4	4	5	3	4	3	**34**
Average	4.5	4.0	4.7	4.5	4.0	5.0	4.7	4.0	2.5	**37.0**

Source: David Phillips and others, *Trans-boundary Water Cooperation as a Tool for Conflict Prevention and for Broader Benefit-sharing*, Global Development Studies No.4 (Stockholm, Ministry for Foreign Affairs, 2006).

Consider different scenarios and possible related trade-offs

Scenario analysis can be used to inform the impacts of alternative policy paths – such as non-cooperation, weak cooperation, and strong cooperation – by asking "what if" questions. The value of the indicators that define each scenario will vary and, since it is unlikely that one single scenario will provide superior values for all the indicators, trade-offs will need to be negotiated. To the extent possible, the different values of those indicators need to be quantified and monetary values attached to them in order to inform decisions involving trade-offs. At the transboundary level, it may be appropriate to focus only on the gross benefits, as there may be different perceptions among the parties regarding how to value any negative impacts. Nevertheless, each individual party should look at the net benefits to inform its position. In addition, possible costs associated with cooperation (both in the short and long terms) should not be overlooked: incorporating these costs into the scenario analysis can contribute to making dialogue more constructive and informed.

Box 18 Scenario planning in the Mekong Basin

The Mekong River Commission addresses problems involving uncertainties by deploying various scenario-based planning tools to envisage future trajectories in the development and management of different aspects of the Mekong River. This includes discerning possible changes with regard to population, economy, ecology, climate change and technology. This process enables the Commission and its member countries to have a vision which is based on where the region wants to go in the future, rather than being trapped in the realities of today.

Scenarios are assessed through an integrated approach using a comprehensive set of 65 indicators to assess the economic, social, environmental, climate change and cooperation conditions. This scenario-based process for the identification of new opportunities is expected to accelerate and optimize development through increased cooperation and benefit sharing. The development of updated scenario assessments of benefits, costs, impacts, risks and exploratory and adapted planned development (including hydropower and irrigation) will be used to suggest alternative pathways for basin-wide optimal and sustainable development through joint projects (multiple sectors), national projects of basin-wide significance and deal structures.

Sources: Anoulak Kittikhoun, Mekong River Commission, personal communication, 2014 and 2015; and Strategic Foresight Group, Mekong Learning Journey in Cambodia and Lao People's Democratic Republic – Outcome Report: Learning from Gradualism, 2014.

Do not expect to generate monetary values for all the benefits

It is rarely possible, desirable, or necessary to provide a monetary value for all the benefits of transboundary water cooperation. A transboundary water cooperation benefit assessment may include qualitative assessment, physical quantification and monetary valuation (through market and non-market techniques). The advantage of being able to provide monetary values is that the importance of the benefits of transboundary water cooperation can be more easily grasped by policymakers, as it becomes easier to compare with other policy initiatives. Essentially, calculating monetary values for all types of benefits would provide a common metric that would simplify the aggregation and presentation of results and the evaluation of trade-offs. However, despite progress made in recent decades in economic science, it is still difficult or impossible to value some of the potential beneficial impacts of transboundary water cooperation. There may even be cases where monetary valuation of certain impacts would create controversies among stakeholders that undermine the process of transboundary water cooperation rather than support its progress (see box 23). The same benefits can be valued differently by different countries; it is therefore important to conduct the assessment jointly, to understand these differences. In addition, the monetary value of benefits might develop dynamically and established values might become outdated over a relatively short time.

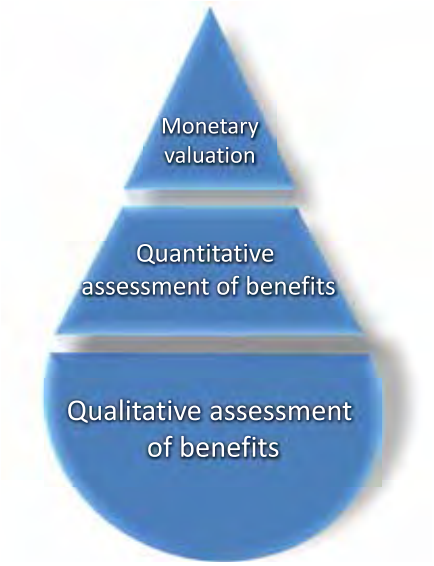
Accept that benefit assessment will be imperfect

Assessing the benefits of transboundary water cooperation is fraught with difficulties. The available methodologies are not always satisfactory. Moreover, while crucial, the knowledge base is often weak, at least for some types of benefits. Attribution of the benefits of policy initiatives, always a thorny issue, is even more difficult in a transboundary context. But even if imperfect, benefit assessment can have major positive impacts in terms of informing decision-making and promoting cooperative solutions.

B. Assessing different types of benefits

As there are many different types of benefits of transboundary water cooperation, assessment approaches will necessarily be different. For most of them, it will be possible to at least undertake a qualitative assessment, possibly through a combination of expert assessment and participatory assessment. For some of them, it will be possible to provide a quantitative assessment. And only for a reduced number of benefits will it be possible to provide a monetary valuation. Figure 3 attempts to reflect this situation.

Figure 3 Scope for assessing benefits



The benefit assessment exercise should be designed to fit the needs of the transboundary water cooperation policy process, which will vary depending on its stage of development (see table 1).

B.1. Assessing economic benefits

Table 4 provides an overview of what policymakers can expect in terms of assessment for the different sub-types of economic benefits discussed in chapter 3. Generally, there is more scope to quantify and attach monetary values to economic benefits than to other benefits of transboundary water cooperation. However, that does not mean that it is an easy task.

The benefits of transboundary water cooperation that result in infrastructure solutions can also generally be quantitatively assessed and monetarily valued. There is indeed a large literature providing technical guidance on how to assess the economic benefits of water projects. At the same time, the economic benefits of many "soft" transboundary water cooperation solutions are often difficult or impossible to quantify.

The cost-benefit analysis framework for water projects assumes that those interventions are "marginal" in the sense that their impacts will not change the structure of the economy. There are other methodologies to evaluate those impacts, such as input-output analysis and general equilibrium modelling, but the informational demands of such economy-wide analyses are very high and not justified for most benefit assessment exercises.

Table 4 Assessing economic benefits: options and methodological approaches

Sub-type of benefits	*Assessment options*	*Comments on methodological approaches*
Expanded activity and productivity in economic sectors (aquaculture, irrigated agriculture, mining, energy generation, industrial production, nature-based tourism)	Quantification and monetary valuation generally possible	Benefits can be valued by applying market prices to the estimated changes in production. If prices are regulated or distorted, shadow prices will need to be estimated. The main challenge may be estimating the changes in production. In most countries there will be economists familiar with the appropriate techniques.
Reduced cost of carrying out productive activities	Quantification and monetary valuation generally possible	Benefits can be valued by applying the expected changes in prices of inputs to the amount of inputs, or calculating estimates of the costs of alternative options to procure the inputs.
Reduced economic impacts of water-related hazards (floods, droughts)	Quantification and monetary valuation generally possible	Benefits can be valued by applying the replacement cost of goods and assets lost. The impact on human lives is included in the category of social and environmental benefits.
Increased value of property	Quantification and monetary valuation sometimes possible	Valuation requires non-market approaches. The hedonic pricing method in particular will be appropriate, but it requires data and expertise that may not be readily available.
Additional economic impacts on the national economy, beyond the basin concerned	Quantification and monetary valuation rarely possible	Valuation requires complex and data-hungry methodologies (such as input-output analysis or general equilibrium analysis) that are not generally justified in benefit assessment exercises, except possibly for major infrastructure developments.

Box 19 Assessing economic benefits for the Columbia River

The Columbia River Treaty is perhaps the classic example of a successful, benefit-sharing international river treaty. The Treaty was signed in 1964 between Canada and the United States of America to develop and operate four large dams for hydropower generation and flood control. The economic benefits of the dams were estimated by a team combining experts from Canada (BC Hydro) and the United States (United States Army Corps of Engineers and Bonneville Power Administration). The benefits for the first 30 years were estimated to be US$ 64 million for flood control and US$ 512 million for hydropower generation. These estimates justified and made possible the agreement. In retrospect, the gross benefits in terms of flood control and hydropower were underestimated, as at that time engineers thought that dikes would be more effective for flood control and the actual price of electricity was significantly higher over the 30-year period than predicted. At the same time, the costs of what have turned out to be longstanding concerns about the social and environmental impacts of the dams were not considered so as to derive net benefit estimates.

Benefits of the Columbia River Treaty	*Costs of the Columbia River Treaty*
Flood control New power generation Increased efficiency in existing power generation Increased integration and coordination of water management	Increased negative impact on fish Negative impacts to wildlife and the loss of important wetlands Displacement of people Flooding of productive valley floor Increased sense of marginalization of local communities and indigenous peoples

Source: Richard K. Paisley, University of British Columbia, Institute of Asian Research, *Case study on the Columbia River Treaty*, prepared for the Counting our Gains workshop, Geneva, May 2014. Available from www.unece.org/env/water/workshop_benefits_cooperation_2014.html#/.

Box 20 Economic benefits in the Senegal River Basin

In the Senegal River Basin, the three countries of Mali, Mauritania and Senegal, through the Senegal River Basin Development Authority, developed a clear methodology and framework to first quantify and then allocate the benefits and costs of multipurpose investments across the entire basin. The Manantali Dam, for example, which is located entirely inside western Mali, was constructed by the Development Authority in the 1980s for hydropower, irrigation and navigation benefits to be distributed across all three countries. The scale of benefits derived and the perceived fairness of the benefit-sharing arrangement, together with the political ideal of solidarity between the three countries, have sustained substantive cooperation and a strong river basin organization on the Senegal River.

Source: Winston Yu, *Benefit Sharing in International Rivers: Findings from the Senegal River Basin, the Columbia River Basin, and the Lesotho Highlands Water Project*, World Bank AFTWR Working Paper 1, 2008. Available from documents.worldbank.org/curated/en/2008/11/10019058/benefit-sharing-international-rivers-findings-senegal-river-basin-columbia-river-basin-lesotho-highlands-water-project.

B.2. Assessing social and environmental benefits

Table 5 provides an overview of what policymakers can expect in terms of assessment for the different sub-types of social and environmental benefits discussed in chapter 3. Generally, there is less scope to quantify and attach monetary values to social and environmental benefits than to economic benefits, but more so than to other benefits of transboundary water cooperation. However, monetary values will be more contested for social and environmental benefits, and thus it should be considered whether the process of quantifying and monetizing such benefits adds value to the transboundary water cooperation policy process before carrying it out.

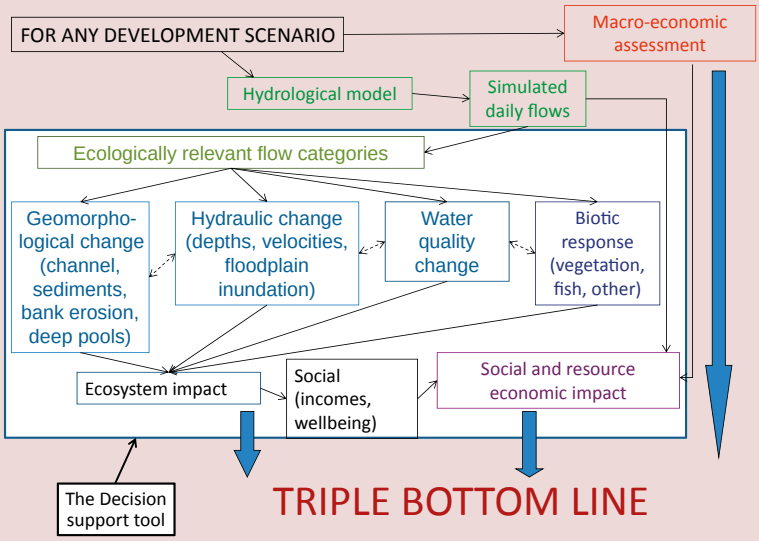
Table 5 Assessing social and environmental benefits: options and methodological approaches

Sub-type of benefits	*Assessment options*	*Comments on methodological approaches*
Health benefits (morbidity and mortality effects)	Quantification generally possible Monetary valuation sometimes possible	Benefits can sometimes be quantified, using dose-response function approaches. It may also be possible to provide a monetary value on the averted loss of human life and illnesses (using value of a statistical life approaches), but this is not recommended unless the countries involved already use those approaches to value public policies and investments.
Employment and anti-poverty benefits	Quantification generally possible Monetary valuation rarely possible	The number of jobs created and the number of people lifted out of poverty can in principle be quantified. An approach to provide a monetary value is to estimate the cost of alternative measures that would generate the same benefits.
Improved access to services (water supply, electricity)	Quantification generally possible Monetary valuation sometimes possible	The number of beneficiaries can generally be quantified. The health impacts are included under the health benefits sub-type. Monetary values can be attached to convenience and other benefits by valuing time savings and eliciting willingness to pay (through survey-based methods, such as contingent valuation or conjoint analysis).
Improved satisfaction due to preservation of cultural resources or access to recreational opportunities	Quantification and monetary valuation sometimes possible	The number of beneficiaries of recreational opportunities can generally be quantified. Monetary values can sometimes be attached through non-market valuation methods (such as the travel-cost method or contingent valuation). While in theory some of those non-market valuation methods can be used to elicit monetary values for the preservation of cultural resources, this can be contested and is thus not recommended.
Environmental benefits (increased ecological integrity and avoided habitat degradation and biodiversity loss)	Quantification and monetary valuation sometimes possible	The total economic value framework distinguishes use and non-use values of environmental preservation. Use values (such as flood control or recreational opportunities) are captured under other sub-types of benefits. Non-use values can be elicited through some non-market valuation methodologies, such as contingent valuation. Those monetary values, however, are sometimes contested by some stakeholders.

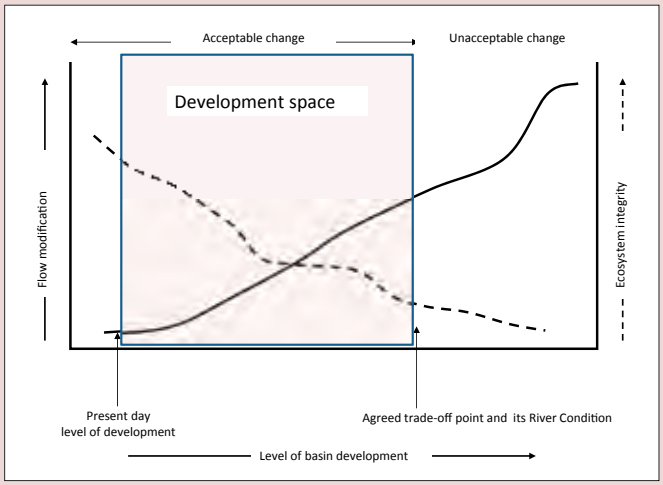
Box 21 Assessing the economic, social and environmental benefits in the Okavango Basin

In order to inform decision-making in the Cubango-Okavango River system, member States of the Permanent Okavango River Basin Water Commission needed to have a common understanding of trends and issues in the basin to be able to ascertain joint development opportunities. An integrated flow assessment methodology was used to support the development of alternative scenarios that would have associated different economic, social and environmental impacts. Economic valuation of ecosystem services was used to assign a monetary value to some of those impacts. The scenarios have helped decision makers to define an "acceptable" development space.

The Integrated Basin Flow Assessment Process



Using the Findings to Negotiate a Basin Development Vision



Source: Ebenizário Chonguica and Tracy Molefi, Permanent Okavango River Basin Water Commission, *Case study on the Cubango-Okavango River Basin*, prepared for the Counting our Gains workshop, Geneva, May 2014. Available from http://www.unece.org/env/water/workshop_benefits_cooperation_2014.html.

B.3. Assessing regional economic cooperation benefits

Assessing the regional economic cooperation benefits generated by transboundary cooperation will generally rely on qualitative assessments. This is largely due to the difficulty in attributing changes in trade or investments between countries to transboundary water cooperation. However, it will be possible to quantify some benefits – for example, the expansion of regional energy infrastructure networks facilitated by hydropower developments in transboundary basins.

Some considerations to be taken into account when approaching the assessment of regional economic cooperation benefits include the trend towards sub-basin agreements, the fact that these types of benefits will not be equally important in all basins, the framing of the outcomes of cooperation (moving away from water allocation, which is perceived as a zero-sum game) and the opportunities to carry out these assessments as part of a nexus assessment.

The assessment of regional economic cooperation benefits should look at interdependencies in economic sectors, as well as opportunities to develop a regional water investment plan and mobilize investments for other types of regional infrastructure.

Box 22 The regional economic cooperation benefits of the Regional Rusumo Falls Hydroelectric Project

With access rates below 20 per cent (and as low as 10 per cent in the case of Burundi), a combined 10.3 million households lack access to electricity in Burundi, Rwanda and United Republic of Tanzania. To exploit their shared hydropower potential, the three countries have long aimed to develop the hydropower potential of the Rusumo Falls. Originally established in 1976 by the Kagera Basin Organization (which stopped working in 1994), the Regional Rusumo Falls Hydroelectric Project was successfully relaunched in 2005, with funding from the International Development Association. The project includes the construction of an 80-megawatt hydropower generation plant as well as almost 380 kilometres of transmission lines and corresponding substations to bring electricity to the three countries. One innovation of this project is that Burundi (the poorest country) will not contribute financially to the project but will nevertheless receive electricity in exchange for agreeing to the project's development. The project is generating a number of benefits, some of them of national scope (access to electricity, local socioeconomic development), but also increased regional economic interdependence through the development of transnational power lines.

Source: Fred Mwango, Intergovernmental Authority on Development, *Case study on the Regional Rusumo Falls Hydroelectric project*, prepared for the workshop, "Beyond Water: Regional economic integration and geopolitical benefits of transboundary water cooperation", Tallinn, January 2015. Available from http://www.unece.org/index.php?id=37301#/. Map provided by the Coordination Unit of the Nile Equatorial Lakes Subsidiary Action Program.

B.4. Assessing peace and security benefits

The context for assessing the peace and security benefits of transboundary water cooperation is evolving rapidly. There is increasing awareness and interest among the foreign policy community of the opportunities and risks related to the management of transboundary waters. However, peace and security objectives for transboundary water cooperation still rank low in many basins, where sovereignty concerns can remain a major obstacle to the promotion of transboundary water cooperation by foreign policy officials. This perception (too much effort for too little gain) can result in limited political efforts.

Thus, in a transboundary water cooperation benefit assessment exercise, peace and security benefits should be discussed but not overemphasized. There are currently no robust methodologies to guide foreign policy officials in the identification and prioritization of transboundary basins on which they should focus their efforts, given the opportunities and risks that the situation in those basins may provide to increasing peace and security at a broader level.

In assessing peace and security benefits, the focus should be on qualitative measures. It may be possible to develop a "traffic-light" indicators framework to identify basin stability by assigning traffic-light values to different steps of building up transboundary water cooperation (such as study tours, a common knowledge base, data sharing, joint monitoring, institution building, etc.) for both the short and the long term. This could help to suggest the potential for peace and security benefits from transboundary water cooperation. Efforts to provide monetary valuations or even quantification should generally be avoided and analytical resources focused on other types of benefits.

A qualitative assessment of peace and security benefits should highlight the cross-cutting links to other policy benefits, both domestic and foreign. It should include a discussion of the contribution of transboundary water cooperation to peace, security and stability through confidence-building and conflict prevention measures – such as keeping dialogue avenues open, interventions in small conflicting basins and building a basin identity. The assessment should further examine how transboundary water cooperation can help to achieve closely related objectives, such as the implementation of the human rights to water and sanitation, and should also provide an analysis of how cooperation can help to manage other risks, such as climate change.

An option for carrying out a qualitative assessment of peace and security benefits is to adopt a two-step approach. The first step is to gather a factual information base, focusing on physical variables of water resources and their impacts, in terms of challenges and opportunities, on economic sectors and other policy objectives. If an integrated assessment of benefits is being carried out, this step should not take much effort as it can make use of the results of the assessment of economic, social and environmental benefits. As a second step, an "expert group assessment" is undertaken to assess the peace and security benefits, using the factual information base as a starting point. This expert group assessment can take two alternative forms: an open forum or a closed-door meeting. The involvement of an external facilitator (United Nations advisers, think tank, etc.) could facilitate the process.

Chapter 5

Communicating the benefits of transboundary water cooperation

A. How to approach the communication of transboundary water cooperation benefits

Identify at the start of the benefit assessment exercise how the results will be fed into the transboundary water cooperation policy process

When starting a benefit assessment exercise, it is important to consider how the results will be communicated, both for internal communication and for public information. Communication efforts are also essential to ensure that the benefit assessment exercise effectively supports the policy process. Poorly planned or executed communication efforts are likely to be counterproductive and damage the transboundary water cooperation process by increasing transaction costs and decreasing ambitions. In developing a communication approach, however simple, it will be necessary to understand how the results of the benefit assessment will be fed into the policy process. It may be necessary to start by identifying the opportunities to influence the policy process through the types of information that can be generated by a benefit assessment – which will lead to the definition of the intended purpose and how to achieve it.

Define how the results of the benefit assessment exercise will be used to support the transboundary water cooperation policy process

The needs of the transboundary water cooperation policy process will determine the type and level of efforts needed to communicate the results of the transboundary water cooperation benefit assessment. The assessment can support the policy process in multiple ways: it can establish a credible and commonly accepted baseline and can contribute to building trust among stakeholders by ensuring transparency; it can provide commonly accepted estimates of benefits that can be generated under different cooperation scenarios; it can inform the design of incentive and deal-making schemes; it can contribute to monitoring the generation of benefits; and it can inform the need to redesign the institutional setting or scope of cooperation. Each of those possible uses of the results of a transboundary water cooperation benefit assessment will require different communication efforts. An analysis of the people to be informed (e.g. environmental NGOs, river communities, etc.) will help to identify the range of target audiences, and accordingly the communication channels and the stakeholders with whom to partner to develop the necessary information, given the intended use of the results.

Include the communication of benefits in the communication plan

In many cases, transboundary water cooperation processes will include a communications plan. **A strategy for communicating the results of a transboundary water cooperation benefit assessment should be carefully included in that communication plan**. This will include issues such as identification of the target audiences, what content needs to be developed for those specific target audiences (key messages and required supporting information), who will deliver the messages, how the messages will be delivered (communication products), and when the messages will be delivered. Effective communication efforts will require financial resources; in some settings, these may be provided by international organizations and the donor community. Stakeholders (e.g. environmental NGOs, unions, churches, interest groups, etc.) may offer cost-efficient means to deliver the messages to the target groups. A stakeholder analysis can therefore be a useful tool to identify a relevant and efficient communication channel to reach specific target audiences.

Think of communication efforts as part of a communications cycle

Transboundary water cooperation is a cyclical process that goes through (not always well defined) analytical, negotiation and implementation phases. Benefit assessment is also a cyclical process that goes through identification, assessment and communication phases. It is important to understand communication as a dialogue (and not a unidirectional communication channel): reactions to the presentation of the benefit assessment findings are an important source of information to further feed the process. **Communication efforts should therefore be conceived as part of a communication cycle that will evolve to support the needs of the cyclical policy process and the accompanying benefit assessment cycle**, rather than as a battery of efforts at the end of a linear process of benefit assessment.

Communicate the benefits of the overall programme of cooperation

Communicating the benefits of transboundary water cooperation includes communication of the benefits from the improved management of both surface and groundwaters, benefits related to water quantity and quality and benefits generated at the basin and beyond the basin scale, as well as the evolution of benefits over time (short term, long term).

Take into account that upstream and downstream countries may have different perspectives

In communicating benefits, it should also be taken into account that upstream and downstream countries often have different perspectives. For example, upstream countries may be more focused on minimizing risks and downstream countries may be more focused on maximizing benefits. It is therefore important to take into account the audience when developing the messages, but also to pay specific attention to the wording of the messages (not a "winner and loser" scheme but a "win-win" situation if considering benefits beyond water; no "asymmetry" but possible "deal making"; "multiplier effect" instead of "trade-offs", etc.).

B. Communicating with different audiences

Audiences

There are several intended audiences for the communication efforts of a benefit assessment exercise, including national decision makers in the foreign policy, public finance and economic policy communities, the national water community in each country, local basin decision makers (municipalities), businesses and the local populations. **Each intended audience will require different types of information and the use of different communication mechanisms**.

Box 23 The impact of communication on cooperation outcomes in the Murray-Darling Basin

The Murray-Darling Basin spans over 1.06 million km^2 across four states and one territory in Australia. Transboundary water cooperation in the basin goes back to 1915. Since 2000, the Federal Government has assumed an increasingly active role to ensure state collaboration and coordination. It introduced the Water Act in 2007, created the Murray-Darling Basin Authority, and implemented the "Water for the Future" policy (with $A 12.9 billion allocated over 10 years to fund water reallocation). One of the goals of the new independent Murray-Darling Basin Authority was to establish an independent, basin-wide plan for water sustainability. In 2010, the Authority released the Guide to the proposed Basin Plan that called for environmental water holdings to be increased by 3,000–4,000 gigalitres annually, which represented an average reduction in current watercourse diversions of 27 to 37 per cent. The Murray-Darling Basin Authority wanted the release of the Guide to be the first time that sustainability diversion limits were proposed, and kept its content secret, with no communication or consultation with other water management authorities (state or federal). In the run-up to the Guide's release, there was great speculation about its content, with lots of rumours spreading fear. The Authority released the Guide and supporting materials on their website with an immediate impact on the national news. It had the misfortune to happen at a time when many irrigation regions were suffering from flooding. The lack of knowledge about water products by journalists led to inaccurate media coverage.

After releasing the Guide, the Authority started touring regional towns in the Murray-Darling Basin, meeting irrigators, answering questions, and handing out copies of the Guide and supporting material. It started the tour in the town of Griffith, one of the areas that stood to suffer the most from reallocation, where angry farmers started a fire and burned copies of the Guide. This became the public image of the Guide and showed how irrigators felt about the water policy. Irrigators did not accept economic modelling studies (usually based on computable general equilibrium models), which modelled impacts on future jobs and agricultural production, and the non-use values of environmental benefits were disputed. Community consultations were dominated by loud and angry farmers and more disruptive actions. This led to a federal inquiry, the resignation of the head of the Authority, new programmes to support rural areas, additional expenditure on irrigation infrastructure to recover water and, finally, a substantial reduction in the targets for environmental holdings in the final Basin Plan. Huge transactions costs, in consultancies and extensive community consultation, were also incurred.

Source: Sarah A. Wheeler, University of Adelaide, *Case study on the Murray-Darling Basin*, prepared for the Counting our Gains workshop, Geneva, May 2014. Available from http://www.unece.org/env/water/workshop_benefits_cooperation_2014.html.

Purpose

The results of a benefit assessment exercise can be used for raising awareness (from national decision makers to a broader audience), for policy development (involving not just decision makers at the national level, but also stakeholders at the basin level) and for negotiations and deal making (which mainly involves national decision makers both in the water sector and outside). Whatever the purpose, it is important to use the results to clarify basic concepts, illustrating the trade-offs of the with/without cooperation alternatives:

Awareness-raising. Many stakeholders in the water policy field may not know what the benefits of strengthened cooperation will be, both in general and for themselves in particular. Communicating those benefits will help to gather support for the process of cooperation;

Policy development. Policy development is not merely a function of evidence: timely evidence presented in the right way can greatly support policy development. Within an established transboundary policy dialogue, evidence will need to be supplied at different stages. At each stage, the type of evidence communicated to policymakers and its level of detail will have to vary. Some stakeholders, such as local governments or civil society organizations, may be keen supporters of the process of cooperation, but they will need the right type of information to try to influence domestic decision-making. In order to keep alive the political will, continual communication of the benefits at a high governmental level is essential;

Negotiations and deal making. Moving towards advanced forms of cooperation will require more detailed and robust information.

Box 24 Danube Day: a basin-wide communication effort

Danube Day is a celebration of healthy rivers, held annually on 29 June. Since Danube Day was celebrated for the first time in 2004, it has grown into the biggest river festival in the world. Some 350 events are organized in 14 of the 19 countries that share the Danube River Basin, drawing support from more than 900 organizations or individuals, including public bodies, civil society and corporate actors. The target audiences are mainly families, children and young people that are engaged with the rivers through a mix of recreational activities and environmental education measures. Participants engage in recreational or cultural activities linked to rivers or lakes to experience the benefits of sound water management and thereby learn about them. Danube Day has a positive message: hard work and cooperation has helped to improve water quality since the 1990s, making rivers more enjoyable for everybody. At the same time, Danube Day creates opportunities for governments and administrations to showcase their success in protecting and conserving water and aquatic ecosystems. Since its launch, Danube Day has drawn considerable financial support from the beverage industry for both basin-wide international and national or local activities. Involving tens of thousands of participants throughout the basin every year, Danube Day fosters a connection between people and their rivers and raises awareness of the transboundary nature of rivers and both international and local efforts to protect them.

Source: Benedikt Mandl, International Commission for the Protection of the Danube River, personal communication, 2014.

Box 25 Long-term communication efforts – from awareness-raising to cooperation development in the Prespa Park Basin

The Prespa Basin is a relatively small basin (1,519 km^2) shared by Albania, Greece and the former Yugoslav Republic of Macedonia. Inter-State cooperation in the region was initiated in 2000, following a joint Prime Ministerial Declaration on the establishment of the Prespa Park. A comprehensive assessment of the potential benefits of transboundary water cooperation was undertaken at the very early stages of institutional cooperation, under the coordination of the Greek umbrella non-governmental organization, the Society for the Protection of Prespa. Environmental and social benefits identified included improved water quality (through improved agricultural practices and wastewater management systems), maintaining river health (by avoiding new diversion works), improved satisfaction of local communities (through on-the-ground activities and the pride generated by greater international recognition) and a stronger civil society (through active participation in sustainable development activities). The assessment also identified a number of regional economic cooperation benefits at the local scale: from the convergence of views at the transboundary municipal level, to transboundary cooperation at sector level that included the water, fisheries, spatial planning sectors, and veterinary and firefighting services. These benefits were systematically communicated to diverse stakeholders at all levels over the years of institutional cooperation in the region. It catalyzed the formation of policies and the formalization of the cross-border cooperation, including the signing of a binding Agreement on the Protection and Sustainable Development of the Prespa Park Area by the three littoral States and the European Commission in 2010 and the signing of trilateral agreements expressing convergence of will at the municipal level.

Source: Daphne Mantziou, Society for the Protection of Prespa, *Case study on the Prespa Park Basin*, prepared for the Counting our Gains workshop, Geneva, May 2014. Available from www.unece.org/env/water/workshop_benefits_cooperation_2014.html#/.

Tactics

Communication efforts should focus on moving from perception to facts. To that end, it is necessary to understand the audiences. Successful tactics include relating the benefits of transboundary water cooperation to national priorities and programmes, packaging benefits and paying attention to timing (e.g. upcoming elections).

Messages

The messages should be meaningful for the intended audiences. They should be simple and fact-based, focusing on topics to which stakeholders can relate. Depending on the stage of the transboundary water cooperation policy process, the messages will be only forward-looking (leading to cooperation) or may be backward-looking as well (building on the results already achieved). Attention should be paid to the framing of the messages. For example, for some audiences it may be more compelling to communicate the avoided losses and risks and the costs of inaction rather than the new gains. Messages should be aligned to the political context. They should aim to develop success stories.

Mechanisms

There are multiple mechanisms that can be used to communicate with the different audiences. The selection of mechanisms will depend on the intended audience and the intended purpose. Table 6 maps out some of the possible mechanisms to be used.

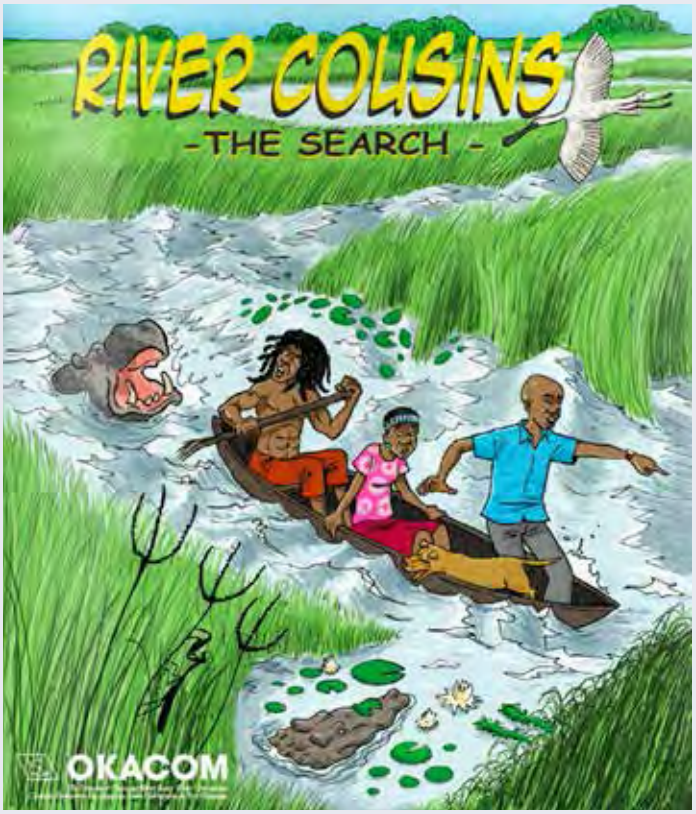
Table 6 Examples of mechanisms to communicate the benefits of transboundary water cooperation

Target audience	*Awareness-raising*	*Policy development*	*Negotiations and deal making*
National decision makers (ministries of foreign affairs, economic development and finance)	Policy briefs	Trusted persons and think tanks Analytical reports making the economic case	Joint analytical reports Independent panel of experts
National water community (ministries of environment or water, basin organizations, large water users/ beneficiaries)	Policy briefs Joint multi-language website Platforms of joint bodies Study tours	Platforms of joint bodies Process of preparation of basin plans Study tours and workshops (tailored to stakeholders and themes)	Joint analytical reports Independent panel of experts
Locals (local governments, local communities, local water users/ beneficiaries)	Articles and op-eds in mass media Training of journalists and teachers Joint multi-language websites Basin day events	Trusted grass-roots organizations	Public consultation mechanisms

Box 26 Communication efforts in the Okavango Basin – different communication products for different audiences

In 1994, the Governments of Angola, Botswana and Namibia established the Permanent Okavango River Basin Commission. After a period of infancy that lasted over a decade, the Commission focused on the development of a Transboundary Diagnostic Analysis (TDA) and a Strategic Action Programme. The TDA used an integrated flow assessment to support the development of different scenarios, which in turn helped to define a development space.

The Commission paid particular attention to the communication of the results from the TDA. It took care to develop different communication products aimed at different target audiences. For policymakers, it developed policy briefs. For experts (including basin technocrats, academics and the private sector), it produced a consolidated technical report, as well as over 70 technical specialist reports made available through the Commission website. For youth and students, it produced the River Cousins Comic Book. For the international community of river scientists, it took part in the 2012 International Riverprize competition. For non-specialist audiences, the results of the "what if" scenario analysis were presented in simple and pragmatic language, using spatial visualization and infographic techniques to make it easier for the target audiences to grasp its meaning. All these efforts were guided by a communications strategy.



Source: Ebenizário Chonguica and Tracy Molefi, Permanent Okavango River Basin Water Commission, *Case study on the Cubango-Okavango River Basin*, prepared for the Counting our Gains workshop, Geneva, May 2014. Available from http://www.unece.org/env/water/workshop_benefits_cooperation_2014.html.

Box 27 Communication efforts in the Teesta Basin: from the general public to high-level Government representatives

The Strategic Foresight Group developed an analysis of the opportunities for and benefits of increasing cooperation between Bangladesh and India in the Teesta Basin. Communication efforts to disseminate the results of the analysis targeted both high-level political representatives and the wider public. The final report was presented to the Offices of the Prime Ministers of both Bangladesh and India, as well as to the National Security Adviser to the Prime Minister of India, the Chief Foreign Policy Adviser to the Prime Minister of Bangladesh, members of parliament of both countries and all major political parties. Efforts to reach the wider public focused on the media – hundreds of related articles were published in the mainstream media and op-ed pieces were published simultaneously in both countries to mobilize public opinion. But in order to reach political representatives, it was key to promote their involvement in the development of the analysis. These efforts helped to create a sense of ownership across the political aisle that should facilitate the signing of the treaty, as well as further steps in transboundary water cooperation.

Source: Anumita Raj, Strategic Foresight Group, *Case study on the Teesta River Basin*, prepared for the Counting our Gains workshop, Geneva, May 2014. Available from www.unece.org/env/water/workshop_benefits_cooperation_2014.html#/

Policy Guidance Note on the Benefits of Transboundary Water Cooperation

Identification, Assessment and Communication

Transboundary water cooperation is necessary to manage shared waters in an integrated and sustainable way. It has the potential to generate many significant benefits for cooperating countries, such as accelerated economic growth, improved human well-being, enhanced environmental sustainability and increased political stability. Nevertheless, many challenges can prevent or delay countries from embracing effective joint management of transboundary waters, including because of an incomplete or biased perception of the benefits that could be attained.

As cooperation is one of the main obligations of the United Nations Economic Commission for Europe Convention on the Protection and Use of Transboundary Watercourses and International Lakes, countries preparing for accession to or implementing the Convention naturally reflect on what benefits such cooperation can bring. A benefit assessment exercise can help these countries to fully realize the potential benefits of cooperation, including by uncovering previously overlooked benefits and identifying opportunities arising from increased cooperation. It can therefore provide arguments and compelling evidence for cooperating and help to ensure the much-needed political support and funding for the cooperation process.

This publication, the result of a broad participatory effort building on the experience of basins from all over the world, aims to support Governments and other actors in realizing the potential benefits of transboundary water cooperation. It does so by introducing the wide range of benefits of cooperation and providing step-by-step guidance on how to carry out a benefit assessment exercise. This includes the separate but related tasks of identification, assessment and communication of benefits. This Policy Guidance Note suggests how to approach those tasks, as well as how the assessment of benefits can be integrated into policy processes to foster and strengthen transboundary water cooperation.

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