United Nations
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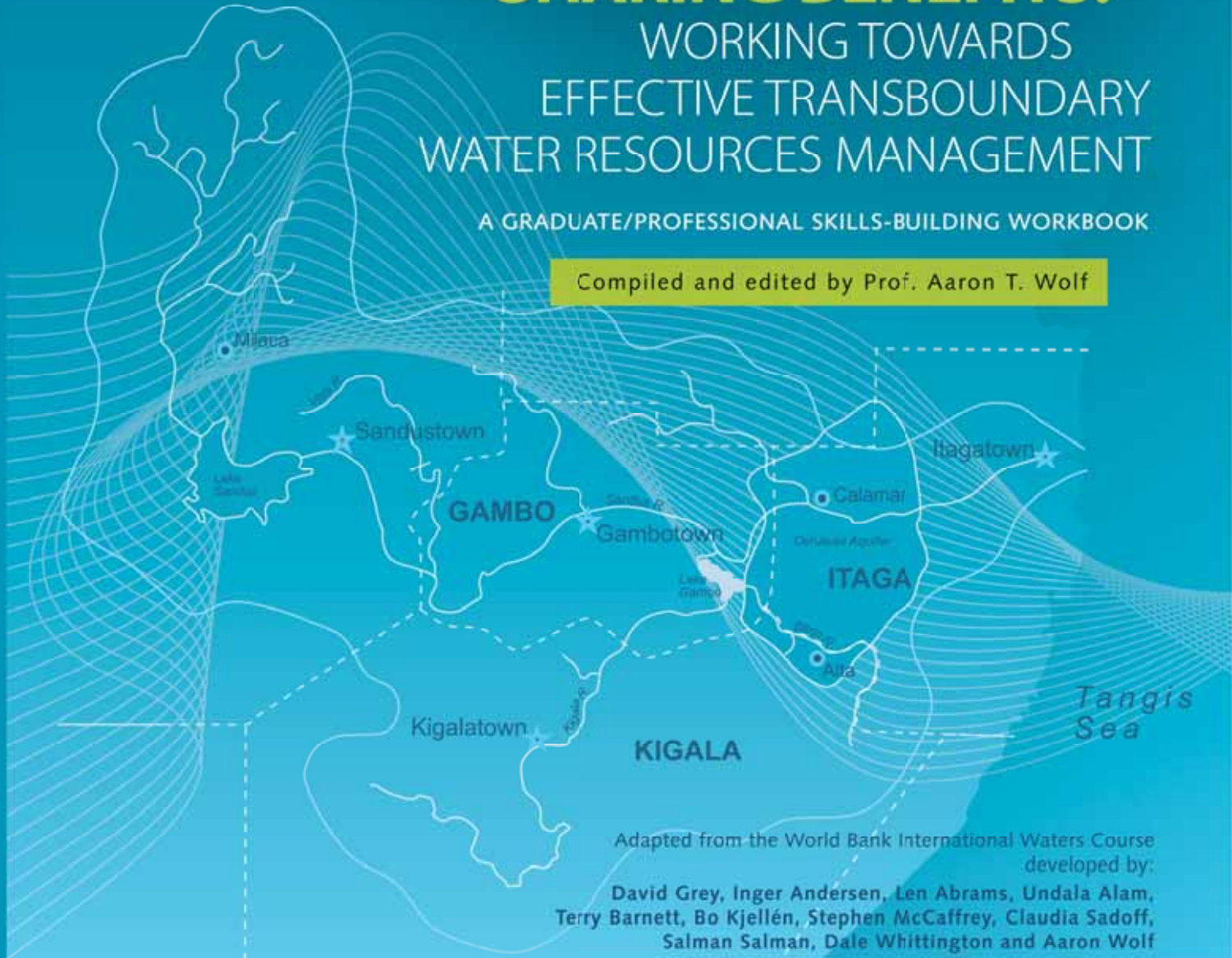
Cultural Organization

International
Hydrological Programme

SHARING WATER, SHARING BENEFITS:
WORKING TOWARDS EFFECTIVE TRANSBOUNDARY WATER RESOURCES MANAGEMENT

A GRADUATE/PROFESSIONAL SKILLS-BUILDING WORKBOOK

Compiled and edited by Prof. Aaron T. Wolf



Adapted from the World Bank International Waters Course developed by:
David Grey, Inger Andersen, Len Abrams, Undala Alam, Terry Barnett, Bo Kjellén, Stephen McCaffrey, Claudia Sadoff, Salman Salman, Dale Whittington and Aaron Wolf

International Hydrological Programme
Division of Water Sciences

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FOREWORD

There were 276 transboundary water basins in the world at last count, covering around 45 percent of the globe's surface. Competition often arises between stakeholders over limited water resources and many institutions lack the capacity to overcome conflicting approaches. These challenges are further exacerbated by population growth, development, and climate change. As communities face escalating threats to water scarcity, water managers, politicians, and engineers must work together to ensure that water is managed in an integrated manner.

Many solutions to water problems lie in better governance, with sharing water as one of the key challenges to be addressed. Although there is a growing literature in the field of water conflict resolution, many water professionals still lack the necessary tools to resolve water conflicts. UNESCO has thus partnered with the World Bank in the publication of this workbook, developed through training courses and seminars funded by the International Waters Window of the World Bank-Netherlands Water Partnership Program (BNWPP), with the goal of making the information available to a wider audience across the globe. The publication is meant for use by mediators, instructors, and facilitators in collaborative learning exercises. The material focuses on the skills necessary for managing water disputes at all levels, from the interpersonal to the international.

The workbook will support UNESCO's International Hydrological Program (IHP) in developing local capacity to resolve water conflicts through the From Potential Conflict to Cooperation Potential (PCCP) project, which facilitates multi-level and interdisciplinary dialogues in order to foster peace, cooperation, and development related to the management of shared water resources.

PCCP has worked towards anticipating and resolving water conflicts through training, technical assistance and research since 2001. This workbook will compliment the educational materials that PCCP already provides to decision makers and diplomats, water professionals, civil society members, educators, and post-graduate students through training sessions and courses on conflict prevention and cooperation in international waters. We hope that the workbook will advance local capacity for negotiation and conflict resolution, and thus increase the likelihood of successful sharing of river basins and other water resources.

András Szöllösi-Nagy
Secretary of UNESCO's International Hydrology Programme
Director of UNESCO's Division of Water Sciences
Deputy Assistant Director-General for the Natural Sciences Sector of UNESCO

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Programme Specialist
Project Coordinator
From Potential Conflict to Co-operation Potential (PCCP)
UNESCO – Division of Water Sciences

PREFACE

This workbook was conceived as a product of the International Waters Window of the World Bank-Netherlands Water Partnership Program (BNWPP). The BNWPP supports work in water management by providing funding through a number of "windows", one of which is the International Waters Window. Training courses and seminars involving participants from international basins all over the world have become a special area of focus for the window. This workbook draws together the materials developed and used in these seminars so that a wider group of people can benefit from them. To this end, the World Bank welcomed a partnership with UNESCO's International Hydrological Programme (IHP) for its production and dissemination.

Integrated water resources management – managing water across a basin to achieve economic, social and environmental goals – is always complex, and particularly so with international basins, where there is no apex (i.e. national) authority to provide binding arbitration. Working on the subject of international waters with representatives of riparian states is a serious and challenging task. There are no blueprint solutions – each solution will be informed by law, economics, and hydrology, but will most likely be determined by politics.

The International Water Window seminars and this workbook focus in particular on the incremental skills and tools needed to deal with the transboundary dimensions of an international basin. These skills and tools have been developed by a core team of specialists, bringing together several disciplines – water law, water economics, political geography, environmental diplomacy, negotiations, and others – in an integrated and cross-cutting manner, viewing complex issues through multiple lenses and making the whole much greater than the sum of the parts in promoting cooperative solutions.

The workbook can be used in many settings – with graduate students or professionals in a classroom, or in support of meetings of riparian states. In some cases, particularly in more formal representative settings, it may be necessary to tailor the use of these materials pragmatically as they were originally developed for a specialized and experienced multi-disciplinary team, and are designed to provoke discussion that could be sensitive and/or raise extremely complex questions. Nevertheless, it is hoped that this workbook will be widely used to help achieve better results in international waters by building knowledge and skills through group learning, discussion and exercises.

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ACKNOWLEDGMENTS

This publication was a team effort at its best. The work began with the close collaboration of the entire International Waters Core Team at the World Bank. The International Waters Window of the World Bank-Netherlands Water Partnership Program (BNWPP) provided funding for the training sessions and seminars which led to this workbook.

We are more grateful than we can say for the pedagogic and professional expertise of Dr. Lisa Gaines of Oregon State University, who worked relentlessly to craft the rationale, structure, and flow of the entire workbook throughout its many iterations. At the World Bank, Vahid Alavian, Kyle Robertson, and Mei Xie provided tremendously helpful comments and material, while Sandy Ruckstuhl has been instrumental in guiding the production process. Prof. Edy Kaufman of the University of Maryland offered unstinting support and a wealth of process material from his own vast expertise in the field. The original Sandus River Simulation, on which ours is based, was developed by Len Abrams when he directed Water Policy Africa. The post-negotiation components were derived from a simulation designed by CMI, and modified for the Sandus exercise. We are tremendously grateful to Prof. Sherm Bloomer, Dean of the College of Science at Oregon State University, for offering web resources in support of this workbook, and to Nathan Eidem of OSU's geography program, for help with the graphics and maps. Mark Bernard, Nathan Eidem, Colin MacLaren, John Metta, Tim Perry, and Rebecca Weaver of OSU's GEO 525: Water Policy course did a detailed dry run and critique, which has been extremely helpful.

The production and distribution of this publication would not have been possible without the support of UNESCO's International Hydrological Programme (IHP) and the From Potential Cooperation to Cooperation Potential (PCCP) project in particular. We would like to thank Maro Haas for book design and layout, and Bozena Blix for copyediting and coordinating the production process.

Finally, we owe an immense debt of gratitude to the professionals who participated in the Bank's International Waters courses over the years, whose enthusiastic involvement and insightful feedback have allowed us to continuously improve and refine this product and ground it in the intricacies of real-world transboundary water resources management.

We owe thanks to the following persons and organizations for reprint permissions.

Professor John Barkai, for permission to reprint:
Professor John Barkai's teaching materials. "Basic Definitions for Dispute Resolution" (teaching notes: *The Art of Negotiation*, p. 3-4); "Five Factors for Planning" and the "Negotiation Planning Chart" (teaching notes: *The Art of Negotiation*, p.13-14)
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Salman M.A. Salman. World Bank Policy for Projects on International Waterways

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CONTENTS

THE INTERNATIONAL WATERS CORE TEAM

The World Bank International Waters (IW) Window and Core Team was established under the Bank Netherlands Water Partnership Program (BNWPP). The BNWPP aims to translate the principles and vision of water resources management into actions on the ground. Through a series of "windows" the BNWPP aims to introduce innovative approaches to the Bank's existing water operations and the broader development community by mobilizing multi-disciplinary teams (from both within the World Bank as well as outside of it) of specialists with practical experience. The objective of the IW Window is to support the World Bank's clients and task teams in the complex arena of managing and developing watercourses shared across political boundaries, tapping the wide range of interdisciplinary skills needed for effective management of transboundary waters.

To facilitate the provision of these interdisciplinary skills, the IW Window, led by David Grey and Inger Andersen, assembled an interdisciplinary "core team", in which each member brings a different but interlinking specialization, and a great deal of experience. The core team consists of:

- **Mr. Terry Barnett** has been President of CMI Washington/Carolina since 1997. Before that, he served as Founding Chairman of Conflict Management, Inc. and Conflict Management Group (offshoots of the Harvard Negotiation Project) from 1984-97. Mr. Barnett resides in Chapel Hill, North Carolina. He leads graduate-level courses on international conflict management for the University of North Carolina and Duke University. He also works with public and private sector clients based in the mid-Atlantic region. He assists strategic relationship alliances, facilitates organizational change, advises negotiation teams, conducts negotiation-training workshops, and resolves internal and external disputes. Prior to the founding of Conflict Management, Mr. Barnett was a partner in a D.C. law firm for ten years, served with several committees of the U.S. Senate, and founded corporations providing cellular telephone services for various U.S. cities. He received an M.P.P. from the Kennedy School of Government at Harvard and his J.D. from Harvard Law School. Mr. Barnett is married to Virginia Carson; they have three grown children.
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- **Ambassador Bo Kjellén** is a Swedish diplomat, who has been involved in issues related to environment and sustainable development since 1990, when he was appointed chief negotiator in the Swedish Ministry of the Environment. In this capacity he represented Sweden in a long series of negotiations during the 1990s, including the Rio Process, the Framework Convention on Climate Change, and Baltic cooperation. He was Chairman of the negotiations for the Convention to Combat Desertification, and led the EU team on climate change during the Swedish Presidency in 2001. For many years, he has been involved in various activities linked to the annual Stockholm Water Week. Kjellén was awarded the Elizabeth Haub Price for Environmental Diplomacy in 1998 and the GEF Award for Environmental Leadership in 1999. He has honorary degrees from Cranfield University, UK, and from Göteborg University and Mälardalen University, Sweden. At present Bo Kjellén is Senior Research Fellow at the Stockholm Environment Institute. In 2004 and 2005 he was Visiting Fellow at Tyndall Centre for Climate Change Research, University of East Anglia, UK.
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- **Professor Stephen McCaffrey** is Distinguished Professor and Scholar at the University of the Pacific, McGeorge School of Law in Sacramento, California, USA. Professor McCaffrey served as a member of the International Law Commission of the United Nations (ILC) from 1982-1991 and chaired the Commission's 1987 Session. He was the ILC's special rapporteur on the Law of the Non-Navigational Uses of International Watercourses from 1985 until 1991, when the Commission provisionally adopted a full set of draft articles on the topic. The ILC's draft articles formed the basis for the 1997 United Nations Convention on the same

subject. Professor McCaffrey served as Counselor on International Law in the Office of Legal Adviser, U.S. Department of State, from 1984-1985. He has been counsel to several States in cases before the International Court of Justice (ICJ) involving international watercourses: to Slovakia in the *Gabčíkovo-Nagymaros Project* case decided by the ICJ in 1997; to Nicaragua in the *Navigational and Related Rights* case decided in 2009; and to Uruguay in the *Pulp Mills on the River Uruguay* case, a decision which is expected in 2010. He has served as Legal Adviser to both the Nile River Basin Negotiating Committee and the Palestinian Authority/PLO. Professor McCaffrey's publications include *The Law of International Watercourses* (Oxford University Press, 2nd ed. 2007), *Understanding International Law* (Lexis Publishing, 2006), *Global Issues in Environmental Law*, with Rachael Salcido (West Publishing, 2009), and *International Environmental Law & Policy*, with Edith Brown Weiss, Daniel Magraw and Dan Tarlock (Aspen, 2nd ed., 2007).
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- **Professor Dale Whittington** is a Professor of Environmental Sciences & Engineering, City & Regional Planning, and Public Policy, and Director of the Environmental Management and Policy Program at the University of North Carolina at Chapel Hill. Since 1986 he has worked for the World Bank and other international agencies on the development and application of techniques for estimating the economic value of environmental resources in developing countries, with a particular focus on water and sanitation policy issues. His current research focuses on the following four areas: (1) the development of planning approaches and methods for the design of improved water and sanitation systems for the rapidly growing cities of Asia; (2) the design of municipal water tariffs in developing countries; (3) estimating the economic benefits of vaccines for malaria, typhoid, cholera, and HIV/AIDS; and (4) Nile water management issues. Prof. Whittington is the author of over 100 publications, including (with Prof. Duncan MacRae) a graduate textbook on public policy analysis, *Expert Advice for Policy Choice (Georgetown University Press, 1997)*.
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- **Professor Aaron T. Wolf** is professor of geography and chair of the Department of Geosciences at Oregon State University. His research focus is on the interaction between water science and water policy, particularly as related to conflict prevention and resolution. He has acted as consultant to the US Department of State, the US Agency for International Development, the World Bank, and several governments on various aspects of transboundary water resources and dispute resolution. He is author of *Hydropolitics Along the Jordan River: The Impact of Scarce Water Resources on the Arab-Israeli Conflict*, (United Nations University Press, 1995), and a co-author of *Core and Periphery: A Comprehensive Approach to Middle Eastern Water*, (Oxford University Press, 1997), *Transboundary Freshwater Dispute Resolution*, (United Nations University Press, 2000), and *Managing and Transforming Water Conflicts* (Cambridge University Press, 2009). Wolf, a trained mediator/facilitator, directs the Program in Water Conflict Management and Transformation, through which he has offered workshops, facilitations, and mediation in basins throughout the world. He coordinates the Transboundary Freshwater Dispute Database, an electronic compendium of case studies of water conflicts and conflict resolution, international treaties, national compacts, and indigenous methods of water dispute resolution (www.transboundarywaters.orst.edu), and is a co-director of the Universities Partnership on Transboundary Waters.
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From within the World Bank, the contributors are:

- **Mr. Len Abrams** is a Kenyan born water resources specialist with a civil engineering background who has lived and worked most of his life in Africa. He has worked in rural development NGOs, as a Ministerial Advisor to the new South African government in the mid 90s and as an international consultant. He is currently a senior water resources specialist in the Africa Region of the World Bank working in Southern and East Africa. His current interests and area of activity are in international river basins and the role of water infrastructure development in economic growth.
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- **Dr. Undala Alam** has been involved in the politics of managing international waters from a theoretical and practical aspect since 1994. The theoretical grounding comes from her doctoral research into the negotiation phase of the 1960 Indus Waters Treaty, and her training as a mediator to highlight the dynamics between India, Pakistan and the World Bank. Her practical experience comes from working for different international development agencies. From 2001-2005, she worked simultaneously for UNDP and the World Bank as a Water Resources Specialist with responsibilities that included being the TRIB Project Coordinator

for UNDP, and working on the Niger and Senegal River basins for the World Bank. Dr Alam continued her work into the politics of water management while at Cranfield University between 2005 and 2009. Dr Alam holds degrees from Imperial College, Leeds University and Durham University.
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- **Ms. Inger Andersen** is the Director, Rural Development, Water and Environment, Middle East & North Africa Region. Ms. Andersen holds a MA from the University of London (Economics, Politics, North & East Africa) and a BA from the University of North London (Economics, Politics). She specializes in policy and strategic aspects of environment and water sectors in MNA and Africa regions, with a focus on riparian engagement and negotiation on shared international rivers and other transboundary environmental commons. From 1982-1986 she managed NGO-funded drought rehabilitation projects in Sudan. From 1987-1992, she was a Program Manager at the United Nations Sudano Sahelian Office, managing project portfolios in Djibouti, Ethiopia, Kenya, Somalia, Sudan and Tanzania. From 1992-1999 she was the Regional GEF Coordinator for Middle East/North Africa at UNDP, overseeing a global environment portfolio in 22 Arab countries. From 1999-2001 she acted as the Coordinator for the UNDP-World Bank International Waters Partnership with focus on policy support and investment planning (environment/water) in the Nile Basin. In 2001-2002 she worked as a Senior Water Resource Specialist, West & Central Africa at the World Bank. From 2002-2004 she was the Sector Manager, Water Supply & Sanitation, Water Resources and Urban Development, West & Central Africa at the Bank.
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- **Mr. David Grey** is the World Bank's Senior Water Advisor and the chair of the Bank's Water Resources Management Group. He is also the Senior Water Advisor for the Africa Region, with oversight responsibility for the Bank's activities in water resources across the region, including in about 25 countries and 5 international river basins. In addition he leads the multi-donor Nile Team that supports the 10 riparian states of the River Nile in their Nile Basin Initiative. He is currently transitioning to be the joint Senior Water Advisor for both the Africa and the South Asia regions, as the water resources agenda is of great importance in both regions. He joined the World Bank in 1983, since then he has worked on water issues in many countries in Africa, East and South Asia, the Middle East, Latin America and Europe, including intensive work on water resources policy and institutions, international waters cooperation and water supply.
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- **Dr. Claudia Sadoff** is a Lead Economist at the World Bank and co-Leader of the South Asia Water Initiative. She is currently based in Nepal working toward cooperative water resource management and climate change adaptation strategies on the rivers of the Greater Himalayas. Her expertise is in water resources policies and institutions; cooperation and benefit sharing in international rivers; and the dynamics of water, wealth and poverty. She has served as leader of the Bank's global Water Resources Team, Coordinator of the Nile Team, and Economic Advisor on joint appointment to the International Water Management Institute (IWMI) and the International Union for Conservation of Nature (IUCN). She is a member of the World Economic Forum's Global Agenda Council on Water Security, the Global Water Partnership's Technical Committee where she chairs the Water and Adaptation Working Group, and the Asia Pacific Water Forum's Steering Group on Water and Climate Change. She holds a PhD in Economics.
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HOW TO USE THIS WORKBOOK

WORKBOOK RATIONALE

In 2001, a core team at the World Bank,[1] with the support of the Bank-Netherlands Water Partnership Program (BNWPP) International Waters Window, began to develop a successful training course in the management of shared water resources, which has been presented to water resource professionals from around the world, as well as to Bank staff. While these courses are offered regularly within the World Bank, it is clear that there is a much larger demand for a workbook which can be used in the myriad venues where water conflict prevention and resolution coursework is offered. From this demand sprang the development of this Shared Waters Training Workbook, which is geared to professional and graduate level instruction,[2] as well as to mediators and instructor/facilitators to use in collaborative learning exercises. It includes background material and interactive exercises for the various skills necessary for the management of water disputes at all levels, from the interpersonal to the international. The workbook is designed to facilitate a variety of types of courses and exercises in collaborative learning on shared waters, and is being made broadly available to trainers from universities, technical organizations, development agencies, and other multilateral organizations. It includes principles, background material, and exercises all designed around the process of "scaling up" for the hydropolitics of the hypothetical "Sandus River Basin".

While there are no "blueprints" for how to prevent and resolve water resource conflicts which would be applicable in every instance, patterns do tend to emerge from which the best of global experience can be culled and offered to enhance the toolbox of the instructor/facilitator. This workbook is centered around the development of negotiations within a hypothetical basin, and allows participants to experience skills-building for conflict transformation at the interpersonal, intersectoral, and international levels, and offers principles for institutional capacity building within the framework of transboundary water resource management.

STRUCTURE OF THE WORKBOOK

The workbook is designed to be an effective aid for teaching students and professionals, and for collaborative learning exercises amongst co-riparians, where a skills-building course can act as an effective vehicle to enhance negotiations. It is written to be equally relevant for the participant **(Part 1)** and for the instructor/facilitator **(Part 2)**. Since we anticipate that most "participants" will need the background and training materials provided for the instructor/facilitator immediately after the course, either for their own professional or personal knowledge or because they are being trained as trainors, we include both sets of material within this same text.

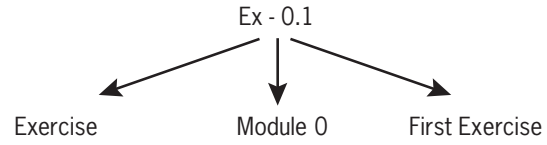
The IW course on which this workbook is based lasted four full eight-hour, consecutive days (mixing lectures and exercises), with each module lasting one day (modules 2 and 3 were done in one day, but many exercises listed here were not included), and can accommodate anywhere between six and 70 participants (the World Bank courses generally enrolled 40-50). With some modifications, the course can be spread out over two weeks consecutively, or over a semester if so desired. It is designed to stand alone, for basic understanding of the issues and processes involved, or to supplement other texts. Relevant supplemental readings are included at the end of each module in Part 1, the Participant Workbook, and extensive citations are listed in the bibliography (Appendix A) to assist the **instructor/facilitator** in preparing lectures and discussions, and to guide the participants in further inquiry. The exercises can be worked straight through or they can be selected individually, as the **instructor/facilitator** deems appropriate.[3]

1. This team was led by David Grey, Sr. Water Advisor, and included Undala Alam, Inger Andersen, Claudia Sadoff and Salman Salman.
2. While we anticipate the use of this Workbook by disciplines throughout the campus, some basic knowledge of water resource management is recommended.
3. For excellent supplemental course material, including a "water message" game, see Van der Zaag, *et al.* 2003.

In a very general sense, the process of building effective transboundary water resources management can be thought of in four non-linear, iterative stages of negotiation – adversarial, reflexive, integrative, and action – around which this workbook is designed:

- **Module 0:** Introduction to Hydropolitics and Conflict Transformation
- **Module I:** Initial State: Basins and Boundaries – Scale is interpersonal, focus is on trust-building, and analysis is of parties, positions and interests. Negotiations are often *adversarial*, with an emphasis on *rights*.
- **Module II:** Changing Perceptions: Basins without Boundaries – Scale is intersectoral, focus is on skills-building, and analysis is on the gap between current and future states. Negotiations move to the *reflexive* stage, and parties define *needs*.
- **Module III:** Enhancing and Sharing Benefits – Scale moves beyond the basin, focus is on consensus-building, and analysis is on benefits of cooperation. Negotiations are *integrative*, where parties define *benefits*.
- **Module IV:** Putting it all Together: Institutional Capacity – Scale is international, focus is on capacity-building, and analysis is on institutional capacity. Negotiations are in the *action* stage, where *equity* is defined and institutionalized.

In **Part 1** of the workbook, each of the modules includes general setting information, overview material, skill-building exercises, and supplemental readings. The exercises in Part 1 are not detailed and only highlight the objectives and key points of the exercise; they are, however, detailed in **Part 2** for the **instructor/facilitator** and in the **instructor/facilitator** only sections of the appendices.



Exercises (Ex), handouts (H), and overheads (Ov) are coded, for example, as follows:
In other words, Ex-0.1 is the first exercise in Module 0; H-I.2 is the second handout in Module I; and so on.

Finally, a note on scale: The IW Window was developed specifically to address issues related to international waters – those waterways which cross the political boundaries of two or more countries. But the framework developed in this workbook is applicable for *any* transboundary waterway, whether surface or groundwater, quality or quantity, or whether the boundaries are those of nations, states, provinces, economic sectors, or even individual users.

MORE INFORMATION

The participant or **instructor/facilitator** interested in additional supporting material is referred to other good resources on teaching transboundary water resource issues, notably UNESCO's PCCP site, which has dozens of publications on theory, practice, case studies, and curricula related to shared water resources: http://www.unesco.org/water/wwap/pccp/; the Global Environment Facility's International Waters Learning Exchange and Resource Network (IW:LEARN): http://www.iwlearn.net/; and the bibliographies and timelines at the Pacific Institute: http://www.pacinst.org/

Oregon State University's Transboundary Freshwater Dispute Database, which maintains a current annotated bibliography, as well as data, treaties, and other publications related to all aspects of shared waters, will maintain web support for this workbook at: http://www.transboundarywaters.orst.edu

There are now excellent courses available to further build skills for managing and resolving water disputes. At the UNESCO-IHE Institute for Water Education, an 18-month Master's programme awards two degrees: an MSc for students enrolled at the UNESCO-IHE Institute for Water Education in Delft and an LLM for those enrolled at the Centre for Water Law, Policy and Science in Dundee. The programme focuses on Water Conflict Management techniques, but also covers Institutional Analysis, Water and Environmental Law, Water Resources Planning and the Management of Water Organizations. The programme was initiated by and developed in partnership with UNESCO's PCCP programme. The modules on Water Conflict Management can be taken as separate short courses by participants who are not enrolled in the 18-month programme.

More information can be found at http://www.unesco-ihe.org/Education/MSc-Programmes/MSc-in-Water-Management/Water-Conflict-Management and http://www.unesco-ihe.org/Education/Short-courses/Regular-short-courses

Oregon State University's Program in Water Conflict Management offers a Certificate in Water Conflict Management, coursework for which can be completed entirely online. The capstone course, Water Governance and Conflict Management, was developed in partnership with UNESCO's PCCP programme, and is structured around this workbook, and likewise can be completed online. More information on the course and the certificate can be found at http://www.transboundarywaters.orst.edu

PART 1

PARTICIPANT WORKBOOK

MODULE 0: INTRODUCTION TO HYDROPOLITICS

SECTION A: INTRODUCTION TO HYDROPOLITICS

Water management is, by definition, conflict management. Water, unlike other scarce, consumable resources, is used to fuel all facets of society, from biology to economies to aesthetics and spiritual practice. Moreover, it fluctuates wildly in space and time, its management is usually fragmented, and it is often subject to vague, arcane, and/or contradictory legal principles. There is no such thing as managing water for a single purpose – all water management is multi-objective and based on navigating competing interests. Within a nation these interests include domestic users, agriculturalists, hydropower generators, recreators, and environmentalists – any two of which are regularly at odds – and the chances of finding mutually acceptable solutions drop exponentially as more stakeholders are involved. Add international boundaries, and, without careful recrafting of the issues involved, the chances decrease exponentially yet again.

Surface and groundwater that cross international boundaries present increased challenges to regional stability because hydrologic needs can often be overwhelmed by political considerations. While the potential for paralyzing disputes is especially high in these basins, history shows that water can catalyze dialogue and cooperation, even between especially contentious riparians. There are 263 rivers around the world that cross the boundaries of two or more nations, and untold number of international groundwater aquifers. The basin areas that contribute to these rivers (Figure 1) comprise approximately 47% of the land surface of the earth, include 40% of the world's population, and contribute almost 80% of freshwater flow (Wolf *et al.* 1999).

Within each international basin, demands from environmental, domestic, and economic users increase annually, while the amount of freshwater in the world remains roughly the same as it has been throughout history. Given the scope of the problems and the resources available to address them, avoiding violent water conflict is vital. Conflict is expensive, disruptive, and interferes with efforts to relieve human suffering, reduce environmental degradation, and achieve economic growth. Developing the capacity to monitor, predict, and preempt transboundary water conflicts, particularly in developing countries, is key to promoting human and environmental security in international river basins, regardless of the scale at which they occur. Yet conflict can yield positive results as well, providing opportunities for dialogue and integrated planning.

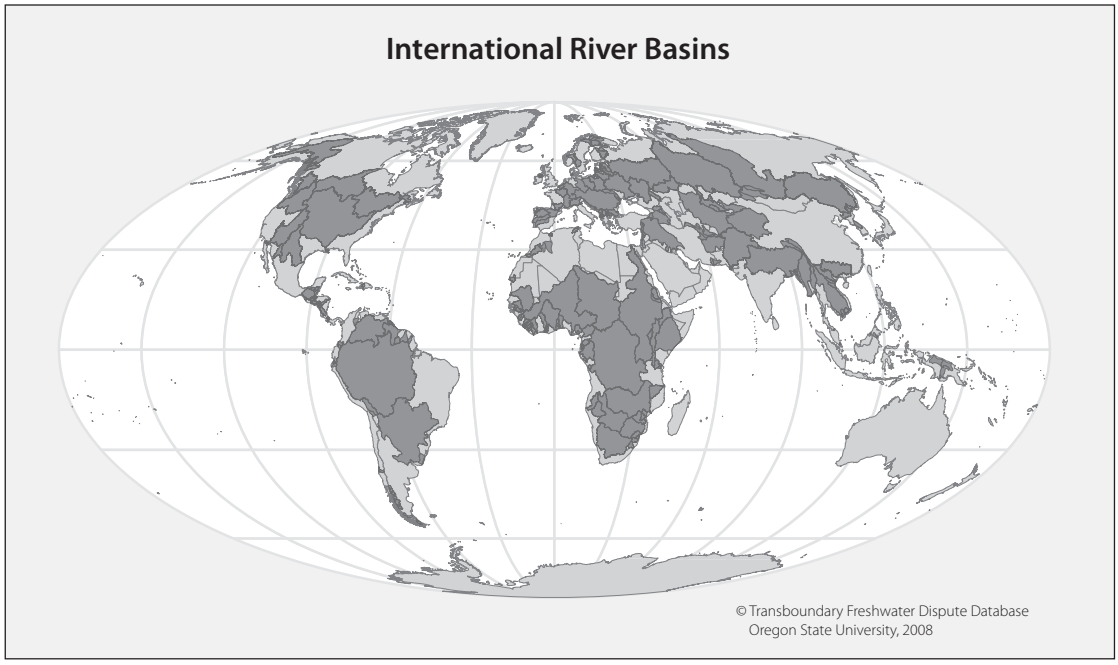


Figure 1: International Basins of the World

A general pattern has emerged for international basins over time. Riparians of an international basin implement water development projects unilaterally first on water within their territory, in attempts to avoid the political intricacies of the shared resource. At some point, one of the riparians, generally the regional power, will implement a project which impacts at least one of its neighbors. This might be to continue to meet existing uses in the face of decreasing relative water availability. This project which impacts one's neighbors can, in the absence of relations or institutions conducive to conflict resolution, become a flashpoint, heightening tensions and regional instability, and requiring years or, more commonly, decades, to resolve.

There is some room for optimism, though, notably in the global community's record of resolving water-related disputes along international waterways. For example, the record of acute conflict over international water resources is overwhelmed by the record of cooperation. Moreover, the most vehement enemies around the world either have negotiated water sharing agreements, or are in the process of doing so as of this writing, and once cooperative water regimes are established through treaty, they turn out to be impressively resilient over time, even between otherwise hostile riparians, and even as conflict is waged over other issues. Violence over water does not seem strategically rational, hydrographically effective, or economically viable. Shared interests along a waterway seem to consistently outweigh water's conflict-inducing characteristics.

Lessons for the International Community

Despite their complexity, the historical record shows that water disputes do get resolved, and that the resulting water institutions can be tremendously resilient. The challenge for the international community is to get ahead of the "crisis curve," to help develop institutional capacity and a culture of cooperation in advance of costly, time-consuming crises, which in turn threaten lives, regional stability, and ecosystem health.

One productive approach to the development of transboundary waters has been to examine the benefits in a basin from a multi-resource perspective. This has regularly required the riparians to get past looking at water as a commodity to be divided, and rather to develop an approach which equitably allocates not the water, but the benefits derived there from.

The most critical lessons learned from the global experience in international water resource issues are as follows:

1. Water crossing international boundaries can cause tensions between nations which share the basin. While the tension is not likely to lead to warfare, early coordination between riparian states can help ameliorate the issue.
2. Once international institutions are in place, they are tremendously resilient over time, even between otherwise hostile riparian nations, and even as conflict is waged over other issues.
3. More likely than violent conflict occurring is a gradual decreasing of water quantity or quality, or both, which over time can affect the internal stability of a nation or region, and act as an irritant between ethnic groups, water sectors, or states/provinces. The resulting instability may have effects in the international arena.
4. The greatest threat of the global water crisis to human security comes from the fact that millions of people lack access to sufficient quantities of water at sufficient quality for their well being.

SECTION B: SUMMARY – CONFLICT AND COOPERATION: THE CHALLENGE OF INTERNATIONAL WATERS[1] (WOLF, BACKGROUND DOCUMENT)

Context

Surface and groundwater that cross international boundaries present increased challenges to effective water management, because hydrologic needs can often be overwhelmed by political considerations. While the potential for paralyzing disputes are especially high in these basins, history shows that water can catalyze dialogue and cooperation, even between especially contentious riparians. Moreover, as we move from thinking about rights to thinking in terms of equitably sharing "baskets" of benefits, the opportunities of cooperation become palpable.

1. Aaron T. Wolf; Oregon State University. See p. 14 for more detail.

Key Lessons

- Approx. 40% of the global population relies upon international waters, while 90% live in countries with international basins.
- Unilateral action by one country to develop its share of an international basin can lead to or exacerbate international tensions.
- Get ahead of the curve – use preventive diplomacy and institutional capacity building to forestall conflict, and optimize shared benefits from shared waters.

Background to International Waters

There are 263 basins, and countless aquifers, which cross the political boundaries of two or more countries. International basins cover 45.3% of the land surface of the earth, affect about 40% of the world's population, and account for approximately 80% of global river flow. Managing these basins is complicated by the involvement of regional politics, in an already difficult task of understanding and managing complex natural systems.

Disparities (economic development, infrastructural capacity, political orientation) between riparian nations further complicate international water resources management. The result is that development projects, treaties and institutions are regularly perceived as ranging from inefficient to ineffective, to even causing new tensions themselves. Yet, despite these tensions inherent to the international setting, riparians have engaged in preventive diplomacy, and created "baskets of benefits" leading to positive-sum, integrative allocations of joint gains.

Traditional Chronology: Development, Crisis, Conflict Resolution

A general pattern has emerged for international basins, whereby, riparians first unilaterally develop their shared waters. At some point, one riparian, generally the regional power, implements a project which impacts on at least one of its neighbors. In the absence of relations or institutions conducive to conflict resolution, this project can become a flashpoint, heightening tensions and regional instability, and require years or, more commonly, decades, to resolve (e.g. the Indus Treaty took 10 years, the Ganges 30 years, and the Jordan 40 years). In the meantime, water quality and quantity degrade, negatively impacting upon the health of dependent populations, and ecosystems. This problem only worsens as the dispute intensifies.

Getting Ahead of the Curve: Preventive Diplomacy and Institutional Capacity Building

Despite their complexity, water disputes *do* get resolved, and the resulting institutions can be very resilient, even among bitter enemies who are fighting over other issues. The resultant treaties and management bodies have often survived subsequent hostilities. The challenge for riparians and the international community is to get ahead of the "crisis curve," to facilitate institutional capacity and cooperation in advance of costly, time-consuming crises which, in turn, exacerbate poverty, threaten lives, regional stability and ecosystems. One successful approach has been to help riparians shift focus away from allocating fixed *quantities* of water, to the overall gains of allocating the *benefits* of cooperative water resources management.

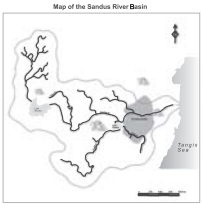
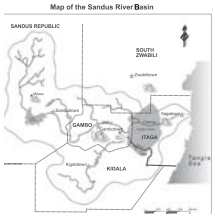
SECTION C: STAGES OF WATER CONFLICT TRANSFORMATION

As mentioned in the Rationale, there are no "blueprints" for water conflict transformation. There does seem to be, however, general patterns in approaches to water conflict which have emerged over time. "Classic" disputes between, for example, developers and environmentalists, rural and urban users, or upstream and downstream riparians, suggest zero-sum confrontations where one party's loss is another's gain where confrontation seems inevitable. Yet such "intractable" conflicts are regularly and commonly resolved, as creative thinking and human ingenuity allow solutions which draw on a more intricate understanding of both water and conflict to come to the fore.

This workbook offers one path to the transformation of water disputes from zero-sum, intractable disputes to positive-sum, creative solutions, and centers on a migration of thought generally through four stages. Note that all stages exist simultaneously, and need not be approached in sequence, and no stage need be achieved necessarily for "success." In today's world, many disputes never move beyond the first or second stage, yet are tremendously resilient, while a few have achieved the fourth stage and are fraught with tension. Nevertheless, like any skill, it is useful to understand the structure of an "ideal" path, in order to perfect the tools required for any individual situation.

The generalized path described here, is structured around an understanding of each of the four stages through any of four perspectives, as described in Figure 2.

In Stage 1, in its initial, *adversarial* setting, regional geopolitics often overwhelms the capacity for efficient water resources management. Metaphorically, the political boundaries on a map at this stage are more prevalent than any other boundaries, either of interest, sector, or hydrology. Dialogue is often focused on the past, based on the *rights* to which a country feels it is entitled, and a period of expressing pent-up grievances can be necessary. As a consequence of these initial tensions, the collaborative learning emphasis is on *trust-building*, notably on active and transformative listening, and on the process of conflict transformation. By focusing primarily on the rights of *countries*, inefficiencies and inequities are inevitable during this stage of negotiations.

Negotiation Stage*	Common Water Claims**	Collaborative Skills***	Geographic Scope
Adversarial	Rights	Trust-building	 Nations
Reflexive	Needs	Skills-building	 Watersheds
Integrative	Benefits	Consensus-building	 "Benefit-sheds"
Action	Equity	Capacity-building	 Region

* These stages build primarily on the work of Jay Rothman, who initially described his stages as ARI – Adversarial, Reflexive, and Integrative (Rothman 1989). When ARI become ARIA, adding Action, Rothman's terminology (1997) also evolved to Antagonism, Resonance, Invention, and Action. We retain the former terms, feeling they are more descriptive for our purposes.

** These claims stem from an assessment of 145 treaty deliberations described in Wolf (1999). Rothman (1995) too uses the terms rights, interests, and needs, in that order, arguing that "needs" are motivation for "interests," rather than the other way round as we use it here. For our purposes, our order feels more intuitive, especially for natural resources.

*** These sets of skills draw from Kaufman (2002), who ties each set of dynamics specifically to Rothman's ARIA model in great detail, based on his extensive work conducting "Innovative Problem Solving Workshops" for "partners in conflict" around the world.

Figure 2: Four Stages of Water Conflict Transformation

As the adversarial stage of negotiations plays out, occasionally some cracks can be seen in the strict, rights-based, country-based positions of each side (although in actual water negotiations, this process can last decades). Eventually, and sometimes painfully, a shift can start to take place where the parties begin to listen a bit more, and where the interests underlying the positions start to become a bit apparent. In this Stage 2, a *reflexive stage*, negotiations can shift from *rights* (what a country feels it deserves), to *needs* (what is actually required to fulfill its goals). Conceptually, it is as if we have taken the national boundaries off the map and can, as

if for the first time, start to assess the needs of the watershed as a whole. This shift, from speaking to listening, from rights to needs, and from a basin with boundaries to one without, is a huge and crucial conceptual shift on the part of the participants, and can be both profoundly difficult to accomplish, and absolutely vital to achieve for any movement at all towards sustainable basin management. To help accomplish this shift, the collaborative learning emphasis is on *skills-building*, and we approach the (boundary-less) basin by sector rather than by nation.

Once participants have moved in the first two stages from mostly speaking to mostly listening, and from thinking about rights to needs, the problem-solving capabilities which are inherent to most groups can begin to foster creative, cooperative solutions. In this Stage 3, an *integrative stage*, the needs expressed earlier begin to coalesce together to form group interests – the "why" underlying the desire for the resource. Conceptually, we start to add benefits to the still boundary-less map, and in fact to think about how to enhance benefits throughout the region, primarily by adding resources other than water, and geographic units other than the basin. The collaborative learning emphasis is now on the *consensus-building* of the group, and we begin to move in "benefit-shed" rather than being restricted by the basin boundaries.

Finally, while tremendous progress has been made over the first three stages, both in terms of group dynamics, and in developing cooperative benefits, Stage 4, the last, *action* stage helps with tools to guide the sustainable implementation of the plans which have been developed, and to make sure that the benefits are distributed *equitably* amongst the parties. The scale at this stage is now *regional* where, conceptually, we need to put the political boundaries back on the map, reintroducing the political interest in seeing that the "baskets" which have been developed are to the benefit of all. The collaborative learning emphasis is on *capacity-building*, primarily of institutions.

It is critical not to think of these "stages" as a linear process, where the further along the better. Most basins ebb and flow back and forth over time, finding the level that meets a particular set of hydropolitical needs for a given place and time – there is no "right" set of answers. One might think of these all existing in parallel "universes" simultaneously, each with its own set of approaches or tools, any of which may be useful at any given time, or conceptually as a helix or set of spheres rather than strictly linear. We break them apart here only for the purposes of explanation.

SECTION D: BASIC DEFINITIONS FOR DISPUTE RESOLUTION[2]

Competitive

Competitive negotiators want to "beat" their opponents; they use high demands, threats, and make few concessions. They generally try to undermine their opponent's confidence and seek the maximum for themselves. This traditional style of negotiating goes by a number of different terms such as positional, win-lose, adversarial, power negotiating, hardball, and hard bargaining.

Cooperative

Cooperative negotiators want to "work with" their opponents; they use reasonable opening offers, show good faith, and initiate the exchange of mutual concessions. They seek a fair and just settlement. This style of negotiating is also called win-win, interest-based bargaining, and problem solving.

Distributive Bargaining

In distributive bargaining the parties think of the items being negotiated as fixed and each party tries to get the most for himself. Usually there is just one issue for negotiation and more for me means less for you. Negotiators are bargaining over the distribution of profit on the bargaining range. This is a "zero sum" negotiation. Although

2. From Barkai (1996).

the goals of the parties are in direct conflict, a negotiator can be either competitive or cooperative in a distributive bargaining situation.

Integrative Bargaining

During integrative bargaining, the parties are working together to increase the amount of resources and to maximize mutual gain. Integrative bargaining requires two or more issues so that trades can be made. Creating the additional resources is sometimes referred to as "expanding the pie". Some would call this "win-win" negotiating. The theory here is that the parties have different interests which can be integrated (reconciled) to create joint gains. Joint gains are an improvement for all parties to a negotiation.

Interest-based

Interest-based bargaining attempts to shift the nature of negotiations to a more collaborative basis. Instead of moving from position to counter-position to compromise, negotiators try to identify their interests PRIOR to the development of solutions. Once interests are identified, the negotiators then jointly develop a wide-ranging set of alternatives, and then choose the best alternative.

Positions

Positions are "what" the negotiators say they want. They are really solutions which have been proposed by the negotiators. Positions are based upon the interests of the parties; interests are usually not disclosed, at least not in competitive negotiations. In most negotiations people take, and then give up, a series of positions. Behind every position lie many interests.

Interests

Interests are "why" the negotiators want the positions they take. Interests lie behind the positions of the negotiators. Interests represent the basic needs to be met. Money and price are not interests in themselves. Money represents purchasing power, the ability to acquire other needs, status, or power itself. Understanding interests is the key to understanding "win-win" negotiating. In many negotiations the interests are never explicitly discussed. In fact, interests are usually kept secret. Successful "win-win" negotiating requires finding a way to disclose interests without being taken advantage of.

SECTION E: UNDERSTANDING CONFLICT

Introductory Exercise 1 (Ex-0.1): Understanding Conflict

Conducted by instructor/facilitator

Part 1: ***Optical Illusion (Figure 3 not shown)***
Objective: To introduce how *misperceptions* can exacerbate conflict

Part 2: ***Scoring Points***
Objective: To introduce how *entrenched thinking* can put us automatically in a conflict posture where often better results can be obtained through cooperation

Part 3: ***Ugli Orange***
Objective: To point to the exacerbating role *miscommunications* play in conflict

Key Points of Exercise

- *Misperceptions* can exacerbate conflict for instance when we say "water" or "rights" or "own" it can mean different things to different people.
- *Entrenched thinking* can put us automatically in a conflict posture where often better results can be obtained through cooperation. This also points to *listening* as a key skill in conflict transformation.
- *Miscommunication* exacerbates conflict.
- There is a difference between *positions* (what someone wants) and *interests* (why they want it). In general, transforming conflict from distributive, or zero-sum, to integrative, or positive-sum, requires understanding the interests which underlie the positions of a party – often incredibly difficult to determine (see Figure 4).
- *Emotions* can run high in negotiations.

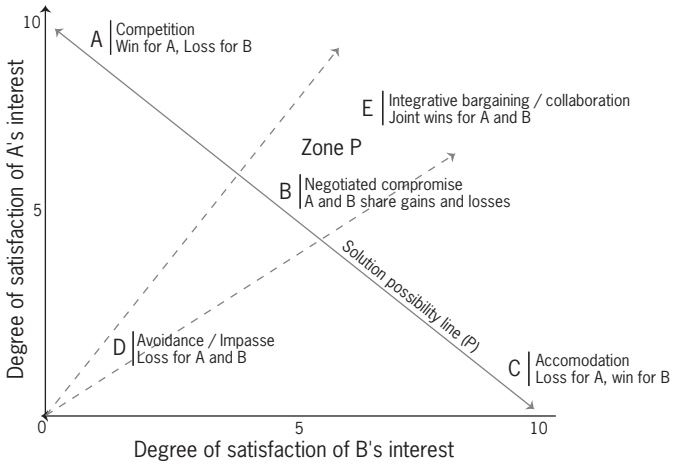


Figure 4: Styles of Conflict Management[3]
Source: Delli Priscoli (1992)

SECTION F: INTRODUCING WATER DISPUTES

Introductory Exercise 2 (Ex-0.2): Introducing Water Disputes

Conducted by instructor/facilitator

***Part 1:* Water Uses**
Objective: To introduce the multiple and often competing uses of water

***Part 2:* Issues in Water Allocation**
Objective: To introduce the difficulties of water allocation

***Part 3:* Principles in International Law**
Objective: To introduce the principles embodied in international law, as reflected in the 1997 Convention on the Law of the Non-Navigational Uses of International Watercourses

Key Points of Exercise

- Worldwide, only 5% of water use goes to personal uses, 70% to agricultural irrigation, and the rest to municipal and industrial uses (M & I).
- There is a distinction between "consumptive" (e.g., drinking and irrigation) and "non-consumptive" (i.e., transportation and aesthetics) uses, and the percentages of each differ significantly between developed and developing countries or regions, and between those in arid and humid zones.

3. See "Basic Definitions" on p. 7 for more information.

Integrated Water Resource Management "Comb"

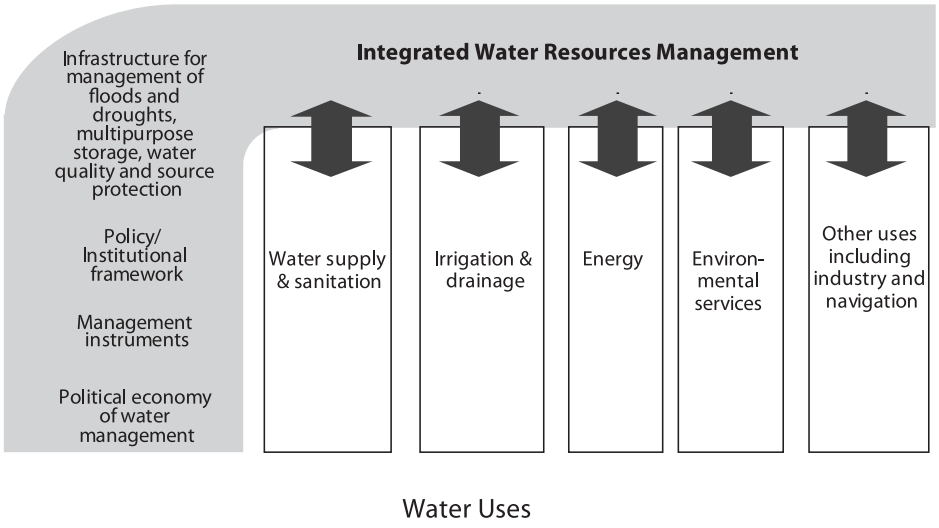


Figure 5: The IWRM "Comb"

At the World Summit on Sustainable Development (WSSD) held in Johannesburg in 2002, the international community took an important step towards more sustainable patterns of water management by including, in the WSSD Plan of Implementation, a call for all countries to "develop integrated water resource management and water efficiency plans by 2005, with support to developing countries".

The Global Water Partnership's Integrated Water Resource Management (IWRM) "comb" was developed as a useful framework for visualizing and categorizing the uses to which water is put: Water Supply & Sanitation; Irrigation & Drainage; Energy Resources; Environmental Services; Industry & Navigation. Interestingly all of the categories of use in the "comb" are economic uses. Aesthetics, religious, and indigenous uses are not included.[4]

Principles in International Law

Article 5: Equitable and reasonable utilization and participation
Watercourse States shall in their respective territories utilize an international watercourse in an equitable and reasonable manner.

Article 7: Obligation not to cause significant harm
Watercourse States shall, in utilizing an international watercourse in their territories, take all appropriate measures to prevent the causing of significant harm to other watercourse States.

Figure 6: Articles 5 and 7 of the 1997 Convention on the Law of the Non-Navigational Uses of International Watercourses

(Figure 7 not shown)

The 1997 Convention was adopted by the UN General Assembly, on the basis of a draft prepared over the course of twenty years by the International Law Commission, by a vote of 103 to 3 (with 33 absent and 27 abstentions).[5] Some votes did reflect a difference between upstream and down: several countries that either were absent or abstained were upstream on basins with a certain level of tension, and the three "no" votes are all upstream on major international waterways: China, Turkey, and Burundi. Nevertheless, and despite the fact

4 Jønch-Clausen, Torkil. 2004. «Integrated Water Resources Management (IWRM) and Water Efficiency Plans by 2005: Why, What and How?" Stockholm, Sweden: Global Water Partnership.

5. To date, nine years after its adoption by the UN General Assembly, only 14 countries are party to the UN Convention, well below the requisite 35 instruments of ratification, acceptance, accession, or approval needed to bring the Convention into force. As noted later, regardless of the Convention's ratification status, it is widely viewed, and treated, as being largely a codification of existing rules of customary international law on the subject. It has also been used and relied on at least as a starting point (and often as an ending point when the parties can't reach agreement on another text) in negotiations between riparian states. For the full text of the Convention, see: http://www.un.org/law/ilc/texts/nonnav.htm

that the process of ratification is moving extremely slowly, the Convention's common acceptance, and the fact that the International Court of Justice referred to it in its 1997 decision in a case between Hungary and Slovakia concerning the *Gabčíkovo–Nagymaros Project* on the Danube, gives the Convention increasing standing as an instrument of customary law. Other instruments do exist, however, notably the International Law Association's "Helsinki Rules" of 1966, updated in its "Berlin Rules" of 2004.[6] The ILC has likewise taken up the complex issue of transboundary groundwater aquifers, work which is currently underway (See Section IV for more detail on international law).

SECTION G: INTRODUCING THE SANDUS BASIN SIMULATION

Introductory Exercise 3 (Ex-0.3): Parties, Issues, and Interests

Conducted by instructor/facilitator
To introduce how parties, issues, positions, and interests begin to influence how groups (countries) approach water perspectives and negotiations

***Part 1:* Country Perspective**
Objective: To identify parties, issues, and position/interests for a simulated water negotiation

***Part 2:* Role Play – Party Representatives**
Objective: To illustrate that countries are not monolithic, autonomous entities, but are rather made up of their constituents
Objective: To illustrate that foreign policy and domestic policy are inextricably linked

***Part 3:* Preparation for Stage I**
Objective: To set the stage for the opening of the Sandus Basin negotiations

Key Points of Exercise

- A key dimension of any negotiation setting is to make sure that the right parties will be participating.
- Some systematic work on the front end identifying parties, positions, and interests, and how they might all interact productively will help facilitate an efficient process.
- Individuals should be considered individually, each with his or her own communication style.

Instructions for Small Group Tasks[7] [Handout (H-0.5)]

- Using the Yellow Post-its, identify Parties that may become involved in the discussion-negotiations over Sandus River basin. These Parties may be individuals, organizations, or agencies in any of the five countries within the basin, or from anywhere else.

  Post your results at the appropriate places on the walls. You should aim for at least 20 such parties.

- Using the Blue Post-Its, identify "Decidable Issues" that are likely to be addressed within and/or among these parties now and in the near future.
  Post your results at the appropriate places on the walls. You should aim for at least 10 such issues.

- Choose at least three key Parties and Issues for each country, and identify at least five key Positions/ Interests for each Party as it considers those issues.
  Write those Position/Interests on the Green Post-Its and post them at the appropriate places on the walls.

- It may help to fill out the following type of form, expanded out for however many parties are identified.[8]

6. http://www.asil.org/ilib/WaterReport2004.pdf
7. This exercise is based on one developed by CMI Washington/Carolina.
8. From Barkai (1996).

Negotiation Planning Chart [Handout (H-0.6)]

Fill in the name of the party and then blocks with information you know. You will need three of these charts (one for each key party, as noted in the instructions).

Party: _____

People	Relationship	Issues	Positions	Interest	Options
Who:	Past:	1.	Estimated initial position:	1.	1.
				2.	2.
	Current:	2.	Estimated bottomline position:	3.	3.
Negotiation Styles:				4.	4.
	Desired:	3.	Estimated BATNA:	5.	5.
				6.	6.

Chart Definitions and Explanations [Handout (H-0.7)]

People: What are the past histories and present feelings of the people involved in this negotiation? What are their goals and objectives? Who is more powerful and what is the source of that power? What influences can they bring to bear on this negotiation? What do you know about their negotiating style?

Relationship: Do the negotiators or their constituents have any history together? What was that prior relationship like? How are they getting along now during the negotiation? Do they have a good relationship? Is it strained? Have they just met for the first time? Will the parties have a continuing relationship or will this be a "one-shot" negotiation? Even if the parties are not likely to work together in the future, will reputations be made in this negotiation that will follow the negotiators in the community?

Issues: The issues involved in the negotiation are the topics to be negotiated. They are also the questions and concerns that each party raises during the negotiation. It is usually very helpful to frame the issues as questions to be answered rather than statements that are made.

Positions: The positions in the negotiation are the solutions that each person has in mind. Positions are the "what" that the negotiators want. Many different positions are considered during a negotiation including, the opening position (demand), a fall back position, a bottom line, and a BATNA (Best Alternative to a Negotiated Agreement).

Interests: Interests are the basic needs that negotiators seek to be met in any agreement. If you know the interests, you know "why" the negotiators take the positions they do during the negotiations. Maslow's hierarchy of needs is helpful here.

Options: Options are the full range of possibilities on which the parties might conceivably reach agreement. Options are, or might be, put "on the table." An agreement is better if it is the best of many options, especially if it exploits all potential mutual gain in the situation.

BATNA: Alternatives are the walk-away possibilities that each party has *if an agreement is not reached*. In general, neither party should agree to something that is worse than its "**BATNA**" – its **B**est **A**lternative **t**o a **N**egotiated **A**greement – "away from the table".

SECTION H: SUPPLEMENTAL READING FOR MODULE 0

Wolf, A. T., Annika Kramer, Alexander Carius, and Geoffrey D. Dabelko . "Managing Water Conflict and Cooperation." Chapter 5 in Worldwatch Institute. *State of the World 2005: Redefining Global Security.* Washington DC: Worldwatch Institute, 2005.

CHAPTER 5

Managing Water Conflict and Cooperation

Aaron T. Wolf, Annika Kramer, Alexander Carius, and Geoffrey D. Dabelko

Stanley Crawford, a former *mayordomo* (ditch manager) of an *acequia* (irrigation ditch) in New Mexico, writes of two neighbors who "have never been on good terms…the lower neighbor commonly accusing the upper of never letting any water pass downstream to his place and then of dumping trash into it whenever he rarely does." Such rivalries over water have been the source of disputes since the Neolithic revolution, when humans settled down to cultivate food between 8000 and 6000 BC. Our language reflects these ancient roots: "rivalry" comes from the Latin *rivalis*, or "one using the same river as another." Riparians—countries or provinces bordering the same river—are often rivals for the water they share. Today the downstream neighbor's complaint about the upstream riparian is echoed by Syria about Turkey, Pakistan about India, and Egypt about Ethiopia.[1]

Regardless of the geographic scale or the riparians' relative level of economic development, the conflicts they face are remarkably similar. Sandra Postel, director of the Global Water Policy Project, describes the problem in *Pillars of Sand*: Water, unlike other scarce, consumable resources, is used to fuel *all* facets of society, from biology and economy to aesthetics and spiritual practice. Water is an integral part of ecosystems, interwoven with the soil, air, flora, and fauna. Since water flows, use of a river or aquifer in one place will affect (and be affected by) its use in another, possibly distant, place. Within watersheds, everything is connected: surface water and groundwater, quality and quantity. Water fluctuates wildly in space and time, further complicating its management, which is usually fragmented and subject to vague,

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arcane, or contradictory legal principles.[2]

Water cannot be managed for a single purpose: all water management serves multiple objectives and navigates among competing interests. Within a nation, these interests—domestic users, farmers, hydropower generators, recreational users, ecosystems—are often at odds, and the probability of a mutually acceptable solution falls exponentially in proportion to the number of stakeholders. Add international boundaries, and the chances drop yet again. Without a mutual solution, these parties can find themselves in dispute, and even violent conflict, with each other or with state authorities. Still, water-related disputes must be considered in the broader political, ethnic, and religious context. Water is never the single—and hardly ever the major—cause of conflict. But it can exacerbate existing tensions and therefore must be considered within the larger context of conflict and peace.

From the Middle East to New Mexico, the problems remain the same. So, however, do many of the solutions. Human ingenuity has developed ways to address water shortages and cooperate in managing water resources. In fact, cooperative events between riparian states outnumbered conflicts by more than two to one between 1945 and 1999. In addition, water has also been a productive pathway for building confidence, developing cooperation, and preventing conflict, even in particularly contentious basins. In some cases, water provides one of the few paths for dialogue in otherwise heated bilateral conflicts. In politically unsettled regions, water is an essential part of regional development negotiations, which serve as de facto conflict-prevention strategies.[3]

Key Issues

While the underlying reasons for water-related controversy can be numerous, such as power struggles and competing development interests, all water disputes can be attributed to one or more of three issues: quantity, quality, and timing. (See Table 5–1.)[4]

Competing claims for a limited quantity of water are the most obvious reason for water-related conflict. The potential for tensions over allocation increases when the resource is scarce. But even when pressure on the resource is limited, its allocation to different uses and users can be highly contested. As people become more aware of environmental issues and the economic value of ecosystems, they also claim water to support the environment and the livelihoods it sustains.

Another contentious issue is water quality. Low quality—whether caused by pollution from wastewater and pesticides or excessive levels of salt, nutrients, or suspended solids—makes water inappropriate for drinking, industry, and sometimes even agriculture. Unclean water can pose serious threats to human and ecosystem health. Water quality degradation can therefore become a source of dispute between those who cause it and those affected by it. Further, water quality issues can lead to public protests if they affect livelihoods and the environment. Water quality is closely linked to quantity: decreasing water quantity concentrates pollution, while excessive water quantity, such as flooding, can lead to contamination from overflowing sewage.

Third, the timing of water flow is important in many ways. Thus the operational patterns of dams are often contested. Upstream users, for example, might release water from reservoirs in the winter for hydropower production, while downstream users might need it for irrigation in the summer. In addition, water flow patterns are crucial to maintaining freshwater ecosystems that depend on seasonal flooding.

Conflicting interests concerning water

Table 5–1. Selected Examples of Water-related Disputes

Location	Main Issue	Observation
Cauvery River	Quantity	The dispute on India's Cauvery River sprung from the allocation of water between the downstream state of Tamil Nadu, which had been using the river's water for irrigation, and upstream Karnataka, which wanted to increase irrigated agriculture. The parties did not accept a tribunal's adjudication of the water dispute, leading to violence and death along the river.
Okavango River	Quantity	In the Okavango River basin, Botswana's claims for water to sustain the delta and its lucrative ecotourism industry contribute to a dispute with upstream Namibia, which wants to pipe water passing through the Caprivi Strip to supply its capital city with drinking water.
Mekong River basin	Quantity	Following construction of Thailand's Pak Mun Dam, more than 25,000 people were affected by drastic reductions in upstream fisheries and other livelihood problems. Affected communities have struggled for reparations since the dam was completed in 1994.
Incomati River	Quality and quantity	Dams in the South African part of the Incomati River basin reduced freshwater flows and increased salt levels in Mozambique's Incomati estuary. This altered the estuary's ecosystem and led to the disappearance of salt-intolerant plants and animals that are important for people's livelihoods.
Rhine River	Quality	Rotterdam's harbor had to be dredged frequently to remove contaminated sludge deposited by the Rhine River. The cost was enormous and consequently led to controversy over compensation and responsibility among Rhine users. While in this case negotiations led to a peaceful solution, in areas that lack the Rhine's dispute resolution framework, siltation problems could lead to upstream/downstream disputes, such as those in Central America's Lempa River basin.
Syr Darya	Timing	Relations between Kazakhstan, Kyrgyzstan, and Uzbekistan—all riparians of the Syr Darya, a major tributary of the disappearing Aral Sea—exemplify the problems caused by water flow timing. Under the Soviet Union's central management, spring and summer irrigation in downstream Uzbekistan and Kazakhstan balanced upstream Kyrgyzstan's use of hydropower to generate heat in the winter. But the parties are barely adhering to recent agreements that exchange upstream flows of alternate heating sources (natural gas, coal, and fuel oil) for downstream irrigation, sporadically breaching the agreements.

SOURCE: See endnote 4.

quality, quantity, and timing can occur on many geographic scales, but the dynamics of conflict play out differently at international, national, and local levels. (See Table 5–2.) Whether the dispute is over quality, quantity, and timing, or at the international, national, or local level, however, the key to understanding—and preventing—water-related conflicts can be found in the institutions established to manage water resources.

International Basins

International basins that include political boundaries of two or more countries cover 45.3 percent of Earth's land surface, host

Table 5–2. Conflict Dynamics on Different Spatial Levels

Geographic Scale	Characteristics
International	Disputes can arise between riparian countries on transboundary waters
	Very little violence, but existing tensions between parties are pervasive and difficult to overcome, resulting in degraded political relations, inefficient water management, and ecosystem neglect
	Long, rich record of conflict resolution and development of resilient institutions
National	Disputes can arise between subnational political units, including provinces, ethnic or religious groups, or economic sectors
	Higher potential for violence than at international level
	Rationale for international involvement is more difficult, given national sovereignty concerns
Local (indirect)	Loss of water-based livelihoods (due to loss of irrigation water or freshwater ecosystems) can lead to politically destabilizing migrations to cities or neighboring countries
	Local instability can destabilize regions
	Poverty alleviation is implicitly tied to ameliorating security concerns

about 40 percent of the world's population, and account for approximately 60 percent of global river flow. And the number is growing: in 1978 the United Nations listed 214 international basins (in the last official count). Today there are 263, largely due to the "internationalization" of basins through political changes like the breakup of the Soviet Union and the Balkan states, as well as access to improved mapping technology.[5]

Strikingly, territory in 145 nations falls within international basins, and 33 countries are located almost entirely within these basins. The high level of interdependence is illustrated by the number of countries sharing each international basin (see Table 5–3); the dilemmas posed by basins like the Danube (shared by 17 countries) or the Nile (10 countries) can be easily imagined.[6]

The high number of shared rivers, combined with increasing water scarcity for growing populations, leads many politicians and headlines to trumpet coming "water wars." In 1995, for example, World Bank vice president Ismail Serageldin claimed that "the wars of the next century will be about water." Invariably, these warnings point to the arid and hostile Middle East, where armies have mobilized and fired shots over this scarce and precious resource. Elaborate—if misnamed—"hydraulic imperative" theories cite water as the prime motivation for military strategies and territorial conquests, particularly in the ongoing conflicts between Arabs and Israelis.[7]

The only problem with this scenario is a lack of evidence. In 1951–53 and again in 1964–66, Israel and Syria exchanged fire over the latter's project to divert the Jordan River, but the final exchange—featuring assaults by both tanks and aircraft—stopped construction and effectively ended water-related hostilities between the two states. Nevertheless, the 1967 war broke out almost a year later. Water had little—if any—impact on the military's strategic thinking in subsequent Israeli-Arab violence (including the 1967, 1973, and 1982 wars). Yet water was an underlying source of political stress and one of the most difficult topics in subsequent negotiations.

Table 5–3. Number of Countries Sharing a Basin

Number of Countries	International Basins
3	Asi (Orontes), Awash, Cavally, Cestos, Chiloango, Dnieper, Dniester, Drin, Ebro, Essequibo, Gambia, Garonne, Gash, Geba, Har Us Nur, Hari (Harirud), Helmand, Hondo, Ili (Kunes He), Incomati, Irrawaddy, Juba-Shibeli, Kemi, Lake Prespa, Lake Titicaca-Poopo System, Lempa, Maputo, Maritsa, Maroni, Moa, Neretva, Ntem, Ob, Oueme, Pasvik, Red (Song Hong), Rhone, Ruvuma, Salween, Schelde, Seine, St. John, Sulak, Torne (Tornealven), Tumen, Umbeluzi, Vardar, Volga, and Zapaleri
4	Amur, Daugava, Elbe, Indus, Komoe, Lake Turkana, Limpopo, Lotagipi Swamp, Narva, Oder (Odra), Ogooue, Okavango, Orange, Po, Pu-Lun-T'o, Senegal, and Struma
5	La Plata, Neman, and Vistula (Wista)
6	Aral Sea, Ganges-Brahmaputra-Meghna, Jordan, Kura-Araks, Mekong, Tarim, Tigris and Euphrates (Shatt al Arab), and Volta
8	Amazon and Lake Chad
9	Rhine and Zambezi
10	Nile
11	Congo and Niger
17	Danube

SOURCE: See endnote 6.

In other words, even though the wars were not fought over water, allocation disagreements were an impediment to peace.[8]

While water supplies and infrastructure have often served as military tools or targets, no states have gone to war specifically over water resources since the city-states of Lagash and Umma fought each other in the Tigris-Euphrates basin in 2500 BC. Instead, according to the U.N. Food and Agriculture Organization, more than 3,600 water treaties were signed from AD 805 to 1984. While most were related to navigation, over time a growing number addressed water management, including flood control, hydropower projects, or allocations in international basins. Since 1820, more than 400 water treaties and other water-related agreements have been signed, with more than half of these concluded in the past 50 years.[9]

Researchers at Oregon State University have compiled a dataset of every reported interaction—conflictive or cooperative—between two or more nations that was driven by water. Their analysis highlighted four key findings.[10]

First, despite the potential for dispute in international basins, the incidence of acute conflict over international water resources is overwhelmed by the rate of cooperation. The last 50 years have seen only 37 acute disputes (those involving violence), and 30 of those occurred between Israel and one of its neighbors. Non-Mideast cases account for only 5 acute events, while during the same period 157 treaties were negotiated and signed. The total number of water-related events between nations is also weighted toward cooperation: 507 conflict-related events versus 1,228 cooperative, implying

that violence over water is neither strategically rational, hydrographically effective, nor economically viable.[11]

Second, despite the fiery rhetoric of politicians—aimed more often at their own constituencies than at the enemy—most actions taken over water are mild. Of all the events, some 43 percent fall between mild verbal support and mild verbal hostility. If the next levels—official verbal support and official verbal hostility—are added in, verbal events account for 62 percent of the total. Thus almost two thirds of all events are only verbal and more than two thirds of these had no official sanction.[12]

Third, there are more examples of cooperation than of conflict. The distribution of cooperative events covers a broad spectrum, including water quantity, quality, economic development, hydropower, and joint management. In contrast, almost 90 percent of the conflict-laden events relate to quantity and infrastructure. Furthermore, almost all extensive military acts (the most extreme cases of conflict) fall within these two categories.[13]

Fourth, despite the lack of violence, water acts as both an irritant and a unifier. As an irritant, water can make good relations bad and bad relations worse. Despite the complexity, however, international waters can act as a unifier in basins with relatively strong institutions.

This historical record proves that international water disputes do get resolved, even among enemies, and even as conflicts erupt over other issues. Some of the world's most vociferous enemies have negotiated water agreements or are in the process of doing so, and the institutions they have created often prove to be resilient, even when relations are strained.

The Mekong Committee, for example, established by the governments of Cambodia, Laos, Thailand, and Viet Nam as an intergovernmental agency in 1957, exchanged data and information on water resources development throughout the Viet Nam War. Israel and Jordan have held secret "picnic table" talks on managing the Jordan River since the unsuccessful Johnston negotiations of 1953–55, even though they were at war from Israel's independence in 1948 until the 1994 treaty. (See Box 5–1.) The Indus River Commission survived two major wars between India and Pakistan. And all 10 Nile Basin riparian countries are currently involved in senior government–level negotiations to develop the basin cooperatively, despite fiery "water wars" rhetoric between upstream and downstream states.[14]

The historical record proves that international water disputes do get resolved, even among enemies, and even as conflicts erupt over other issues.

In southern Africa, a number of river basin agreements were signed when the region was embroiled in a series of local wars in the 1970s and 1980s (including the "people's war" in South Africa and civil wars in Mozambique and Angola). Although negotiations were complex, the agreements were rare moments of peaceful cooperation among many of the countries. Now that most of the wars and the apartheid era have ended, water is one of the foundations for cooperation in the region. In fact, the 1995 Protocol on Shared Watercourse Systems was the first protocol signed within the Southern African Development Community. Riparians will go through tough, protracted negotiations in order to gain benefits from joint water resources development. Some researchers have therefore identified cooperation over water resources as a particularly fruitful entry

Box 5–1. Water Sharing Between Israel, Jordan, and the Palestinians

The most severe water scarcity in the world is in the Middle East. The deficit is particularly alarming in the Jordan River basin and the adjacent West Bank aquifers, where Israeli, Palestinian, and Jordanian water claims intersect. In Gaza and the West Bank, the annual availability of water is well below 100 cubic meters of renewable water per person, while Israel has less than 300 and Jordan around 100 cubic meters. A country is generally characterized as water-scarce if the availability falls below 1,000 cubic meters.

Population growth, a result both of high birth rates among Palestinians and Jordanians and of immigration to Israel, puts increasingly severe pressure on the already scarce water resources and raises the risk of water-related conflicts. Israeli settlers in the West Bank and Gaza receive a larger share of the available water than the Palestinians, further complicating the situation.

Despite fears of water-related violence, Israel has maintained basic cooperation with Jordan and the Palestinians over their shared waters. This was true even after the second *intifada* began in September 2000. Low-level water cooperation between Israel and Jordan—under U.N. auspices—extends back to the early 1950s, even though both countries were formally at war. This interaction helped build trust and a shared set of rules and norms, which were later formalized within the peace agreement between Israel and Jordan in 1994. As stipulated in that agreement, a Joint Water Committee for coordination and problem solving was established that helped resolve disagreements over allocations.

A 1995 interim agreement regulates Israeli-Palestinian water issues such as protection of water and sewage systems. The Joint Water Committee and its subcommittees have continued to meet despite the violence of the last years. For the Palestinians, the existing agreement is unsatisfactory from both a rights and an availability perspective. Talks aimed at a final agreement are part of the overall negotiating process and, given the political stalemate and ongoing violence, are not likely to be completed any time soon. Nevertheless, there is agreement between Israel and the Palestinians that cooperation over their shared water is indispensable.

Two main policy recommendations can be drawn from this case. First, water cooperation is intimately linked to politics—a highly complex process influenced by both domestic and international considerations. If donors fail to thoroughly analyze the political context, they are unlikely to understand how water is sometimes subordinate to more important political priorities and used as a political tool.

Second, donor agencies and international organizations can play an important role if they are prepared to provide long-term support for establishing cooperation over shared water. Donors typically want to see tangible results within a short time frame. Yet it is essential to understand that risks are involved, occasional setbacks will occur, and rewards are unlikely to materialize quickly. Donors will need to engage in "process financing" that supports not an ordinary development project with a cycle of 2–4 years but rather a process that can span 10–25 years. In the Israeli–Jordanian case, the U.N. Truce Supervision Organization, which worked as an "umbrella" for discussions on water coordination in spite of the absence of a peace agreement, played a critical role.

Although more conflicts of interest are likely to arise in the future over the waters in the Jordan River basin, water management—properly supported—offers a window of opportunity for broader cooperation in this troubled part of the world.

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SOURCE: See endnote 14. The views expressed are those of the author and not the Swedish Ministry for Foreign Affairs.

point for building peace. (See Chapter 8.)[15]

So, if shared water does not lead to violence between nations, what is the problem? In fact, complicating factors, such as the time lag between the start of water disputes and final agreements, can cause water issues to exacerbate tensions. Riparians often develop projects unilaterally within their own territories in an attempt to avoid the political intricacies posed by sharing resources. At some point, one of the riparians (usually the most powerful one) will begin a project that affects at least one of its neighbors.

Without relations or institutions conducive to conflict resolution, unilateral action can heighten tensions and regional instability, requiring years or decades to resolve: the Indus treaty took 10 years of negotiations; the Ganges, 30; and the Jordan, 40. Water was the last—and most contentious—issue negotiated in a 1994 peace treaty between Israel and Jordan, and was relegated to "final status" negotiations between Israel and the Palestinians, along with difficult issues like refugees and the status of Jerusalem. During this long process, water quality and quantity can degrade until the health of dependent populations and ecosystems is damaged or destroyed. The problem worsens as the dispute intensifies; the ecosystems of the lower Nile, the lower Jordan, and the tributaries of the Aral Sea have effectively been written off by some as unfortunate products of human intractability.[16]

When unilateral development initiatives produce international tensions, it becomes more difficult to support cooperative behavior. As mistrust between riparians grows, threats and disputes rage across boundaries, as seen in India and Pakistan or Canada and the United States. Mistrust and tensions (even if they do not lead to open conflict) can hamper regional development by impeding joint projects and mutually beneficial infrastructure. One of the most important sources of water for both Israelis and Palestinians, the Mountain Aquifer, is threatened by pollution from untreated sewage. The existing conflict has impeded donor initiatives to build wastewater treatment plants in Palestine, setting the stage for a vicious circle as groundwater pollution increases regional water scarcity and, in turn, exacerbates the Israeli-Palestinian conflict.[17]

Disputes within Nations

The literature on transboundary waters often treats political entities as homogeneous monoliths: "Canada feels…" or "Jordan wants…." Recently, analysts have identified the pitfalls of this approach, showing how subsets of national actors have different values and priorities for water management. In fact, the history of water-related violence includes incidents between tribes, water use sectors, rural and urban populations, and states or provinces. Some research even suggests that as the geographic scale drops, the likelihood and intensity of violence increases. Throughout the world, local water issues revolve around core values that often date back generations. Irrigators, indigenous populations, and environmentalists, for example, all may view water as tied to their way of life, which is increasingly threatened by new demands for cities and hydropower.[18]

Unilateral action can heighten tensions and regional instability, requiring years or decades to resolve.

Internal water conflicts have led to fighting between downstream and upstream users along the Cauvery River in India and between Native Americans and European settlers. In 1934, the landlocked state of

Arizona commissioned a navy (it consisted of one ferryboat) and sent its state militia to stop a dam and diversion project on the Colorado River. Water-related disputes can also engender civil disobedience, acts of sabotage, and violent protest. In the Chinese province of Shandong, thousands of farmers clashed with police in July 2000 because the government planned to divert agricultural irrigation water to cities and industries. Several people died in the riots. And from 1907 to 1913 in California's Owens Valley, farmers repeatedly bombed a pipeline diverting water to Los Angeles.[19]

National instability can also be provoked by poor or inequitable water services management. Disputes arise over system connections for suburban or rural areas, service liability, and especially prices. In most countries, the state is responsible for providing drinking water; even if concessions are transferred to private companies, the state usually remains responsible for service. Disputes over water supply management therefore usually arise between communities and state authorities. (See Box 5–2.) Protests are particularly likely when the public suspects that water services are managed in a corrupt manner or that public resources are diverted for private gain.[20]

Local Impacts

As water quality degrades or quantity diminishes, it can affect people's health and destroy livelihoods that depend on water. Agriculture uses two thirds of the world's water and is the greatest source of livelihoods, especially in developing countries, where a large portion of the population depends on subsistence farming. Sandra Postel's list of countries that rely heavily on declining water supplies for irrigation includes eight that currently concern the security community: Bangladesh, China, Egypt, India, Iran, Iraq, Pakistan, and Uzbekistan. When access to irrigation water is cut off, groups of unemployed, disgruntled men may be forced out of the countryside and into the city—an established contributor to political instability. Migration can cause tensions between communities, especially when it increases pressure on already scarce resources, and cross-boundary migration can contribute to interstate tensions. (See Chapter 2.)[21]

Thus, water problems can contribute to local instability, which in turn can destabilize a nation or an entire region. In this indirect way, water contributes to international and national disputes, even though the parties are not fighting explicitly about water. During the 30 years that Israel occupied the Gaza Strip, for example, water quality deteriorated steadily, saltwater intruded into local wells, and water-related diseases took a toll on the residents. In 1987, the second *intifada* began in the Gaza Strip, and the uprising quickly spread throughout the West Bank. While it would be simplistic to claim that deteriorating water quality caused the violence, it undoubtedly exacerbated an already tenuous situation by damaging health and livelihoods.[22]

An examination of relations between India and Bangladesh demonstrates that local instabilities can spring from international water disputes and exacerbate international tensions. In the 1960s, India built a dam at Farakka, diverting a portion of the Ganges from Bangladesh to flush silt from Calcutta's seaport, some 100 miles to the south. In Bangladesh, the reduced flow depleted surface water and groundwater, impeded navigation, increased salinity, degraded fisheries, and endangered water supplies and public health, leading some Bangladeshis to migrate—many, ironically, to India.[23]

So, while no "water wars" have occurred, the lack of clean fresh water or the competi-

Box 5–2. Conflict over Water Services Management: The Case of Cochabamba

Issues of water supply management can lead to violent conflict, as demonstrated by the confrontations that erupted in 2000 in Cochabamba, Bolivia's third largest city, following the privatization of the city's water utility. Cochabamba had long suffered from water scarcity and insufficient, irregular provision of water services. Hoping for improved services and higher connection rates, in September 1999 the Bolivian government signed a 40-year concession contract with the international private water consortium Aguas del Tunari (AdT).

By January 2000, drinking water tariffs increased sharply; some households had to pay a significant share of their monthly income for water services. Consumers felt they were simply paying more for the same poor services and responded with strikes, roadblocks, and other forms of civil protest that shut the city down for four days in February 2000.

While increased water bills triggered the protests, some people also opposed a law threatening public control of rural water systems. Long-standing water scarcity had encouraged the development of well-established alternative sources of supply. In rural municipalities surrounding Cochabamba, farmer cooperatives drilled their own wells and used an informal market for water based on an ancient system of property rights. Under the concession contract, AdT was granted the exclusive use of water resources in Cochabamba, as well as any future sources needed to supply city consumers. It was also granted the exclusive right to provide water services and to require potential consumers to connect to its system. The rural population feared they would lose their traditional water rights and AdT would charge them for water from their own wells.

Farmers from surrounding municipalities joined the protest in Cochabamba, which spread to other parts of Bolivia. Months of civil unrest came to a head in April 2000, when the government declared a state of siege for the whole country and sent soldiers into Cochabamba. Several days of violence left more than a hundred people injured and one person dead. The protests eased only after the government agreed to revoke AdT's concession and return the utility's management to the municipality.

Performance continues to be unsatisfactory, however. Many neighborhoods have only occasional service, and the valley's groundwater table continues to sink. Although many view the concession's cancellation as a victory for the people, it did not solve their water problems. Meanwhile, AdT filed a complaint against the Bolivian government in the World Bank's trade court, the International Centre for Settlement of Investment Disputes, in Washington, D.C. According to the *San Francisco Chronicle*, the consortium is demanding $25 million in compensation for the canceled contract. The case is still pending.

SOURCE: See endnote 20.

tion over access to water resources has occasionally led to intense political instability that resulted in acute violence, albeit on a small scale. Insufficient access to water is a major cause of lost livelihoods and thus fuels livelihood-related conflicts. Environmental protection, peace, and stability are unlikely to be realized in a world in which so many suffer from poverty.[24]

Institutional Capacity: The Heart of Water Conflict and Cooperation

Many analysts who write about water politics, especially those who explicitly address the issue of water conflicts, assume that scarcity of such a critical resource drives people to

conflict. It seems intuitive: the less water there is, the more dearly it is held and the more likely it is that people will fight over it. Recent research on indicators for transboundary water conflict, however, did not find any statistically significant physical parameters—arid climates were no more conflict-prone than humid ones, and international cooperation actually increased during droughts. In fact, no single variable proved causal: democracies were as susceptible to conflict as autocracies, rich countries as poor ones, densely populated countries as sparsely populated ones, and large countries as small ones.[25]

When Oregon State University researchers looked closely at water management practices in arid countries, they found institutional capacity was the key to success. Naturally arid countries cooperate on water: to live in a water-scarce environment, people develop institutional strategies—formal treaties, informal working groups, or generally warm relations—for adapting to it. The researchers also found that the likelihood of conflict increases significantly if two factors come into play. First, conflict is more likely if the basin's physical or political setting undergoes a large or rapid change, such as the construction of a dam, an irrigation scheme, or territorial realignment. Second, conflict is more likely if existing institutions are unable to absorb and effectively manage that change.[26]

Water resource management institutions have to be strong to balance competing interests and to manage water scarcity (which is often the result of previous mismanagement), and they can even become a matter of dispute themselves. In international river basins, water management institutions typically fail to manage conflicts when there is no treaty spelling out each nation's rights and responsibilities nor any implicit agreements or cooperative arrangements.[27]

Similarly, at the national and local level it is not the lack of water that leads to conflict but the way it is governed and managed. Many countries need stronger policies to regulate water use and enable equitable and sustainable management. Especially in developing countries, water management institutions often lack the human, technical, and financial resources to develop comprehensive management plans and ensure their implementation.

Moreover, in many countries decision-making authority is spread among different institutions responsible for agriculture, fisheries, water supply, regional development, tourism, transport, or conservation and environment, so that different management approaches serve contradictory objectives. Formal and customary management practices can also be contradictory, as demonstrated in Cochabamba, where formal provisions of the 1999 Bolivian Water Services Law conflicted with customary groundwater use by farmers' associations.[28]

In countries without a formal system of water use permits or adequate enforcement and monitoring, more powerful water users can override the customary rights of local communities. If institutions allocate water inequitably between social groups, the risk of public protest and conflict increases. In South Africa, the apartheid regime allocated water to favor the white minority. This "ecological marginalization" heightened the black population's grievances and contributed to social instability, which ultimately led to the end of the regime.[29]

Institutions can also distribute costs and benefits unequally: revenues from major water infrastructure projects, such as large dams or irrigation schemes, usually benefit only a small elite, leaving local communities to cope with the resulting environmental

and social impacts, often with little compensation. (See Box 5–3.)[30]

The various parties to water conflicts often have differing perceptions of legal rights, the technical nature of the problem, the cost of solving it, and the allocation of costs among stakeholders. Reliable sources of information acceptable to all stakeholders are therefore essential for any joint efforts. This not only enables water-sharing parties to make decisions based on a shared understanding, it also helps build trust.[31]

A reliable database, including meteorological, hydrological, and socioeconomic data, is a fundamental tool for deliberate and farsighted water management. Hydrological and meteorological data collected upstream are crucial for decisionmaking downstream. And in emergencies such as floods, this information is required to protect human and environmental health. Tensions between different water users can emerge when information is not exchanged. Disparities in stakeholders' capacity to generate, interpret, and legitimize data can lead to mistrust of those with better information and support systems. In the Incomati and Maputo River basins, the South African monopoly over data generation created such discomfort in downstream Mozambique that the basins' Piggs Peak Agreement broke down, and Mozambique used this negotiation impasse to start developing its own data.[32]

Moving Toward Cooperative Water Management

Although there are many links between water and conflict, and competing interests are inherent to water management, most disputes are resolved peacefully and cooperatively, even if the negotiation process is lengthy. Cooperative water management mechanisms—probably the most advanced approach—can anticipate conflict and solve smoldering disputes, provided that all stakeholders are included in the decisionmaking process and given the means (information, trained staff, and financial support) to act as equal partners. Cooperative management mechanisms can reduce conflict potential by:

- providing a forum for joint negotiations, thus ensuring that all existing and potentially conflicting interests are taken into account during decisionmaking;
- considering different perspectives and interests to reveal new management options and offer win-win solutions;
- building trust and confidence through collaboration and joint fact-finding; and
- making decisions that are much more likely to be accepted by all stakeholders, even if consensus cannot be reached.[33]

In international river basins, water management institutions typically fail to manage conflicts when there is no treaty spelling out each nation's rights and responsibilities nor any implicit agreements.

On the local level, traditional community-based mechanisms are already well suited to specific local conditions and are thus more easily adopted by the community. Examples include the *chaffa* committee, a traditional water management institution of the Boran people in the Horn of Africa, or the Arvari Parliament, an informal decisionmaking and conflict-resolution body based on traditional customs of the small Arvari River in Rajasthan, India. On the international level, river basin commissions with representatives from all riparian states have been successfully involved in joint riparian water resources management. Especially in transboundary basins, achieving

Box 5–3. Harnessing Wild Rivers: Who Pays the Price?

Since World War II, some 45,000 large dams have been built, generating an estimated 20 percent of the world's electricity and providing irrigation to fields that produce some 10 percent of the world's food. Yet for the 40–80 million people whose lives and livelihoods were rooted in the banks and valleys of wild rivers, dam development has profoundly altered the health, economy, and culture of communities and entire nations.

Because dams are generally situated near the ancient homes of indigenous nations, it is ultimately rural and ethnic minorities far from the central corridors of power who are typically forced to pay the price. Ill-considered development plans, forced evictions, and resettlement with inadequate compensation generate conditions and conflicts that threaten the security of individual and group rights to culture, self-determination, livelihood, and life itself.

These dynamics are illustrated in the case of the Chixoy Dam in Guatemala, which provides 80 percent of that nation's electricity. It was planned and developed by INDE (the National Institute for Electrification) and largely financed with loans from the Inter-American Development Bank and the World Bank. Designs were approved and construction was begun without notifying the local population, conducting a comprehensive survey of affected villages, or addressing compensation and resettlement for the 3,400 mostly Mayan residents. The military dictatorship of Lucas Garcia declared the Chixoy Dam site and surrounding region a militarized zone in 1978.

Some villagers accepted resettlement offers but found poorer quality housing, smaller acreage, and infertile land. Others refused to move and instead attempted to negotiate more equitable terms. Tensions escalated as the government declared remaining villagers subversive, seized community records of resettlement promises and land documents, and killed community leaders. Following a second military coup in March 1982, General Rios Montt initiated a "scorched earth" policy against Guatemala's Mayan population. As construction on the dam was completed and floodwaters began to rise, villages were emptied at gunpoint and homes and fields burned. Massacres ensued, including in villages that provided refuge to survivors. In the village of Rio Negro, for instance, 487 people—half the population—had been murdered by September 1982.

Following the 1994 Oslo Peace Accords ending Guatemala's civil war, a series of investigations broke the silence over the massacres. In 1999 a United Nations–sponsored commission concluded that more than 200,000 Mayan civilians had been killed, that acts of genocide were committed against specific Mayan communities, and that the government of Guatemala was responsible for 93 percent of the human rights violations and acts of violence against civilians.

Today, the issue is far from settled. The failure to provide farm and household land of equivalent size and quality for those resettled has produced severe poverty, widespread hunger, and high malnutrition rates. Communities that were excluded from the resettlement program also struggle with an array of problems. Dam releases occur with no warning, and the ensuing flashfloods destroy crops, drown livestock, and sometimes kill people. Most inhabitants of former fishing villages, their livelihoods destroyed, have turned to migrant labor. Upstream communities saw part of their agricultural land flooded, and access to land, roads, and regional markets was cut off. No mechanism exists for affected people to complain or negotiate assistance.

Chixoy Dam–affected communities have met to discuss common problems and strategies, testified before truth commissions, and, with help from national and international advocates, are working to document the dam's impact. In September 2004, some 500 Mayan farmers seized the dam, threatening to cut

Box 5–3. (continued)

power supplies unless they were compensated for land and lives lost.

In a growing number of instances, the efforts by dam-affected peoples to document experiences and protest injury, damage, and loss have succeeded in producing some measure of remedy. In Thailand, where the Pak Mun Dam destroyed fisheries and the livelihood of tens of thousands, a decade of protests prompted the government to decommission the dam temporarily. Affected villagers conducted research on the impact of the dam on their lives and the Mun River ecosystem, documenting the return of 156 fish species to the river after floodgates were opened and the subsequent revitalization of the fishing economy and village life. These assessments played a key role in the decision to operate the dam on a seasonal basis.

At a second dam on the Mun River, the Rasi Salai, displaced people established a protest village in 1999, refusing to leave while the reservoir waters submerged their encampment. Their nonviolent protest and their willingness to face imminent drowning struck a chord in the nation. In July 2000, the Rasi Salai floodgates were opened to allow environmental recovery and impact assessments, and they remain open to this day.

In documenting the many failures to address rights and resources properly, dam-affected communities have taken the lead in challenging the assumptions that drive development decisionmaking and in demanding institutional accountability. Their demands for "reparations" are much more than cries for compensation. They are demands for meaningful remedy, which means that free, prior, and informed consent of residents is obtained before financing is approved and dam construction initiated, that scientific assessments and plans are developed with the equitable participation of members of the affected community, that governments and financiers respect the rights of indigenous peoples to self-determination—including the right to say no, and that new projects are not funded until any remaining problems from past projects are addressed.

—Barbara Rose Johnston, Center for Political Ecology, Santa Cruz, California

SOURCE: See endnote 30.

cooperation has been a drawn-out and costly process. Recognizing this, the World Bank agreed to facilitate the Nile Basin Initiative negotiation process for 20 years.[34]

Capacity building—to generate and analyze data, develop sustainable water management plans, use conflict resolution techniques, or encourage stakeholder participation—should target water management institutions, local nongovernmental organizations, water users' associations, or religious groups. On the international level, strengthening less powerful riparians' negotiating skills can help prevent conflict. On the local level, strengthening the capacity of excluded, marginalized, or weaker groups to articulate and negotiate their interests helps involve them in cooperative water management. The Every River Has Its People Project in the Okavango River basin, for instance, aims to increase participation by communities and other local stakeholders in decisionmaking and basin management through educational and training activities.[35]

Preventing severe conflicts requires informing or explicitly consulting all stakeholders, such as downstream states or societies, before making management decisions. The process of identifying all relevant stakeholders and their positions is crucial to estimating, and consequently managing, the risks of conflict. Without extensive and regular public partic-

ipation, the general public might reject infrastructure project proposals. For example, the decision to build the Hainburg Dam on the Danube River was announced in 1983 after only limited public participation. Environmental groups and other civil society organizations, supported by the general public, occupied the project site and managed to stop the dam's construction. Subsequently, the site became a national park.[36]

The crux of water disputes is still about little more than opening a diversion gate or garbage floating downstream.

Cooperative water management is a challenging issue that requires time and commitment. Extensive stakeholder participation might not always be feasible; in some cases, it may not even be advisable. On any scale of water management, if the level of dispute is too high and the disparities are too great, conflicting parties are not likely to reach consensus and might even refuse to participate in cooperative management activities. In such cases, confidence and consensus-building measures, such as joint training or joint fact-finding, will support cooperative decisionmaking.

Conflict transformation measures involving a neutral third party, such as mediation, facilitation, or arbitration, are helpful in cases with open disputes over water resources management. Related parties, such as elders, women, or water experts, have successfully initiated cooperation when the conflicting groups could not meet. The women-led Wajir Peace Initiative, for example, helped reduce violent conflict between pastoralists in Kenya, where access to water was one issue in the conflict. In certain highly contentious cases, such as the Nile Basin, an "elite model" that seeks consensus between high-level representatives before encouraging broader participation has enjoyed some success in developing a shared vision for basin management. Effectively integrating public participation is now the key challenge for long-term implementation of elite-negotiated efforts.[37]

Water management is, by definition, conflict management. For all the twenty-first century wizardry—dynamic modeling, remote sensing, geographic information systems, desalination, biotechnology, or demand management—and the new-found concern with globalization and privatization, the crux of water disputes is still about little more than opening a diversion gate or garbage floating downstream. Yet anyone attempting to manage water-related conflicts must keep in mind that rather than being simply another environmental input, water is regularly treated as a security issue, a gift of nature, or a focal point for local society. Disputes, therefore, are more than "simply" fights over a quantity of a resource; they are arguments over conflicting attitudes, meanings, and contexts.

Obviously, there are no guarantees that the future will look like the past; the worlds of water and conflict are undergoing slow but steady changes. An unprecedented number of people lack access to a safe, stable supply of water. As exploitation of the world's water supplies increases, quality is becoming a more serious problem than quantity, and water use is shifting to less traditional sources like deep fossil aquifers, wastewater reclamation, and interbasin transfers. Conflict, too, is becoming less traditional, driven increasingly by internal or local pressures or, more subtly, by poverty and instability. These changes suggest that tomorrow's water disputes may look very different from today's.

On the other hand, water is a productive pathway for confidence building, cooperation, and arguably conflict prevention, even in particularly contentious basins. In some

cases, water offers one of the few paths for dialogue to navigate an otherwise heated bilateral conflict. In politically unsettled regions, water is often essential to regional development negotiations that serve as de facto conflict-prevention strategies. Environmental cooperation—especially cooperation in water resources management—has been identified as a potential catalyst for peacemaking. (See Chapter 8.)[38]

So far, attempts to translate the findings from the environment and conflict debate into a positive, practical policy framework for environmental cooperation and sustainable peace show some signs of promise but have not been widely discussed or practiced. More research could elucidate how water—being international, indispensible, and emotional—can serve as a cornerstone for confidence building and a potential entry point for peace. Once the conditions determining whether water contributes to conflict or to cooperation are better understood, mutually beneficial integration and cooperation around water resources could be used more effectively to head off conflict and to support sustainable peace among states and groups within societies.

SECURITY LINK

Resource Wealth and Conflict

Abundant natural resources—such as oil, minerals, metals, diamonds, timber, and agricultural commodities, including drug crops—have fueled a large number of violent conflicts. Resource exploitation played a role in about a quarter of the roughly 50 wars and armed conflicts of recent years. More than 5 million people were killed in resource-related conflicts during the 1990s. Close to 6 million fled to neighboring countries, and anywhere from 11–15 million people were displaced inside their own countries.[1]

The money derived from the often illicit resource exploitation in war zones has secured an ample supply of arms for various armed factions and enriched a handful of people—warlords, corrupt government officials, and unscrupulous corporate leaders. But for the vast majority of the local people, these conflicts have brought a torrent of human rights violations, humanitarian disasters, and environmental destruction, helping to push these countries to the bottom of most measures of human development.[2]

In places like Afghanistan, Angola, Cambodia, Colombia, and Sudan, the pillaging of resources allowed violent conflicts to continue that were initially driven by grievances or secessionist and ideological struggles. Revenues from resource exploitation replaced the support extended to governments and rebel groups by superpower patrons that largely evaporated with the cold war's end. Elsewhere, such as in Sierra Leone or the Democratic Republic of the Congo, predatory groups initiated violence not necessarily to gain control of government, but as a way to seize control of a coveted resource.[3]

Commercial resource extraction can also be a source of conflict where governance is undemocratic and corrupt. The economic benefits accrue only to a small domestic elite and to multinational companies, while the local population shoulders an array of social, health, and environmental burdens. All over the world, indigenous communities confront oil, mining, and logging firms. Violent conflict has occurred in places like Nigeria (more than 1,000 people were killed there in 2004), Colombia, Papua New Guinea's Bougainville island, and Indonesia's Aceh province.[4]

Finally, tensions and disputes arise as major consumers of natural resources jockey for access and control. The history of oil, in particular, is one of military interventions and other forms of foreign meddling, of which the Iraq invasion is but the latest chapter. As demand for oil becomes more intense, a new set of big-power rivalries is now emerging.[5]

The United States, Russia, and China are backing competing pipeline plans for Caspian resources, and China and Japan are pushing mutually exclusive export routes in their struggle for access to Siberian oil. In Africa, France and the United States are maneuvering for influence by deepening military ties with undemocratic regimes in Congo-Brazzaville, Gabon, and Angola. China is seeking a greater role for its oil companies, particularly in Sudan, and working to increase its political clout in Africa and the Middle East. U.S. soldiers patrol the oil-rich, violence-soaked Niger Delta with their Nigerian counterparts and help protect a Colombian export pipeline against rebel attacks.[6]

Resource-rich countries often fail to invest adequately in critical social areas or public infrastructure. But resource royalties help their leaders maintain power even in the absence of popular legitimacy—by funding a system of patronage and by beefing up an internal security apparatus to suppress challenges to their power.[7]

A number of conflicts—in Sierra Leone,

L. Lartigue/USAID

Diamond miners, Sierra Leone

Liberia, and Angola—have finally come to an end, but others burn on. In the Democratic Republic of the Congo, foreign forces that invaded in 1998 have withdrawn, yet fighting among various domestic armed factions continues, and elaborate illegal networks and proxy forces have been set up that continue to exploit natural resources.[8]

The enormous expansion of global trade and financial networks has made access to key markets relatively easy for warring groups. They have little difficulty in establishing international smuggling networks and sidestepping international embargoes, given a degree of complicity among certain companies and often lax customs controls in importing nations.[9]

Over the past five years or so, awareness of the close links between resource extraction, underdevelopment, and armed conflict has grown rapidly. Campaigns by civil society groups and investigative reports by U.N. expert panels have shed light on these connections, making it at least somewhat more difficult for "conflict resources," such as diamonds, to be sold on world markets. To discourage illicit deals, revenue flows associated with resource extraction need to become more transparent, but governments, companies, and financial institutions often still shirk their responsibilities.[10]

Commodity-tracking regimes are equally important. In the diamond industry, national certification schemes and a standardized global certification scheme have been established. But the resulting set of rules still suffers from a lack of independent monitoring and too much reliance on voluntary measures. Efforts are also under way by the European Union to establish a certification system for its tropical timber imports—up to half of which are connected to armed conflict or organized crime.[11]

Natural resources will continue to fuel deadly conflicts as long as consumer societies import materials with little regard for their origin or the conditions under which they were produced. Some civil society groups have sought to increase consumer awareness and to compel companies to do business more ethically through investigative reports and by "naming and shaming" specific corporations. Consumer electronics companies, for instance, were pressured to scrutinize their supplies of coltan, a key ingredient of circuit boards, and to ask processing firms to stop purchasing illegally mined coltan.[12]

Promoting democratization, justice, and greater respect for human rights are key tasks, along with efforts to reduce the impunity with which some governments and rebel groups engage in extreme violence. Another goal is to facilitate the diversification of the economy away from a strong dependence on primary commodities to a broader mix of activities. A more diversified economy, greater investments in human development, and help for local communities to become strong guardians of the natural resource base would lessen the likelihood that commodities become pawns in a struggle among ruthless contenders for wealth and power.

—Michael Renner

SECURITY LINK

The Private Sector

In an address to the United Nations Security Council in April 2004, U.N. Secretary-General Kofi Annan highlighted the important role that private companies can play—good or bad—in the world's most conflict-prone countries: "Their decisions—on investment and employment, on relations with local communities, on protection for local environments, on their own security arrangements—can help a country turn its back on conflict, or exacerbate the tensions that fuelled the conflict in the first place."[1]

In recent years, grassroots campaigners and U.N. panels have documented the alleged complicity of multinational companies in a wide range of conflict situations—from human rights abuses in oil-rich Sudan and Nigeria, to the trafficking of diamonds and timber from the Congo and Sierra Leone, to the misuse of financial services for arms purchases and terrorist acts. In light of these reports, corporations are increasingly aware that in addition to fueling violence, investments in a conflict situation can seriously taint a company's reputation, and may even become a legal liability.[2]

In one prominent case, the Canadian petroleum company Talisman Energy was forced to sell its oil interests in Sudan following accusations that it had contributed to the 20-year-long civil war. Beginning with the completion of an export pipeline in 1999, crude oil produced by the Talisman-led consortium contributed as much as $500 million a year to government revenues. These payments were alleged to have contributed to a doubling of the government's defense budget in the same period and thus to the "scorched earth" campaign to clear people out of the country's oil fields. In at least one reported instance, helicopter gunships and other military aircraft used the consortium's landing strip as a staging point for attacks on civilians.[3]

In March 2003, having been targeted in a class action suit in New York, Talisman sold its share in the oil consortium to the Indian energy firm ONGC Videsh. Yet even as this initiated a boom in Talisman's share value, the company's retreat from Sudan posed a complex dilemma. On the one hand, it demonstrated to the oil industry that questionable investments or activities could affect a company's reputation and lower its stock value (by up to 15 percent in Talisman's case). On the other hand, the withdrawal of top multinational investments from unstable countries could ultimately reduce international scrutiny of these places, lessening pressure on remaining firms to adhere to minimum social and environmental standards.[4]

There are also instances where the private sector has been instrumental in helping bring hostilities to a close. In Sri Lanka, an attack on the international airport in July 2001 marked a turning point in the decades-long conflict between the Sinhalese majority and separatist Tamils. Prominent business leaders from both sides formed Sri Lanka First to build grassroots support against the war. The group helped coordinate a million-person demonstration in September, and during the subsequent election it campaigned on behalf of legislators who favored a negotiated settlement. These actions helped move the Tamil separatists and the government toward a cease-fire in early 2002.[5]

Companies should play a role in reducing conflict rather than contributing to it. To do so, however, they will need to develop guidelines for managing social risks, strengthening transparency and accountability, and forging collaborative relationships—thus enabling managers to navigate difficult

Esso Photo

Building the Chad-Cameroon pipeline

situations more responsibly.

First and foremost, the consequences of business and development projects must be better understood. By analyzing the likely impacts of conflict on company operations, as well as the impacts of corporate activities on local communities and the broader social fabric, companies would have the opportunity to refocus their core business operations, social investment activities, and public policy strategies on the goal of minimizing harm. To spur their adoption, governments could require export credit agencies (ECAs) and other lenders to conflict-prone areas to make such assessments a condition for preferential access to finance. Similarly, the World Bank's private-sector lending arms and the ECAs could establish guidelines for the assessments, similar to those they use for the environment.[6]

Increasing the transparency of corporate actions will also be essential. The nongovernmental Publish What You Pay initiative seeks to ensure transparency of extractive project royalties and other payments to governments. And the U.K. government–led Extractive Industries Transparency Initiative calls on host governments to be more transparent about the use of these revenue streams. Boosting the capacity of civil society in host countries to hold governments accountable for how these funds are spent is the other necessary building block.[7]

Clear and internationally agreed norms of legal accountability for corporate complicity in gross human rights violations, war crimes, and violations of U.N. sanctions are needed. Corporate accountability could be upheld through the International Criminal Court or through domestic civil courts using mechanisms like the Alien Tort Claims Act in the United States. While voluntary codes of conduct that address human rights and corruption—such as the U.N. Global Compact—are valuable starting points, a degree of enforceability based on internationally agreed minimum standards is critical.[8]

Private-sector actors can also form valuable partnerships with governments, development agencies, and civil society organizations in areas of ongoing or potential conflict. These can enhance corporate sensitivity and legitimacy while reducing risk, thus increasing overall investment. Multistakeholder assurance groups set up under the supervision of the World Bank, for example, have strengthened the accountability of governments and project operators for delivery of social programs and mitigation of project impacts in the case of the Chad-Cameroon and Baku-Tblisi-Ceyhan pipelines.[9]

The price of getting private-sector investments wrong has reached unprecedented heights. Corruption, patronage, and war profiteering are destabilizing countries and causing unjustified human suffering. But if ethics, regulation, and incentives support the shift, responsible business can become a leading force for peace.

—Jason Switzer, International Institute for Sustainable Development

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5. Michael T. Klare, *Resource Wars: The New Landscape of Global Conflict* (New York: Metropolitan Books, 2001); Michael Renner, "Post-Saddam Iraq: Linchpin of a New Oil Order," *Foreign Policy in Focus*, January 2003; Chalmers Johnson, "America's Empire of Bases," *TomDispatch.com*, January 2004, at www.tomdispatch.com/index.mhtml?pid=1181; Matthew Yeomans, "Oil, Guns and Money," 2 September 2004, Global Policy Forum, at www.globalpolicy.org/empire/analysis/2004/0902yeomans.htm.

6. Caspian from Lutz Kleveman, "Oil and the New 'Great Game'," *The Nation*, 16 February 2004, pp. 12–13; Ayako Doi, "Asian Enmities—China and Japan Revert to Hostility, and Hope for Reconciliation Fades," *Washington Post*, 29 August

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9. Renner, op. cit. note 1.

10. For transparency codes and other efforts, see Ian Bannon and Paul Collier, eds., *Natural Resources and Violent Conflict: Options and Actions* (Washington, DC: World Bank, 2003).

11. Ibid.; Ian Smillie, *Conflict Diamonds: Unfinished Business* (Ottawa, ON, Canada: International Development Research Centre, 2002); U.S. Government Accounting Office, *Critical Issues Remain in Deterring Conflict Diamond Trade* (Washington, DC: 2002), pp. 17–21; Jeremy Smith, "E.U. Aims to Stem Illegal Rainforest Timber Trade," *Reuters*, 14 October 2003.

12. See, for example, the Campaign to Eliminate Conflict Diamonds at www.phrusa.org/campaigns/sierra_leone/conflict_diamonds.html, the Fatal Transactions Campaign at www.niza.nl/fataltransactions/partner.html, Global Witness at www.globalwitness.org, Christian Aid at www.christian-aid.org.uk, and Project Underground at www.moles.org.

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7. Publish What You Pay campaign, at www.publishwhatyoupay.org; Extractive Industries Transparency Initiative, at www2.dfid.gov.uk/pubs/files/eitinewslettermarch04.pdf.

8. Georgette Gagnon, Audrey Macklin, and Penelope Simons, *Deconstructing Engagement: Corporate Self-Regulation in Conflict Zones—Implications for Human Rights and Canadian Public Policy* (Ottawa, ON, Canada: SSHRC/Law Commission of Canada, 2003); Philippe Le Billon, *Getting It Done: Instruments of Enforcement*, in Paul Collier and Ian Bannon, eds., *Natural Resources and Violent Conflict: Options and Actions* (Washington, DC: World Bank, 2003).

9. For more on Afghanistan and other pilot efforts at business investment in post-conflict zones, see Business Humanitarian Forum, at www.bhforum.ch; for more on tri-sector partnerships in the extractives sector, see the Natural Resource Cluster of the Business Partners for Development initiative, at www.bpd-naturalresources.org; for multistakeholder groups, see, for example, the Chad-Cameroon Independent Assurance Group, at www.gic-aig.org.

MODULE I
INITIAL STATE – BASINS AND BOUNDARIES
OVERVIEW

Negotiation Stage	Common Water Claims	Collaborative Skills	Geographic Scope
Adversarial	Rights	Trust-building	 Nations

Stage 1 of Water Conflict Transformation

SECTION A: GENERAL SETTING

In its initial, *adversarial* setting, regional geopolitics often overwhelms the capacity for efficient water resources management. Metaphorically, the political boundaries on a map at this stage are more prevalent than any other boundaries, either of interest, sector, or hydrology. Dialogue is often focused on the past, based on the *rights* to which a country feels it is entitled, and a period of venting of pent-up grievances can be necessary. As a consequence of these initial tensions, the collaborative learning emphasis is on *trust-building*, notably on active and transformative listening, and on the process of conflict transformation. By focusing primarily on the rights and interests of countries, inefficiencies and inequities are inevitable during this stage of negotiations.

Initial positions in advance of water negotiations are often extreme, and usually based either on hydrography, i.e. from where a river or aquifer originates and how much of that territory falls within a certain state, or on chronology, i.e. who has been using the water the longest. The "doctrine of absolute sovereignty" is often initially claimed by an upstream riparian. This principle, often referred to as the Harmon Doctrine (for the US attorney-general who suggested this stance in 1895 regarding a dispute with Mexico over the Rio Grande), argues that a state has absolute rights to water flowing through its territory.[9] Considering this doctrine was immediately rejected by Harmon's successor and later officially repudiated by the US (McCaffrey 1996), was never implemented in any water treaty (with the rare exception of some internal tributaries of international waters), was not invoked as a source for judgment in any international water legal ruling, and was explicitly rejected by the international tribunal over the Lac Lanoux case in 1957, the Harmon Doctrine is wildly over-emphasized as a principle of international law.[10]

The downstream extreme claim often depends on climate. In a humid watershed, the extreme principle advanced is "the doctrine of absolute riverain integrity," which suggests that every riparian is entitled to the natural flow of a river system crossing its borders. This principle has reached acceptance in the international setting as rarely as absolute sovereignty. In an arid or exotic (humid headwaters region with an arid downstream) watershed, the downstream riparian often has older water infrastructure which is in its interest to defend. The principle that rights are acquired through older use is referred to as "historic rights" (or "prior appropriations" in the US), that is, "first in time, first in right".

9. "The fundamental principle of international law is the absolute sovereignty of every nation, as against all others, within its own Territory" (cited in LeMarquand 1993, 63). Harmon was making the hydrologically preposterous argument that upstream water diversions within the territorial US would not legally affect downstream navigation on international stretches of the Rio Grande since the diversions were to be carried out by individuals, not States (McCaffrey 1997).

10. As far back as 1911, the Institut de Droit International had asserted that the dependence of riparian states on each other precludes the idea of absolute autonomy over shared waters (Laylin and Bianchi 1959, 46).

These conflicting doctrines of hydrography and chronology clash along many international rivers, with positions usually defined by relative riparian status.[11] Downstream riparians often receive less rainfall than their upstream neighbors and therefore have depended on river-water for much longer historically. As a consequence, modern "rights-based" disputes often take the form of upstream riparians arguing in favor of the doctrine of absolute sovereignty, with downstream riparians taking the position of historic rights.

These extreme and contradictory positions are neither tenable nor sustainable, and parties almost invariably move beyond their insistence on their own "rights" at the expense of other parties, as will be seen below. In order to move from this adversarial, rights-based positioning, we focus on interpersonal skills and relationships, developing trust-building, and identifying and analyzing parties, positions, and interests.

SECTION B: SUMMARY – THE SEVEN ELEMENTS OF CONFLICT RESOLUTION [12] (BARNETT, BACKGROUND DOCUMENT)

Alternatives

Alternatives are the walk-away possibilities that each party has *if an agreement is not reached*. In general, neither party should agree to something that is worse than its "**BATNA**" – its **B**est **A**lternative **T**o a **N**egotiated **A**greement – "away from the table."

Interests

Interests are not positions; positions are parties' demands. Underlying the positions are the reasons they are demanding something: their needs, concerns, desires, hopes and fears. The better an agreement satisfies the parties' interests, the better the deal.

Options

Options are the full range of possibilities on which the parties might conceivably reach agreement. Options are, or might be, put "on the table." An agreement is better if it is the best of many options, especially if it exploits all potential mutual gain in the situation.

Legitimacy

Legitimacy refers to the perceived fairness of an agreement. An agreement will leave both parties feeling fairly treated to the extent that it is based on external benchmarks, criteria, or principles beyond the will of either party. Such external standards of fairness include laws and regulations, industry standards, current practice, or some general principle like reciprocity or precedent.

Commitments

Commitments are oral or written statements about what a party will or won't do. They may be made during the course of a negotiation or may be embodied in an agreement reached at the end of the negotiation. In general, an agreement will be better to the extent that the promises made have been well planned and well-crafted so that they will be practical, durable, easily understood by those who are to carry them out, and verifiable if necessary.

11. The inherent conflict between upstream and downstream riparian occurs in most settings and scales. Crawford (1988, 88-90) describes such disputes along the traditional acequia canal systems in New Mexico.

12. Terry Barnett; CMI Washington/Carolina. See p. 45 for more detail.

Communication

The quality of communication in a negotiation depends on both the level of mutual understanding and the efficiency of the process. In high quality communication, the messages understood by the receivers carry the meaning intended by the senders. That is, the parties understand each other – even if they disagree. High-quality communication is also efficient in that negotiators minimize the resources expended in coming to agreement or deciding to discontinue negotiations.

Relationship

Most important negotiations are with people or institutions with whom we have negotiated before and will negotiate again. In general, a strong working relationship empowers the parties to deal well with their differences. Any transaction should improve, rather than damage, the parties' ability to work together again.

SECTION C: ACTIVE, TRANSFORMATIVE, AND INTERCULTURAL LISTENING

Module I: Exercise 1 (Ex-I.1): Listening Skills

Conducted by instructor/facilitator

To offer two skill-sets for listening: *active listening*, which is a set of ground rules for polite, constructive discourse; and *transformative listening*, which allows for deeper work, useful especially when powerful emotion is present.[13]

Part 1: ***Active Listening***
Objective: To facilitate healthy dialogue

Part 2: ***Transformative Listening*** [14]
Objective: To engage in and understand transformative listening

Part 3: ***Intercultural Negotiations*** [15]
Objective: To understand differences in terms of one's own personal style, the generalized style of one's culture, and/or the style of other cultures

Key Points of Exercise

- The most difficult leap in negotiations (or in most discussions, for that matter), is to get past *positions* (what someone is saying) to understanding their *interests* (why they are saying it). Yet understanding interests is critical to effective dialogue. The single most effective way to accomplish this leap is to listen – truly listen – to the speaker. Listening at depth is not an easy skill, especially in many western cultures where power seems to be associated with how much is said (and sometimes with how loudly).
- When real emotion is present, classic problem-solving approaches to dialogue are generally not practical. Water, as we have seen, can be tied in to all levels of existence, from basic survival to spiritual transformation. Often, water negotiations are tied inextricably to regional conflicts, including in some of the most contentious regions in the world, and negotiators carry the weight of those disputes with them into the dialogue setting.

13. There is also a school called "dialogic" listening, which argues that both styles presented here put too much emphasis on the speaker, and not enough on the group. "Dialogic listening" focuses on group processes, utilizing metaphor and mutual encouragement to develop mutual interests. See John Stewart and Milt Thomas, "Dialogic Listening: Sculpting Mutual Meanings," in John Stewart (ed), Bridges Not Walls. 6th edition, (New York: McGraw- Hill, 1995), p. 184-201

14. This part of the exercise was developed by the Harvard Negotiation Project and taught by Erica Fox, director of the Harvard Negotiation Insight Initiative at the Program on Negotiation: http://www.pon.harvard.edu/. Used here with permission.

15. LeBaron, Michelle (2003) is a comprehensive introduction to culture and negotiations in general, and Faure & Rubin eds. (1993) focuses on culture and its role in water negotiations.

- A facilitator/mediator, however, needs to be acutely aware of, and sensitive to, how cross-cultural dynamics can impact the flow of communication and ideas, as well as their own inherent assumptions.

Paying Attention
- Face the person who is talking.
- Notice the speaker's body language; does it match what he/she is saying?
- Listen in a place that is free of distractions, so that you can give undivided attention.
- Don't do anything else while you are listening.

Eliciting
- Make use of "encourages" such as "Can you say more about that?" or "Really?"
- Use a tone of voice that conveys interest.
- Ask open questions to elicit more information.
- Avoid overwhelming the speaker with too many questions.
- Give the speaker a chance to say what needs to be said.
- Avoid giving advice, or describing when something similar happened to you.

Reflecting
- Occasionally paraphrase the speaker's main ideas, if appropriate.
- Occasionally reflect the speaker's feelings, if appropriate.
- Check to make sure your understanding is accurate by saying "It sounds like what you mean is...Is that so?" or "Are you saying that you're feeling..."

Source: Kaufman (2002), p. 220

Figure 8: Techniques of Active Listening

Intercultural Negotiations

Shared basins are often defined by crossing political boundaries, but even more profoundly, they cross cultures – those of societies and ethnic groups, of religions and professions, of language and of class. The concept of a problem-solving workshop such as this has been described over time in western academic literature (and, possibly overly, much of the terminology and assumptions in this manual draw from this world), but the ideas have deep roots in cultural traditions throughout the world. A facilitator/mediator, however, needs to be acutely aware of, and sensitive to, how cross-cultural dynamics can impact the flow of communication and ideas, as well as their own inherent assumptions.[16]

The whole concept of analytic problem-solving, for example, is fraught with cultural assumptions. Abu-Nimer (1996) describes the premises of North American mediators from a Middle Eastern and Muslim perspective, and Lederach (1995) describes his experiences acting as a mediator in Central America:

"Why is it...that in the middle of listening to someone give their side of a problem, I have a natural inclination to make a list, to break their story down into parts such as issues and concerns? But when I ask them about issues, they seem to have a natural inclination to tell me yet another story. The difference...lies in the distinction between analytical and holistic thinking. Our North American conflict resolution approaches are driven by analysis; that is the breaking of things down into their component parts. Storytelling...keeps the parts together. It understands problems and events as a whole."[17]

Avruch sums up: "Even while acknowledging that the capacity to reason is a human universal, we face the other fact that the representations of the worlds about which humans bring their reason to bear can differ profoundly from one another...To try to suppress this variance, even in the powerful setting of a conflict resolution problem-solving workshop, seems to be an invitation to failure." (p. 94)

16. The western academic development of the problem-solving workshop, and culture's impact, can be found in Avruch 1998, p. 84-100.
17. Lederach, *Preparing for Peace*, p. 81.

He cites Cohen (in Faure and Rubin 1993) for a good model of culturally aware mediators, who are neither specialists nor globalists: "First, these individuals are aware of the gamut of cultural differences and do not naively assume that "underneath we are all pretty much the same." Second, they perceive the potency of religious and other cultural resonances. Third, [they] grasp that Western "rationality" is based on culture-bound values and assumptions. Finally, they do not take for granted that an expedient (such as face-to-face negotiation) that works for one culture necessarily works for another." (p. 104)

Nevertheless, Zartman (in Faure and Rubin) suggests that "culture" is too often used as an excuse for failure, while Lowi and Rothman (in Faure and Rubin) use the water negotiations over the Jordan basin to show how cultural differences can actually be harnessed to induce more effective dialogue. Agrees Lederach (1995): "Culture is rooted in social knowledge and represents a vast resource, a rich seedbed for producing a multitude of approaches and models in dealing with conflict." (p. 120)

There are many ways to characterize cultural differences. Brooks Peterson (2004),[18] for example, has pulled together a number of models to describe differences along five axes based on the relative importance of particular characteristics.

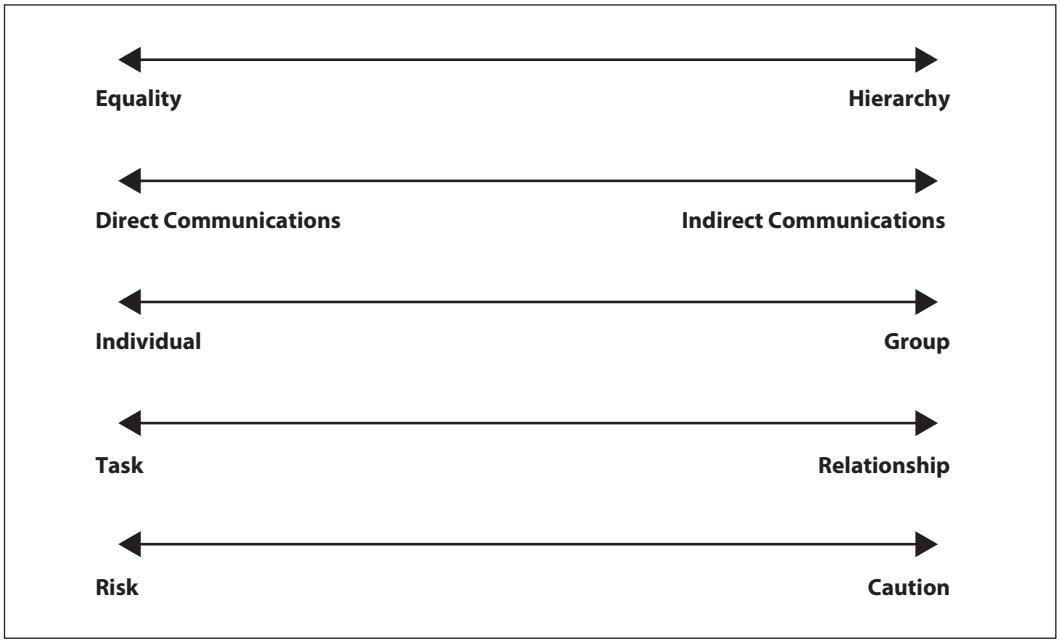

Figure 9: Characteristics of Cultural Differences

Another common set of distinctions, characterized by Hall (1977)[19] is that between "high context" and "low context" cultures. In very general terms, lower context cultures would fall towards the left of the axes above (e.g. US, Western Europe), while higher context cultures would tend towards the right side (e.g. much of Asia and the Middle East).

18. Peterson, Brooks. Cultural Intelligence: *A Guide to Working with People from Other Cultures.* Yarmouth, Maine: 2004.
19. Hall, Edward T. *Beyond Culture.* New York: Doubleday, 1977.

SECTION D: THE SANDUS BASIN: NEGOTIATING BY COUNTRY

Module I: Exercise 2 (Ex-I.2): Negotiating by Country

Conducted by instructor/facilitator

To illustrate the difficulty of negotiating water issues by country

Key Points of Exercise

- Negotiating by country is tremendously difficult, and generally opens with parties focusing on their own *rights* often at the expense of the good of the basin
- Without cooperation, basin management is, at best, inefficient and, at worst, a conflict waiting to happen
- The aims of political decision making and integrated basin management can be (apparently) diametrically opposed

SECTION E: SUPPLEMENTAL READING FOR MODULE I

The Seven Elements of Conflict Resolution[20]

Terry Barnett
CMI

Alternatives

(Alternatives Interests Options Legitimacy Commitments Communication Relationship)

Working Assumption: Determining and developing your best walk-away alternative to a negotiation protects you from bad outcomes and helps you to negotiate better ones.

1. **Problem: People reach agreements that they later regret.** This reaction usually stems from one of two causes. You may feel that you have been pressured into accepting a "bad deal," or you may wish you had not accepted an offer so quickly. You feel you could have done better had you acted more resolutely or cautiously. It is distressing to believe that you failed to get what you ought to have gotten simply because the other side seemed so powerful or spoke so persuasively.

2. **Cause: People decide to agree based on their prospects "at the table."** Often, you must decide at several points in a negotiation whether or not to agree with the other side. When they make an offer, threaten to walk out, or say, "take it or leave it," you must respond. You too must decide whether to talk or walk. To help themselves decide, people tend to consider the consequences of talking. They think about what they could expect to gain by further bargaining and compare this expectation to the offer on the table. Making this judgment, however, requires a difficult estimation of each party's influence across a range of hypothetical negotiation scenarios. Your judgments are bound to be subjective and imperfect. They may leave you overconfident or demoralized, and more prone to make regrettable decisions.

3. **Approach: Analyze each party's alternatives to agreement.** Another approach would be to focus on the consequences of walking. Ask yourself, "What will I do if we fail to agree?" What is my **B**est **A**lternative **T**o a **N**egotiated **A**greement (BATNA)? to protect yourself from agreeing to a deal you should have rejected. Compare the deal on the table to your BATNA. When preparing, investigate all possible alternatives to agreement. What can you do without relying on the other side's assent? Generate a similar list for the other party. Identify their BATNA in order to develop realistic proposals and deal with situations where their overconfidence prevents them from accepting a good offer.

When you know your BATNA, you can more accurately identify the point at which you should reject a deal. It may even help you shift that point since, in negotiations, power is partially determined by the willingness of each side to walk away. If you are truly willing to walk, you can present your interests more forcefully.

4. **Consider the following guidelines:**

   a. *Devote resources to improving your BATNA.* Verify that what appears to be your BATNA is, in fact, realistic. If your BATNA could be better at a reasonable cost, improve it. Resources expended on making your BATNA more attractive pay off by insuring that the outcome will be better for you, regardless of whether you reach an agreement.

   b. *Consider ways to weaken their BATNA.* To lower the inflated expectations of another party, reveal what you know of their BATNA. If their BATNA seems so good that you doubt they will negotiate seriously, you may be able to take steps to change it. Care is required since such a strategy can appear illegitimate and damage the relationship.

   c. *Gauge the potential for agreement.* If you and they both have attractive BATNAs, reconsider whether negotiations are appropriate.

Interests

(Alternatives Interests Options Legitimacy Commitments Communication Relationship)

Working Assumption: Focusing on interests rather than positions increases your chances of achieving a good outcome.

1. **Problem: People tend to focus on positions, not interests.** At the beginning of a negotiation, each side presents its own solution. Each defends its position and attacks that of the other side. The goal is to "win" by having the final agreement more closely resemble your opening position than the other side's. Even if attained, the victory may be a hollow one since positional bargaining often cripples a working relationship and often produces poor agreements.

2. **Cause: People assume that a negotiation is a fight over conflicting positions.** Indeed, positions often *do* conflict with each other. Two sisters want the same orange; your colleague wants to attend a distant meeting and you do not. Fundamentally, however, negotiation is not a fight over positions. Your needs, desires, concerns, and fears (i.e. your *interests*) motivate you to negotiate in the first place, and are far more important than positions. Because the other side's positions are opposed to yours, you may assume that your interests must also be opposed. Yet, most negotiations involve interests that do not conflict.

3. **Approach: Focus on interests.** Think clearly about both your own interests and those of other parties. If the other side's interests seem obscure, try looking behind their positions for the interests that motivated them. Determine which underlying interests may be shared or compatible. The two sisters may be willing to split an orange so long as one gets the fruit to eat, and the other the peel to cook with; you may be perfectly willing to go a meeting so long as your colleague drives. It is far easier to accommodate interests into a mutually acceptable package than it is to reconcile positions.

4. **Consider the following guidelines:**

   a. *When preparing, use interests to analyze the choice "they" face:* Examine how they perceive what it is you want them to agree to (their "Currently Perceived Choice"), and then determine what interests of theirs prevent them from agreeing to it. What interests of theirs could you satisfy to increase the chance that they will agree (their "Possible Future Choice")?

   b. *Focus discussion on interests, not positions.* Discuss interests explicitly.

c. Use leadership. Be prepared to take the lead by talking about some of your own interests. If you are not willing to tell them something about your own needs, desires, concerns, and fears, then you cannot expect them to be willing to talk about theirs.

d. *Treat positions as clues to their interests.* If they continue to talk about positions despite your efforts to the contrary, ask them for help in understanding what is leading them to this position. Ask them "Why?"

Options

(Alternatives Interests Options Legitimacy Commitments Communication Relationship)

Working Assumption: Inventing options for mutual gain can create a better agreement for both parties.

1. **Problem: Both sides leave "money on the table."** Too often people feel like the proverbial sisters who quarreled over an orange. After they finally agreed to divide the orange in half, the first sister took her half, ate the fruit, and threw away the peel, while the other threw away the fruit and used the peel from her half in baking a cake. Inefficient outcomes plague negotiations.

2. **Cause: Inventing options can seem unnecessary. . .** People are used to accepting the first good answer to come along without probing further for better solutions. You may assume that once you find an option that satisfies your interests and looks reasonable, you can stop looking. Ultimately, this assumption disempowers. You don't get things that would cost the other side little or nothing and they don't get things of little or no cost to you.

   . . . or even dangerous. Whether inventing with people from your side or their side, your creative juices are often constrained by reasonable fears. With people from your own side, you may fear critics who might judge any new idea harshly and make you appear foolish. With people from the other side, you may fear that by inventing new options you will disclose information that may jeopardize your bargaining position.

3. **Approach: Two key steps.**

   a. *Invent multiple options for mutual gain.* Operate on the assumption that the pie is not fixed. Both sides would like to split a larger pie. Figuring out how to expand the pie is a shared problem. Prepare for a negotiation by generating as many options as possible and plan to extend your list during the negotiation. Use your understanding of the relevant interests as a guide. Focus your inventing on ways to satisfy these interests, not the positions. Remember that it is in your interest to help create an option that will meet the other side's legitimate interests. If their concerns are not addressed by your ideas, then they will have no reason to say "yes."

   b. *Separate the process of inventing from the process of deciding.* Both while preparing and negotiating, arrange for inventing sessions where *no commitments or criticisms* are allowed. Evaluate the ideas these sessions produce only after you call a halt to inventing.

4. **Consider the following guidelines:**

   a. *Use symbols to encourage creativity.* Consider using a separate room for these sessions – an "inventing room."

   b. *Seek to develop the widest possible range of ideas.* Encourage ideas which might normally be considered a bit crazy since they can stimulate other ideas that might work, but have not yet been thought of.

   c. *Enforce the rules.* It may help to have an instructor/facilitator with the explicit duty of stopping commitment and criticism when and if they occur. Place signs on the walls that read, "No Commitments. No Criticism."

Legitimacy

(Alternatives Interests Options Legitimacy Commitments Communication Relationship)

Working Assumption: It is easier, faster, and more pragmatic to resolve issues on the basis of objective criteria, than on the basis of will.

1. **Problem: Issues are often decided by a contest of will that puts the agreement and relationship at risk.** Negotiations can be decided on the basis of willpower (i.e. which side can force the other to comply?) or on the basis of legitimacy (i.e. which side can persuade the other that its proposed approach is fair and appropriate, based on standards or criteria independent of the will of either party?).

2. **Cause: People forget about the other side's desire to be treated fairly. Human beings like being treated fairly.** Whether it is superpowers trying to decide appropriate levels of arms reductions, or corporate executives deciding on specific contract terms, no one wants to be unfairly treated. Negotiators often assume that what they want is fair because they want it, and what the other side wants is unfair because the other side wants it. The parties don't engage in a joint inquiry about what might be fair.

3. **Approach: Use legitimacy firmly but flexibly, as a sword and as a shield.** After generating options for dealing with specific issues, you must decide *how* to choose among them. Criteria of fairness – precedent, the opinion of a neutral party, etc. – can be used to persuade others of the appropriate answer and to protect you against coercion. Particularly in complex negotiations, using external criteria helps produce wise, durable agreements while enhancing the working relationship. In contrast, reliance on willpower tends to reward intransigence, produce arbitrary outcomes, damage working relationships and set bad precedents.

4. **Consider the following guidelines:**

    a. *As a sword: In preparation,* search for a range of standards that might be applied, especially those which may persuade *the other side. In negotiation*, start with the most favorable argument that you would be willing to put before an impartial arbitrator.

    b. *As a shield: Do not yield to pressure, only to principle.* If the other side applies illegitimate pressure and you give in, you reward their bullying and encourage them to repeat it. If, however, they use reasoned arguments to persuade you and you change your approach in response, you demonstrate to them that legitimacy works and encourage them to continue its use.

    c. *Frame each issue as a search for legitimate standards.* Rather than asking what the other side is *willing* to do ("If I reduce my price by 10%, will you say yes?"), ask how the issue *ought* to be decided ("What standards should we use to decide the indemnification issue? Why?")

    d. *Inquire into their reasoning.* To convert a positional negotiation to one based on legitimacy, respond to the other side's demands by asking about the reasoning that underlies their proposal. ("You have proposed that I swap one metric ton of commodity X for 3 metric tons of commodity Y. Why is that ratio a fair one? If you were in my shoes, how would you justify acceptance of this ratio to my superiors?")

Commitments

(Alternatives Interests Options Legitimacy Commitments Communication Relationship)

Working Assumption: Abstaining from commitments on substance until the end of the process improves the efficiency of negotiations and the quality of outcomes.

1. **The Problem: People often get locked-in to commitments during negotiations.** Negotiations often resemble bargaining in a bazaar. Each party commits to a position and then haggles for concessions. Each adopts extreme opening positions and concedes slowly. Consequently, parties spend most of their time and effort determining if any agreement is possible, rather than inventing the best possible agreement. The

pressure each party puts on the other to abandon its positions tends to foster resentment and damage the working relationship. When too much attention is paid to positions, underlying interests get ignored. The final agreement, if it ever materializes, is unlikely to be well-crafted.

2. **Cause: People tend to focus on the one element of commitment.** You may assume that, because the purpose of negotiations is to make commitments, you should focus on that first. Yet you would pursue few commitments which you knew to be ineffective, impractical, unclear or suboptimal. It is the quality of the commitment that counts most, and that quality can rarely be judged early in a negotiation. New issues appear, requiring new commitments. Reasonable ideas may not be operational. Often, premature commitments turn out to be poor ones.

3. **Approach: On matters of substance, postpone commitment to the end.** The best time for crafting commitments on issues of substance is after all interests are understood, many options are on the table, and criteria for selecting fair terms have been agreed upon. When preparing for a meeting, determine whether or not the parties have reached the stage for commitment. If, earlier in the process, certain agreements seem necessary or desirable, consider less binding types of agreement. Often, preliminary or conditional agreements are most appropriate. By viewing commitment as a simple either/or activity, you cripple your ability to utilize this element of negotiation to your advantage.

4. **Consider the following guidelines:**

    a. *Clarify your thinking on commitments with colleagues.* It is important to always know and to let other parties know when you are making commitments and when you are asking for them to be made. Meetings move more efficiently when everyone knows what they are supposed to be producing. Whenever possible, test your assumptions about what types of commitments are desirable.

    b. *Try drafting potential commitments in advance.* It helps to have one or more actual drafts to focus discussion or to present when participants decide to seek agreement. These drafts are best viewed as possible options open to criticism rather than as set goals. Other participants will want to contribute more than just their seal of approval.

    c. *Commit early to a process that defers substantive commitments to the end.* Propose that no binding commitments be made on matters of substance until all parties agree that the negotiation has reached the commitment stage. Statements of intent made earlier would be considered tentative.

Communication

(Alternatives Interests Options Legitimacy Commitments <u>Communication</u> Relationship)

Working Assumption: Each party to a negotiation gains by creating and maintaining clear two-way communication.

1. **Problem: Negotiations are often plagued by misunderstanding.** During a negotiation, communication often resembles the sending of smoke signals in a high wind. Difficulties with communicating pose a serious problem, since communication is the lifeblood of negotiations. Just as blood clots block circulation and cause heart attacks, poor communication blocks progress and ruptures negotiations and relationships.

2. **Cause: When you communicate, you focus on *telling* them what you think.** You may tend to focus on what *you* think you are saying rather than what *they* hear. The other party may not hear your message, and you may not hear theirs. When others do not understand your problems, they are less able to help you solve them.

3. **Approach: Aim for two-way communication.** Two-way communication means that both parties are listening as well as speaking. No message is truly communicated until it is heard and understood. If you seek to communicate productively, you must *listen* and show the other side they have been heard. Your proposals will carry more weight with others if you can state their case as well as they can – and then deal with it. If you do so, the other side cannot dismiss what you say as showing a lack of understanding for their concerns.

4. **Consider these guidelines:**

   a. *Communicate regardless of disagreement.*

   b. *Consider consulting before deciding.* Whenever possible, ask others for advice before making decisions on issues that would significantly affect them. Model two-way communication while retaining full authority to make a decision.

   c. *Listen actively, and let them know it.* Pay close attention to what they say in order to understand them as they see themselves. However, do not confuse empathy with agreement. Demonstrate your attentiveness by inquiring and press them to clarify any ambiguities. Consider repeating back to them what you have heard to check its accuracy.

   d. *Speak for a purpose.* Before making a significant statement, know what you want to communicate or find out, and what purpose this information will serve.

   e. *Keep private channels of communication open.* Avoid addressing multiple audiences. Consider using private channels for one-on-one problem-solving.

   f. *Speak for yourself, not them.* Talk about what you have undeniably observed or felt. Avoid attributing motives to the other side, or telling them what they think or said.

The Working Relationship

(Alternatives Interests Options Legitimacy Commitments Communication Relationship)

Working Assumption: Separating how you interact as people from how you deal with substantive problems will improve both the negotiated outcome and the relationship.

1. **Problem: Many relationships function poorly.** Most negotiations are episodes in an ongoing relationship between two individuals or organizations. The working relationship – the behavior you use to cope with differences as they arise – determines how efficient and profitable the relationship will be. Too often, relationships break down just when you need them the most – when you encounter serious problems. With a successful working relationship, you should be able to handle even the most severe disputes while maintaining confidence in your ability to handle future disputes.

2. **Cause: People entangle the relationship with the substance.** Relationship issues concern the way people deal with others: logically or emotionally, clearly or ambiguously, honestly or deceptively. Substantive issues are the subjects of discrete negotiations: the length of a project, the fee for services, and the terms of a contract. Relationships function poorly when parties *mix* relationship with substance. Making the relationship contingent on substantive concessions gives the other party little incentive to maintain the relationship. At other times, you let short-term substantive concerns dominate your interest in a long-term relationship. Acting emotionally or coercively, however, damages your ability to deal more constructively with other issues.

   When you perceive others to be disregarding the relationship, you often may try to protect yourself and punish them by *responding in kind.* If they are unreliable, you will be too. You get angry, stop listening, deceive, resort to coercion, denigrate their concerns, and put the worst interpretation on their actions when they do the same.

3. **Approach: Two key steps.**

   a. *Separate relationship issues from substantive issues.* Deal with each independently. Weigh your long-term interests in a successful working relationship. Avoid holding the relationship hostage to gain on substance.

b. *Be unconditionally constructive on relationship issues.* Your actions should strengthen every element of the working relationship *without* sacrificing substantive concerns, regardless of the behavior of the other negotiator.

4. Consider these guidelines:

a. *Rationality:* Even if they act emotionally, balance emotions with reason.

b. *Understanding:* Even if they misunderstand you, try to understand them.

c. *Communication:* Even if they are not listening, consult them on relevant matters.

d. *Reliability:* Even if they try to deceive you, be reliable.

e. *Influence:* Even if they try to coerce you, do not yield to coercion or try to coerce them. Be open to persuasion; try to persuade them.

f. *Acceptance:* Even if they reject you and your concerns as unworthy of consideration, accept theirs as worthy of your consideration, care about them, and be open to learning from them.

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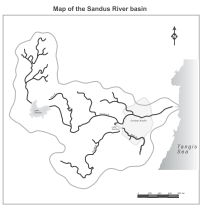
MODULE II
CHANGING PERCEPTIONS – BASINS WITHOUT BOUNDARIES

OVERVIEW

Negotiation Stage	Common Water Claims	Collaborative Skills	Geographic Scope
Reflexive	Needs	Skills-building	 Watersheds

Stage 2 of Water Conflict Transformation

SECTION A: GENERAL SETTING: THE REFLEXIVE STAGE OF NEGOTIATION

As the adversarial stage plays out, occasionally some cracks can be seen in the strict, rights-based, country-based positions of each side (although in actual water negotiations, this process can last decades). Eventually, and sometimes painfully, a shift can start to take place where the parties begin to listen a bit more, and where the interests underlying the positions start to become a bit apparent. In this *reflexive stage*, negotiations can shift from *rights* (what a country feels it deserves), to *needs* (what is actually required to fulfill its goals). Conceptually, it is as if we have taken the national boundaries off the map and can, as if for the first time, start to assess the needs of the watershed as a whole. This shift, from speaking to listening, from rights to needs, and from a basin with boundaries to one without, is a huge and crucial conceptual shift on the part of the participants, and can be both profoundly difficult to accomplish, and absolutely vital to achieve for any movement at all towards sustainable basin management. To help accomplish this shift, the collaborative learning emphasis is on *skills-building*, and we approach the (boundary-less) basin by sector rather than by nation.

As described above, many sets of negotiations surveyed begin with parties basing their initial positions in terms of *rights* – the sense that a riparian is entitled to a certain allocation based on hydrography or chronology of use. Upstream riparians often invoke some variation of the principle of "absolute sovereignty," claiming that water rights originate where the water falls. Downstream riparians often claim absolute river integrity, claiming rights to an undisturbed system or, if on an exotic stream, historic rights based on their history of use. In most disputes which have actually been resolved, however, particularly on arid or exotic streams, the paradigms used for negotiations have not been "rights-based" at all – neither on relative hydrography nor specifically on chronology of use, but rather "needs-based." Needs are defined by irrigable land, population, or the requirements of a specific project.[21]

One might speculate as to why negotiations move from rights-based to needs-based criteria for allocation. The first reason may have something to do with the psychology of negotiations, and the natural trajectory through the four levels of negotiations mentioned here. Where each negotiator may initially see him- or herself as a national first and foremost, where the rights of one's own country are paramount, over time one must empathize to some degree to notice that even the entity on the other side of the table, regardless of the level of enmity, requires the same amount of water for the same use with the same methods as oneself.

21. Here we distinguish between "rights" in terms of a sense of entitlement, and legal rights. Obviously, once negotiations lead to allocations, regardless of how they are determined, each riparian has legal "rights" to that water, even if the allocations were determined by "needs."

The second reason for the shift from rights to needs may simply be that rights are not quantifiable and needs are. We have seen the vague guidance that the 1997 Convention provide for allocations – a series of occasionally conflicting parameters which are to be considered as a whole. If two nations insist on their respective rights of upstream versus down, for example, there is no spectrum along which to bargain; no common frame of reference. One can much more readily determine a needs-based criterion – irrigable land or population, for example – and quantify each nation's needs. Even with differing interpretations, once both sides feel comfortable that their minimum quantitative needs are being met, talks eventually turn to straightforward bargaining over numbers along a common spectrum.

Finally, taking the borders "off the map" allows for thinking about water needs by *sector*, rather than purely by political entity. Shifting that emphasis allows for greater cross-boundary efficiencies in *all* sectors, and provides greater opportunities for integrated management.

While the allocation of water, particularly in international systems, is often contentious, the underlying interests of most riparians are to secure the benefits of water use. Focusing on the benefits derived from the use of water in a river system, rather than the physical water itself, provides many more opportunities for defining cooperative management arrangements that are acceptable to all parties. Benefit sharing provides riparians with the flexibility to separate the physical distribution of river development (where activities are undertaken), from the economic distribution of benefits (who receives the benefits of those activities.) This allows riparians to focus firstly on generating basin-wide benefits, and secondly on sharing those benefits in a manner that is agreed as fair. One fundamental lesson of universal experience is that a river is best managed as a basin unit, as any action in one part of the basin has impacts in another. Just as good water resource management practices can increase the availability of water in a river system, integrated planning that maximizes the benefits derived from water can clearly increase the overall productivity of a river system. Furthermore, a focus on sharing the benefits derived from the use of water, rather than the allocation of water itself, provides far greater scope for identifying mutually beneficial cooperative actions.

SECTION B: SUMMARY – ENVIRONMENTAL DIPLOMACY: HOLDING INFORMED MULTILATERAL NEGOTIATIONS [22] (KJELLÉN, BACKGROUND DOCUMENT)

Context

Environmental diplomacy is a new branch of diplomacy that demands of its practitioners a technical understanding of the issues being negotiated, as well as the standard skills usual to a diplomat working in a multilateral setting. Developing a technical understanding of issues surrounding environmental threats to a nation, and placing them within the national context, necessitates a dialogue between a number of communities within a country – the political, the technical and society at large.

Observations

These observations stem from personal involvement in climate change negotiations as a senior environmental diplomat, with which parallels are drawn to international waters.

Negotiating science and national political interests

Negotiating competently on the environmental matters necessitates negotiators having a technical understanding of the issues. Scientific evidence and awareness first lead to the understanding that one country alone cannot contend with the emerging environmental issues. Scientific knowledge can thus formulate the impetus for, and agreement on, international negotiations. Environmental diplomats, however, cannot rest with merely understanding the subject matter. Thus, alongside with a technical understanding, environmental diplomats also need to have a keener understanding of economics and other factors.

22. See p. 54 for more detail.

Building capacity within developing countries (LDCs)

It is imperative that the capacity within the scientific communities in the developing countries is enhanced, so that international negotiations are more of a level playing field. Even with modest resources, scientists from developing countries can provide their societies and negotiators with a more balanced and up-to-date understanding of the potential environmental, economic, and social costs and benefits that could result from the discussions in the global environmental arena. Developing countries often suffer from three main limitations: (I) knowledge limitations which means that they often have to rely on information and analyses supplied by the more developed countries; (II) economic limitations; and (III) commitment limitations in that the environment is often low on the political agenda.

How to include different communities

Informing negotiators of the scientific issues is insufficient, as the outcomes of any negotiations will impact on current economic and technical systems. Thus, civil society needs to be involved. The challenge is, therefore, to integrate civil society into developing policies that focus on long-term sustainability of natural resource use. Institutions cannot alter the basic fact that important areas of policy are involved and major economic actors outside government are strongly affected. But just as politics can change institutions, institutions can influence politics.

SECTION C: TAKING THE BOUNDARIES OFF THE MAP: NEGOTIATING BY SECTOR

Module II: Exercise 1 (Ex-II.1): *Negotiating by Sector*

Conducted by instructor/facilitator

To reinforce the concept of a boundary-less basin

Key Points of Exercise

- Taking away the political boundaries allows for a tremendously efficient planning of a basin, *if planning a basin were the only set of interests to consider*; however, they emphatically are not.
- "Hydropolitics" is made up of two factors – water *and* politics. Negotiators will have to go home to "sell" their plan also to their constituents.

SECTION D: SUPPLEMENTAL READING FOR MODULE II

Environmental Diplomacy: Holding Informed Multilateral Negotiations
Bo Kjellén
Sweden

Environmental diplomacy is a new branch of diplomacy that demands of its practitioners a technical understanding of the issues being negotiated, as well as the standard skills usual to a diplomat working in a multilateral setting. The negotiations on climate change of the past decade have clearly illustrated this need for a technical competence amongst diplomats.

Developing a technical understanding of issues surrounding environmental threats to a nation, and placing them within the national context, necessitates a dialogue between a number of communities within a country – the

political, the technical and society at large. Through such a dialogue diplomats will come to understand what is in their country's interests, be able to develop realistic BATNAs (best-alternative-to-a-negotiated-agreement) and thus be better prepared when conducting international negotiations over natural resources that transcend international political boundaries.

The following observations stem from personal involvement in climate change negotiations as a senior environmental diplomat, with which parallels are drawn to international waters.

A. Negotiating science and national political interests

Classical multilateral diplomacy between countries has traditionally focused on foreign policy, security, trade and economic cooperation. Recently, a new dimension has been introduced through global environmental threats such as desertification and water stress. Negotiating competently on environmental matters necessitates negotiators having a technical understanding of the issues. The danger otherwise is that irrespective of the skill of the diplomat in negotiating, the options and agreements that they arrive at may not be in the overall interest of their country.

This new multilateral diplomacy can be termed "environmental diplomacy", which by necessity is driven by the natural sciences. Scientific evidence and awareness first lead to the understanding that one country alone cannot contend with the emerging environmental issues. This prompts a country to negotiate within a region or globally. Scientific knowledge can thus formulate the impetus for, and agreement on, international negotiations. The result is that emergent options may extend beyond national borders and interests to encompass regional needs and interests.

The challenge posed to environmental diplomats is larger than that which faced diplomats negotiating the more traditional topics listed above. Environmental diplomats cannot rest with merely understanding the subject matter. With negotiated options often carrying financial and political implications for a national government, environmental diplomats also need to understand and explore the many linkages between different sectors and sectoral policies that exist in modern society. Thus, alongside with a technical understanding, environmental diplomats also need to have a keener understanding of economics and other factors.

Agreements often involve the adoption of policies and the coordination of policies and measures, such as regulations, voluntary agreements or economic instruments. Though the substantive nature of these measures can seem fairly straightforward the political consequences can make it much harder to implement. Coupled with financial constraints, a government may be hard pressed to undertake expensive (financial, political, reputational) obligations.

Environmental threats can occur at a scale which obliges countries to cooperate internationally since with so much unknown of the technical needs, no single individual or country has the solution. Negotiators must forge realistic options which are politically workable for all the parties involved, through realistic compromises. Therefore, the outcome of any negotiations may be very different from the expectations with which the parties entered talks.

The challenge is exacerbated by negotiations often being multilateral, on technically and politically complex issues. In multilateral negotiations the logistics and management of the negotiations influences the substantive outcome. The chairperson sets the tone, and therefore, needs to have experience with both the technical and people components of international negotiations. Group dynamics once negotiations have started can often take on a life of their own. Negotiators can even begin to see the situation as a shared problem to be faced rather than a zero-sum game. This in turn can lead to windows of opportunities emerging unexpectedly.

It is important to remember that negotiators do not simply abide by government instructions in an attempt to construct political deals, but they often shape what is seen as a desirable objective. It is, therefore, imperative that the negotiators are informed by the different interests and expertise that surround a given resource in any society.

B. Building capacity within LDCs

What has emerged from the climate change negotiations is that industrialized countries of the North tend to set agendas of international dialogue around their own priorities. Meanwhile the South is unable to express its environmental priorities or assess the costs and benefits of the international environmental agenda put forward by the North. Yet, in most cases, agreements do not end negotiations, but forge a general framework for further negotiation of the hard-core issues: goals, costs, and deadlines.

With domestic institutions playing an important role in international environmental politics, it is imperative that the capacity within the scientific communities in the LDCs is enhanced, so that international negotiations are more of a level playing field.

Given that in less developed countries, scientific research is often underfunded, technical experts may not be up-to-date on the latest scientific research and methodologies, which hinders their capacity to inform their political counterparts of the latest breakthroughs. Yet, this is not to say that a dialogue cannot occur between the technical and political communities.

Even with their modest resources, scientists from LDCs can provide their societies and negotiators with a more balanced and up-to-date understanding of the potential environmental, economic, and social costs and benefits that could result from the discussions in the global environmental arena.

LDCs often suffer from three main limitations: (I) knowledge limitations which means that they often have to rely on information and analyses supplied by the more developed countries; (II) economic limitations; and (III) commitment limitations in that the environment is often low on the political agenda. These countries can better prepare for international negotiations by: (a) committing themselves to their national and regional environmental problems; (b) increasing their ability to relate regional and national priorities to the global ones; and (c) increasing their understanding of the alternatives involved in environmental negotiations.

C. How to include different communities

Another feature of environmental diplomacy is the involvement of civil society in the decision making process. There has to be an ongoing dialogue across different communities – horizontally between the technical and political, and vertically between the political decision-makers and those affected by those decisions. This implies including members of civil society who have hitherto been excluded and the voices expressed through NGOs, the epistemic community, and other social movements.

Informing negotiators of the scientific issues is insufficient, as the outcomes of any negotiations will impact on current economic and technical systems. Thus, civil society needs to be involved. For example, at the informal level, NGOs play an important role in environmental education and in focusing attention on particular environmental issues.

However, given the large number of sectors directly or indirectly involved, and the important economic and social interests associated with them it is a daunting task to include all the stakeholders. Major economic interests are involved, with very significant effects on lifestyles and employment for large groups of people. This is bound to have major political repercussions, and involve many governmental organizations.

The institutions that have been set up to structure interactions among political actors also influence their goals and affect political outcomes. These institutions can influence access to the formal policy formation process, mediate power relations among actors and establish certain political incentives and constraints. In other words, institutions are critical intervening variables that affect which voices have a say in policy formation. Often, once institutional arrangements are created, they tend to persist. Powerful interests have an interest in supporting the status quo and preventing changes to institutional arrangements that will give other interests in society greater influence.

The challenge is, therefore, to integrate civil society into developing policies that focus on long-term sustainability of natural resource use. Institutions cannot alter the basic fact that important areas of policy are involved and major economic actors outside government are strongly affected. But just as politics can change institutions, institutions can influence politics.

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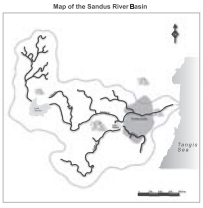
MODULE III
ENHANCING AND SHARING BENEFITS
OVERVIEW

Negotiation Stage	Common Water Claims	Collaborative Skills	Geographic Scope
Integrative	Benefits	Consensus-building	 "Benefit-sheds"

Stage 3 of Water Conflict Transformation

SECTION A: GENERAL SETTING: THE INTEGRATIVE STAGE OF NEGOTIATION

Once participants have moved in the first two stages from mostly speaking to mostly listening, and from thinking about rights to needs, the problem-solving capabilities which are inherent to most groups can begin to foster creative, cooperative solutions. In this third, *integrative stage*, the needs expressed earlier begin to coalesce together to form group interests – the "why" underlying the desire for the resource. Conceptually, we start to add *benefits*[23] to the still boundary-less map, and in fact to think about how to enhance benefits throughout the region, primarily by adding resources other than water, and geographic units other than the basin. The collaborative learning emphasis is now on the *consensus-building* of the group, and we begin to move in "benefit-shed" rather than being restricted by the basin boundaries.

At the heart of this framework is the potential to move from national agendas that are unilateral, to national agendas that incorporate significant cooperation, and to converge upon a shared cooperative agenda. The extent to which this will occur will be determined by each party's perception of the benefits it can secure from cooperation. Convergence towards a cooperative agenda will be facilitated by several important and practical steps. First, the perception of the range and extent of potential benefits needs to be expanded to the extent possible, from the obvious to the less apparent. Second, the distribution of benefits, and benefit-sharing opportunities to redistribute the costs and benefits of cooperation, need to be explored to enable the definition of a cooperative agenda that will be perceived as fair by all parties. Third, alternative modes of cooperation need to be recognized and appropriate types of cooperation identified to secure the greatest net benefits. Each of these steps is examined below.

A first step in motivating cooperation is to recognize the widest possible range of potential benefits that cooperation could bring. There will be no cooperation if benefits are perceived to be insufficient relative to the costs of cooperation. Benefits are broadly defined here to include economic, social, environmental and political gains. Integrated, basin-wide water resources management is increasingly recognized as the ultimate goal for ensuring the sustainability and productivity of river systems and is a challenge in any setting, as the priorities and concerns of myriad users must be reconciled. In the context of international rivers, moves toward integrated management cannot be made without international cooperation. The complexity and costs of international cooperation can be very great, and must be achieved in the absence of any ultimate entity with the mandate and authority to impose a solution.

23. Finding an international symbol for "benefits" has been a challenging task. We settled on the cornucopia, especially given its origin in mythology, as described by Ovid: In a battle for his wife, Deianira, Hercules defeated the god of the river Achelous. In this contest, the left fork of the river was wrenched off from the main body, and snatched up into heaven, where it was turned into a cornucopia pouring out a wealth of fruit and flowers upon the reclaimed valley and enriching the entire kingdom.

A useful framework for broadening the range of recognized benefits of cooperation proposes the identification of four types of cooperative benefits.[24] The first type of benefit derives from cooperation that enables better management of ecosystems, providing *benefits to the river*, and underpinning all other benefits that can be derived. The second type of benefit derives from the efficient, cooperative management and development of shared rivers, yielding major *benefits from the river*, in increased food and energy production, for example. The third type of benefit derives from the lessening of tensions because of cooperation, resulting in the *reduction of costs because of the river*, as tensions between co-riparian states will always be present, to a greater or lesser extent, and those tensions will generate costs. And finally, as international rivers can be catalytic agents, cooperation that yields benefits from the river and reduces costs because of the river can yield a fourth type of benefit derived from greater cooperation between states, even economic integration among states, generating *benefits beyond the river*.

SECTION B: SUMMARY – BEYOND THE RIVER: THE BENEFITS OF COOPERATION ON INTERNATIONAL RIVERS (SADOFF AND GREY, BACKGROUND DOCUMENT)

Context

Managing rivers for the common good is a societal goal in countries around the world. All international rivers, without exception, create some degree of tension among the societies that they bind. Where rivers flow between sovereign nations there is rarely an institutional structure with ultimate authority. One fundamental lesson of universal experience is that a river is best managed as a basin unit, as any action in one part of the basin has impacts in another. The choice between cooperation and conflict regarding the management of international rivers will be determined, in large part, by their perceived relative benefits. In this paper, Sadoff and Grey seek to broaden the range of perceived benefits – some obvious, some not – by exploring the dynamics driving the choice between conflict and cooperation (i.e., incentives, catalyst, and linkages). The authors offer a framework for examining the extent of potential benefits that could underlie these choices, and present the challenges and opportunities of each type of benefit.

Main Points

The framework categorizes four types of cooperative benefits. First, cooperation will enable better management of ecosystems, providing *benefits to the river* (environmental benefit), and underpinning all other benefits that can be derived. Second, efficient, cooperative management and development of shared rivers can yield major *benefits from the river* (economic benefit). Third, cooperation on an international river will result in *the reduction of costs because of the river* (political benefit), as tensions between co-riparian states will always be present, to a greater or lesser extent, and those tensions will generate costs. While costs because of the river are not always readily seen or quantified, they can be very real and substantial, and can compound other tensions leading to higher costs still. And finally, as international rivers can be catalytic agents, cooperation that yields benefits from the river and reduces costs because of the river can pave the way to much greater cooperation between states, even economic integration among states, generating *benefits beyond the river* (indirect economic benefit).

Though each of these types of benefits has the potential to be obtained in all international river basins, the range of political, geographic, economic, and cultural circumstances of a basin will shape the extent and relative importance of each type of benefit. The broader the range of benefits under discussion, the more likely riparians will be able to find a configuration of benefits that is mutually acceptable. While some benefits are difficult to share or compensate, in general the optimization of benefits should be more robust and more flexible than the optimization of physical water resources, because benefits tend to be more easily monetized and compensated and they have less political and psychological significance.

Identifying and understanding the range of often inter-related benefits derived from the cooperative management and development of international rivers is central both to better management of the world's rivers and to relations among the nations sharing those rivers.

24. See Claudia W. Sadoff and David Grey. 2002. Beyond the river: The benefits of cooperation on international rivers. *Water Policy* 4 (5):389-403.

SUMMARY – WATER RESOURCES MANAGEMENT IN THE NILE BASIN: THE ECONOMIC VALUE OF COOPERATION (WHITTINGTON, *ET AL.*, BACKGROUND DOCUMENT)

Context

To argue that "water is an economic good" is now part of the international water resource community's lexicon. Though this means different things to different people, it calls for the recognition that water has an economic value and that that value must be a central consideration in water resources management. Since 1999, the Nile Basin Initiative has been underway among the Nile Riparian countries to explore opportunities for maximizing the benefits of the river's waters through cooperative development and management of the basin. However, there has been virtually no explicit discussion of the economic value of cooperative water resources development. A serious discussion about the economics of Nile cooperation is inevitable and will not lessen the importance of environmental, social, or cultural issues.

Concepts of the "Economic Value of Water"

User value – Water has an economic value to a user at a specific time and location. The user value is the amount of money a user will be willing to pay to obtain more water and is determined by the specific use of the water and the amount of money the user has.

System value (shadow value) – This is defined as the total value generated by the water within the river system, the sum of all benefits and costs to the riparians as a whole. From the systems perspective how changes in water availability affect all water users and thus the cumulative value of the water system is important.

Four Economic Pressures at Play in the Nile

1. Withdraw water for irrigation as far upstream as possible – before you lose it through evaporation and seepage

2. Withdraw water for irrigation as far downstream as possible in order to take full advantage of hydroelectric power generation facilities

3. Store water upstream to reduce evaporation losses

4. Withdraw water where its user value is greatest

Balancing Economic Pressures in a Systems Context: The Nile Economic Optimization Model (NEOM)

NEOM provides a framework for integrating hydrological and economic information to consider the effect of the four economic pressures. Thirteen key findings resulted from the NEOM analysis. Results show that in most scenarios, the total direct economic benefits are generated "relatively" evenly in Ethiopia, Sudan, Egypt, and the Equatorial States, though the composition of benefits vary by country. A systems perspective, focusing on cooperative system-wide development and management of Nile waters instead of unilateral investment planning, should enable riparians to better sustain the ecosystem and generate greater economic benefits for all people in the Nile basin.

SECTION C: ENHANCING BENEFITS: BEYOND THE BASIN, BEYOND WATER

Module III: Exercise 1 (Ex-III.1): *Beyond the Basin, Beyond Water*

To think together about how to enhance the benefits to all the parties, by both moving beyond the basin to think in "benefit-sheds" and beyond water to incorporate other benefits, enlarging the overall "basket of benefits".

Key Points of Exercise

- Two conceptual shifts:

  a. *Watersheds to "problemsheds".* The watershed is the most efficient unit of management if water management were the only concern of the parties involved. What else is on the parties' minds as they negotiate? Clearly, their geographic borders are of concern, probably much superseding those of the watershed. What other units are of issue? Road-networks? Electricity grids? Ecosystems and flyways? Climatic patterns? Strategic interests? What are the geographic units of each of these "problemsheds" and how are they expressed in negotiating strategy?

  b. *Beyond water to enhance benefits.* If we begin to understand the interconnectivity of these overlapping problemsheds, we can now start to think about enhancing the "basket of benefits" by thinking beyond water to "benefit-sheds." Which of the issues raised in a), above, can be introduced to a discussion of enhancing benefits?

Type 1: Environmental Increasing Benefits	*To the river*	Improved ecosystem sustainability, conservation and water quality
Type 2: Economic Increasing Benefits	*From the river*	Improved productivity, and flood and drought management
Type 3: Political Decreasing Costs	*Because of the river*	Policy shift to cooperation and development
Type 4: Indirect Economic Increasing Benefits	*Beyond the river*	Broader regional cooperation and integration

Figure 10: Four Types of Benefits of International Waters Cooperation

SECTION D: SUPPLEMENTAL READING FOR MODULE III

Sadoff, Claudia W. and David Grey. 2002. Beyond the river: The benefits of cooperation on international rivers. *Water Policy*. 4(5):389-404.

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Beyond the river: the benefits of cooperation on international rivers

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Abstract

International rivers can elicit cooperation or conflict. The choice between the two will in large part be determined by perceptions of their relative benefits. In this paper, we explore the dynamics that drive the choice between conflict and cooperation, and present a simple framework for examining the extent of potential benefits that could underlie these choices. The paper seeks to broaden the range of perceived benefits, as some are obvious and some are much less apparent. The framework categorizes four types of cooperative benefits. First, cooperation will enable better management of ecosystems, providing *benefits to the river*, and underpinning all other benefits that can be derived. Second, efficient, cooperative management and development of shared rivers can yield major *benefits from the river*, in increased food and energy production, for example. Third, cooperation on an international river will result in the *reduction of costs because of the river*, as tensions between co-riparian states will always be present, to a greater or lesser extent, and those tensions will generate costs. And finally, as international rivers can be catalytic agents, cooperation that yields benefits from the river and reduces costs because of the river can pave the way to much greater cooperation between states, even economic integration among states, generating *benefits beyond the river*. While each of these four types of benefits could potentially be obtained in all international river basins, the extent and relative importance of each type will vary greatly between basins, reflecting a wide range of political, geographic, economic and cultural circumstances. In some cases, the scale of benefits may not justify the costs of cooperative actions, in others the sum of benefits could be very high. The paper concludes that identifying and understanding the range of often inter-related benefits derived from the cooperative management and development of international rivers is central both to better management of the world's rivers, and to relations among the nations sharing those rivers.

Keywords: International rivers; Water resources management; Cooperation and conflict; Economic cooperation; Regional integration; Water wars

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1. Introduction

Rivers[1] are extraordinary phenomena, with physical, cultural and psychological expression in human societies; they bring life and death, civilization and devastation, opportunity and risk. Managing rivers effectively has always been a goal of human societies and nation states. Under Roman law, documented in the 3rd Century Roman Digest, aqua profluens (flowing water) was a common good, neither public nor private, emphasizing equity and society-wide ownership. Managing rivers for the common good remains today a societal goal in countries around the world. To achieve this goal a range of instruments is being adopted: river basin organizations are bringing stakeholders together to internalize the politics of allocation, market mechanisms are widely used to rationalize the economics of allocation, and legislation is enacted and enforced to ensure the regulation of allocation. One fundamental lesson of universal experience is that a river is best managed as a basin unit, as any action in one part of the basin has impacts in another.

The management of rivers is complicated by the fact that they cross political boundaries indiscriminately. Rivers intersect or even form borders between the many different users that must share their water. River basins wholly within a nation invariably give rise to debate and discord, to a greater or lesser extent, among users with conflicting demands and management preferences. Strong national institutions can deal effectively with such differences, although in federal nations with strong state legislatures (as in the US, India or Australia) management planning of, and user disputes over, inter-state rivers often present major challenges. However, in all these cases, there remains a national legislative structure with ultimate authority. There is rarely an institution of equivalent authority, however, where rivers flow between, and disputes arise among, sovereign nations. There are about 260 rivers that cross or form international borders; their basins cover almost half of the world's land surface and include about 40% of the world's population (Wolf, 1998). As water everywhere becomes increasingly scarce relative to demand, conflicting expectations of international rivers will grow, with only limited and little-tested supra-national legal and institutional instruments available for nations to look to in order to allocate and conserve the water of the rivers that they share.

There has been much written recently in the economic, political and scientific literature about international rivers, with a sharp focus on 'water wars'. Some write of water wars, both in the past, and, more importantly, in the future. Others argue that no war in history has ever been

[1] Some clarity over terms is necessary. In this paper, freshwater flows (whether surface water or groundwater), and the lakes and wetlands which some of these flows may pass through, derive from or terminate within, are described, very loosely and evocatively, as 'rivers'. The term 'international rivers' is used in this text to refer to freshwaters whose basins are situated within the borders of more than one state. We recognize that there is a long-standing, formal debate over such terminology. Some believe that the use of the word 'international' is incorrect as it implies that the waters (as in seas) do not belong to any state, whereas only the basin states have rights to an international river. Some use 'transboundary rivers', which confuses others as many river channels form international borders without crossing them (although in these cases the river basins themselves will almost certainly be transboundary). Furthermore, transboundary rivers include those that cross intra-national (e.g. state) borders—not only international borders. Others use 'shared rivers', which is disputed by some who do not perceive the use of such waters as 'shared'. Again, others use the term 'watercourse', which is rejected by some who believe that it does not include the full extent of the hydrologic basin and all its water sources. This often heated and rarely conclusive debate serves to emphasize the importance of achieving a common understanding on the issues of 'international rivers'—an understanding best reached through recognizing the benefits of cooperation. This is the subject of this paper.

fought over water, and that international rivers tend to induce cooperation. There is a case for both positions, although, in this paper, we align ourselves with neither, and instead take a somewhat different approach.

All international rivers, without exception, create some degree of tension among the societies that they bind.[2] There are consequences of these tensions, and of the cooperative or non-cooperative responses they elicit, that can reach far 'beyond the river'. These tensions, and their responses, are bundled with many other factors—historic, cultural, environmental and economic—that affect relations between neighboring nations. Within these bundled dynamics, international rivers can in some cases become a powerful catalyst for conflict, or a powerful catalyst for cooperation. Fully unbundling water's role from the complex dynamics of relationships between states is not possible. Control of international rivers is inextricably entwined with economic opportunity, national security, society and culture. Water—narrowly defined—is unlikely to be or have been the sole source of any war, just as, we believe, war is unlikely to be or have been fought for any single interest or purpose. The management of shared water can be a force for peace, or a force for war, but politics—as a proxy for the full bundle of relationships, and associated tensions, that arise between states—will determine whether cooperation or conflict is chosen.

In this paper, we draw upon World Bank experience in different parts of the world and we outline a framework, which is proving relevant and useful in considering cooperation on international rivers. In setting the scene for this framework, we need to consider the nature of a river and its roles in the environment and in the economic endeavors and political relationships of human society.

2. The ubiquitous river

Rivers are a central feature of the ecology of the planet. Crustal processes build mountains and create deep basins. Rain falls, is captured in rivers, erodes mountains, and deposit sediments in lowlands, infilling basins. Rivers play a dominant role in sculpting landscapes and sustaining ecosystems. All life needs water and the presence of water gives life, within the river itself, within associated wetlands, lakes and riverine vegetation, and within the landscape sustained by the river. While the river sustains life and ecological systems, so also do these systems sustain the river, providing natural regulation of water quantity and quality.

Rivers have always been and remain a central feature of the economic environment. Human settlement has almost always been close to water, because of the essential role water plays in human life and economic endeavor. Only in the past century has technology allowed permanent human settlement far from water. It is no coincidence that many of the world's great cities are found along the banks of rivers. Rivers provide water for drinking, for food production, for energy and for transport and have played a role in the development of human civilization—nowhere more so than in the major alluvial basins of the world, such as the Mekong, the Indus, the Euphrates and the Nile basins. People who settled in the floodplain had great opportunity to grow crops along the river, as the annual flood receded, leaving fresh silt and high water levels

[2] The word rival has the same root as river, derived from the riparian concept of dwellers on opposite riverbanks.

which boosted production, and to use the river as a transport route to trade that production. In fact, the need to ensure navigation along rivers provided the incentive for some of the earliest recorded institutions and agreements on international rivers. The relationship between the flow of rivers and the economy has long been recognized; the early Egyptians built Nilometers some 5000 years ago to measure the flow of the River Nile at Aswan in order to determine annual taxes for farmers.

Rivers have also, less obviously, long been a feature of the political environment. History shows us that they have played a part in defining the structure of human societies in many parts of the world and in many ways. While early societies in alluvial basins had great opportunities, they also faced great risk, for, if seasonal flood was high, or if it failed, then life was at risk. Harnessing the flood took ingenuity and physical structures (with levees, dykes and canals) requiring the organization of large numbers of people, as well as rules and institutions for water allocation. From this emerged bureaucracies, hierarchies and innovations which helped strengthen civilizations and cities.[3] Societies in upland headwaters did not face the same imperatives, and historically appear to have more often been characterized by smaller, less structured social groupings. On the plains, proximity to rivers has been both a source and a reward of strength. Stronger and wealthier societies tend to live close to rivers, while weaker, poorer ones are forced away from rivers, where water is harder and more costly to obtain, and food supplies are less secure. Similarly, in the less developed parts of the world today, stronger and wealthier groups tend to live close to abundant clean water sources or water supply systems, while the poorest are forced to travel significant distances to obtain water of generally lesser quality at greater cost. Rivers are thus as closely linked with the economic and political fabric of human society as they are with the landscape.

Today's international rivers are also interwoven with the geo-political map. Many rivers have always been natural barriers and have defined boundaries (the Roman Empire reached but did not cross the Rhine and Danube rivers). Similarly, the boundaries of watersheds are borders in many parts of the world today, as they formed natural lines where there was no dispute over water. In recent times, however, the drawing of lines on maps to form borders has ignored the significance of hydrology. Africa is a case in point; lines drawn on maps in London, Paris, Berlin and Lisbon have left over 60 rivers crossing national borders, with more river basins per country and more countries per river basin in Africa than in any other continent.

Rivers are thus extraordinary, multi-dimensional systems. They are ecological systems, with critical life- and landscape-sustaining functions. Cooperation on an international river could enable better management of these ecosystems, providing *benefits to the river*, and underpinning all other benefits that can be derived. Rivers are physical and economic systems, whose efficient, cooperative management and development can yield major *benefits from the river*, in increased food and energy production, for example. Rivers have political significance—particularly so when they are shared between states; non-cooperation on an international river will result in tensions between states that will always be present, to a greater or lesser extent, and those tensions will

[3] See Wittfogel in *Oriental Despotism* (1957). Wittfogel argued that control of water for irrigation was central to the Asian system of economic production, and had a profound impact on the organization of what he termed 'hydraulic societies' The control of water was therefore a source of power that could be exploited by a central bureaucracy—a theory that came to be known as 'hydraulic monopoly'.

Table 1
Types of cooperation and benefits on international rivers

Type	The challenge	The opportunities
Type 1: increasing benefits *to the river*	Degraded water quality, watersheds, wetlands, and biodiversity	Improved water quality, river flow characteristics, soil conservation, biodiversity and overall sustainability
Type 2: increasing benefits *from the river*	Increasing demands for water, sub-optimal water resources management and development	Improved water resources management for hydropower and agricultural production, flood-drought management, navigation, environmental conservation, water quality and recreation
Type 3: reducing costs *because of the river*	Tense regional relations and political economy impacts	Policy shift to cooperation and development, away from dispute/conflict; from food (and energy) self-sufficiency to food (and energy) security; reduced dispute/conflict risk and military expenditure
Type 4: increasing benefits *beyond the river*	Regional fragmentation	Integration of regional infrastructure, markets and trade

generate costs; significant benefits could be derived by *reducing costs arising because of the river*. International rivers can be catalytic agents, as cooperation that yields benefits from the river and reduces costs because of the river can pave the way to much greater cooperation between states, even economic integration among states, resulting in *benefits beyond the river*. We will explore these four types of benefits, set out in Table 1, as a framework for our discussion, while recognizing that they feed into each other inextricably and that they are integrated elements of a much broader, even more complex system that cannot be unbundled.

3. The ecological river: benefits accorded 'to the river'

Cooperation across borders in the sustainable management of a river ecosystem, according *benefits to the river*, can be a valuable and unthreatening place for international cooperation to start. Environmental management is a cornerstone of river basin management and development and can bring benefits to all river uses and users. While there is a growing debate over the 'preferred' ecological state of a river—from 'pristine' to 'engineered', modern river basin management typically incorporates a conscious design process to ensure a 'healthy' river system, however defined, which accounts in some way for the inevitable tradeoffs of river development. A healthy river is typically one with: protected watersheds, preserving soil fertility and reducing contaminant and sediment soil transport; conserved wetlands, floodplains and groundwater

recharge areas, to maintain their natural capacity to buffer river flow and water quality variations; protected aquatic and riverine terrestrial biodiversity; and controlled water abstraction and wastewater discharge, to manage river flows and water quality.

Although rivers are resilient ecological systems that can recover from natural and anthropogenic shock, growing populations and industrializing societies almost invariably cause environmental damage to rivers, by, for example, reducing flows, eroding water quality and destroying fish stocks. Organizing affirmative action to protect the river within a nation state has proved complex and is costly if left until major damage is done and remedial action is needed, as many industrial nations have discovered. The US Superfund is a case in point, where tens of billions of dollars are being invested to restore surface and ground water systems, and particularly the latter, as groundwater clean up is invariably difficult.

The challenge of the protection of international waterways is much greater still, although there are recent examples of major cooperative efforts to restore and protect shared water systems. Initiatives in the Baltic and Red seas, and in the Danube basin, all supported by the Global Environment Facility, are good examples of this, bringing 'benefits to the river'. Cooperation among the eight Rhine riparian states is another interesting example. Cooperation on the Rhine goes back over a thousand years to navigation agreements. In the mid-19th century salmon production was an important economic activity in the Rhine. Growing populations and industries led to a complete extinction of salmon in the Rhine by the 1920s—with over half of the world's chemical production occurring along the Rhine by the 1950s, when the Rhine was known as 'the sewer of Europe'. In 1987, ministers of the Rhine countries launched the Rhine Action Plan, with the symbolic goal of 'Salmon 2000'—a readily understood objective which popularized the much more complex goal of reducing chemical contaminants to a level that would bring life back to the river. Following intensive international cooperation, major investment and widespread public support, by 2000 salmon were swimming up the river as far as Mannheim to breed once more, signifying a healthy river again. Today, much wider Rhine cooperation is planned—such as in the area of flood control.

In poorer regions of the world, there may appear to be fewer incentives for, and therefore less interest in, the management of the ecosystems of rivers. Yet, rivers are balanced systems and upsetting this environmental balance by unmanaged development can have major social and economic impacts. As populations and pressures on land grow in less developed nations, the poorest of the poor are forced into more and more marginal lands. In river basin headwaters, these are vulnerable uplands, often with high slopes and vulnerable soils. Forests are cut down, wetlands drained and slopes are cultivated. Soils are eroded, resulting in reduced crop yields and, eventually, unsustainable livelihoods. More insidiously, groundwater recharge is reduced and levels lowered, river flows become much more flashy and downstream flood and drought impacts can be greatly enhanced. In these circumstances, watershed management can be one key to sustainable development. There are a growing number of countries where this is recognized, with funds channeled to rural people for development programs, recognizing that they act as guardians of the watersheds that feed cities and industries downstream. This is much more difficult to organize in international river basins, where upstream nations are the guardians of the watersheds for downstream nations.

Take the case of Southern Africa, where there are numerous international rivers. Drought in the early 1990s had massive economic and social impacts with, for example, a 45% decline in

agricultural production in Zimbabwe in 1992. In 2000 and 2001 flooding of the Save and Limpopo rivers also had major impacts, particularly on the poor living in the most vulnerable parts of the floodplains in Mozambique, a downstream riparian state on eight international rivers. Smallholder settlement on vulnerable headwaters upstream, coupled with recurring drought and flood, has led to serious soil erosion and altered hydrologic regimes, with impacts throughout the river basins of the region. In the case of Mozambique, managing floods and droughts requires actions in the watersheds of upstream states. Unintentionally, the settlement of vulnerable watersheds in one country, often by the very poor, can thus have major impacts on a downstream country—and often on the very poor settled in the floodplains. There can be no reasonable solution without international cooperation.

It is clear that cooperation in the management of land and water within a basin ecosystem, according *benefits to the river*, can bring benefits to all—and may even be a pre-requisite for deriving *benefits from the river*.

4. The economic river: benefits to be reaped 'from the river'

Cooperative management of the water flowing in an international river can reap benefits *from the river*. Managing a river basin from a system-wide perspective can increase the quality, the available quantity, and the economic productivity of river flows. River basin development seeks to promote this integrated, system-wide perspective, where the full range of water use opportunities and the various inter-relationships of individual water uses can be considered. River flows and water uses can be optimized to yield, inter alia, more food, more power, and more navigational opportunities, while sustaining environmental integrity. There will often be difficult tradeoffs to be assessed between environmental conservation and river development, with these assessments best made at the basin scale. This is always difficult, even within national boundaries. In international river basins, this system-wide perspective is much more difficult to obtain, and this can only be achieved through cooperation. The gains that result from this shift in planning perspective, are the most obvious and direct economic gains to be made from the cooperative management of shared waters.

There is a widespread perception that water allocation is a zero-sum game, that water resources are finite and that one use will always preclude another. While physical water resources are, indeed, finite, the quantity of *available* water resources can be influenced by management actions. This is particularly true where rainfall is low and highly variable. Good water management practices can effectively increase the available water resources in a system by, for example, protecting watersheds to minimize erosion, maximize infiltration and extend the period of run-off; providing over-year storage to buffer rainfall variability and reserve water in abundant years that would otherwise be lost; and by locating storage in areas of the basin that minimize evaporation and environmental disruption. In semi-arid Spain, for example, effective water management practices have increased water availability from 8% of total flow to 60%. There are also many non-consumptive uses of water, such as hydropower generation, navigation and recreation. The 'use' of water for these purposes will not necessarily diminish the water available in the system for other uses.

Focusing on the benefits[4] derived from the use of water in a river system, rather than the physical water itself, is another way to broaden the perspective of basin planners. The allocation of water, particularly in international systems, is often contentious. However, the underlying interest of many involved, often not recognized, is commonly not the water itself—but rather the benefits and opportunities they hope to obtain from access to that water (i.e. not cubic meters but dollars). A focus on the benefits derived from water use may provide greater scope, and hence greater flexibility, in defining cooperative management arrangements that are acceptable to all parties.

Just as good water resource management practices can increase the availability of water in a river system, integrated planning that maximizes the benefits derived from water can clearly increase the overall productivity of a river system. The positive-sum nature of international cooperation in this context is more intuitive, because of the interaction of economic activities and the integrity of the ecosystem. Basin-wide configurations of consumptive and non-consumptive water uses can be explored to optimize benefits. In some cases, potential non-consumptive benefits may exist that could provide significant additional benefits to a basin without any change in the pattern of water extractions.

There are many good examples of cooperation reaping economic benefits from the river. In the case of the Senegal river, Mali, Mauritania and Senegal are cooperating to regulate river flows and generate hydropower, with a legal and institutional framework and co-owned infrastructure assets, including the Manantali dam that is located 300 km inside Mali. In another case, Lesotho and South Africa are cooperating in the construction of infrastructure on the Orange River in the Lesotho Highlands Project, providing least cost water supply to South Africa's industrial heartland and royalties to Lesotho amounting to 5% of GDP.

Major (joint or several) development, such as the construction of dams and major abstractions for irrigation, present special challenges due to the need to assess options and tradeoffs and to apply environmental and social safeguards effectively and reasonably across international borders and jurisdictions. Again, both the Senegal river and Orange river cases illustrate this, with ongoing debates on environmental issues made more complex by their international nature.

Yet, even significant gains to cooperation in a river system may not be sufficient motivation for cooperation if the distribution of those gains is, or is perceived as, inequitable. It is possible, for example, that a cooperative river management scheme which generates significant gains to the group as a whole might provide fewer benefits to one particular riparian than an alternative non-cooperative scheme. That particular riparian would therefore have little incentive to cooperate. Even if all states benefit more from cooperation than non-cooperation, the relative distribution of gains could inhibit cooperation. Concepts such as Tedd Gurr's 'relative deprivation' or William Baumol's 'envy' suggest that parties are not indifferent to the gains of others, and that some might choose to forgo their own potential gains in order to bar other parties from receiving relatively greater, or preferred, gains.[5] In such cases, a cooperative arrangement may not be agreed without redistribution or compensation.

[4] Economic benefits here can include anything to which societies attach value.

[5] In addition to equity concerns, the spatial and political relationships between riparians may make relative gains relevant to regional development, integration and relations. Water resource management affects economic and demographic development patterns, enabling or undermining the growth of economic activities and human settlements.

An equitable benefit sharing arrangement may well require some form of redistribution or compensation. The form that compensation takes will be highly situation specific, but could involve monetary transfers, granting of rights to use water, financing of investments, or the provision of non-related goods and services. The range of benefits under discussion is also a critical issue. The broader the range of benefits under discussion, the more likely the riparians will be able to find a configuration of benefits that is mutually acceptable. While some benefits are difficult to share or compensate,[6] in general the optimization of benefits should be more robust and more flexible than the optimization of physical water resources, because benefits tend to be more easily monetized and compensated and they have less political and psychological significance.

A body of international water law has evolved that focuses on the river as a physical system. Cooperative international management of water resources falls within a legal framework that focuses on water rights. Early principles still cited in the context of international water negotiations are those of 'prior appropriations' or 'first in time—first in right', often cited by a downstream riparian state, and that of 'absolute sovereignty', where water within a nation state is considered to belong to that state, often cited by an upstream state.[7] After decades of consideration, important principles have been codified in 1997 in the 'UN Convention for the Non-navigational Uses of Shared Watercourses', which has yet to be ratified by a sufficient number of states to enter into force. The key principles of the Convention are those of 'equitable utilization', which emphasizes equity for all riparians, and 'no significant harm', which emphasizes protection for all riparian interests.

However, the application of these principles is fraught with difficulty and they risk opposing each other. The embrace of the first principle by many upstream states and the second by downstream states is a consequence of this. It must be recognized that both principles apply upstream and downstream equally. It is obvious that upstream users must recognize the dependence (sometimes total) on the river of downstream states and the risks of causing significant harm by reducing river flows. It is also true, though much less obvious, that downstream development can generate harm upstream by effectively foreclosing future opportunities for upstream use. Clearly upstream extraction generates externalities downstream by diminishing flows physically. On the other hand, downstream extraction can generate externalities upstream by diminishing future available flows upstream because of downstream claims of acquired rights to that water.

International water law is commonly interpreted as focusing on the allocation of water, resulting in riparian disputes being perceived as zero-sum prospects. International law provides guidance but no clear hierarchy for competing claims on shared waters. The law does provide important principles for developing a sound framework for cooperation between nations. However, there will also always be political motives for, and consequences of, non-cooperation that derive not *from the river* directly, but *because of the river*.

(*footnote continued*)

The growth, decline or character of nearby industrial and urban developments, for example, could have real impacts, both positive and negative, on market opportunities and environmental quality in neighboring states.

[6] For example, those benefits derived from environmental or social values may not be substitutable or easily compensated.

[7] Memorably cited by Judge Harman in 1895, in the case of the Rio Grande, shared by the US and Mexico.

5. The political river: costs arising 'because of the river'

Far-reaching gains from cooperation in international rivers may accrue as savings of the costs of non-cooperation arising *because of the river.* The control of rivers and river flows has long been—and to some extent always is in all international rivers—a source of tension and dispute; and an issue of sovereignty, strategic necessity, and national pride. Such tensions (often inextricably linked to, and perhaps even indistinguishable from, other tensions) may reach the point where they color the geo-political relationships between states within a basin and become obstacles to growth by constraining the regional political economy and diverting resources from economic development.

International cooperation can ease tensions over shared waters, and provide gains in the form of the savings that can be achieved, or the costs of non-cooperation or dispute that can be averted. These tensions and costs will always be present to some degree in all river basins; in some basins they may be insignificant, in others they may be very high and may present enormous challenges. In particularly, this occurs where water quantity is the major issue—as is likely to be the case with rivers flowing through arid areas, where contesting claimants commonly (but often not correctly) perceive a zero-sum game. Good examples of such cases include the Jordan, Nile, Euphrates and Indus basins, where relations between riparian states are significantly influenced by the waters that they share and are characterized by dispute.

Tensions arising because of the river, particularly where they are acute or long-standing, can thus significantly strain broader relations between states and impact the political economy of a region. Strained international relations tend to inhibit regional integration and manifest themselves in the fragmentation of markets, infrastructure, telecommunications, transport connections, labor flows, financial systems, etc. This fragmentation compromises all of the affected economies by denying them the benefits of regional integration that are potentially extremely important, particularly for small or developing economies. In some international river basins, little flows between the basin countries except the river itself—no labor, power, transport, or trade.

Tense regional relations may encourage the adoption of polices that focus on self-sufficiency, rather than on trade and integration. In the agriculture and power sectors, for example, this could mean the promotion of food and power self-sufficiency, which emphasizes the need to produce, in-country, all the food and power the country demands, even if the cost of doing so is greater than the cost of imports. Generally it is more economically efficient to promote food and power security, which focuses on a state's capacity to secure its food supply either through trade or production—whichever is most cost effective.

In extreme cases, tensions arising because of the river may result in diversion of strategic human resources and policy focus from economic development to security concerns related to water and a diversion of financial resources to military preparedness. If these tensions contribute to conflict, then the human and financial costs can be extremely high. While these costs because of the river are not readily seen or quantified, they can be very real and substantial, and can compound other tensions leading to higher costs still.

We have referred to the extensive debate in the literature on the specter of 'water war'. The reality is likely to lie somewhere between those that contend that water is a source of increasing tension and a potential flashpoint for conflict, and those that argue that there has never been a

water war and that the issue is less explosive than it seems. Clearly, as water becomes increasingly scarce relative to demand there will be competing claims on its use, which may increase geo-political tensions. Where these tensions are high, they may be one of many underlying issues that contribute to souring relationships, and catalyze conflict. It is reasonably argued that there has rarely been a 'water war', where water is the sole cause of conflict. However, it is probably the case that there has never been a single cause for any war, and resource conflicts—land, water, minerals—are clearly common contributory factors to many past and present (and future) conflicts.

It is difficult to unbundle the importance of shared waters in the dynamics between riparian states from other contributory factors in conflict. From our experience, water plays a significant part in a number of recent and current disputes, even conflicts, around the world, especially where climate variability and water scarcity, coupled with major transboundary flows, create high levels of perceived threats to national water security. By the same token, cooperation with regard to shared waters contributes to strengthening relations between countries, and catalyzing broader cooperation, integration and stability. It is for this reason that the debate in the literature over whether there have been or will be 'water wars' is misguided; shared water has always and will always be one contributory factor in determining relations between states. The challenge is for international rivers to enhance relationships through shared opportunities, contributing to the benefits of cooperation and integration *beyond the river*.

6. The catalytic river: benefits enabled 'beyond the river'

Cooperation in the management and development of international rivers may contribute to, or even result in, political processes and institutional capacities that themselves open the door to other collective actions, enabling cross-border cooperation *beyond the river*. Increasing the benefits from the river and decreasing the costs arising because of the river enable broader economic growth and regional integration that can generate benefits even in apparently unrelated sectors. Improved river basin management can increase the productivity of a river system, which may then generate additional opportunities in other sectors through forward linkages in the economy. The easing of tensions among riparian states may also enable cooperative ventures unrelated to water that would not have been feasible under strained relations. Flows other than the river—such as improved communications and trade—may grow. Thus, progress in cooperation on shared river management can enable and catalyze benefits 'beyond the river', more directly through forward linkages in the economy and less directly through diminished tensions and improved relationships.

The forward linkage effects of generating benefits from the river, for example in food and energy production and trade, are relatively obvious. Agricultural surpluses may spur growth in agro-processing or trade. Enhanced hydropower production and interconnection could both expand productive opportunities and increase the profitability and competitiveness of existing power-using enterprises. This may lead to additional investments in industry or infrastructure, and strengthened trade relations. Investments, improved infrastructure networks and trade relations can in turn generate additional growth opportunities, and so on. These types of forward

linkages could be national, supporting growth and development within basin states, or international, promoting exchange, trade and interconnection among basin states.

It is less obvious that diminishing the tensions that arise because of the river will enable greater economic integration among basin riparians and help to redress the regional fragmentation that may exist as a consequence, at least in part, of tensions arising because of the river. Easing these tensions could enable cooperation among countries by diminishing formal and informal restrictions on the movement of goods, labor and finance between countries, increasing integration even in apparently unrelated sectors such as transport, telecommunications or tourism. Regional infrastructure systems can be of particular importance. The fragmentation of regional infrastructure, especially in the case of small, landlocked economies, 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, shared by Cambodia, China, Laos, Myanmar, Thailand, and Vietnam, where relationships among the riparians have been turbulent for decades, provides an interesting case. While there have not been major disputes arising over the Mekong itself (and thus relatively small costs 'because of the river'), significant benefits have been derived 'from the river' through cooperative management. Sharing the Mekong's benefits has proved to be an important stabilizing factor in the region, bringing substantial benefits 'beyond the river', both directly from forward linkages and indirectly from diminishing tensions. During years of conflict between Laos and Thailand, for example, Laos always provided hydroelectricity to Thailand, and Thailand always paid. Similarly, the Government of Thailand has followed an explicit strategy of increasing regional stability by creating mutual dependency and thus purchases gas from Myanmar and Malaysia and hydropower from Laos and China, 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.

Cooperation with regard to river systems may therefore facilitate the political processes needed to enable cooperation on other 'systems' within and beyond the river basin, such as labor flows, markets and infrastructure. These economic 'systems' may extend well beyond the river, yet tensions because of the river system can be barriers to their development. Developing and integrating these broader economic systems can make each individual economy stronger and more competitive, and more easily integrated into the global economy.

7. The cooperative river: the dynamics of multi-type benefits

The cooperative river can therefore be seen to generate benefits of multiple types, although the potential sum of these benefits in different basins will vary greatly. The first type are the benefits accorded to the river by cooperative basin-wide environmental management, the second are those benefits to be reaped from the river by cooperative development of the basin, the third are the savings that can be made by diminishing the costs of non-cooperation arising because of the river, and the fourth are broader opportunities that are catalyzed beyond the river.

The relative importance of each type of benefit, and the dynamics among the types will be unique to each basin and the states which share it, reflecting, for example, history, hydrology, economics, politics and culture. While it is likely that in all basins there will be some potential benefits of each of these types, the value of these benefits, individually and in total, will vary

significantly among river basins. These potential benefits must be weighed against the generally high costs of establishing and maintaining multi-country river basin institutions, and may not everywhere justify cooperative efforts.

Seen another way, non-cooperation will have costs in terms of foregone opportunities of each of these types. Opportunities and gains may be highly visible, or extremely subtle. Cooperation on an international river may even be a necessary (but clearly not sufficient) condition for stable international relations and trade between basin states. Thus, it is quite possible that the greatest gains associated with cooperation on international rivers will derive from apparently unrelated development that would never have been considered had tensions over shared waters remained between nations. This relationship needs to be more widely understood and recognized, to increase the incentives for cooperation on international rivers.

Some river basins have the potential to generate significant benefits of multiple types; the Nile is a good example. Ten countries share the Nile; five are among the 10 poorest countries in the world; four are landlocked; and seven are, or recently have been, involved in internal or international conflicts. All of the riparians rely to a greater or lesser extent on the waters of the Nile for their basic needs and economic growth. For some, the waters of the Nile are perceived as central to their very survival. It is not surprising, therefore, that for centuries the Nile nations have been concerned by the actions of other riparians. This has been the basis, supplemented by many other factors, for tensions between riparian states. It is clear that Type 3 costs 'because of the river' are high. Environmental management is also a challenge. The Nile is the world's longest river, it covers one-tenth of Africa's total land mass and is home to Lake Victoria, the second largest freshwater lake, and the Sudd swamps, a wetland the size of Belgium. To effectively preserve the vast Nile ecosystem and bring Type 1 benefits 'to the river', cooperation is needed. The potential for Type 2 economic gains 'from the river' are significant, for example, through the cooperative management of river flows to mitigate against endemic floods and droughts, and coordinate hydropower and agricultural production, with major opportunities to construct shared infrastructure. Finally, cooperation on the management of the river can catalyze flows other than water between the countries, by diminishing regional tensions, increasing production, and promoting broader regional integration and cooperation 'beyond the river', bringing Type 4 benefits. The 10 Nile riparians are currently engaged in a cooperative effort, the Nile Basin Initiative, which explicitly seeks to develop and share all four types of benefits.

Table 2 explores the dynamics of cooperation on international rivers. The incentives for cooperation suggest *why* cooperation takes place, often due to concerns over problems, such as climate (and associated river flow) variability or recognition of opportunities, such as economic potentials. The catalysts for cooperation suggest *how* cooperation is fostered and promoted, often through improved communications and dialogue at many different levels. The linkages show the dynamics between the different types of cooperation, and to some extent suggest *when* cooperation of each type may take place. The linkages between types of cooperation suggest that making a start in environmental (Type 1) or direct economic cooperation (Type 2) can lead to growing political (Type 3) and indirect economic cooperation (Type 4)—or vice versa. The dynamics between types might be positive or negative. For example, while Type 3 cooperation may help further advance Type 1 and Type 2 cooperation, setbacks in Type 3 relations may impede cooperation of Types 1 and 2.

Table 2
Dynamics of cooperation on international rivers

Type	Incentives	Catalysts	Linkages
Type 1 (environmental): increasing benefits *to the river*	Concerns over river flows (including flood and drought) and pollution	Public awareness	Type 1 actions underpin sustainable Type 2 and 4 development
	Ecosystem sustainability	Joint environmental diagnostic analysis	Type 1 action builds Type 3 trust (inaction fuels Type 3 tensions)
Type 2 (direct economic): increasing benefits *from the river*	Recognized economic growth and business opportunities	Joint analysis of optimized river development	Type 2 actions motivate Type 1 joint stewardship of resources
	High variability of river flows, giving unreliable supplies and flood and drought risk	Fora for engagement of key actors (e.g. water and power industries, farmers, agri-business)	Type 2 actions ease Type 3 tensions (unilateral actions fuel Type 3 tensions)
	Growing water scarcity	Identification of win–win investments	Type 2 actions may generate production surpluses (agriculture, power) for Type 4 integration
Type 3 (political): reducing costs *because of the river*	Concern for improved international relations and peace given increasing water demands	Improved communications (infrastructure, telecoms, media, etc)	Type 3 gains facilitated by Type 1 actions that build trust
	Need to ensure long-term river flows and benefits from flows	Specific political dialogue (possibly mediated)	Type 3 dialogue and engagement promoted by Type 2 actions and shared benefits (unilateral actions to capture benefits will increase tensions)
	Recognition of opportunities lost by policy focus on non-cooperation	Broader regional/global political initiatives and agreements	Type 3 gains enable further Type 1 and 2 actions and Type 4 opportunities
Type 4 (indirect economic): benefits increasing *beyond the river*	Recognized gains from economic cooperation (particularly for small and /or landlocked economies)	Broad analysis of economic cooperation barriers and opportunities	Type 4 gains sustained by Type 1 actions
		Civil society and private sector exchange	Type 4 opportunities arise from tradable surpluses generated by Type 2 actions
		Broader regional/global economic initiatives and agreements	Type 4 integration enabled by Type 3 gains in policy shift to regional cooperation, lowering barriers to trade and communication

8. Conclusions

We have proposed in this paper an analytic framework describing four types of benefits (environmental, direct economic, political and indirect economic) from cooperation on international rivers. While there is enormous variation among the numerous international rivers of the world, we submit that costs of non-cooperation, and benefits of cooperation of all four types will manifest in all international river systems, to a greater or lesser extent. However, although these types of cooperation can be recognized, they are closely interwoven with each other. Furthermore, cooperation—and non-cooperation—between states on international rivers feeds into, and is fed by, a much broader bundle of international relations, from which it cannot be isolated. Thus conflict is unlikely to result over international rivers alone, but international rivers can be one significant cause of conflict. Similarly, joint management of international rivers will not be the sole area of cooperation between states, but it can be a significant catalyst for peace and economic integration.

The international rivers of the world are coming under growing pressure from increasing water demand and water quality deterioration. It is important to understand what the benefits of cooperation on international rivers may be, why cooperation may occur and how it may be fostered. Greater cooperation on an international river will lead to better management and development of the river itself, and, in many cases, it may also promote economic integration and regional security, beyond the river.

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Water resources management in the Nile basin: the economic value of cooperation

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Abstract

Since 1999 a multilateral effort termed the Nile Basin Initiative has been underway among the Nile riparians to explore opportunities for maximizing the benefits of the river's waters through cooperative development and management of the basin. However, to date there has been virtually no explicit discussion of the economic value of cooperative water resources development. We believe that a serious discourse among Nile riparians about the economics of Nile cooperation is both inevitable and desirable, and that this discourse will not diminish the importance of environmental, social, or cultural issues that new infrastructure on the Nile will entail. To initiate such a discussion, in this paper we present the results of the first economic model designed to optimize the water resources of the entire Nile basin. Total (potential) annual direct gross economic benefits of Nile water utilization in irrigation and hydroelectric power generation are estimated to be on the order of US$7–11 billion. This does not account for the costs of building or operating the infrastructure.

Keywords: Cooperation; Economic optimisation; Nile basin; Water conflicts

Introduction

It is now part of the international water resource community's lexicon to argue that "water is an economic good". Though this phrase means different things to different people, it clearly calls for recognition that water has an economic value and that this value must be a central consideration in the management of water resources. Since 1999, a pathbreaking multilateral effort termed the Nile Basin Initiative (NBI) has been underway among the Nile riparians to promote cooperation and explore opportunities for maximizing the benefits of the river's waters through cooperative development and management of the basin system. Yet to date there has been virtually no explicit discussion of the

economic value of cooperative water resource development from a basin-wide perspective. We believe that a serious discourse among Nile riparians about the economics of Nile cooperation is both inevitable and desirable (and in no way diminishes the importance of the environmental, social, or cultural issues that new infrastructure development on the Nile will entail). To initiate such a discussion, we present the results of the first economic model designed to optimize the water resources of the entire Nile Basin.

If the countries of the NBI are successful in launching cooperative basin-wide development and management schemes, this will represent a water management enterprise of historic proportions. Although the Nile south of Aswan is currently one of the least developed of the major international rivers of the world, the river system offers numerous opportunities for developments that would facilitate the management of Nile waters. Multipurpose dams on the Blue Nile in Ethiopia and elsewhere in the Blue Nile watershed could, for example, manage the Blue Nile flood and enable water resources managers to mitigate both the considerable inter-year and intra-year variations in the flow of the Blue Nile. The construction of such dams could generate hydropower income for Ethiopia and positive downstream externalities for Sudan and Egypt in terms of drought, flood and sedimentation control. Such control structures could also allow water managers to operate the system in such a way that the total flow of water available to the riparians would increase.

On the White Nile, over-year storage in the Equatorial Lakes (Lake Victoria, Albert and Kyoga) and perhaps small water control structures on the tributaries feeding Lake Victoria, could provide hydropower generation and water supply for the White Nile riparians, especially Uganda, Tanzania and Kenya. A major unanswered question on the White Nile is whether the Jonglei Canal Project will be finished and, if so, what form it will take.[1] Although variations in the flow of the White Nile are far less dramatic than in the Blue Nile, management of these waters would still provide positive downstream externalities in terms of drought, flood and sedimentation control.

For several decades, individual riparians have contemplated a variety of plans for the types of water control infrastructure projects described above (Whittington, 2004). More recently, as part of the NBI, investment planning has begun to be examined from a more cooperative, regional perspective. If cooperative investment projects are agreed and undertaken, the riparians could move closer to achieving system-wide, economically optimal management of the shared resources of the Nile. Whatever set of projects is agreed upon and eventually carried out by the riparians, however, will signal the end of an historic period of Nile investment planning by putting in place the physical infrastructure that will allow the riparians collective control of the flow of Nile waters.

These investments will usher in an era of Nile management in which the waters of the Nile can be delivered wherever and at whatever time the collective political leadership of the riparian countries decides. This new era of Nile water management will not be focused on investment planning and the construction of new projects, but on management questions: deciding how to use the waters of the Nile to maximize their benefits to different users in different riparian countries. The challenge will not be to control the Nile waters, but to determine how they should be managed to ensure their most beneficial use. This new era of Nile water resources management will pose problems quite different from the

[1] The Jonglei Canal was conceived to run through the Sudd wetlands of the White Nile in Southern Sudan in order to conserve some of the estimated 50% of flow reduction attributed to wetlands consumption and evaporation in the marshes each year. Despite serious environmental concerns, construction of the Canal began in 1978 as a joint Sudanese–Egyptian effort. As a consequence of the security situation in Southern Sudan, the project was suspended in 1984 with 250 km of the proposed 360 km canal completed. Concerns have been raised regarding the social and environmental impact of the Jonglei Canal.

construction of the engineering works of the first period of Nile water management. Instead of looking for ways to augment supply, water resource managers will need to find ways to use existing supplies more wisely in order to maximize benefits, promote economic growth and alleviate poverty in the Nile Basin.[2] Using the economic optimization model presented in this paper, we look ahead to the challenges of this new era of Nile management. We examine issues that will inevitably arise concerning the economic forces at play in water management decisions and the implications they will have for the economic value of water in the Nile Basin.

This paper is divided into five sections. In the next, second section of the paper we briefly review the concept of the "economic value of water", and make the distinction between the economic value of water to a particular user (user value) and the economic value of water within a river basin system (systems value). We also discuss four economic "pressures" on the economic value of water in the Nile system that arise from a combination of interrelated physical and institutional factors and present some preliminary information on the magnitude of these different influences in the Nile basin.

In the third section we present the economic optimization model developed to analyze the economic benefits of cooperation in the Nile Basin; we also discuss its limitations. The fourth section presents the main results of this model. In the fifth and concluding section of the paper, we summarize our findings and offer some preliminary lessons about the economic value of water in the Nile basin.

Background: two concepts of the "economic value of water" and four economic "pressures" at play in the Nile system

In the context of river basin management, there are two notions of the "economic value of water" that are both conceptually correct and commonly confused (Sadoff *et al.*, 2002). The first, which we term "user value", is the idea that water has economic value to a particular user at a specific location and point in time, such as a household with a private connection using water for domestic purposes, or a farmer abstracting water for irrigation. The economic user value of water is the amount of money a user will be willing to give up to obtain more water and it will be determined both by the use to which this water will be put and the amount of money the user has. This definition of the economic value of water to a user is not based on some abstract notion that water is intrinsically desirable, but is fundamentally determined by its transaction value in a world of scarcity.

It is difficult to generalize about the economic value of water to different users in different locations because both the intended uses of water and users' incomes differ in different times and locations. Information on the current economic value of water to different types of users in different locations in the Nile basin is not available; it is even harder to estimate what such values will be in the future. However, evidence clearly indicates that municipal and industrial users typically have the highest economic values of water (Briscoe, 1996). The economic value of water in irrigated agriculture is much less. How much a farmer is willing to pay for water for irrigation depends on the crop being cultivated, the amount of rainfall, the prices of agricultural products, the prices of other inputs such as fertilizer and labor and other factors, but it is typically in the range of US$0.01–0.25 per cubic metre. The economic value of water for large-scale irrigation of cereal crops such as wheat or rice is at the low end of this

[2] An important corollary question is how to share these benefits among riparian countries in an equitable manner. We intend to examine this question in a future paper.

range. The economic value of water for the irrigation of high-value fruits and vegetables is occasionally at the high end of this range, but depends to a large extent on market conditions and transportation costs of delivering produce to market.

The economic value of water to an individual need not, however, depend only on whether an individual actually abstracts water for use in some "economically productive" activity or for final consumption. People may well be willing to exchange scarce resources or money to leave water in its natural state in the environment. In this case water "generates" economic value for people by doing what it is already doing, sustaining natural ecological systems. People may value water in its natural state because this enables them to harvest certain products and wildlife (e.g. fish) from the ecosystem. For example, many people living near the Sudd swamps in Sudan harvest fish and graze their cattle on the grasses sustained by the retreating waters of the annual floods on the White Nile. For them water in the natural environment has economic value, although their willingness to pay for these ecological services must be very low, simply because their incomes are minimal. At the other extreme, some Europeans might be willing to pay substantial amounts of money to maintain the current hydrological regime of the Sudd swamps in order to sustain the migratory bird life that winters there and summers in Europe (Whittington & McClelland, 1992).

Individuals may also be willing to pay to leave Nile water in its natural state, not because they want to fish or preserve bird life that they may some day enjoy seeing, but simply to preserve a natural environment for its own sake, because it is the "right" or moral thing to do. This "existence" or "non-use" value is also a component of the true economic value of water if people are willing to sacrifice (or pay) to preserve water in the natural environment. Individuals who derive economic value from the preservation of Nile water in its natural state might be willing to pay to avoid the flooding of the canyons of the Blue Nile gorge by a series of reservoirs, in part perhaps to preserve the biological diversity and genetic resources that exist in a largely undeveloped natural habitat. The waters of the Nile can thus create economic value to individuals living far outside the boundaries of the watershed. Typically individuals' motivations for preservation would represent a combination of both use and non-use values.

The second notion of the "economic value of water" incorporates the first, but takes a broader, systems perspective. This "systems value" or "shadow value" of water is defined as the total value generated by water within the river system – the sum of all benefits and costs to the riparians as a whole. Rather than asking what the value of water would be to a specific user, we attempt to ascertain the aggregate value of water to all of the inter-related users in the river system. From the systems perspective, we look at how changes in water availability – perhaps caused by changes in the water management strategy for a river basin – would affect all water users and hence the cumulative value of water in the system. The economic value of water from a systems perspective will be different from that of a single user because of the physical interdependencies of water use in a river basin that result in both positive and negative externalities. It is the concept of the economic value of water from a systems perspective that allows us to estimate the economic value of cooperation in an international river basin.

The economic value of water in the Nile Basin from this second, systems perspective will be determined by the interactions and magnitude of several different relationships, including the size of the evaporation and seepage losses, the hydroelectric power generation potential at different sites and the magnitude of the agricultural user values in different locations. These factors, coupled with the physical structure of the river basin network, create four principal "economic pressures" that affect how the water resources system should be managed and operated to maximize the system-wide economic benefits. We next discuss these four "economic pressures" and present estimates of some of the data that will

determine their relative magnitude in the Nile system. Some of these data depend upon what projects are assumed to be in place and in operation in the Nile Basin, how they are operated and how much water is withdrawn by the riparian countries. For these illustrative calculations, we assume that the water withdrawals are at current levels and that a full set of Nile infrastructure projects is in place (Table 1).[3]

Economic pressure no. 1: "Withdraw water for irrigation as far upstream as possible – before you lose it through evaporation and seepage"

As Nile water flows north toward the Mediterranean, much is lost from evaporation and seepage. For each cubic metre of water that leaves Lake Tana in Ethiopia, about 40% is lost by the time it reaches the Mediterranean (assuming none is withdrawn for irrigation along the way). In some stretches of the river, evaporation and seepage losses are larger than in other places and in the southern reaches of both the White and Blue Niles rainfall in part compensates for evaporation and seepage losses. Seepage losses in one stretch may enter the groundwater aquifer along the river and contribute to in-stream flows downstream. But from Khartoum north, the Nile flows through severe desert and the net evaporation and seepage losses are substantial.

Figure 1 shows the proportion of a cubic metre of water starting at Lake Tana that remains at different points along the Blue and Main Niles. Figure 2 shows similar information for a cubic metre of water starting at Lake Victoria and travelling down the White and Main Niles. The losses experienced include average evaporation from major reservoirs, both existing and proposed. The evaporation losses amount to 1–2% of the flow along each stretch north of Khartoum. Evaporation losses from the Sudd swamps and the Aswan High Dam Reservoir are particularly severe, constituting almost 50% and 15% of the entering flows, respectively.

From an economic perspective, if there were no other countervailing pressures, one would want to withdraw water for consumptive uses such as irrigation and municipal water supply before it flowed downstream, because this strategy would minimize evaporation and seepage losses. In other words, *ceterus paribus*, there is more water to use if it is used upstream rather than downstream, so economic efficiency would dictate that it be used upstream.

Economic pressure no. 2: "Withdraw water for irrigation as far downstream as possible in order to take full advantage of hydroelectric power generation facilities"

Hydropower is a non-consumptive water use and thus it is advantageous from an economic perspective to let each cubic metre flow through as many hydropower generation facilities as possible before it is withdrawn for consumption. This second economic pressure would dictate that, *ceterus paribus*, consumptive uses should occur downstream so that water flows through as many hydropower generation facilities as possible. One of the opportunity costs of withdrawing water upstream is therefore the foregone hydropower generation potential from all hydropower facilities downstream of that consumptive use that could have been obtained if the water had not been withdrawn.

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[3] This list of infrastructure projects is derived from existing proposals; it is not our recommendation for the "best" set of infrastructure projects for the Nile basin.

Table 1. Potential development projects in the Nile Basin.

Project	Hydropower production (installed capacity in MW)	Water savings (in billion m^3)
Blue Nile		
Blue Nile storage projects (Lake Tana, Karodobi Dam, Mabil Dam, Mendaia Dam and Border Dam)	5700 MW	4
White and main Nile		
Wetland projects (Jonglei I and II, Machar Marshes and Ghazal projects)	–	11
Demolition of Jebel Aulia dam	–	3
White Nile reservoirs (Lake Albert and Lake Kyoga)	–	–
White Nile hydropower stations (Owen Falls Dam, Bujagali, Kalangala, Kamdini, Ayago South, Ayago North and Murchison Falls)	2300 MW	–

The magnitude of hydropower generation at each point in the system is largely a function of two factors: (1) the quantity of water passing through the turbines and (2) the net head at each hydroelectric power generation site. Figures 3 and 4 show the average annual flows passing through the existing and some potential hydroelectric power facilities on the Blue and main Niles and White and main Niles, respectively. The flow of water passing through the potential hydroelectric power facilities on the Blue Nile increases steadily as the Blue Nile gathers volume, peaking at the Ethiopian–Sudanese border (at the proposed Border Dam). Releases from the Aswan High Dam are higher even after accounting for evaporation and seepage losses because the flow of the White Nile has augmented the flow of the Blue Nile at Khartoum.

Figures 5 and 6 illustrate the average net head at each existing and some potential hydropower facilities along the Blue and main Niles and the White and main Niles, respectively. As shown, the net heads available on the upper reaches of the Blue Nile are much larger than those at sites on the Blue Nile in Sudan or even at the Aswan High Dam Reservoir. The net heads on the upper reaches of the White Nile are also large, but considerably less than on the Blue Nile in Ethiopia (Georgakakos, 1998).

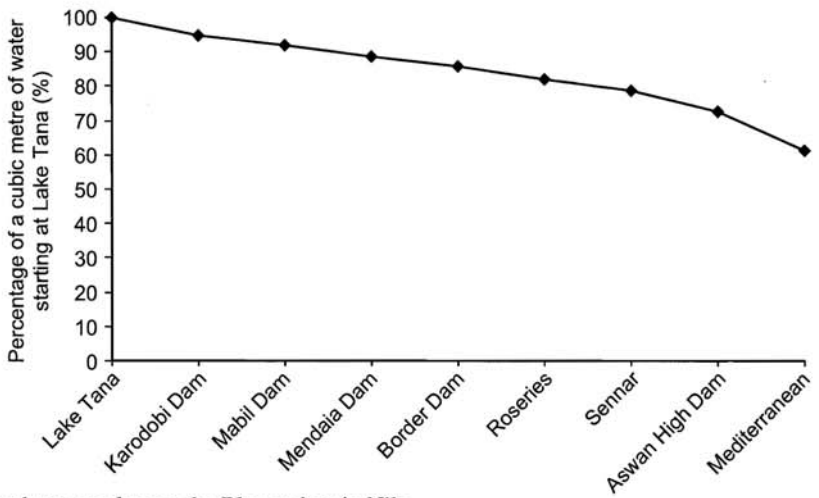

Fig. 1. Evaluation and seepage losses: the Blue and main Nile.

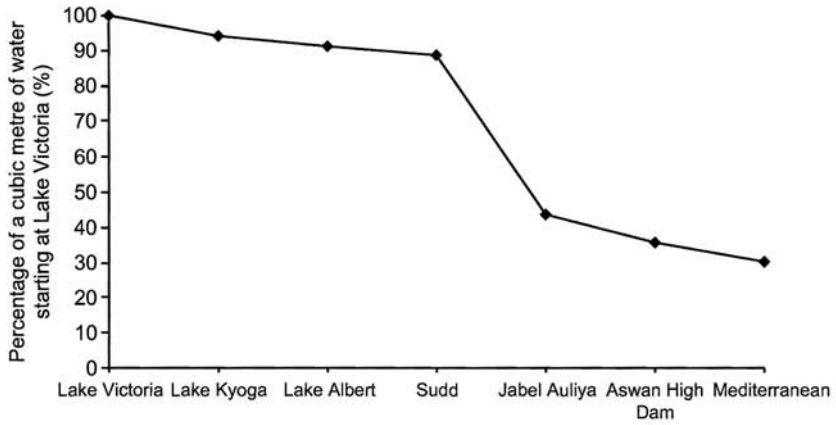

Fig. 2. Evaluation and seepage losses: the White and main Nile.

Figure 7 shows the monetary value created by a cubic metre of water flowing through hydroelectric power turbines at each of the sites along the Blue and main Niles, assuming each kilowatt-hour has an economic value of US$0.08. The economic value of hydropower created per cubic metre is highest upstream on the Blue Nile in Ethiopia owing to the large net heads at Lake Tana and Karadobi. The cumulative value generated by a cubic metre of water flowing downstream in the Blue Nile does not increase much after the Border Dam because the net heads at the subsequent downstream reservoirs (Roseires, Sennar and Aswan High Dam) are not great and substantial evaporation and seepage losses are incurred along the way. Figure 8 shows the cumulative value of the hydropower generated by a cubic metre of water flowing downstream on the Blue and main Niles.

Figures 9 and 10 present the results of similar calculations for the White Nile. Existing studies suggest that there are six potential power station sites between Lake Victoria and Lake Kyoga, with capacity ranging from 150–350 MW. For a cubic metre of water flowing from Lake Victoria, the economic value

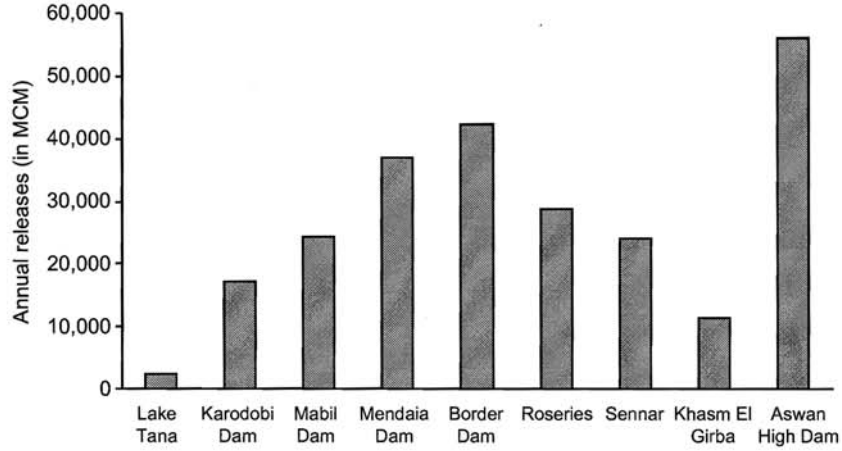

Fig. 3. Average annual flows: the Blue and main Nile. MCM = million cubic metres.

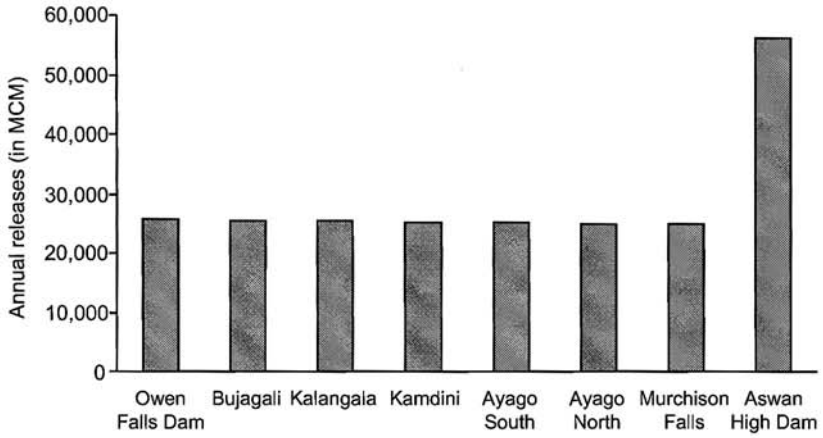

Fig. 4. Average annual flows: the While and main Nile. MCM = million cubic metres.

of hydropower generated at Aswan High Dam only accounts for a small fraction of the total value because of the substantial evaporation and seepage losses in both the Sudd area and the dam itself.

Economic pressure no. 3: "Store water upstream to reduce evaporation losses"

Figures 1 and 2 illustrate the importance from a systems perspective of minimizing the economic losses associated with evaporation losses at Aswan. As noted above, one way of doing this is to use water upstream. Another approach is to reduce storage in the Aswan High Dam Reservoir by moving storage upstream into the potential Blue Nile Reservoirs and the Equatorial Lakes. For an equivalent amount of storage, evaporation losses upstream are reduced because (1) volume-to-elevation relationships are more favorable at the upstream reservoir locations and (2) evapotranspiration is lower at the more humid upstream sites (Guariso & Whittington, 1987).

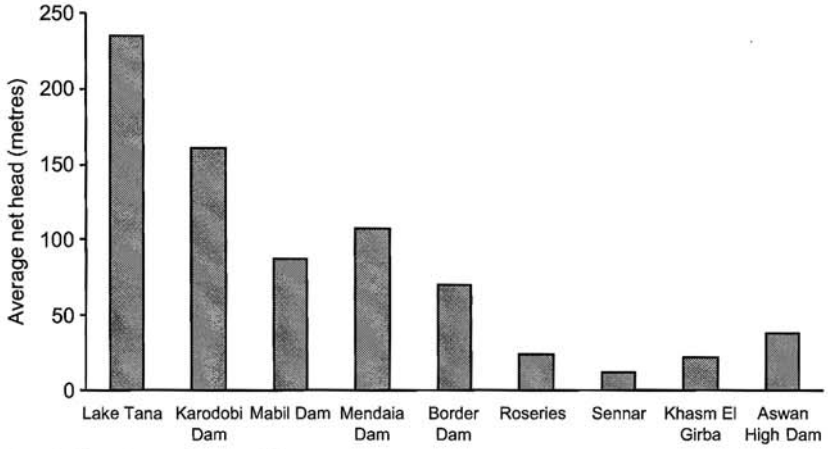

Fig. 5. Average net head: the Blue and main Nile.

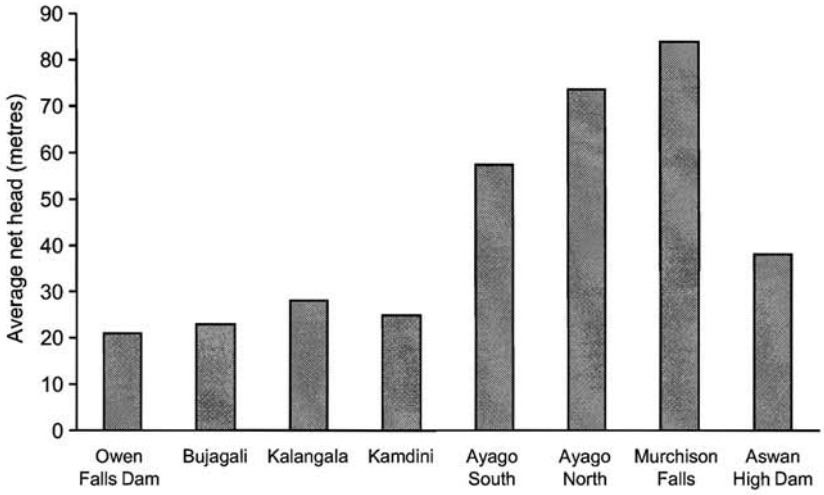

Fig. 6. Average net head: the White and main Nile.

Economic pressure no. 4: "Withdraw water where its user value is greatest"

The economic benefits from water use will be greatest when water is used by those who use it most productively, i.e. those with the highest user values. At this time not enough is known about the economic value of water to users to make any definitive statements about where in the Nile Basin user values of water will be highest. However, four relationships will almost certainly hold. First, the initial units of water that a riparian country receives have the potential to be the most valuable. Users will derive more value per unit of water when it is scarce than when it is abundant, because there is generally a limit to the amount of water that will be used in the most highly productive sectors, i.e. household and industrial consumption. Initial units of water should be allocated to their most productive uses, while

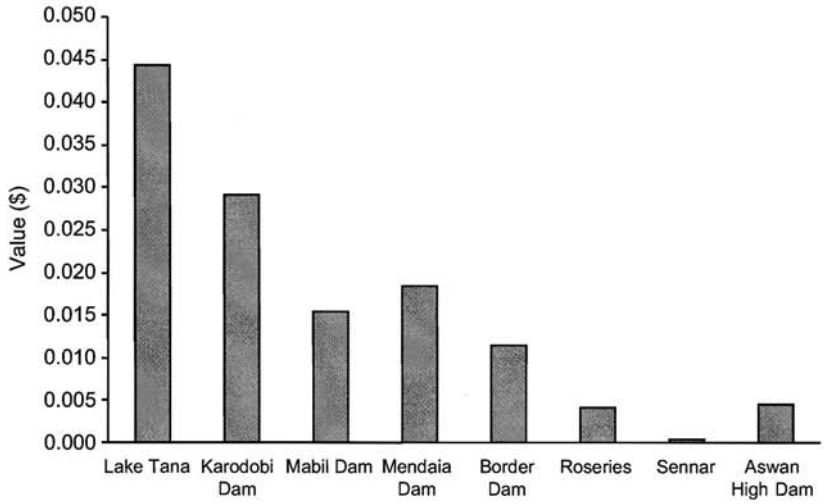

Fig. 7. Economic value of hydropower generated by a cubic metre of water flowing through the Blue and main Nile.

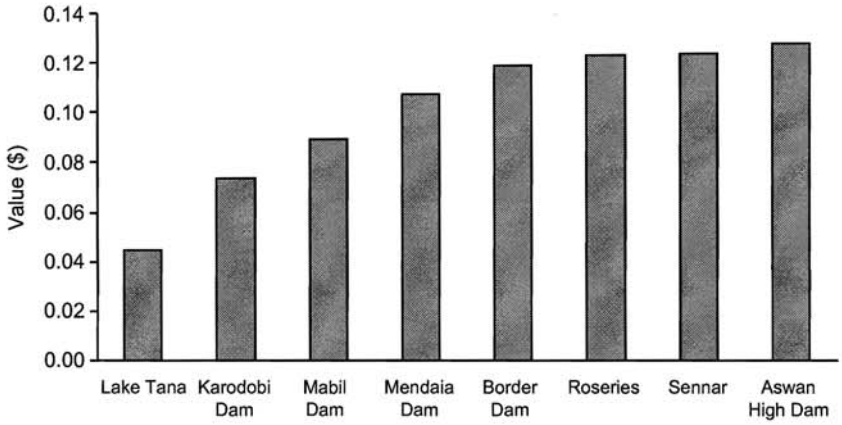

Fig. 8. Cumulative economic value of hydropower generated by a cubic metre of water flowing through the Blue and main Nile.

subsequent units of water should be allocated to uses of decreasing productivity. Riparian countries with little current access to water may still have opportunities to expand high-value uses that have already been fully exploited by countries with abundant supplies.

Second, those countries that have the most economically sound water resource management policies, practices and institutions, will likely generate the highest user values for water. Countries that are able to devise and implement institutional arrangements to charge water users prices that reflect scarcity values, for example, are much more likely to foster economically efficient water use (and put water to high-value uses) than countries that do not. Thus, the highest user values of water in the Nile Basin will not simply be the result of technological, economic and climatic factors, but also of the water resource policies and practices adopted by the riparian countries themselves. Because policies change, the relative economic value of water to different users in the basin is best viewed as dynamic. As discussed below, this insight is a key to unlocking the economic potential of the Nile's water resources.

Third, those countries with economically sound policies in water-related sectors will also be more likely to generate higher use values for water. Agricultural policies that promote the production of high value crops and water-efficient farming methods, infrastructure policies that enable market access for high value agricultural products, and industry or service sector policies that encourage high value production with moderate or minimal water requirements will all increase the user value of water in a country.

Fourth, the economic value of leaving water in a free-flowing river to preserve natural ecosystems and to provide recreational opportunities will grow over time. The critical environmental assets at risk from Nile water management are the canyons of the Blue Nile gorge in Ethiopia and the immense freshwater swamps on the White Nile in Sudan. Today the environmental and aesthetic values associated with free-flowing stretches of the Nile will seem of secondary importance to many Nile riparian countries. Yet experience suggests that the economic value of these environmental assets will increase; even today they may have surprisingly high values for ecotourism and debt-for-nature swaps.

Balancing economic pressures in a systems context: the Nile economic optimization model (NEOM)

The Nile economic optimization model (NEOM) provides a framework for integrating hydrological and economic information in order to consider jointly the effects of the four economic pressures

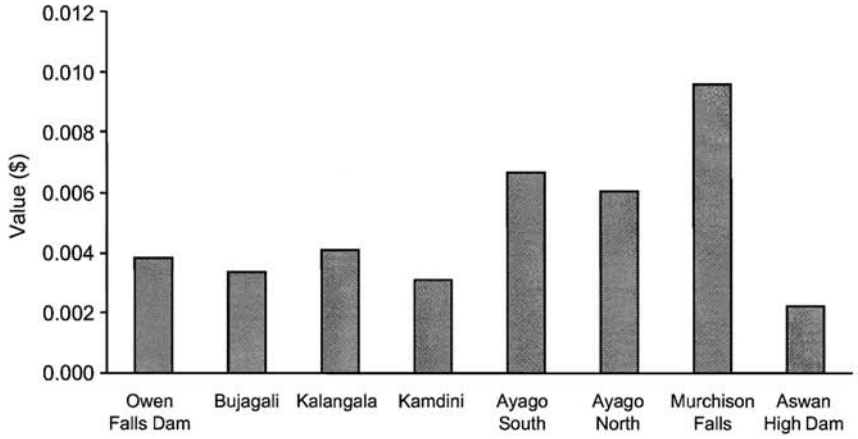

Fig. 9. Economic value of hydropower generated by a cubic metre of water flowing through the While and main Nile.

described above. It is formulated as a non-linear, constrained optimization problem designed to determine the annual pattern of water use that will maximize the sum of economic benefits from irrigated agriculture and hydropower generation in the Nile basin (i.e. the systems value of water generated from irrigation and hydropower). Figure 11 shows how the Nile system is represented in the NEOM.[4] The water resources network is characterized as a series of nodes and links between these nodes. There are two kinds of nodes in the NEOM: reservoirs and irrigation schemes. The model includes all the existing reservoirs and irrigation schemes in the basin, as well as eight new reservoirs and 13 new irrigation schemes. The links between nodes in the NEOM describe the physical characteristics of the Nile river along different stretches (e.g. the capacity of the channel and the net evaporation and seepage losses along each stretch). The Jonglei Canal is a special type of link because the user can specify whether or not it can be assumed that it will be built and the amount of water it can be assumed to be able to carry.

The mathematical formulation of the NEOM can be expressed as:

$$Maximize \sum_{c}\left\{\sum_{i,c}P_w^{i,c}\sum_{t}Q_t^{i,c}+\sum_{i,c}P_e^{i,c}\sum_{t}KWH_t^{i,c}\right\}$$

Subject to the following constraints:

Continuity constraints for reservoir nodes

$$S_{t+1}^{i}=S_t^i+I_t^i+\left(1-EV_t^{j-i}\right)R_t^j-\left(e_t^i-r_t^i\right)\left[a^i+b^i\left(\frac{S_t^i+S_{t+1}^i}{2}\right)\right]-Q_t^{i,c}-R_t^i \tag{1}$$

for $t=1,2,3\ldots12$

[4]See Wu (2005) for a more detailed description of the NEOM.

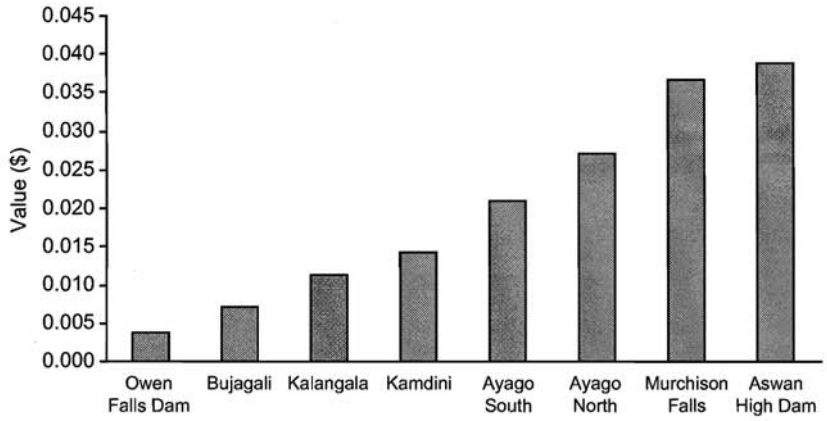

Fig. 10. Cumulative economic value of hydropower generated by a cubic metre of water flowing through the White and main Nile.

Continuity constraints for intermediate nodes

$$\left(1 - EV_t^{j-i}\right)R_t^j + I_t^i = R_t^i + Q_t^{i,c} \tag{2}$$

for $t = 1, 2, 3 \ldots 12$ (j indicates nodes immediate before i and can be more than one node)

Storage capacity constraints for reservoir nodes

$$S_{Min}^i \leq S_t^i \leq S_{Max}^i \tag{3}$$

Irrigation water withdrawal pattern

$$Q_t^{i,c} = Q^{i,c}\delta_t^i \tag{4}$$

for $t = 1, 2, 3 \ldots 12$

Hydropower generation equalities

$$KWH_t^{i,c} = \eta R_t^i f\left(S_t^i, S_{t+1}^i\right)\varepsilon \tag{5}$$

for $t = 1, 2, 3 \ldots 12$

Hydropower generation capacity constraints

$$KWH_t^{i,c} \leq CAP^{i,c} \tag{6}$$

for $t = 1, 2, 3 \ldots 12$

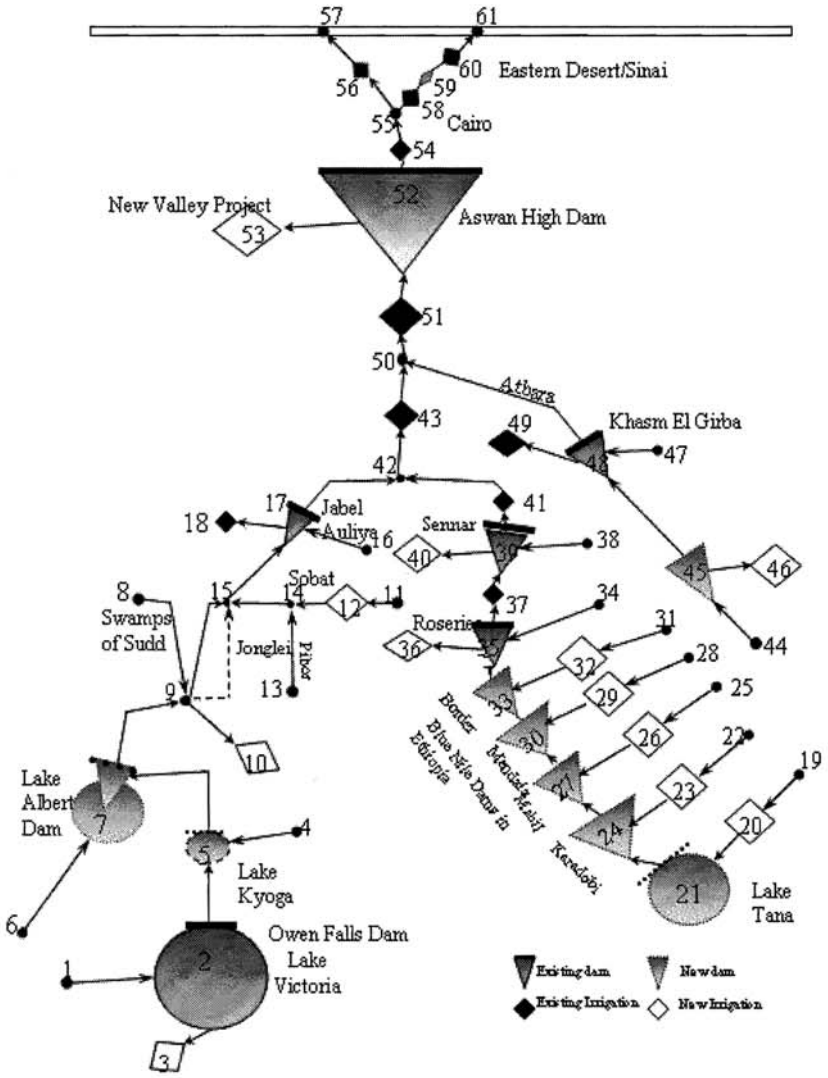

Fig. 11. Schematic diagram of the Nile Basin.

Non-negativity constraints

$$S_t^i, R_t^i, Q_t^i, KWH_t^{i,c} \geq 0 \tag{7}$$

for all the decision variables and for $t = 1, 2, 3 \ldots 12$

where

$P_w^{i,c}$ = the economic value of water for irrigation at site i for country c (in US\$/m^3),
$Q_t^{i,c}$ = the quantity of water withdrawal for irrigation at site i for country c in month t,
$P_e^{i,c}$ = the electricity price at site i for country c (in US\$/kWh),
$KWH_t^{i,c}$ = the hydropower generated at site i for country c in month t,

S_t^i = reservoir storage for reservoir i in month t,
I_t^i = the inflow to site i in month t,
R_t^i = the release (or the outflow) from site i in month t,
EV_t^{j-I} = the percentage of evaporation loss for water flowing from site j, where j indicates immediate nodes before site i and can be more than one, to site I,
e_t^i = the evaporation rate at site i in month t,
r_t^i = the addition to flow at site i in month t owing from rainfall,
a^i and b^i = the constant and the slope of the area storage relation of the reservoir, respectively,
S_{Min}^i and S_{Max}^i = the minimum and maximum storage for any reservoir at site I,
$Q^{i,c}$ = the irrigation withdrawal for irrigation site i in October,
δ_t^i = the coefficients of irrigation withdrawal for site i in month t in relation to irrigation withdrawal for site i in October,
η = unit conversion constant,
$f(S_t^i, S_{t+1}^i)$ = function determining average productive head,
ε = hydropower efficiency and
$CAP^{i,c}$ = the maximum hydropower that can be generated at site i in month t.

The model uses a time increment of one month and solves for values of the decision variables S_t^i(reservoir storage), R_t^i(release for outflow), $Q_t^{i,c}$(withdrawal for irrigation), $f(S_t^i, S_{t+1}^i)$ (average productive head) and $KWH_t^{i,c}$(amount of electricity generated) for a single year to determine the combination of monthly releases from a specified set of Nile hydropower generation facilities and the monthly abstractions at specified sets of irrigation schemes that will generate the greatest annual economic benefits to the riparian countries as a whole. The constraints require continuity at different nodes, storage capacity constraints, irrigation water withdrawal patterns, hydropower generation equalities, hydropower generation capacity constraints and non-negative constraints.

This basic model formulation was first proposed by Thomas & Revelle (1966) for studying the operation of the Aswan High Dam. It was later extended by Guariso & Whittington (1987) to include reservoirs on the Ethiopia portion of the Blue Nile. The model presented above is the first time the formulation has been used to characterize the entire Nile Basin. The model is quickly solved on a personal computer using GAMS software.

The model can be used to evaluate the economic implications of different combinations of proposed Nile water control infrastructure that have been proposed by the riparian countries (Figure 11). The user can specify the total amount of water available over the course of the model year (i.e. whether the water resources managers are attempting to operate the control structures during an average, high or low hydrological year). The user of the model can also constrain the optimization to ensure specific levels of water flow or withdrawals, for example, to meet basic needs, priorities or obligations at any point in the river system. Municipal and industrial water withdrawals can be specified for each riparian country and the model can be constrained so that these demands are always met. Environmental goals can also be incorporated in NEOM as constraints on system management. For example, minimum flows through the Sudd swamps can be required. NEOM can be used to examine the implications of not flooding portions of the Blue Nile gorge, or requiring minimum flows along different stretches of the river. The user can also prohibit the construction of specific environmentally sensitive projects.

NEOM does not explicitly include the economic benefits of flood control. In the future, if most of the proposed control infrastructure is built, operating the Nile system to maximize the economic benefits

from irrigation and hydropower generation should in fact solve flooding problems on the Blue and main Niles. The economic benefits of flood control are thus relevant for investment planning purposes in terms of ensuring that the economic benefits of proposed dams justify their costs. Once these control structures are completed, however, operating the system to achieve hydropower and irrigation objectives will indirectly ensure that flood damage is minimized because the seasonal variability of the Nile flow will be smoothed. The proposed reservoirs will likely be sufficiently large to store substantial amounts of the water from high floods for use during periods of low floods, mitigating the effects of floods and, to some extent, droughts.

There are numerous other limitations of this model formulation. For example, neither water quality considerations nor sediment transport is incorporated, nor are groundwater flows incorporated explicitly in the model. The NEOM is deterministic and assumes that the managers of the system know the pattern of inflows throughout the basin over the coming year. Moreover, this is an annual model and does not address the complexity of over-year storage issues.

Most importantly, the capital costs of the infrastructure development projects are not included. There are two contexts in which this admittedly extreme assumption might be relevant. The first is if international donors provided grant financing to build the proposed Nile infrastructure projects. Second, after such infrastructure is built, the capital represents sunk costs and from both an economic and social perspective should be operated to maximize economic benefits. Nevertheless, it is important to emphasize that the results presented in this paper should not be viewed as an *ex ante* economic justification for the construction of infrastructure projects in the Nile basin.

We have confronted numerous data deficiencies and were forced to make many simplifications to formulate and solve this economic optimization model for the Nile Basin. However, from an economic perspective, the main problem is the lack of information on the demand functions for irrigation water in the different riparian countries. This is not a problem that will be solved easily or quickly because these user values of water are simply unknown today in the Nile Basin. It is also important to emphasize that such economic user values of water are not static. They will change over time in response to infrastructure investments and technological and climatic factors, as well as macroeconomic and sector policies in the riparian countries.

To address this uncertainty in the user values of water in irrigated agriculture, our data analysis consisted of three steps. First, we have assumed an economic value of water in agriculture and a value of hydropower that are generally consistent with international experience (US\$0.05/m^3 in irrigated agriculture and US\$0.08/kWh) in well-run irrigation schemes and power systems. We have assumed that these user values are the same in all riparian countries in the Nile basin and that they are constant regardless of the amount of water withdrawn in a particular country (i.e. for this step of the analysis we have assumed perfectly horizontal demand curves for water in agriculture and hydropower.) We then used the NEOM to examine several scenarios with different assumptions about the water control projects in place in the basin and the locations and amounts of water withdrawals. Water withdrawals for several of the scenarios were constrained so that fixed amounts were withdrawn by each riparian, while water withdrawals in the final model run were unconstrained so that the model could determine where and how much water should be withdrawn to maximize total economic benefits (systems values). We then compared (a) the scenarios in which the results were constrained by fixed water withdrawals, to (b) the scenario in which water withdrawals were unconstrained (i.e. in which water was free to be allocated to the highest value uses). This approach allowed us to examine the economic implications of different patterns of water withdrawal for irrigation.

Second, we conducted sensitivity analysis by varying the user value of water in irrigated agriculture. We evaluated how the economic value of cooperation would change for different user values of water for irrigation, still maintaining the assumption that the user value for the water in irrigation would be the same across different riparian countries.

Third, we relaxed the assumption that different riparian countries had the same user value of water in irrigation and allowed this value to differ across countries. Starting from the baseline case for which the user value of water in irrigation was assumed to be US$0.05/m^3 for both upstream and downstream riparian countries, we evaluated four cases for which a group of countries (upstream or downstream riparian countries) would have high or low user value of water for irrigation while the user value of water in irrigation for the rest of the riparian countries (downstream or upstream riparian countries) remains at US$ 0.05/m^3: (1) high user value for water in irrigation for upstream riparian countries (Ethiopia and Equatorial states), (2) low value for upstream riparian countries, (3) high value for downstream riparian countries (Sudan and Egypt) and (4) low value for downstream riparian countries.

The next section of this paper presents the results of the analyses for each of these three steps for dealing with the uncertainty in user values.

Results

In order to determine the economic value of cooperation, we first calculate the total economic benefits under two cases: the *status quo* conditions and full cooperation. Under the *status quo* situation, no proposed infrastructure is built and irrigation water is allocated to individual riparian countries in approximately the current allocation pattern. We define "cooperative full development" as the state of the world in which all proposed infrastructure projects (i.e. Blue Nile reservoirs, wetland conservation projects and White Nile power projects currently under consideration by the riparians) will be completed and operated to optimize the total economic benefits for the whole basin. We judge that it would be impossible to build the full set of Nile infrastructure projects under discussion and to operate them to maximize economic benefits without full cooperation among the riparians. On the other hand, the Nile riparians could cooperate fully in the construction and operation of a lesser number of infrastructure projects; we term this state of the world "cooperative partial development". On the other hand, a smaller number of infrastructure projects might result from less than full cooperation, that is, coalitions among some subset of Nile riparians.

Table 2 presents the comparison between the *status quo* and cooperative full development (assuming the value water for irrigation is US$0.05/m^3 and the value for hydropower is $0.08/kWh). The difference

Table 2. Economic value of cooperation: *status quo* versus full cooperation.

	Total economic value (millions of US$)		
	Status quo	Full cooperation	Economic value of cooperation
Ethiopia	50	3010	
Sudan	723	513	
Egypt	3204	4313	
Others	186	1272	
Total	4164	9107	4943

between the total economic benefits between the *status quo* and cooperative full development can be interpreted as the economic value of cooperation.[5] Table 2 shows that the economic value of cooperation is US$4.94 billion (1 billion $= 10^9$) annually, more than the total economic benefits realized at present for the *status quo* conditions for the whole basin. In terms of the average economic value per cubic metre, the economic value of water will increase from 0.04 per m^3 (including both irrigation and hydropower benefits) to 0.09 per m^3 due to cooperative full development.

While cooperative full development in the Nile basin would create significant economic benefits compared to the *status quo*, this is only one of many possible scenarios for the future Nile development. We thus consider four additional scenarios in our analysis. These scenarios are defined based on the status of capital investment projects that are completed. A brief description for each scenario is given in Table 3, including the *status quo* (Scenario 1) and cooperative full development (Scenario 6). Scenarios 2 to 5 represent situations in which only some of the currently proposed infrastructure projects are completed. These may be envisaged as partial cooperation solutions, or alternatively as steps on the path to full cooperation (where investment is constrained by either a lack of capital for investment or a lack of political agreement about which projects to construct). Scenario 2 represents the partial cooperative development of hydropower potential in the Blue Nile (only Lake Tana, Mobil Dam and Border Dam are assumed to be built). Scenario 3 represents the full development on the Blue Nile (all five proposed dams in Ethiopia are assumed to be built) and Scenario 4 represents the full development on the Blue Nile plus the completion of the wetland projects on the White Nile. Scenario 5 represents full development on the White Nile (demolition of Jebel Aulia dam and the construction of the While Nile reservoirs and power stations and wetland projects) plus partial development on the Blue Nile (only Lake Tana, Mobil Dam and Border Dam are assumed to be built).

For each scenario of these six scenarios, we consider two cases: (1) fixed amounts of water withdrawals for individual riparian countries and (2) no constraints on water withdrawals in a particular country. Two factors are taken into consideration in establishing water withdrawal constraints in our analysis. The first is current use patterns which reflect the 1959 Nile Waters Agreement between Egypt and Sudan. The second is the aspiration of the upstream riparian countries to utilize Nile water for development of irrigation schemes. We assume that Ethiopia would eventually utilize 10 billion m^3 of water from the Nile basin for irrigation purposes (Whittington *et al.*, 1995) and that the equatorial states would use at least 2 billion m^3 of water annually.

It is, in fact, impossible to know what water withdrawal targets would "satisfy" all riparian countries and moreover it must be assumed that desired withdrawals will change over time. The specific water withdrawal constraints used in these analyses are thus somewhat arbitrary and are used only for purposes of illustration. Our main objective is to demonstrate that imposing water withdrawal targets can be quite costly from an economic perspective.

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[5] Some specific characteristics of these investment projects justify our use of the term "economic value of cooperation" here. The idea of building these investment projects is not new; in fact many projects discussed here are little different from the Century Storage Project proposed by H.E. Hurst more than half a century ago. The primary reason for lack of progress in putting these investment projects in place has been lack of cooperation among the Nile riparian countries. Some countries where it is proposed that these projects be built have not had the financial means to take on these investment projects on their own and owing to the potential objection of downstream countries, the financing of these projects has been complicated. Such a situation is likely to continue unless the Nile riparian countries can agree to cooperative schemes that will allow riparians jointly to harness the potential of these investment projects, either as individuals or through joint partnership arrangements.

Table 3. Description of scenarios.

	Blue Nile projects	Wetland projects (Jonglei, Machar, Ghazal)	White Nile projects (White Nile reservoirs and power stations and demolition of Jebel Aulia dam)
Scenario 1: *status quo*	No	No	No
Scenario 2	LakeTana/Mabil/Border	No	No
Scenario 3	Full development	No	No
Scenario 4	Full development	Yes	No
Scenario 5	LakeTana/Mabil/Border	Yes	Yes
Scenario 6: full cooperation	Full development	Yes	Yes

The economic value of cooperation on the Blue Nile can be seen by comparing Scenarios 2 and 3 with Scenario 1 (*status quo*). Under the scenario of limited infrastructure development on the Blue Nile, the annual economic value of cooperation is between US$1.15 billion and US$1.97 billion (Tables 4 and 5), depending on whether or not the water withdrawal targets are imposed. In the case where all Blue Nile development projects are built (Scenario 3), such benefits increase to between US$2.76 billion and US$3.63 billion annually. The economic value of cooperation on the Blue Nile derives mainly from two sources: (1) economic benefits from additional hydropower production from Blue Nile hydropower stations and (2) water savings from shifting storage from the Aswan High Dam Reservoir to these Blue Nile reservoirs. The sizeable difference in economic benefits between the case for which water withdrawal targets are imposed and the case for which such constraints are removed indicates that imposing water withdrawal targets can be costly. Under our assumptions, about US$800 million would be lost annually if these water withdrawal targets were imposed.

The economic benefits of wetland projects are shown in Scenario 4.[6] If no water withdrawal constraints are imposed, the incremental benefits of adding the wetland project to the infrastructure system, given the assumed values for irrigation (US$ 0.05/m^3) and hydropower (US$0.08/kW-h), are quite small (about US$100 million annually). The marginal benefits of the wetland project, however, increase dramatically when water withdrawal targets are imposed (Table 4). Without the water savings from the wetland project, it is impossible to meet the water withdrawal targets for upstream riparian countries while not compromising the irrigation water withdrawal targets of Sudan and Egypt.

Tables 4 and 5 also show the economic value of cooperation on the White Nile. The difference between Scenario 2 and Scenario 5 is that in the latter the White Nile power stations are added (along with the wetland project). Without the White Nile power stations, the NEOM suggests that water from Lake Victoria basin can be best utilized by the equatorial states, even if the wetland project is completed (Scenario 4). With the White Nile power stations, the model allocates most of the White Nile flows from Lake Victoria to the downstream countries. The hydropower power facilities along the White Nile effectively tip the balance in favor of downstream users. Egypt is thus a major beneficiary of the construction of the White Nile power stations because once water passes through the White Nile power stations, the NEOM indicates that the best strategy is for it to continue on to the Aswan High Dam Reservoir in order to capture the hydropower and irrigation benefits in Egypt. From the Egyptian

[6] By wetland projects, we refer here to the Jonglei and the Machar Marshes projects, which could be operated to preserve the majority of the current wetlands.

Table 4. Scenario analysis: economic value of cooperation with water withdrawal constraints.

	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6
Water allocation (BCM)						
Ethiopia	1.00	10.00	10.00	10.00	10.00	10.00
Sudan	12.00	15.00	15.00	17.00	17.00	17.00
Egypt	54.00	45.00	45.00	53.00	54.75	54.60
Others	2.00	2.00	2.00	2.00	2.00	2.00
Total	69.00	72.00	72.00	82.00	83.75	83.60
Hydropower generated (GWh)						
Ethiopia	0	14,948	35,299	35,129	14,812	35,399
Sudan	1543	1572	1902	1990	2382	2448
Egypt	6303	3951	3345	1327	5788	5761
Others	1074	963	963	860	15,533	15,533
Total	8920	21,434	41,509	39,307	38,514	59,141
Total economic value (millions of US$)						
Ethiopia	50	1696	3324	3310	1685	3332
Sudan	723	876	902	1009	1041	1046
Egypt	3204	2566	2518	2756	3201	3191
Others	186	177	177	169	1343	1343
Total	4164	5315	6921	7245	7269	8911
Economic value of cooperation (millions of US$)		1151	2757	3081	3105	4748

Table 5. Scenario analysis: economic value of cooperation without water withdrawal constraints.

	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6
Water allocation (BCM)						
Ethiopia	1.00	0.00	0.00	0.00	0.00	0.00
Sudan	12.00	22.67	30.01	30.01	3.85	6.34
Egypt	54.00	38.27	31.90	33.85	76.11	73.91
Others	2.00	23.77	23.77	23.77	0.00	0.00
Total	69.00	84.71	85.68	87.63	79.97	80.26
Hydropower generated (GWh)						
Ethiopia	0	16,814	37,687	37,687	16,813	37,619
Sudan	1543	2457	2457	2457	2448	2448
Egypt	6303	4250	3596	3789	7957	7714
Others	1074	156	156	156	15,895	15,895
Total	8920	23,677	43,896	44,089	43,113	63,676
Total economic value millions of US$						
Ethiopia	50	1345	3015	3015	1345	3010
Sudan	723	1330	1697	1697	388	513
Egypt	3204	2253	1883	1996	4442	4313
Others	186	1201	1201	1201	1272	1272
Total	4164	6130	7796	7908	7447	9107
Economic value of cooperation (millions of US$)		1966	3632	3745	3284	4943

perspective, a strategy for alleviating concerns over potential irrigation withdrawals in the equatorial states might thus be to assist these countries in the expansion of their hydropower facilities.

Figure 12 shows how the total economic benefits would increase when the level of cooperation (infrastructure development) increases. The level of cooperation can be interpreted as either (a) more riparian countries are brought into cooperative development schemes, or (b) more capital investment projects are added to the system, or (c) both. The effects of imposing country-level water withdrawal constraints are also shown in Figure 12. Except for the case of full cooperation, imposing water withdrawal constraints will significantly reduce the economic benefits of cooperation. In fact, the economic savings in removing water withdrawal constraints for the case of full cooperation in the Blue Nile exceeds the marginal benefits of building a wetland project – even without taking into consideration the capital costs and negative environmental impact associated with the wetland project.

Tables 6 and 7 present the results from the sensitivity analyses, varying the value of irrigation water. If the economic value of water for irrigation is reduced to US$0.02/m^3, the NEOM allocates all of the irrigation water to Egypt because it is preferable to withdraw irrigation water after the hydropower benefits of release from the Aswan High Dam are realized instead of irrigating upstream and losing out on these hydropower benefits. The second economic pressure – "withdraw water for irrigation as far downstream as possible" – has clearly dictated the model results here. The model allocates more water to Sudan as the economic value of water for irrigation increases. When the economic value of water for irrigation increases to US$0.08/m^3, it is better to withdraw water before the Aswan High Dam because the gains of additional hydropower generated at Aswan High Dam cannot offset the losses from evaporation.

Table 6 also shows that, if the value of water for irrigation is the same across different riparian countries, it is not justified from the systems point of view to allocate any water for upstream riparian countries for irrigation purposes within the range of economic value of irrigation water assumed for this sensitivity analysis (US$ 0.02/m^3 to US$ 0.08/m^3). The model would allocate water to upstream riparian countries if the economic value of water for irrigation in these countries is much higher than that in the

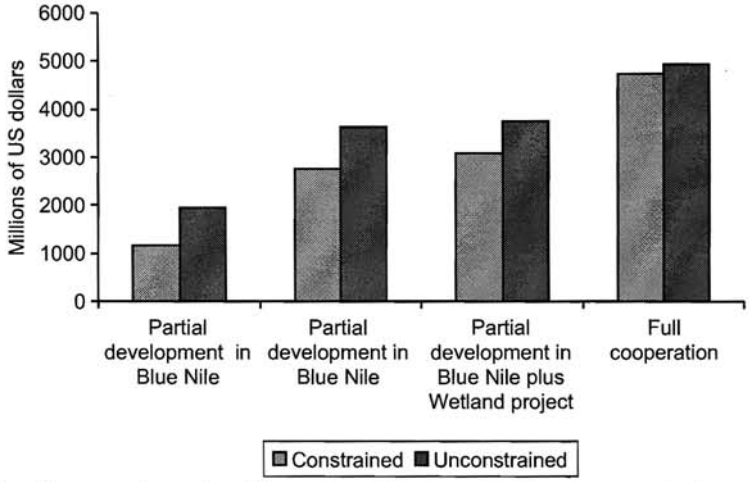

Fig. 12. Economic value of cooperation under different scenarios: constrained vs. unconstrained.

Table 6. Sensitivity analyses for variation in the value for irrigation (assume the value for irrigation is the same across different riparian countries).

	Low value of water for irrigation: US$ 0.02/m^3		Median value of water for irrigation: US$ 0.0.5/m^3		High value of water for irrigation: US$ 0.08/m^3	
	Status quo	Full cooperation	*Status quo*	Full cooperation	*Status quo*	Full cooperation
Water allocation (BCM)						
Ethiopia	1	0	1	0	1	0
Sudan	12	0	12	6	12	71
Egypt	54	69	54	74	54	17
Others	2	0	2	0	2	0
Total	69	69	69	80	69	88
Hydropower generated (GWh)						
Ethiopia	0	37,687	0	37,619	0	37,568
Sudan	1543	2467	1543	2448	1543	2422
Egypt	6303	12,559	6303	7714	6303	2134
Others	1074	15,895	1074	15,895	1074	15,895
Total	8920	68,608	8920	63,676	8920	58,019
Total economic value (millions of US$)						
Ethiopia	20	3015	50	3010	80	3005
Sudan	363	197	723	513	1083	5858
Egypt	1584	2382	3204	4313	4824	1532
Others	126	1272	186	1272	246	1272
Total	2094	6866	4164	9107	6234	11,666
Economic value of cooperation (millions of US$)		4773		4943		5433

Table 7. Sensitivity analyses for variation in economic value of water for irrigation (value for irrigation can differ across riparian countries).

	Low value of water for irrigation for upstream riparian countries: US$ 0.02/m^3		High value of water for irrigation for upstream riparian countries: US$ 0.08/m^3		Low value of water for irrigation for downstream riparian countries: US$ 0.02/m^3		High value of water for irrigation for downstream riparian countries: US$ 0.08/m^3	
	Status quo	Full cooperation	*Status quo*	Full cooperation	*Status quo*	Full cooperation	*Status quo*	Full cooperation
Water allocation (BCM)								
Ethiopia	1	0	1	38	1	36	1	0
Sudan	12	6	12	4	12	0	12	71
Egypt	54	74	54	38	54	43	54	17
Others	2	0	2	8	2	6	2	0
Total	69	80	69	87	69	85	69	88
Hydropower generated (GWh)								
Ethiopia	0	37,687	0	29,435	0	29,863	0	37,630
Sudan	1543	2448	1543	758	1543	889	1543	2418
Egypt	6303	7709	6303	4220	6303	4984	6303	2134
Others	1074	15,895	1074	13,969	1074	14,643	1074	15,895
Total	8920	63,738	8920	48,383	8920	50,379	8920	58,078
Total economic value (millions of US$)								
Ethiopia	20	3015	80	5357	50	4193	50	3010
Sudan	723	515	723	253	363	71	1083	5857
Egypt	3204	4311	3204	2243	1584	1260	4824	1531
Others	126	1272	246	1746	186	1474	186	1272
Total	4074	9122	4254	9599	2184	6997	6144	11,670
Economic value of cooperation (millions of US$)		5039		5346		4814		5526

downstream riparian countries (Table 7). The fourth economic pressure – "Withdraw water where its user value is greatest" – prevails only when the difference in user values is very large.

An interesting finding is that the economic value of cooperation is surprisingly robust to the variations in the user value of water for irrigation. The economic value of cooperation fluctuates in a relatively narrow range (from US$ 4.7 billion to US$ 5.5 billion annually) when the value of water for irrigation in various riparian countries changes from US$ 0.02/m^3 to US$ 0.08/m^3. These results suggest that the managers of an integrated Nile system could adapt to different economic values of water for irrigation by putting more or less emphasis on hydropower generation. For example, more electricity will be generated if the value of water for irrigation is relatively low and emphasis will be shifted to reduce evaporation losses. In addition, much of the value of cooperation is from the hydropower generation associated with the assumed infrastructure projects in the Blue Nile and White Niles. Thus the bulk of the value for cooperation will not change if the economic value for hydropower is assumed to be fixed.

Discussion

Table 8 summarizes 13 key results of the model analyses. Total (potential) annual direct gross economic benefits of Nile water utilization in irrigation and hydroelectric power generation are on the order of US$7–11 billion. Again, this does not account for the costs of building or operating the infrastructure and thus may strike some observers as a relatively small number. However, for policymakers in countries with gross domestic products per capita of less than US$300, it is likely to appear quite large. Moreover, there is a strong likelihood that the global community will pay for much of the financial costs of this infrastructure, so that the direct economic benefits could be largely captured by the people in the Nile Basin (Song & Whittington, 2004). Finally, it is anticipated that these cooperative investments will yield significant indirect benefits and leverage opportunities "beyond the river" for greater regional integration and cooperation (Sadoff & Grey, 2002).

In most scenarios the total direct economic benefits are generated "relatively" evenly in Ethiopia, Sudan, Egypt and the Equatorial States. This result is likely to surprise many policymakers and analysts in the Nile basin, who often fear that benefits will accrue unequally among the riparian countries. How these benefits are shared will need to be determined by negotiation.[7] However, the economically efficient location of water use can be strongly affected by which Nile riparian countries have the best set of macroeconomic and sector policies in place. Macroeconomic and sector policies will be primary determinants of the value of water in irrigation and the value of kilowatt hours of electricity. Inter-country power grids will enable electricity producers to obtain maximum prices, increasing the value of water in hydropower generation. These results are again likely to surprise many people in the basin, who often expect such natural advantages as soil type and precipitation to dominate policy variables.

Although total economic benefits would be generated relatively equally in Egypt, Sudan, Ethiopia and the Equatorial States, the composition of the benefits differs by county. If large-scale infrastructure development in the Nile basin is undertaken, the majority of the economic benefits from hydroelectric

[7] Hydropower facilities could be owned and operated by consortia of riparian countries as is currently the case in the Senegal River Basin. Other potential negotiated benefit sharing arrangements could involve government or private sector riparian power purchase arrangements, power interconnection infrastructure and wheeling arrangements, agricultural investment by riparian private sector entities across the basin, or the bundling of other apparently unrelated investments such as rail or telecom interconnections (Waterbury & Whittington, 1998; Waterbury, 2002).

Table 8. Summary of model results: thirteen observations.

No.	NEOM results/observations
1	Total (potential) annual direct economic benefits of Nile water utilization in irrigation and hydroelectric power generation are on the order of US$7–11 billion (this does not account for the costs of building or operating the infrastructure).
2	In most scenarios, total direct economic benefits are generated "relatively" evenly in Ethiopia, Sudan, Egypt and the Equatorial States. How these benefits are shared will need to be determined by negotiation.
3	The economically efficient location of water use will primarily depend on which Nile riparian countries have the best set of macroeconomic and sector policies in place.
4	Macroeconomic and sector policies will be primary determinants of the value of water in irrigation and, to a lesser extent, the value of kilowatt hours of electricity. Inter-country power grids will enable electricity producers to obtain maximum prices, increasing the value of water in hydropower generation.
5	With large-scale infrastructure development, the majority of the economic benefits from hydroelectric power generation are generated in Ethiopia and to a lesser extent in Uganda; power interconnections will increase these benefits.
6	With large-scale infrastructure development, the majority of the irrigation benefits are generated in Sudan and Egypt.
7	If the economic value of water in irrigation were the same in Ethiopia, Uganda, Egypt and Sudan, from a system-wide perspective the economically efficient management solution would be to use water for irrigation in downstream riparian countries. But low crop water requirements in the Ethiopian highlands may increase the economic value of water in irrigation.
8	Abstracting irrigation water in the Ethiopian highlands upstream of the proposed Blue Nile reservoirs results in significant losses in hydroelectric power generation. The model does not promote water use for irrigation in the highlands region of Ethiopia if the value of water in irrigation is the same throughout the Nile basin (but this may not be the case). This is because it wants to capture the hydroelectric power generation along the Blue Nile gorge.
9	The economic benefits of irrigation to Ethiopia are likely to be greater near the border with Sudan, in the west of the country, because such water supplies have already generated substantial hydropower benefits.
10	The within-country tradeoff between hydropower generation and irrigation is not limited to Ethiopia. Uganda, Sudan and Egypt also confront this tradeoff.
11	The more economically valuable is a kilowatt-hour of electricity from hydropower, the higher the economic penalty of withdrawing water for irrigation in the Ethiopian highlands and the greater the system-wide benefits of downstream riparians using water for irrigation purposes downstream of power generation.
12	Once you get water through the Ethiopian highlands and capture the hydroelectric power potential there, it does not matter much whether you use the water for irrigation in Sudan, Egypt, or the lowlands of Ethiopia (except you do not want to withdraw water directly above hydropower facilities).
13	Most of the projects on each country's drawing boards have been designed from the country's perspective only, not from a basin-wide perspective. A suboptimal outcome of the Nile Basin Initiative would be if the result of the riparians' negotiations was that every riparian got their "own" unilaterally designed projects approved. This could lead to conflicts down the road over the operation of the infrastructure. There are too many projects on the drawing board for them all to make economic sense. Furthermore such unilaterally designed projects will fail to capture the greater gains afforded by system-wide management and development.

power generation will be generated in Ethiopia and to a lesser extent in Uganda. Power interconnections will increase the magnitude of these benefits. On the other hand, the majority of the irrigation benefits are generated in Sudan and Egypt. If the economic value of water in irrigation were the same in Ethiopia, Uganda, Egypt and Sudan, from a system-wide perspective the economically efficient management solution would be to use water for irrigation in downstream riparian countries. But low crop water requirements in the Ethiopian highlands may increase the economic value of water in irrigation.

If the economic value of water in irrigation is the same throughout the Nile basin, the model does not promote water use for irrigation in the highlands region of Ethiopia. This is because it wants to capture the hydroelectric power generation along the Blue Nile gorge. Abstracting irrigation water in the Ethiopian highlands upstream of the proposed Blue Nile reservoirs results in significant losses in hydroelectric power generation. The more economically valuable a kilowatt-hour of electricity from hydropower, the higher the economic penalty of withdrawing water for irrigation in the Ethiopian highlands and the greater the system-wide benefits of downstream riparians using water for irrigation purposes downstream of power generation. This "within-country" tradeoff between hydropower generation and irrigation is not limited to Ethiopia. Uganda, Sudan and Egypt also confront this tradeoff.

The economic benefits of irrigation to Ethiopia are likely to be greater near the border with Sudan, and in the west of the country, because such water supplies have already generated substantial hydropower benefits. Once water flows through the Ethiopian highlands and the hydroelectric power potential there is captured, it does not matter much whether the water is withdrawn for irrigation in Sudan, Egypt, or the lowlands of Ethiopia (except that the model does not want to withdraw water directly above hydropower facilities).

Finally, most of the projects on each Nile riparian country's drawing boards have been designed only from the perspective of a single riparian country, not from a basin-wide perspective. A suboptimal outcome of the NBI would be if the result of the riparians' negotiations was that every riparian got their "own" unilaterally-designed projects approved. This could lead to conflicts down the road over the operation of the infrastructure because there are simply too many projects on the drawing boards for them all to make economic sense. Furthermore such unilaterally designed projects will fail to capture the greater gains afforded by system-wide management and development.

Whatever the eventual level of infrastructure development in the Nile basin, the NBI has set in motion an historic shift from unilateral investment planning to a focus on cooperative system-wide development and management of Nile waters. This new perspective should enable the riparians better to sustain the ecosystem and generate greater economic benefits for all people in the Nile basin. The direct economic value of cooperation will be substantial and if cooperation on the Nile can be achieved, it will catalyze other development gains throughout the region.

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Structured Decision Making

The focus of development investment has shifted away from narrow economic interests towards multi-purpose projects with the explicit goal of achieving broader social and environmental improvements, regional cooperation, peace and security. It is shifting away from a "least cost planning plus mitigation" planning model towards a sustainability paradigm that more proactively integrates ecological, economic and social objectives upstream in the planning process. And, in response to intense international scrutiny and controversy surrounding decisions to invest in large infrastructure projects on internationally important waterways, it is shifting away from top-down decisions toward more inclusive and transparent ones. All of these shifts are profoundly changing the context for development decision making and therefore require a new mechanism to facilitate decision making in the development context.

Structured decision making is an organized approach to identifying and evaluating options and making choices in complex decision situations. It is designed to engage stakeholders, technical experts and decision makers in a deliberative decision process, using best practices in decision making. Its goal is to both inform and actively aid decision makers, but specifically not to prescribe a solution. It provides a framework to guide and integrate planning, analysis and consultation activities in support of decisions.

In a very practical way, structured decision making brings insights to decision makers about how well their objectives are achieved by different alternatives, how risky some alternatives are relative to others, what the core trade-offs are, and how the people affected by the trade-offs view them. It provides a level of penetration into complex problems and a focus on creative collaborative solutions that is simply not possible with more conventional economic approaches (such as cost-benefit analysis), consensus-based approaches (such as negotiations and dispute resolution), or scientific approaches (such as risk assessment). In contrast to economic and scientific approaches, structured decision making is more targeted at working directly with stakeholders, decision makers and the decision making team to develop creative solutions. In contrast to negotiations, it is rooted in rigorous analysis of consequences and uncertainties, it requires that participants consider these analyses in their deliberations, and it explicitly leaves decision making authority in the hands of decision makers.

As a structured approach is of most value for decisions characterized by complexity, one of the most important benefits of adopting a structured decision making approach for transboundary waters management will be the legitimacy it brings to potentially controversial decisions.

There are six core steps that are applied to any structured decision making process. These steps are reviewed and then refined through an iterative approach as the process moves towards its final solution. The core steps are provided below and presented in a logical diagram in Figure A.

1. **Clarify the decision context:** defining what question or problem is being addressed and why, identifying who needs to be involved and how, and establishing scope and bounds for the decision.

2. **Set objectives and evaluation criteria:** Objectives should reflect the things that matter or the felt needs of the people affected. The evaluation criteria should be unambiguous, comprehensive but concise, direct, operational, understandable, and additive, and these criteria should be used to determine the expected impact of each alternative on the objectives.

3. **Identify Alternatives:** Rather than allowing the decision process to devolve into an economic valuation exercise or a scientific stand-off about uncertainties, it should focus on comparing and refining alternatives rather than precisely valuing their monetary benefits, and should search for alternatives that are robust to key uncertainties or that reduce those uncertainties over time. A short list of high quality creative alternatives should be developed that are value-focused, technically sound, clearly and consistently defined, comprehensive and mutually exclusive, and able to expose fundamental trade-offs. Involving stakeholders enriches the number and quality of creative options.

4. **Estimate Consequences:** A consequence table should be prepared that links objectives, evaluation criteria and alternatives so that key trade-offs among objectives across the alternatives can be exposed.

5. **Evaluate and Select:** While stakeholder consensus is desired, it is not mandatory. Areas of agreement and disagreement among stakeholders and the reasons for disagreement should be documented and presented to decision makers.

6. **Monitor and Review:** A decision process that is serious about sustainability is one that will create a legacy of learning and adaptation, leading to greater capacity – in terms of technical information, human resources and institutional capacity – to make better decisions in the future. A key challenge will be to both reduce critical uncertainties through monitoring and review and build in institutional flexibility to respond to new information without overextending management and political resources.

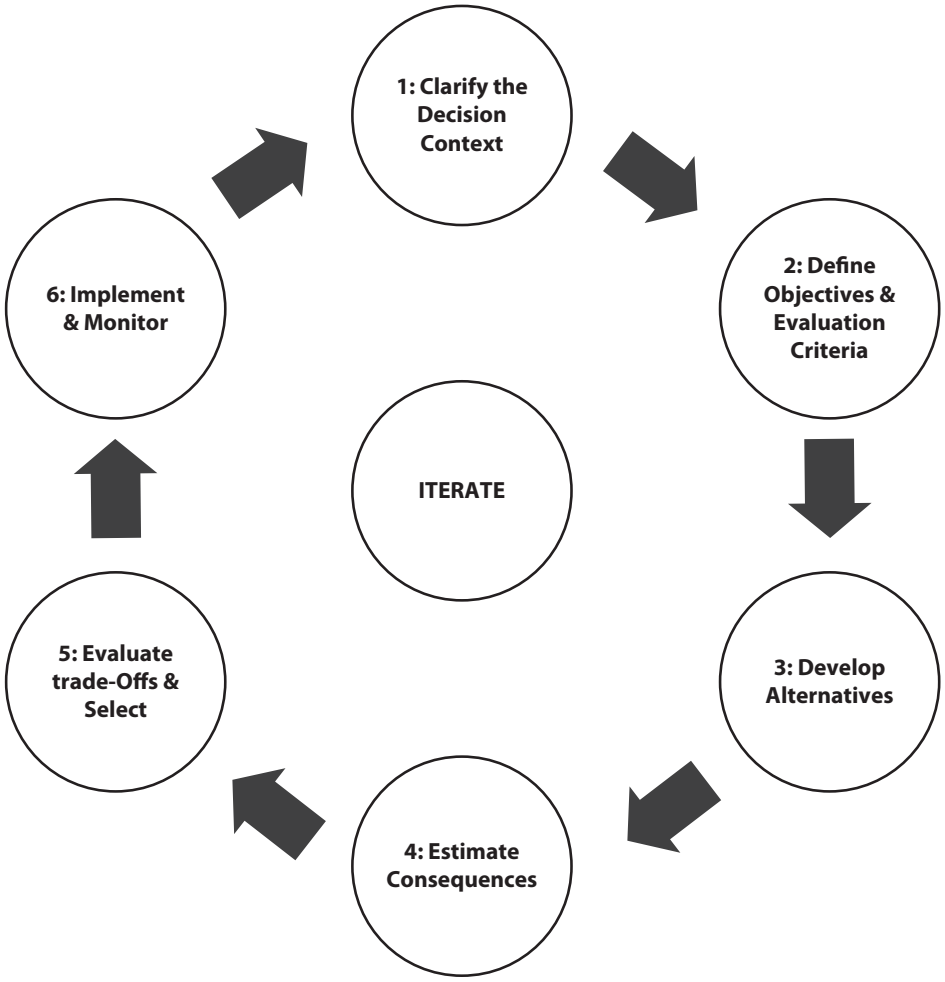

Figure A – Conceptual Framework for Structured Decision Making
Source: Heun, J.C., Koudstaal, R.C, 2000. Lecture Notes: Water Resources Planning: A Framework for Analysis, Volume 1: Main Text. UNESCO-IHE Institute for Water Education, Delft, The Netherlands.

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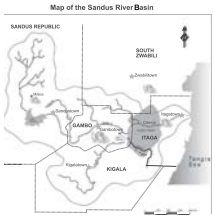
MODULE IV
PUTTING IT ALL TOGETHER – INSTITUTIONAL CAPACITY

OVERVIEW

Negotiation Stage	Common Water Claims	Collaborative Skills	Geographic Scope
Action	Equity	Capacity-building	 Region

Stage 4 of Water Conflict Transformation

SECTION A: GENERAL SETTING: THE ACTION STAGE OF NEGOTIATION

While tremendous progress has been made over the first three stages, both in terms of group dynamics, and in developing cooperative benefits, this last, action, stage helps with tools to guide the sustainable implementation of the plans which have been developed, and to make sure that the benefits are distributed *equitably* amongst the parties. The scale at this stage is now *regional* where, conceptually, we need to put the political boundaries back on the map, reintroducing the political interest in seeing that the "baskets" which have been developed are to the benefit of all. The collaborative learning emphasis is on *capacity-building*, primarily of institutions

Sharing benefits and costs. A "fair" distribution of benefits and costs is central to achieving sustained cooperation. If significant benefits accrue in one country, while significant costs are borne by another, it is possible that a project providing net benefits on a basin-wide scale could actually generate net losses in any one country. If benefits are simply secured where they are generated under an optimal cooperative scenario (e.g., at the most productive hydropower or irrigation sites), the distribution of benefits this creates may well be perceived as unfair by some riparians. Where this initial distribution of benefits from a cooperative management and development scenario is seen as unfair, benefit-sharing mechanisms can play a pivotal role in motivating and sustaining cooperation. Benefit sharing can be defined as any action designed to affect the allocation of costs and benefits. Benefit sharing provides riparians with the flexibility to separate the physical distribution of river development (where activities are undertaken), from the economic distribution of benefits (who receives the benefits of those activities). This allows riparians to focus firstly on generating basin-wide benefits, and secondly on sharing those benefits in a manner that is agreed as fair.

Tools for sharing benefits and costs. Opportunities and mechanisms for benefit sharing should be considered from the earliest stages of project identification and design. The form it takes will be highly situation specific, but could involve monetary transfers, granting of rights to use water, financing and ownership of investments, or the provision of non-related goods and services. The range of benefits under discussion is also a critical issue. The broader the range of benefits under discussion, the more likely riparians will be able to find a configuration of benefits that is mutually acceptable. While some benefits are difficult to share or compensate, in general the optimization of benefits should be more robust and more flexible than the optimization of physical water resources, because benefits tend to be more easily monetized and compensated.

SECTION B: SUMMARY – THE LAW OF INTERNATIONAL WATERCOURSES: THE GLOBAL CONTEXT [25] (MCCAFFREY, BACKGROUND DOCUMENT)

Context

May take either of two forms, either treaty law or customary international law. If states sharing international freshwater resources are not parties to an applicable treaty, their rights and obligations are governed by customary international law. The best evidence of the customary international law of international watercourses is the 1997 United Nations Convention on the Law of the Non-Navigational Uses of International Watercourses. The Convention is based on a text prepared by the UN International Law Commission that was negotiated in the UN and adopted by the General Assembly. It is cited as evidence of customary law by the World Court in the *Danube* case (1997) even though it is not in force.

General Principles of International Watercourse Law

There are three main general principles of the customary law of international watercourses that are widely accepted:

1. Equitable and reasonable utilization

2. Prevention of significant harm

3. Prior notification of potentially harmful planned activities

An emerging principle is the protection of ecosystems of international watercourses from harm through pollution and other human activities.

Equitable and reasonable utilization – This means that each state must use an international watercourse in a manner that is equitable and reasonable vis-à-vis other states sharing the watercourse. What constitutes "equitable and reasonable utilization" must be determined on a case-by-case basis, taking into consideration all relevant factors; such factors include both natural and human-related phenomena.

Prevention of significant harm – A basic principle of international law is that one state must not harm another. In the field of international watercourses this means that states must do their best to prevent uses within their territories from causing significant harm to other states. Perhaps the most controversial issue in the field is that of the relationship between this principle and that of equitable utilization, in that can one state's use cause some harm to another state and still be justified as equitable? The UN Convention seems to answer this question in the affirmative.

Prior notification – A state must notify other states of planned activities that may adversely affect those other states. Potentially affected states must be permitted to comment on and consult with the notifying state concerning the plans.

Protection of watercourse ecosystems – There is general recognition of the importance of protecting and preserving the ecosystems of international watercourses. In the Danube and Nuclear Weapons cases, the World Court has strongly endorsed the obligation not to harm the environment of other states or areas beyond the limits of national jurisdiction.

25. Stephen McCaffrey; University of the Pacific. See p. 112 for more detail.

SUMMARY – COOPERATION ON INTERNATIONAL RIVERS: A CONTINUUM FOR SECURING AND SHARING BENEFITS (SANDOFF AND GREY, BACKGROUND DOCUMENT)

Achieving international cooperation is always a long and complex journey, for which there is no single path and few short cuts. Instead, there are many routes that can be followed and many steps that can be taken, with various options to consider and choices to be made. This paper explores the practicalities of achieving cooperation on international rivers and presents a framework of options and choices to consider. At the heart of it is the potential to move from national agendas that are unilateral, to national agendas that incorporate significant cooperation, and to converge upon a shared cooperative agenda. The extent to which this will occur will be determined by each party's perception of the benefits it can secure from cooperation. Convergence towards a cooperative agenda will be facilitated by several important and practical steps.

- First, there is the perception of the range and extent of potential benefits that needs to be expanded to the extent possible, from the obvious to the less apparent.
- Second, the distribution of benefits, and benefit-sharing opportunities to redistribute the costs and benefits of cooperation, need to be explored to enable the definition of a cooperative agenda that will be perceived as fair by all parties.
- Third, alternative modes of cooperation need to be recognized and appropriate types of cooperation identified to secure the greatest net benefits.

Cooperation on an international river can bring many benefits that may allow the whole to be greater than the sum of the parts – not least because treating the river basin as one system allows optimized management and development (the ultimate goal of integrated water resources management). There are many different types of benefits (social, economic, environmental, and political) that can be secured through the cooperative management of international waters, with each individual basin offering different potential cooperative benefits with different associated costs. A useful framework for broadening the range of recognized benefits of cooperation proposes the identification of four types of cooperative benefits (benefits to the river, benefits from the river, benefits because of the river, and benefits beyond the river).

For each international basin the optimal mode of cooperation will depend on a mix of factors including: hydrologic characteristics, the economics of cooperative investments, numbers and relationships of riparians, and the costs of parties coming together. However, a continuum of cooperation can be conceived from *unilateral action* (independent, non-transparent national plans), to *coordination* (communication and information on national plans), to *collaboration* (adaptation of national plans for mutual benefits), to *joint action* (joint plans, management or investment). The continuum is non-directive, *dynamic, and iterative*. Different modes of cooperative effort will create different options for benefit sharing (Figure 12) and similarly different benefit-sharing mechanisms will require different levels of cooperation.

Cooperative Regional Assessments are tools specifically designed to promote cooperation on international rivers. The uniqueness of each international basin will offer a different set of potential cooperative benefits, calling for different modes of cooperation and a different set of cooperative and benefit sharing mechanisms.

SECTION C: INSTITUTIONAL CAPACITY-BUILDING AND SHARING BENEFITS

Module IV: Exercise 1 (Ex-IV.1): *Crafting Institutions*

Key Points of Exercise

- Developing and enhancing benefits for the basin is vital, but each stakeholder must address their own constituents as well, requiring some thinking about equity
- The equitable distribution of benefits may be addressed through a number of mechanisms, including side payments or broadening the "basket of benefits"

- Crafting resilient institutions and identifying potential future pitfalls are key components for viable agreements

Guidelines for Equitable Distribution of Benefits. Putting the borders back on the map reminds us of the critical national interests at stake in negotiations. It is not enough, politically speaking, to sustainably develop a region for its own sake – constituents will want to know, justifiably, "what's in it for us?" Chances are, when the plans for regional development were crafted in the last stage, the benefits were distributed unequally across space. Now with the borders back on the map, it is clear that this inequity translates to nations – some countries and regions will gain greater benefits, and some fewer.

In many agreements, principles of international law are called upon to help guide equity. Recall from Stage I, however, that law offers general guidelines rather than specific formulae for allocating either water or benefits (see McCaffrey material for more information). In the few water treaties which define and allocate benefits rather than water (see Wolf 1999 for examples), benefits are usually defined economically, and mechanisms such as side payments are developed for their equitable distribution.

To summarize the problem:

- Regional planning can identify "optimal" (productivity maximizing) development;
- If benefits are captured at the natural, physical location of benefit generation, the distribution of benefits among riparians may be perceived as unfair;
- Principles and mechanisms are needed to create "fair" distributions
  – based on international "standards" and law
  – subjective and situation specific
- Political decisions – not just legal or economic

Water Sharing	Benefit Sharing
Assigning rights	**Direct payment for water use** e.g., municipal or irrigation supplies (rights already assigned)
	Direct payment for benefits e.g., fisheries, watershed management or compensation for costs (inundated land, pollution) **Purchase agreements** e.g., power, agriculture products (benefit transfer through terms/price) **Financing and ownership agreements** e.g., power infrastructure (benefit transfer through deal structure) **Broadened bundle of benefits** e.g., including provision of unrelated goods and services and less tangible benefits

Figure 11: Sharing Benefits: Possible Mechanisms

Institutional Capacity for Sustainable Development. Figuring out in theory what benefits will be developed and how they will be distributed has been a tremendous exercise, but still leaves out who will manage the effort and how. Institutional capacity should be increased to ensure that institutions have: (1) a clear and strong mandate to promote and enhance the institutionalization of good water management and water use throughout all levels of society, (2) an organizational system conducive to effective and efficient management decisions with good incentives, accountability and control, and (3) improved decision support mechanisms through research on lessons learned and the use of indigenous knowledge. Again, crafting institutions requires a balance between the efficiency of integrated management with the sovereignty-protection of national interests. Along with greater integration of scope and authority may come greater efficiency, but also greater potential for disagreements, greater infringement on sovereignty, and greater transaction costs (see Feitelson and Haddad (1998) for

more information). Simultaneously, bearing in mind the often limited financial and manpower resources of governments, some circumstances may prove that effective and efficient service delivery can be achieved by empowering and strengthening the capabilities of local communities and user groups to assume part of the management responsibility and authority over infrastructure and the resource itself. Such empowerment can often be established simply by providing a formalized platform that allows all interested parties to voice their concern and contribute to the decision making process. Some possible institutional models are offered in Figure 12 below. Nevertheless, for every set of political relations, there is some possible institutional arrangement which will be acceptable (even if it is only to collect data separately but in a unified format, in the hopes that they may one day be merged) and, if its management is iterative and adaptive, responsibility can be regularly "re-crafted" to adapt or even lead political relations.

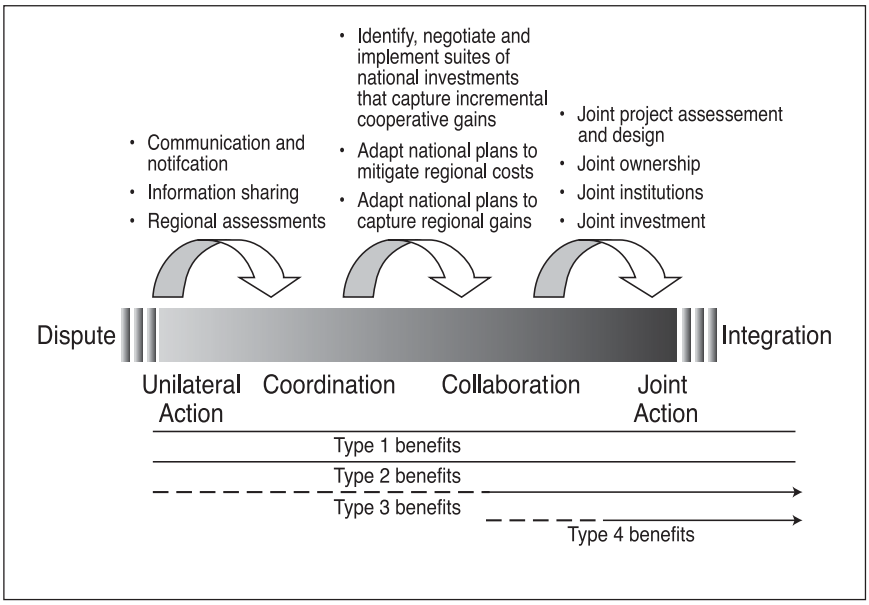


Figure 12: Types of Cooperation – the Cooperation Continuum

An agreement or institution may be thought of as a sociopolitical analogue to a vibrant ecosystem, and thus vulnerable to the same categories of stresses which threaten ecosystem sustainability. Will the agreement and institutions which were crafted in the exercise sustain themselves through:

- Biophysical stresses? Are there mechanisms for droughts and floods? Shifts in the climate or rivercourse? Threats to ecosystem health?
- Geopolitical stresses? Will the agreement survive elections or dramatic changes in government? Political stresses, both internal and international?
- Socioeconomic stresses? Is there public support for the agreement? Does it have a stable funding mechanism? Will it survive changing societal values and norms?

Similar to an ecosystem, the best management is adaptive management, i.e., the institution has mechanisms to adapt to changes and stresses, and to mitigate their impact on its sustainability.[26]

26. See Lee (1995) for the classic text on adaptive management.

Guidelines for Going Home [Handout (H-IV.3)]

These 11 guidelines are but a few of the areas that need to be reviewed periodically. Be sensitive with yourself and others, and you will find that re-entry brings opportunities which you never even dreamed of.

1. The more intense the experience has been, the greater the chance for distress or dissatisfaction with any questioning about the "new you" when you return. You may need additional time to reacclimate yourself back home. Adjustment may be aided or hampered by close relationships, personality issues and work stress. Allow more time than you think will be necessary before judging success or failure.

2. Because of the closeness established with other participants in a relatively short period of time, there may be an additional sense of loss when you return home, as well as a sense of jealousy from those close to you upon your return. Be gentle with yourself as well as with people at home. Also keep contact if possible with someone from your new network. They will probably be experiencing some of the same things.

3. Although you have had time to process what you've learned, those at home have not. Remember how skeptical you were initially. Allow the same period of skepticism for colleagues and friends at home. It's a classical case of lag time between learning something in a cognitive way and experiencing it as reality.

4. As you describe what you've learned, be aware of oversimplifying or under-simplifying. Descriptions of past happenings bring visions to you that are inaccessible for those who were not there. Set a scene and then fill in the activity only to the level that you think is of interest. Monitor how others receive your information and modify your descriptions accordingly. If you want to successfully incorporate what you've learned, you don't want to bore people or set unrealistic expectations with any proposed changes.

5. The thing that you are bringing back home will be questioned. Avoid defending them or the whole experience as the "right way of life." It may help to share some negative aspects of your experiences as well as the positive ones. It keeps your eye on reality and puts the whole experience in a more acceptable light.

6. Feedback is valuable. People will be more comfortable with you if they can tell you how your stories about your experience sound to them. It also provides an excellent way to modify any ideas that aren't accurately reflected.

7. Learning continues long after presentation of material. It is not at all unusual to have "aha" experiences after returning home. This kind of realization is particularly likely after laboratory or experiential learning. It's refreshing to know that learning of this kind is continuous and may be triggered at any time.

8. Seek colleagues and friends who share your concerns and values. It is with these people that you will find the support necessary to implement change. Using allies to best advantage will spread excitement for your ideas farther than you can.

9. The culture of experiential learning is not accepted or understood globally. Be prepared to explain things in a very concrete sense. Avoid buzzwords or phrases and remember that some of the more insignificant aspects of the experience for you might be quite powerful for others. Respect others' learning process as the leaders of your group respected yours.

10. There is never enough time to practice things that you've learned. If you can share, try learning by teaching others. Expect some mistakes, realizing that practice makes perfect.

11. Learning in a classroom or laboratory is temporary and needs to be both nurtured and reinforced before it becomes permanent or institutionalized.

Source: Kaufman (2002), p. 234

SECTION D: ONE-MINUTE EVALUATION **[Handout (H-IV.4)]**

Please answer the following questions. Your responses will help the instructor/facilitator to improve how he/she conducts future workshops.

1. What worked well during this course?

2. What aspects needed work?

3. What specific improvements would you make?

4. What grade (A-F) would you give the course? The instructor?

Many thanks!

SECTION E: SUPPLEMENTAL READING FOR MODULE IV

The Law of International Watercourses: The Global Context
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Introduction

This paper provides general background information on the law of internationally shared freshwater resources. In particular, it focuses upon the law of the non-navigational uses of international watercourses. A treaty on this subject was concluded under United Nations auspices in 1997. It is entitled the United Nations Convention on the Law of the Non-Navigational Uses of International Watercourses ("Convention" or "UN Convention").[27] The Convention is generally regarded as reflecting the fundamental rules of customary international law applicable in the field. This proposition was reinforced by the judgment of the International Court of Justice in the *Case Concerning the Gabčíkovo-Nagymaros Project* (Hungary/Slovakia) (the "*Danube Case*").[28]

27. United Nations, 21 May 1997, annexed to U.N. Doc. A/RES/51/229, of 8 July 1997.
28. 1997 ICJ 7, judgment of 25 Sept. 1997.

Terminology

a. "Watercourse"

The term used in the UN Convention to refer to a river, stream, or lake, as well as many types of aquifers, is "watercourse". This term is also in general use internationally. However, this expression should not be conceived of restrictively, for example, as applying only to the main stem of a stream. Instead, it refers to the entire system of waters in a drainage basin or catchment. Thus it would include tributary flows, whether consisting of surface water or groundwater.

The UN Convention defines the term "watercourse" in the following way: "Watercourse" means a system of surface waters and groundwaters constituting by virtue of their physical relationship a unitary whole and normally flowing into a common terminus.

Finally, while it may seem to refer only to the "course", channel or bed in which water flows, the term "watercourse" is taken to embrace both the water and the bed, aquifer, etc., in which it is physically contained.

b. "International Watercourse"

An "international watercourse", then, is a "watercourse" that is shared by two or more countries. The UN Convention defines this term as follows: "International watercourse" means a watercourse, parts of which are situated in different States.[29]

It is important to bear in mind that the breadth of these definitions means that the rules of international law concerning shared freshwater apply to any and all "parts" of an international watercourse that may be located in a given country. Thus they would apply, for example, to: headwaters or tributaries in State *A* of a stream that flows into State *B*; a groundwater basin that straddles the border between States *A* and *B* and is fed by surface water in State *A*;[30] or a groundwater basin wholly located in State A that feeds a tributary of a stream flowing into State *B*.

c. "Riparian State"

As used in this paper, the expression "riparian state" refers to a state in whose territory a part of an international watercourse is situated. Similarly, "co-riparian state(s)" refers to a state or states sharing an international watercourse. These terms are not used in the UN Convention but are employed here from time to time for convenience.

General Rules of Law concerning the Use of International Watercourses

There are several rules of international law of a general and fundamental nature that govern the conduct of states in relation to international watercourses. The most basic of these are the following:

- The requirement that a state use an international watercourse in a way that is equitable and reasonable vis-à-vis other states sharing the watercourse.
- The requirement that riparian states take all appropriate measures to prevent the causing of significant harm to co-riparian states.
- The requirement that a riparian state provide prior and timely notification to co-riparian states concerning any new use or change in existing uses of an international watercourse, together with relevant technical information, and that it consult with the co-riparian states.

It is probable that there is also an emerging rule requiring the protection of the ecosystems of international watercourses. The following paragraphs will attempt to provide an overview of these general rules and some of their implications.

29. UN Convention, art. 2*(b)*.

30. There is some question as to the extent to which the rules of international law described herein apply to so-called "confined transboundary groundwater" – i.e., groundwater intersected by an international boundary that does not interact in any way with surface water or other groundwater. The UN International Law Commission, which prepared the draft upon which the UN Convention is based, made this form of groundwater the subject of a separate resolution. That resolution, however, recommends that states, in their relations concerning confined transboundary groundwater, be guided by the principles governing international watercourses.

1. Equitable Utilization

There is perhaps no more fundamental rule of international law concerning the use of international watercourses than that of equitable and reasonable utilization. In its judgment in the *Danube Case* the International Court of Justice referred to the "basic right" of a state (there, Hungary) to "an equitable and reasonable sharing of the resources of an international watercourse."[31]

This obligation requires each riparian state to ensure, in an ongoing manner, that its use is equitable and reasonable vis-à-vis other riparian states. What is equitable and reasonable in any given case may be determined only by taking into account all relevant factors and circumstances – both natural (climate, hydrography, etc.) and human-related (social and economic needs of the riparian states, effects of uses in one state on co-riparians, existing and potential uses, etc.).[32]

But conditions may change over time, producing consequential changes in the weight assigned to given factors. For example, a drought would reduce the available water supply; a population increase would result in greater need for water; etc. Maintaining a regime of utilization that is equitable in relation to other riparian states is therefore necessarily a dynamic process. It requires regular communication between the countries sharing the watercourse – communication regarding data and information relating to the condition of the watercourse (flow and any regulation thereof, pollution, meteorological factors that could influence utilization, etc.) and regarding any new projects or changes in existing uses. Many countries sharing international watercourses have found that this kind of systematic communication may be effectively and efficiently accomplished through a joint management mechanism, such as a commission.

Absent such an organization or some other system allowing regular communication, it can be challenging at best to maintain a regime of utilization that is equitable vis-à-vis a state's co-riparians.

2. Equitable participation

Often a river or other form of watercourse will be used so intensively by co-riparian states that it will be necessary for them to take affirmative steps – such as construction or maintenance of works or other forms of regulation of the watercourse – to make it possible for other riparias to utilize the shared watercourse equitably. This notion is captured in the concept of "equitable participation", a principle reflected in the UN Convention.[33] In the *Danube Case* the International Court of Justice laid stress on the importance of equitable participation in the "common utilization of shared water resources for the achievement of the several objectives mentioned in the Treaty [in question]".[34]

3. Prevention of Significant Harm

It is a fundamental rule of international law that one state should not cause significant harm to another. This principle has been recognized in several important decisions in international cases.[35] However, the application of the principle to international watercourses is highly controversial. While it is clear that one state may not intentionally cause harm to another through, e.g., flooding or deliberate releases of toxic pollution, there is dispute about whether one state's use that reduces the available supply in another state is prohibited by this norm.

The better view is that the latter situation is governed first and foremost by the principle of equitable utilization: if harm is caused through a pattern of utilization that is otherwise equitable, it should not be prohibited. Otherwise, for example, a later-developing upstream state would be prevented from developing the portion of an international watercourse in its territory to the extent that such development impaired existing uses in downstream states. This view – that in respect of apportionment the principle of equitable utilization prevails over that of harm prevention if the two come into conflict – would appear to be borne out by the UN

31. 1997 ICJ p. 54, para. 78.

32. UN Convention, art. 6.

33. See art. 5(2) of the UN Convention setting forth this concept.

34. 1997 ICJ p. 80, para. 147. The objectives referred to included hydropower production, improvement of navigation, protection from floods and protection of water quality and riverine ecosystems.

35. Chiefly the *Trail Smelter, Lake Lanoux* and *Corfu Channel* cases.

Convention.[36] Moreover, the International Court of Justice in the *Danube Case* referred only to the principle of equitable utilization when addressing the parties' respective rights to the uses and benefits of the river; the principle of prevention of harm figured only – although importantly – as a constraint on actions that would affect the environment of other states.

Regardless of its relationship to equitable utilization, the duty to prevent significant harm to other states is not absolute; it requires that a country exercise its best efforts[37] to prevent harm. Whether a state has complied with this obligation will thus be, in part, a function of its capability to do so. Presumably, therefore, developing countries would generally have more leeway in this regard than developed countries, by virtue of the greater capacity of the latter to prevent harm to co-riparians.

4. Rules concerning New Uses

Although it has been controversial in the past, today there is little doubt that customary international law requires a state planning a new use to provide notice thereof to other states that the use might adversely affect. This rule applies to all projects that have the potential to change the regime of the watercourse in a way that would be prejudicial to other riparian states. In its classical conception it applies to projects (including both new uses and changes in existing uses) that may have adverse factual impacts upon other states. More recently it has been recognized that adverse *legal* effects should also be covered by the rule. Thus, for example, a planned project in a downstream state might, when implemented, make it impossible for an upstream state to implement a project of its own without running the risk that its project would result in its overall utilization being considered inequitable. Because of this possibility, notification should be provided to co-riparian states of all planned projects of significance, even if they would not have the potential of causing adverse factual effects in those states.

Once notification has been provided, the state in which the project is planned has a duty to consult with the potentially affected state or states. The planning and potentially affected states are expected to arrive at an equitable resolution of any differences between them with regard to the project.

5. Rules concerning Pollution

The UN Convention provides that states sharing an international watercourse have an obligation to protect and preserve the watercourse's ecosystems. While this obligation is not tied to harm to other states, it seems unlikely that a co-riparian would assert a violation unless it had suffered some harm. More specifically, states are required to prevent, reduce and control pollution that may cause significant harm to co-riparians. Like the obligation to prevent significant harm, this duty is one of due diligence.

6. The Special Case of Shared Groundwater

The rules discussed above apply to all components of an international watercourse system, including groundwater. However, in view of the different characteristics of groundwater, the rules may apply somewhat differently. This is a developing area of the law. It is therefore not clear to what extent the rules, or their application, differ in the case of groundwater.

It does seem possible, however, to arrive at certain general conclusions. First, the obligation of equitable and reasonable utilization applies equally to surface and groundwater. Second, the obligation to prevent significant harm may be somewhat more stringent in the case of groundwater because of the greater importance of prevention where it is concerned: harm occasioned through an aquifer often takes longer to remedy than in the case of surface water. This is particularly the case with pollution, which may cause contamination of an aquifer that cannot be remedied for many years, if at all. And third, the special characteristics of groundwater make close cooperation between states sharing it particularly important. Prior notification, the sharing of data and information on a regular basis, and where possible, the establishment of joint management mechanisms take on greater significance with regard to shared groundwater.

36. See art. 7 of the UN Convention, and especially para. 2 of that article.

37. Article 7 of the UN Convention requires states to "take all appropriate measures" to prevent harm to other states.

Links with World Bank Procedures

There are three Bank documents that are relevant to the law of international watercourses:

1. Bank Operational Policies (OP 7.50): Projects on International Waterways

2. Bank Procedures (BP 7.50): Projects on International Waterways

3. Bank Good Practices (GP 7.50): Projects on International Waterways

These documents indicate Bank policy and set forth procedures to be followed in respect of projects on international watercourses. (The term "waterways" in the titles of the documents should not be interpreted restrictively to refer only to those that are navigable. See OP 7.50, para. 1.)

The documents essentially provide that:

- International water rights issues be assessed as early as possible in project identification, and that
- The Bank advise the state proposing the project that it should formally notify the other states sharing the watercourse of the proposed project, including project details, if it has not already done so. (BP 7.50, paras. 1 and 2.)
- The information provided should be sufficient to enable the other states to determine whether the proposed project has potential for causing appreciable harm through water deprivation or pollution or otherwise.
- If other states object, the Bank assesses the objection and decides whether and how to proceed. The opinion of independent experts may be sought if needed.
- These procedures are generally consistent with the law of international watercourses, as outlined elsewhere in this handout.

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The UN Convention on the Law of the Non-Navigational Uses of International Watercourses: Prospects and Pitfalls

Stephen McCaffrey*

AN OVERVIEW OF THE UN CONVENTION

The Convention on the Law of the Non-Navigational Uses of International Watercourses was adopted by the United Nations General Assembly on May 21, 1997.[1] It had been negotiated in the Sixth (Legal) Committee of the General Assembly, on the basis of draft articles adopted by the International Law Commission (ILC)[2] after some twenty years' work on the project.[3] The Convention is a general, framework agreement that contains thirty-seven articles, which are divided into seven parts. The most important substantive and procedural provisions are contained in Part II, General Principles, Part III, Planned Measures, and Part IV, Protection, Preservation and Management. Also important is Article 33 on the Settlement of Disputes. In the following overview, I will pay particular attention to the articles that I believe may be of special significance for the Bank's work.

Perhaps the most logical starting place is the Convention's definition of the term "international watercourse." It is natural to think of this expression as being synonymous with "international river", but as used in the Convention it is much broader. The definition takes into account that most fresh water is in fact underground, and that most of this groundwater is related to, or interacts with, surface water. Thus, for example, pollution of surface water can contaminate groundwater, and vice versa, just as

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1 The Convention is annexed to U.N.G.A. Res. 51/229, 21 May 1997, adopted by a vote of 103 for and 3 against, with 27 abstentions. *See generally* Attila Tanzi, *Codifying the Minimum Standards of the Law of International Watercourses: Remarks on Part One and a Half,* 21 NAT. RESOURCES J. 109 (1997); and John Crook & Stephen McCaffrey, *The United Nations Starts Work on a Watercourses Convention,* 91 AM. J. INT'L. L. 374 (1997).

2 *Report of the International Law Commission on the Work of its Forty-sixth Session*, U.N. GAOR, 49th Sess., Supp. No. 10, 197, U.N. Doc. A/49/10 (1994) [hereinafter *1994 ILC Report*]. *See* Stephen McCaffrey, *The International Law Commission Adopts Draft Articles on International Watercourses,* 89 AM. J. INT'L. L. 395 (1995).

3 The ILC included the topic in its general program of work in 1971. It began study of the topic in 1974 with the establishment of a sub-committee and the appointment of the first of five special rapporteurs. *See e.g.*, [1985] Y.B. INT'L. L. COMM'N, vol. 2, pt. 2, 68 (1986).

withdrawals of groundwater can affect surface water flows. Article 2, therefore, defines "watercourse" as "a system of surface waters and groundwaters constituting by virtue of their physical relationship a unitary whole..." This definition calls the attention of states to the interrelationship between all parts of the system of surface and undergroundwaters that make up an international watercourse. Thus it should be clear immediately that an effect on one part of the system will generally be transmitted to other parts. Let us assume, for example, that an aquifer is intersected by the border between states A and B. Mining of the groundwater in that aquifer in country A can affect groundwater levels in state B. It may also affect surface flows in state B to the extent that the aquifer contributes to those flows. Nevertheless, the inclusion of groundwater in the Convention was cited as a reason for the abstentions of two states from the vote on the Convention.[4]

The relationship of the Convention to agreements concerning specific watercourses is dealt with in Articles 3 and 4 of the Convention, which have been covered by Professor Caflisch. Article 3 generally encourages states sharing watercourses to enter into agreements that apply and adjust the provisions of the Convention to the particular characteristics of the watercourse concerned. While existing agreements remain unaffected by the Convention, parties are called upon to "consider harmonizing" those agreements with its "basic principles."[5] As you can imagine, some delegations, such as Ethiopia's, believed that harmonization should have been required. But given the vast number and variety of existing agreements, such a requirement would have been impractical. However, this does not mean that the principles reflected in the Convention will be without significance in the *interpretation* of existing agreements.

Article 3 also addresses the situation in which less than all of the states sharing a watercourse enter into an agreement concerning its use. In that case, the agreement may not adversely affect uses of other states on that watercourse without their consent. Then there is the situation in which a riparian state believes the principles of the Convention should govern the watercourse it shares with another state or states. Article 3 provides that in such a case, the states sharing the watercourse *must* enter into consultations "with a view to negotiating in good faith for the purpose of concluding a watercourse agreement."

Article 4 deals with the rights of riparian states to participate in specific agreements that apply to an entire international watercourse and those that apply "only to a part of the watercourse or to a particular project, program or use." If an agreement is to apply to an entire international watercourse, all states on the watercourse are entitled to participate in the negotiation of, and to become a party to the agreement. As to agreements concerning only a part of a watercourse or particular project, a riparian state whose use of the watercourse may be affected by the implementation of a prospective agreement of this kind may participate in consultations relating to the agreement, "and,

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4 Verbatim record, 99th plenary meeting, U.N. General Assembly, 21 May 1997, U.N. Doc. A/51/PV.99, at 5 (Pakistan) and 12 (Rwanda).

5 Some delegations believed harmonization should have been required. See, e.g., the statement of Ethiopia in explaining its vote on the Convention, Verbatim record, *id.* at 9-10.

where appropriate, in the negotiation thereof in good faith with a view to becoming a party thereto, to the extent that its use is thereby affected."

Part II, General Principles, is the core of the Convention. It is introduced by Article 5, "Equitable and Reasonable Utilization and Participation." This article sets forth what many regard as the cornerstone of the law of international watercourses—namely, the principle that a state must use an international watercourse in a manner that is equitable and reasonable vis-à-vis other states sharing the watercourse. Indeed, the International Court of Justice, in its recent decision in the *Gabčíkovo-Nagymaros* case, emphasized the importance of operating the project involved in the case "in an equitable and reasonable manner."[6] According to Article 5, to be equitable and reasonable, the use must also be consistent with adequate *protection* of the watercourse from pollution and other forms of degradation.

But how does upstream State A, for example, know whether its use of an international watercourse is equitable and reasonable vis-à-vis downstream States B and C? The answer is, this may be a very difficult thing for State A to determine, in the absence of a joint mechanism with States B and C, or a very close working relationship with them. Article 6 of the Convention sets forth a non-exhaustive list of factors to be taken into account in making the determination, and Article 9 requires riparian states to exchange data and information concerning the condition of the watercourse on a regular basis. The Article 6 factors will doubtless be of assistance to State A in making the equitable utilization determination, as will the Article 9 data and information—indeed, it would be nearly impossible for a state to ensure its use was equitable without data and information from other riparian states. However, the principle of equitable and reasonable utilization is much better suited to implementation through very close cooperation between the states concerned, ideally through a joint commission, or by a court or other third party. After all, the doctrine had its origins in decisions of the United States Supreme Court in water disputes between U.S. states. This having been said, however, it seems clear that there is no other general principle that can take into account adequately the wide spectrum of factors that may come into play with regard to international watercourse throughout the world.

What this underlines is the importance of *cooperation* between riparian states with a view to achieving a regime of equitable and reasonable utilization and participation for an international watercourse system as a whole. Thus, Article 8 of the Convention lays down a general obligation to cooperate "in order to attain optimal utilization and adequate protection of an international watercourse." It is interesting to note that the delegations negotiating the Convention attached such significance to cooperation *through joint mechanisms* that they added a paragraph to Article 8 calling for states to "consider the establishment of [such] mechanisms or commissions..."

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[6] Case Concerning the Gabcikovo-Nagymaros Project (Hung./Slovk.), 1997 I.C.J. 92 (Sept. 25), 37 I.L.M. 162 (1998), para. 150, at 69, <http://www.icj-cij.org/idocket/ihs/ihsjudgment/ihsjudcontent .html7>.

Returning for a moment to Article 5, that provision also introduces the new concept of equitable *participation.* The basic idea behind this concept is that in order to achieve a regime of equitable and reasonable utilization, riparian states must often cooperate with each other by taking *affirmative* steps, individually or jointly, with regard to the watercourse. While this idea is, in effect, a feature of some well-developed cooperative relationships between river basin countries, it had not been reflected as such in attempts to codify the law in this field until the International Law Commission included it in Article 5. Its acceptance as a part of the Convention is welcome, because it helps to convey the message that a regime of equitable utilization of an international watercourse system, together with the protection and preservation of its ecosystems, cannot be achieved solely through individual action by each riparian state acting in isolation; again, affirmative cooperation will often be necessary. The utility of this concept is illustrated by the fact that the ICJ quoted the entire paragraph of Article 5 that sets forth the obligation of equitable participation in its judgment in the *Gabčíkovo-Nagymaros* case.[7]

I now come to the most controversial provision of the entire Convention, the obligation not to cause significant harm, which is set forth in Article 7. That article was treated as being closely linked with Articles 5 and 6 throughout the negotiations in the U.N. The three-article package was finally adopted by a vote of 38 to 4, with 22 abstentions.

At first blush it seems obvious that one state should not cause significant harm to another state, whether through its use of a watercourse or otherwise. But at least in the case of international watercourses, it is not so simple. Suppose, for example, that—as is often the case—upstream State A has not significantly developed its water resources because of its mountainous terrain. The topography of the downstream states on the watercourse, B and C, is flatter, and they have used the watercourse extensively for irrigation for centuries, if not millennia. State A now wishes to develop its water resources for hydroelectric and agricultural purposes. States B and C cry foul, on the ground that this would significantly harm their established uses. How should the positions of State A, on the one hand, and States B and C, on the other—neither of which seems unreasonable on its face—be reconciled?

This question is at the heart of the controversy over Article 7 and its relationship with Article 5 on equitable and reasonable utilization. I will take up each of these points in turn—albeit only briefly. First, as to how the so-called "no significant harm" obligation should be formulated: The International Law Commission's first draft of the article, adopted in 1991, was the essence of simplicity. It provided: "Watercourse States shall utilize an international watercourse in such a way as not to cause appreciable harm to other watercourse States." The Commission's final draft, adopted in 1994, introduced considerable flexibility into the text, in two principal respects. First, it expressly made the obligation one of "due diligence": "Watercourse States shall *exercise due diligence* to utilize an international watercourse in such a way as not to cause significant harm ...

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7 *Id.,* para. 147. See also Chapter 7 of this Report.

[etc.]." (You will notice, incidentally, that it also changed "appreciable" to "significant." I don't regard this as a terribly "significant" change, however.) But the insertion of the "due diligence" modifier made it clear beyond any doubt that this was not in any way an *absolute* obligation, but rather one of due diligence, or best efforts under the circumstances.

The second way in which flexibility was introduced was by adding a lengthy paragraph 2, which converted the "no harm" obligation into what the ILC described as "*a process* aimed at avoiding significant harm as far as possible while reaching an *equitable result* in each concrete case." Paragraph 2 did this by requiring that if significant harm was caused despite the exercise of due diligence, the states involved must enter into consultations concerning two things: first, the extent to which the harmful use is equitable and reasonable; and second, whether the harming state should adjust its use to eliminate or mitigate the harm, and, "where appropriate, the question of compensation."

The ILC's text was changed in the U.N. negotiations. Undoubtedly, scholars will spill much ink over the extent to which the changes are "significant." I, personally, don't think they are. In my view the deletion of "due diligence" from paragraph 1 and its replacement with "take all appropriate measures" is merely saying the same thing in different words. The real fight was over the second paragraph. The question there was whether equitable utilization should prevail over the "no-harm" obligation, or vice-versa. To illustrate, allow me to return to our hypothetical fact situation. If equitable utilization is the controlling legal principle, upstream State A may develop its water resources in an equitable and reasonable manner vis-à-vis downstream States B and C, even though that development would cause significant harm to their established uses. If, on the other hand, the obligation not to cause significant harm is dominant, State A could engage in no development, no matter how equitable and reasonable, that would cause States B and C significant harm.

To some delegations at the U.N. negotiations, the ILC's final text—which represents an effort to strike a balance between the two principles—favored equitable utilization too heavily. They argued for a text that more clearly gave precedence to the "no-harm" principle. Other delegations took the opposite view. For them the basic rule was equitable utilization; at most, any harm to another riparian state should merely be one factor to be taken into account in determining whether the harming state's use was equitable. You see before you the compromise formula arrived at in the U.N. negotiations. Perhaps not surprisingly, the final text is somewhat like a basket of Halloween candy: there is something in it for everyone. No matter whether you are from the equitable utilization or the no-harm school, you can claim at least partial victory. In my view, however, paragraph 2 of Article 7 of the Convention gives precedence to equitable utilization over the no-harm doctrine. The very existence of a second paragraph implicitly acknowledging that harm may be caused without engaging the harming state's responsibility supports this conclusion. Also indicating a recognition that significant harm may have to be tolerated by a watercourse state are the numerous mitigating clauses in paragraph 2, especially the phrase "having due regard for the provisions of articles 5 and 6"—the two equitable utilization articles. Finally, the proposition that the "no-harm"

rule does not enjoy inherent preeminence is supported by Article 10 of the Convention, which provides that any conflict between uses of an international watercourse is to be resolved "with reference to articles 5 to 7..." This would presumably mean that if State A's hydroelectric use conflicts with State B's agricultural use, the conflict is not to be resolved solely by applying the "no-harm" rule of Article 7, but rather through reference to the "package" of articles setting forth the principles of both equitable utilization and "no-harm."

But in actual disputes, it seems probable that the facts and circumstances of each case, rather than any *a priori* rule, will ultimately be the key determinants of the rights and obligations of the parties. Difficult cases, of which there are bound to be more in the future, will be solved by cooperation and compromise, not by rigid insistence on rules of law. This is one of the lessons of the World Court's judgment in the *Gabčíkovo-Nagymaros case.*

Before leaving the "General Principles" part of the Convention, I should say an additional word about Article 10. Originally conceived as a provision that would clearly specify that navigational uses no longer enjoy inherent priority over non-navigational ones—if they ever did—this article now has a much richer texture. In particular, paragraph 2 provides that a conflict between different kinds of uses of an international watercourse is to be "resolved with reference to articles 5 to 7, with special regard being given to the requirements of vital human needs." The expression "vital human needs" was discussed at some length in the U.N. negotiations. The final text maintains the ILC's language but a "statement of understanding" accompanying the text of the Convention indicates that: "In determining 'vital human need,' special attention is to be paid to providing sufficient water to sustain human life, including both drinking water and water required for production of food in order to prevent starvation." This is no doubt right. What some countries may fear is that the concept of "vital human needs" could become a loophole, enabling a state to argue that its use should prevail on this ground when in fact it was highly debatable whether vital human needs were involved at all. But since the "statement of understanding" is based on the ILC's commentary, which would in any event be relevant to an interpretation of paragraph 2, the "statement" probably adds no new problems.

Part III of the Convention, Planned Measures, contains a set of procedures to be followed in relation to a new activity in one state that may have a significant adverse effect on other states sharing an international watercourse. The fact that the basic obligation to provide prior notification of such changes was accepted as a part of the Convention by most delegations[8] is, in itself, important: it provides further evidence that the international community as a whole emphatically rejects the notion that a state has

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[8] Three that did not were Ethiopia, Rwanda and Turkey. Verbatim record, 99th plenary meeting, *supra* note 4, at 4-5 (Turkey), 12 (Rwanda) and 9 (Ethiopia). In explaining its negative vote on the Convention, Turkey stated that Part III introduces a "veto". *Id.*, at 5. While it is true that the articles provide for a temporary suspensive effect upon implementation of measures by the planning state (see Articles 13 and 17), no veto is provided for in Part III.

unfettered discretion to do as it alone wishes with the portion of an international watercourse within its territory.[9]

While the Working Group made a number of drafting changes, the essence of the system envisaged in Part III is unchanged from the ILC's draft. It essentially provides that a state contemplating a new use or a change in an existing use of an international watercourse that may have a significant adverse effect on other riparian states must provide prior notification to the potentially affected states. Those states are then given six months within which to respond. If they object to the planned use, they are to enter into discussions with the notifying state "with a view to arriving at an equitable resolution of the situation." This entire process could take twelve months or longer. If the matter is not resolved to the satisfaction of any of the states concerned, the dispute settlement procedures of Article 33 would be applicable. A final important point concerning Part III is that it seems clear that, of necessity, it is premised on the assumption that the planning state will conduct an environmental impact assessment to identify, possible adverse effects on co-riparian states.[10]

Part IV of the Convention, entitled "Protection, Preservation and Management," contains the "environmental" provisions of the Convention. While a variety of proposals were made in the U.N. negotiations for the strengthening of these provisions, in the end only minor changes were made to the ILC's text. Article 20, Protection and Preservation of Ecosystems, is a simple but potentially quite powerful provision. It says that riparian states have an obligation to "protect and preserve the ecosystems of international watercourses." Like Article 192 of the United Nations Convention on the Law of the Sea, on which it is modeled, this obligation is not qualified. For example, it does not say that the ecosystems must be protected only if failure to do so may harm another riparian state. Since the "ecosystems" of international watercourses include land areas contiguous to them, Article 20 requires that such land areas be maintained in such a way that the watercourses they border are not harmed by, for example, excessive agricultural runoff. Doubtless this is not an absolute obligation, however. That is, it is an obligation to exercise due diligence to protect and preserve watercourse ecosystems. This standard takes into account the sensitivity of the ecosystem as well as the capability of the state involved.

Pollution of international watercourses is dealt with in Article 21, Prevention, Reduction and Control of Pollution. After defining the term "pollution," it uses the standard formula—also employed in Article 194 of the Law of the Sea Convention—that riparian states must "prevent, reduce and control" pollution of international watercourses. Unlike Article 20, however, this obligation is qualified. It is triggered *only* if the pollution "may cause significant harm to other watercourse States or to their environment..." Of

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9 The doctrine of "absolute territorial sovereignty", which would support such unfettered discretion, has long been rejected by the state that invented it. *See* Stephen McCaffrey, *The Harmon Doctrine One Hundred Years Later: Buried, Not Praised,* 36 NAT. RESOURCES J. 725 (1996).

10 *But cf.* art. 12.

course, it is at least arguable that pollution that would harm only the environment of the state of origin would have to be controlled pursuant to Article 20.

Article 22 requires riparian states to prevent the introduction of alien or new species into international watercourses. Like Article 21, the obligation contained in Article 22 applies only where significant harm will be caused to other riparian states.

Article 23 addresses, in a very general way, the problem of marine pollution from landbased sources. Like Article 20, the obligation applies whether or not other states are injured. Article 23 actually goes beyond the problem of pollution, however. Since it requires riparian states to "protect and preserve the marine environment," it would presumably apply also to such things as the protection of anadromous species and of coral reefs.

In a "statement of understanding" the Working Group in which the Convention was negotiated indicated that Articles 21-23 "impose a due diligence standard on watercourse States." It is interesting that this statement does not cover Article 20. But, as I have already indicated, I believe Article 20 must also be read to reflect an obligation of due diligence.

Article 24, Management, is a provision believed by many specialists to be too modest in view of the importance of joint commissions. But the ILC did not feel it could go any further than this in a general, framework instrument. It was of the view that while international law may require riparian states to cooperate with each other, it does not go so far as to require them to form joint commissions. I believe the Commission was correct in this assessment, although in my view the article could have gone somewhat further in indicating the concrete forms that institutionalized cooperation between riparian states might take. But some states—and indeed some members of the Commission—were somewhat uncomfortable even with the article as it presently stands, let alone a more specific provision.

Regulation of watercourses, international or national, is a common phenomenon, as any hydraulic engineer will tell you. This often takes the form of fortifying banks to prevent erosion, straightening the course of a river, building up embankments, and the like. Article 25 deals with these activities, requiring riparian states to cooperate in responding to needs for regulation, and to participate in the required works on an equitable basis.

The proper construction and maintenance of dams and similar works is dealt with in Article 26, Installations. Since a faulty dam may pose great danger to downstream states, this article requires that a state in whose territory a dam is located maintain it and protect it from forces that may result in harm to other riparian states.

Part V is entitled "Harmful Conditions and Emergency Situations." It contains one article on each of those topics. By "harmful conditions" is meant such things as water-borne diseases, ice floes, siltation and erosion. Article 27 requires riparian states to

take "all appropriate measures" to prevent or mitigate such conditions, where they may be harmful to other states sharing the watercourse. Article 28 deals with emergency situations. This term is defined broadly to include both natural phenomena such as floods, and those that are caused by humans, such as chemical spills. A state within whose territory such an emergency originates must notify other potentially affected states as well as competent international organizations. It must also take "all practicable measures ... to prevent, mitigate and eliminate harmful effects of the emergency."

Part VI, Miscellaneous Provisions, contains Articles 29 to 33. Article 29, dealing with armed conflict, serves as a reminder that there are rules of international law that protect international watercourses and related installations, facilities and other works during hostilities.

Article 30 provides for riparian states to utilize indirect procedures to fulfill their obligations of cooperation under the Convention when there are serious obstacles to direct contacts between them, such as where they do not have diplomatic relations with each other.

Article 31 simply safeguards classified information that is "vital to ... national defense or security."

Article 32 deals essentially with private remedies. Its intent was to ensure equal access and nondiscrimination, so that an injured or threatened party could have access to judicial or administrative procedures in the state of origin, regardless of whether that was on the other side of an international boundary. The article provoked controversy in the U.N. negotiations, including a proposal that it be deleted. Evidently not all states are yet comfortable with the idea of granting private persons from other (usually neighboring) countries nondiscriminatory access to their judicial and administrative procedures relating to transboundary harm or the threat thereof.

Article 33 on the settlement of disputes was also somewhat controversial, principally because it provides for compulsory fact-finding at the request of any party to a dispute. Any compulsory dispute-settlement procedure is bound to draw strong objection from certain countries,[11] even if all that is compulsory is fact-finding, and even if that only becomes compulsory after negotiations have failed to settle the dispute within six months. The ranks of these "automatic objectors" were swelled somewhat by a few upstream states,[12] who were evidently reluctant to surrender whatever leverage their position on an international watercourse conferred upon them. Yet facts are of critical significance with regard to the core obligations of the Convention. For example, how can

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11 E.g., China and India. Verbatim record, 99th plenary meeting, *supra* note 4, at 7 (China) and 9 (India).

12 E.g., France, Israel (effectively upstream on the Jordan) and Rwanda. These states, together with China and India, generally maintained that the principle of free choice of means should have been followed in Article 33. Verbatim record, 99th plenary meeting, *supra* note 4, at 8 (France), 11 (Israel) and 12 (Rwanda). In a separate vote on Article 33 in the Working Group, the following five countries voted in the negative: China, Colombia, France, India and Turkey. The tally was 33 for, 5 against, with 25 abstentions.

states determine whether their utilization is "equitable and reasonable" under article 5 without an agreed factual basis? And how can a state establish that it has sustained significant harm if the state that is alleged to have caused the harm denies that it has caused it or that any harm has been suffered? The importance of facts in this field is no doubt what led the ILC to depart from its usual practice by including an article on dispute settlement in its draft. Article 33 also provides for states to declare upon becoming parties to the Convention that they accept as compulsory the submission of disputes to the International Court of Justice or to arbitration in accordance with procedures set out in the Annex to the Convention.

TO WHAT EXTENT DOES THE CONVENTION REFLECT CUSTOMARY INTERNATIONAL LAW?

I would now like to turn very briefly to the question of the extent to which the Convention reflects rules of customary international law. I think it may be said with some confidence that the most fundamental obligations contained in the Convention do indeed reflect customary norms. Indeed, in the *Gabčíkovo-Nagymaros* judgment the Court said that the adoption of the Convention "strengthened" the "principle" of the "community of interests" in an international watercourse.[13] While the International Law Commission does not take a position on whether a particular article or paragraph is a codification of international law or an effort to progressively develop that law, it seems reasonable to conclude on the basis of state practice that at least three of the general principles embodied in the Convention correspond to customary norms. These are the obligations to use an international watercourse in an equitable and reasonable manner, not to cause significant harm, and to notify potentially affected riparian states of planned measures on an international watercourse. Of course, other provisions of the Convention, such as some of those relating to the environment, are closely related to, or even flow from these principles. To the extent that these provisions are based on the fundamental principles, they too might be said to reflect custom.

I will add just one additional word on this subject, and it relates to the World Court's judgment in the *Gabčíkovo-Nagymaros* case. As I have already indicated, the Court referred several times in its judgment to the right to an equitable and reasonable share of the uses and benefits of an international watercourse.[14] Notable for its absence was any reference to the "no-harm" principle. Hungary had relied fairly heavily upon this concept in its pleadings, but the Court did not accept its invitation to use it as a basis of its judgment. I do not believe that means the "no-harm" rule has been significantly weakened; but it suggests that the Court views the principle of equitable utilization to be the more important of the two.

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13 *Supra* note 6, para. 85, slip op. at 47.

14 *Id.* para. 78 and 85.

CONCLUSION: THE CONVENTION'S ENVIRONMENTAL PROVISIONS

As a conclusion, I would like to comment upon the environmental provisions of the Convention in terms of how they compare with similar provisions in other instruments. First and foremost, it must be borne in mind that this is a universal, framework agreement. Because of this fact, one cannot expect either the level of detail or the degree of "Greenness" that one might find in a bilateral or regional instrument. Indeed, a number of proposals were made during the U.N. negotiations for strengthening and, it was said, "updating" the provisions of the Convention from an environmental standpoint. Most of these proposals came from Western European delegations, but a few came from other regions, such as Latin America. Very few of these proposals were ultimately accepted. One cannot say, therefore, that stronger environmental provisions are missing from the Convention because they were not thought of in the negotiations. The fact is, they *were* thought of, but were simply not acceptable to a sufficient number of delegations.

A second point also relates to the fact that this is a *framework* instrument. It is therefore intended to be supplemented by more detailed agreements concerning specific watercourses shared by two or more countries. The level of protection that might be appropriate for Canada and the United States, for example, might not be found suitable by other countries. But I would submit that the Convention does provide an appropriate framework for the negotiation by riparian states of agreements suited to their circumstances and needs.

World Bank Policy for Projects on International Waterways
Salman M. A. Salman

World Bank Policy for Projects on International Waterways

Salman M. A. Salman*

Introduction

The World Bank faced the issue of how to deal with projects on international waterways in the late 1940s, soon after it started its operations. A number of hydropower, irrigation, water supply and industrial projects that the Bank started financing were likely to have an impact on the quantity or quality of waters shared by two or more states. Those types of projects could affect the relations between the Bank and its borrowers, as well as between the riparian states themselves. Accordingly, the Bank had to decide how to handle such projects.

International water law at that time was in its infancy. There were no established rules regulating the uses and protection of shared watercourses.[1] A few tribunal decisions laid down some general international law principles the application of which could be extended to shared waters. One such example is the Trail Smelter case which established responsibility of a state for using its territory in such a manner as not to cause harm to other states.[2] The Lake Lanoux Arbitration tribunal ruled that although France was entitled to use the waters of Lake Lanoux, which it shares with Spain, it could not ignore Spain's interests.[3] Accordingly, there were no universally established or agreed upon principles that the Bank could rely on, and the Bank had to develop a policy for dealing with the riparian issues related to those projects without the benefit of established, or even emerging, principles of international water law. Moreover, international water

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[1] It should be added that two conventions related to the uses of international watercourses were in force at that time: (i) the 1921 "Convention and Statute on the Regime of Navigable Waterways of International Concern" which is also known as the Barcelona Convention, and (ii) the 1923 "General Convention Relating to the Development of Hydraulic Power Affecting More Than One State" which is also known as the Geneva Convention. However, both conventions dealt with specific limited issues and did not lay down generally applicable principles regulating the use and protection of international watercourses. Moreover, few countries are parties to either of the two conventions.

[2] In 1941, the Arbitration Tribunal in the Trail Smelter case concluded that "… no state has the right to use or permit the use of its territory in such a manner as to cause injury by fumes in or to the territory of another or the properties or persons therein, when the case is of serious consequence and the injury is established by clear and convincing evidence." *See Trail Smelter Arbitration* (United States v. Canada), 3 R.I.A.A. 1911 (1941) at 1965. The application of this principle was extended later on to international watercourses, basically strengthening the obligation against causing harm.

[3] *See Lake Lanoux Arbitration (France v. Spain)*, 24 I.L.R. 101 (1957). The Tribunal went further and stated that Spain was entitled to demand that Spanish rights be respected and its interests be taken into account.

The Bank's initial approach towards such projects developed on a somewhat *ad hoc* basis.[5] Indeed, the need for an approach was dictated by a number of factors which still apply today. Before any loan is made by the Bank, the merits of the proposed project must be carefully studied.[6] Moreover, the Bank, as an international financial cooperative institution, owes certain duties to all its members (the borrower as well as the other riparians in case of such projects).[7] Thus, in considering a loan for a project involving the use of the waters of an international waterway, the Bank should ensure that the proposed uses will not be harmful to the interests of other riparians, whether upstream or downstream. It should also ensure that the proposed project will not be adversely affected by other riparians' uses of the international waterway. Additionally, the Bank should also ensure that the project is not inconsistent with international law, or with the provisions of any bilateral or multilateral treaty to which the beneficiary state is a party. As such, the Bank's approach was consistent with the general principles of international law emerging at that time.

Following the steady increase in the number of projects on international waterways, the Bank formulated its first procedural guidelines for such projects in 1956.[8] Operational Memorandum No. 8 "Projects on International Inland Waterways" instructed staff that the Bank's management should be informed promptly of any project the carrying out of which would involve the use of an international inland waterway, and that no steps were to be taken to investigate the merits of the project or to process the project without prior approval by management of a procedure dealing with the international aspects of the project. Accordingly, an early warning system for projects affecting international rivers and lakes was established, although no substantive rules were adopted.

Operational Memorandum No. 8 was revised and reissued in 1965. The application of the revised Memorandum was expanded from international inland waters to include some types of coastal waters, namely bays, gulfs, straits or channels bounded by two or more states, or if within one state, recognized as necessary channels of communication between the open sea and other states. The new Memorandum also

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[5] The Bank, for example, did not finance any projects on any river where there was a dispute, and insisted that an agreement be reached first. Such projects included some on the Indus River System in both India and Pakistan before the 1960 Indus Water Treaty was concluded, and on the Nile River in Egypt before the 1959 Nile Treaty between Egypt and Sudan was entered into.

[6] Article III, Section 4 (iii) of the Articles of Agreement of the Bank specifies, as one of the conditions for making a loan or a guarantee, that "a competent committee … has submitted a written report recommending the project after a careful study of the proposal."

[7] Article III, Section 4 (v) of the Articles of Agreement of the Bank requires the Bank to "….act prudently in the interests both of the particular member in whose territories the project is located and of the members as a whole."

[8] The issuance of this Memorandum was the result of a protest by Turkey against the Ghab Project in Syria, which the Bank had intended to finance in 1950. The project would have involved the use of the waters of the Orontes River, which Lebanon, Syria and Turkey share. Following this protest, Turkish and Syrian experts met to discuss the issue, and the Bank delayed further processing of the project until the differences were resolved by agreement between the two countries. However, Syria decided at a later stage in the discussions to withdraw its request for the loan for the project. Those developments prompted Bank management to issue Operational Memorandum 8.

required that the Executive Directors be informed of the international aspects of projects on international waterways, and the manner in which those aspects were to be handled. The contents of this Memorandum, with minor revisions, and under different titles, continued to guide the work of the Bank until 1985 when it was replaced by an elaborate, comprehensive policy, the main parameters of which are still in place.

During the period 1956 to 1985 the Bank followed, by and large, the practice that the other riparians should be notified of the proposed project that might affect the shared waters, despite the fact that this was not explicitly required under any of the then existing policies. This was done by the beneficiary state itself, or by the Bank directly or through the Executive Directors representing the other riparians. The notified states would be given a reasonable period of time, varying between two to six months, to reply. However, this practice was not reflected in any of the policies adopted before 1985.

Following lengthy delays of the consideration of one project affecting an international river in 1984 because of a protest by one of the riparians,[9] the management of the Bank prepared, and the Executive Directors approved in 1985, a new policy entitled "Projects on International Waterways."[10] It should be recalled that, by the time the new Policy was approved, a number of rules dealing with international watercourses had been adopted, including the famous Helsinki Rules which were issued by the International Law Association.[11] It should also be added that the International Law Commission had already started working on a draft watercourses convention and had, by that time, issued a number of reports.[12] In addition, the new Policy drew substantially from the Bank experience with projects on international waterways over the course of operation during the past forty years back.

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[9] The issuance of the Policy in 1985 was triggered by a protest lodged by Iran against an irrigation project that the Bank had intended to finance in Turkey on the Aras river. The Aras river is shared by Iran and Turkey, and at that the Soviet Union. Consideration of the project by the Executive Directors of the Bank was delayed because of the Iranian protest, and that prompted the Executive Directors to ask Bank management to prepare a detailed policy for dealing with projects on international waterways.

[10] That Policy underwent some minor modifications since its issuance in 1985, and is currently reflected in Operational Policy (OP) 7.50, and Bank Procedures (BP) 7.50, dated June 2001, which are included on pages 140 and 142.

[11] The Helsinki Rules were adopted in 1966 by the International Law Association. They were the first comprehensive and authoritative set of rules regulating the uses of international watercourses. The authoritative nature of the Helsinki Rules, despite the fact that those Rules were not binding *per se,* emanated from the fact those Rules reflected customary international law, and were widely accepted by most of the riparian states.

[12] The United Nations General Assembly (UNGA) asked the International Law Commission (ILC) in 1970 to study the topic of "international watercourses" and prepare a draft convention. The ILC is a UN body composed of legal experts, nominated by states and elected by the UNGA, and tasked with the codification and progressive development of international law. The ILC prepared a number of reports and drafts of the convention, and completed its work in 1994 when it adopted the draft UN Convention on the Law of the Non-Navigational Uses of International Watercourses. The ILC recommended the draft Convention to the UNGA, which, after lengthy sessions of discussion, adopted the Convention on May 21, 1997 (see McCaffrey, Stephen. The UN Convention on the Law of the Non-Navigational Uses of International Watercourse: Prospects and Pitfalls, p. 117).

Types of International Waterways

The Policy applies to the following types of international waterways:

(a) any river, canal, lake, or similar body of water that forms a boundary between, or any river or body of surface water that flows through, two or more states, whether Bank members or not;

(a) any tributary or other body of surface water that is a component of any waterway described in (a) above; and

(b) any bay, gulf, strait, or channel bounded by two or more states or, if within one state, recognized as a necessary channel of communication between the open sea and other states—and any river flowing into such waters.

The 1985 Policy continued using the term "waterways." It defined the term in such a way to include not only shared fresh waters, but also semi-enclosed coastal waters. Such coastal waters could be bounded by two or more states. They could also fall within one state, but in such a case, they should be recognized as a necessary channel of communication between the open sea and other states.[13] The definition also includes rivers flowing into any of the semi-enclosed coastal waters covered by the Policy. The reference here is clearly to national rivers. Such rivers have been included in the definition of "international waterways" by virtue of their emptying into semi-enclosed international waters. Poor and improper uses of such national rivers could adversely affect those semi-enclosed coastal waters, and this in turn could adversely affect other states. However, it should be clarified that the Policy deals with the qualitative aspects of the waters of those types of waterways, while in the case of rivers and lakes, both quantitative and qualitative aspects are covered by the Policy. Furthermore, the Policy applies regardless of whether the states sharing the waters are Bank members or not.

Another observation about the definition of "international waterways" under the Policy is that it does not include shared groundwater. The drafters of the Policy felt, at the time the Policy was being prepared, that not enough technical information was available to assist with the inclusion of shared groundwater.[14] However, soon after the Policy was adopted, the Bank financed a project involving the use of transboundary groundwater in Algeria in 1990, and the General Counsel at that time instructed application of the Policy provisions to transboundary groundwater. Those instructions have since been followed in a somewhat *ad hoc* basis, and the Policy continues to be widely, and often strictly, applied to transboundary groundwater. To date, no amendment has been introduced to the definition of the term "international waterways" to include transboundary groundwater. A

[13] As an example, this would include in the definition the strait of Bosporus and the Sea of Marmara in Turkey since they are recognized as the only channels of communication between a number of states (the other Black Sea States) and the Mediterranean Sea.

[14] It should be clarified that the 1966 Helsinki Rules did include transboundary groundwater connected to surface water. However, in 1986, the International Law Association issued the Seoul Rules which extended application of the Helsinki Rules to aquifers that do not receive water from, or contribute water to surface water.

number of international legal instruments, such as the UN Watercourse Convention, define "international watercourses" to include transboundary groundwater.[15]

Types of Projects

The Policy applies to the following types of projects:

(a) hydroelectric, irrigation, flood control, navigation, drainage, water and sewerage, industrial, and similar projects that involve the use or potential pollution of international waterways; and
(b) detailed design and engineering studies of projects under para. (a) above, including those to be carried out by the Bank as executing agency or in any other capacity.

The Policy enumerates the projects that are to be covered, and such projects include not only projects involving installations and works, but also other types of projects such as navigation. Also included are detailed design and engineering studies for the enumerated projects. This is because the Bank, as a cooperative financial institution, believes it is appropriate to include those types of detailed design and engineering studies, and extend application of the notification requirement to them, because such design and studies are likely to lead to investment projects.

Riparian Cooperation

The Policy states that the Bank, as a cooperative financial institution, recognizes that cooperation and goodwill of all the riparian states is essential for the efficient utilization and protection of international waterways. Therefore, the Bank attaches great importance to riparians' making appropriate agreements or arrangements for these purposes for the entire waterway or any part thereof. In cases where differences remain unresolved between the state proposing the project and the other riparians, prior to financing the project, the Bank normally urges the beneficiary state to offer to negotiate in good faith with the other riparians to reach appropriate agreements or arrangements.

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[15] Like the Helsinki Rules, the UN Watercourses Convention applies only to "a system of surface waters and groundwaters constituting by virtue of their physical relationship a unitary whole and normally flowing into a common terminus" Accordingly, the Convention does not extend to aquifers that do not receive water from, or contribute water to surface waters. Other instruments dealing with transboundary groundwater include the 1991 Espoo Convention (Convention on Environmental Impact Assessment in a Transboundary Context), and the Helsinki Convention of 1992 (Convention on the Protection and Use of Transboundary Watercourses and International Lakes). The Espoo Convention requires notification of other riparian states in cases where the annual volume of water to be abstracted from the shared aquifer by one state amounts to 10 million cubic meters or more. The UN International Law Commission is currently working on "Transboundary Groundwaters." Its Third Report, presented on February 11, 2005, includes a Draft Convention on the Law of Transboundary Aquifers. This Draft is modeled on the UN Watercourses Convention, and includes provisions on notification of planned activities that may have significant adverse effects on other aquifer states. The draft covers all types of groundwaters.

This emphasis on proactive engagement by the Bank to promote riparian agreement is important, although this task can be extremely complex, costly, long-term and risky, as evidenced by the Bank's work on the Indus, Aral Sea, Mekong and Nile Basins. While this is not the usual Bank operational work, it is a very important focus for the Bank, and one that the Bank is uniquely equipped to tackle, due to its convening power and skill sets, and the "carrot of investments."

Notification

The policy requires that the international aspects of a project on an international waterway are dealt with at the earliest possible opportunity in the project cycle. The prospective borrower should notify the other riparians (both upstream and downstream) of the proposed project and its details. The notification contains, to the extent available, sufficient technical specifications, information, and other data to enable the other riparians to determine as accurately as possible whether the proposed project has the potential for causing appreciable harm through water deprivation (whether actual deprivation as in the case of downstream riparians, or foreclosure of future uses as in the case of upstream riparians, as discussed below), or through pollution or otherwise. Riparian states are given a reasonable period, which could range from two to six months (depending on the nature of the project), to reply.

If the prospective borrower indicates to the Bank that it does not wish to give notification, normally the Bank itself does so on behalf of the borrower.[16] If the prospective borrower does not wish to give notification, and objects to the Bank's doing so, the Bank discontinues processing of the project. This is understandable given the need to maintain the good neighborliness between the riparian states, which is the underlying reason for notification. In case there is no central government with effective legal authority in a country, the Bank will notify the Executive Director representing such a country in the Bank Board.[17] If the country concerned is not represented by any Executive Director, the Bank assesses the situation and makes its determination depending on the impact the project may have on this country. The Bank will proceed with the project if it determines that it will not cause any appreciable effect on such a country. If a United Nations administration is set up for a country, the Bank would notify such United Nations body.[18]

A number of observations can be made about the requirement of notification under the Policy:

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[16] Article 30 of the UN Watercourses Convention includes similar procedures. The article states that when there are serious obstacles to direct contacts between the watercourse states concerned, they shall then fulfill their obligations of cooperation, including notification, through any indirect procedures accepted by them.

[17] This is the practice that the Bank has followed with regard to Somalia since early 1990s.

[18] For the Lesotho Highlands Water Project, the United Nations Council for Namibia was notified by Lesotho of the project in 1985. The Council was established by a United Nations Security Counsel resolution to administer Namibia prior to its independence.

First, the Policy requires notification "of the other riparians," and not just downstream riparians, of the project. Since the Policy was adopted, the Bank has required notification to all riparians, whether downstream or upstream. It is a common mistaken belief among both lawyers and non-lawyers that harm can only "travel" downstream, and it is not recognized that harm can also take place upstream. In other words, this mistaken notion is based on the assumption that only upstream riparians can harm downstream riparians. It is obvious, and clearer, that the downstream riparian can be harmed by the physical impacts of water quality and quantity changes caused by use by an upstream riparian. It is much less obvious, and generally not recognized, that the upstream riparian can be harmed by the potential foreclosure of its future use of water caused by the prior use and the claiming of rights by a downstream riparian.[19] For example, a poor upstream country could be precluded from developing the water resources of an international waterway tomorrow if a richer downstream riparian, without consultation or notification, develops it today. This is an important principle in international water law, and the Bank Policy has shown through implementation of the notification process how the principle actually works, and its relevance and appropriateness. Indeed, some countries have realized and are aware of this aspect of international water law,[20] and some recent treaties have incorporated it.[21]

Second, the Policy has not established a threshold for notification. Rather, it requires notification in all the projects enumerated in the Policy that are to be carried out on international waterways, subject to certain exceptions discussed below. This is in contrast to some recent international legal instruments that have established a threshold for notification, and because of that have not enumerated the types of projects covered under such instruments. The UN Watercourses Convention requires notification for projects which may have "significant adverse effect" upon other watercourse states.[22] With the increasing number of projects financed by the Bank which either have no effects, or minimal effects, on other riparians, it would seem quite appropriate for the Bank to move in the direction of establishing a threshold for notification.

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[19] The Helsinki Rules require a riparian state "regardless of its location in a drainage basin" to "furnish to any other basin states the interests of which may be substantially affected, notice of any proposed construction." The UN Watercourses Convention requires a watercourse state before it implements planned measures "which may have a significant adverse effect upon other watercourse states" to provide those states with timely notification. Although neither instruments limits notification to downstream riparians, it is not understood that upstream states need to be notified. This is because of the misconception that harm can only be inflicted by upstream states on downstream states.

[20] For example, Ethiopia protested to Sudan and Egypt when the two countries concluded the 1959 Nile Agreement that divided the Nile waters between them and paved the way for the construction of the High Dam.

[21] The Senegal River Water Charter which was concluded by Senegal, Mauritania and Mali in May 2002, and which Guinea signed in 2006, enumerates in Article 4 a number of principles for distribution of the water of the Senegal River. Such principles include "the obligation of each riparian state before engaging in any activity or project likely to have an impact on water availability and/or the possibility to implement future projects."

[22] See Article 12 of the UN Watercourse Convention. As stated earlier, the Helsinki Rules require notifying the riparian states whose interests may be substantially affected.

Third, although no threshold is established under the Policy for notification, the Policy requires that the project on an international waterway which the Bank intends to finance should not cause appreciable harm to other riparians. Hence, the Policy has embraced the obligation not to cause harm.[23] One of the criticisms often voiced about the Bank Policy is that it has not incorporated the principle of equitable and reasonable utilization. However, the decision of what is equitable and reasonable utilization is an outcome that has to be reached by the parties themselves. The Bank does not have the authority to decide that for any of the riparian states. Yet, the Policy is not crafted in complete disregard to the principle of equitable and reasonable utilization. Indeed, harm can result from water deprivation as well as from pollution. As discussed earlier, harm through water deprivation goes both ways. Upstream riparian states can cause harm to other riparian states though use of substantive amounts of the shared waters that adversely affects the downstream riparians. Similarly, downstream riparians can cause harm to upstream riparians through foreclosure of future uses of the shared waters. The Bank would not consider financing a project that would use too much water from the shared river. Such use would be considered more than the equitable and reasonable share of the riparian state concerned, and thus would result in harm to other riparians. Hence, the Bank Policy has provided an intersection, indeed a confluence, for the two concepts: the obligation not to cause harm, and the principle of equitable and reasonable utilization. Although crafted in terms of the obligation not to cause harm, application of that principle would necessitate consideration of the principle of equitable and reasonable utilization.

Response to the Notification

The response of the riparian states to the notification varies. The beneficiary state or the Bank (in case the notification is undertaken by the Bank on behalf of the beneficiary state) may receive a positive response from the other riparians in the form of consent, no objection, support to the project, or confirmation that the project will not cause appreciable or adverse effects to them. One or more of the riparians may not respond in any way to the notification, or may respond asking for more information. There may also be an objection from one or more of the riparian states.

In case of an objection to the project by one or more of the riparian states, or in case no reply is received from one or more of the riparian states after the specified date, Bank staff assesses the objection raised, and ascertains whether the proposed project would cause appreciable harm to the other riparians. The staff also makes a recommendation to Bank management on how to proceed. The Bank may, in appropriate cases, appoint one or more independent experts to examine the objection. Such experts have no decision-making role in project processing, and their opinion is submitted for Bank purposes only. Should the Bank decide to proceed with the project despite the objection, the Bank informs such a riparian (or riparians) of its decision.

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[23] For further discussion of this issue, *see* Raj Krishna, Evolution and Context of the Bank Policy for Projects on International Waterways, in Salman M. A. Salman and Laurence Boisson de Chazournes, *International Watercourses – Enhancing Cooperation and Managing Conflict* (World Bank Technical Paper No. 414, 1998) at 31.

The Policy is silent on how a request from one or more of the riparian states for more information is to be handled. However, both Good Practices 7.50,[24] and the Bank implementation experience provide answers to this issue. Both direct Bank staff to make every effort to provide any information requested, or clarifications sought, by one or of the riparian states. They also direct that a reasonable additional time be provided for such riparian states for study and response.

Thus, the Policy does not grant a veto power to any riparian state over a project on an international waterway it intends to finance. The other riparians are notified, regardless of how minimal the effect the project may have on such states. Their views would be considered by the Bank, and in some cases where the objection may raise some issues, the Bank may appoint one or more independent experts to examine the objection. It should be clarified that such experts have no decision-making role in the project processing. Their technical opinion is submitted for the Bank's purposes only, and does not in any way bind the Bank, or determine the rights and obligations of the riparians. This is because the independent experts are not an arbitration panel. Accordingly, the final decision about the project rests exclusively with the Bank.

Exceptions to Notification

As specified earlier, the Policy requires, as a general rule, notification of all the riparians of a project on an international waterway. However, the Policy provides for three exceptions to the Bank's requirement that the other riparian states be notified of the proposed project. Those exceptions are:

(a) For any ongoing schemes, projects involving additions or alterations that require rehabilitation, construction, or other changes that in the judgment of the Bank (i) will not adversely change the quality or quantity of water flows to the other riparians; and (ii) will not be adversely affected by the other riparians' possible water use.[25]
(b) Water resource surveys and feasibility studies on or involving international waterways. However, the state proposing such activities includes in the terms of reference for the activities an examination of any potential riparian issues.
(c) Any project that relates to a tributary of an international waterway where the tributary runs exclusively in one state and the state is the lowest downstream riparian, unless there is concern that the project could cause appreciable harm to other states.

[24] Good Practices were operational memoranda that that the Bank used to issue outlining best practices for situations relevant to the specific Operational Policy. Although they are not legally binding *per se*, those Good Practices usually reflect Bank implementation experience, and as such they derive their authority from precedents. Such Good Practices have been discontinued and are being replaced by Source Books, or Hand Books, which explain and elaborate on the particular aspects of the policy.

[25] According to the Policy, this exception applies only to minor additions or alterations to the ongoing scheme; it does not cover works and activities that would exceed the original scheme, change its nature, or so alter or expand its scope and extent as to make it appear a new or different scheme. In case of doubt regarding the extent to which a project meets the criteria of this exception, the executive directors representing the riparians concerned are informed and given at least two months to reply. Even if projects meet the criteria of this exception, the Bank tries to secure compliance with the requirements of any agreement or arrangement between the riparians.

The first exception is interpreted to apply to rehabilitation of existing schemes. It is worth noting that although the Policy has not established a threshold for notification, it has set such a threshold for application to this exception. The works to be financed for the rehabilitation of the existing schemes should be minor, and should not adversely change the quality or quantity of water flow to other riaprians. If there is doubt about this determination, then the Policy requires notifying the Executive Director or Directors representing the affected riparian states, providing them with the project details and giving them at least two months to reply.

The second exception dealing with water resources surveys and feasibility studies should be distinguished from detailed design and engineering studies. The latter indicates an advanced stage in project preparation and requires notifying other states, which is not the case with surveys and feasibility studies

The third exception follows also a similar approach as the first exception by requiring that the project in the lowest downstream riparian should not cause appreciable harm to other states. However, those three exceptions would not be needed if the Policy were to be amended to include a threshold for notification. Those exceptions would then be subsumed under the threshold of "appreciable harm" or "adverse effects" established as the new basis for notification.

Existing Arrangements and Agreements

The Policy requires that the Bank ascertains whether the riparians have entered into agreements or arrangements covering the issues involved, or have established any institutional framework for the waterway concerned. In the latter case, the Bank ascertains the scope of the institution's activities and functions and the status of its involvement in the proposed project, bearing in mind the possible need for notifying the institution. Indeed, institutions that are endowed under their constituent instruments with the authority to act on behalf of the riparian states are now being notified of projects under the Bank Policy. Such institutions include the International Commission for the Protection of the Danube, the Lake Chad Commission, and the Black Sea Commission. If one or more of the riparians is not a party to the agreement establishing the institution, and as such are not represented in the institution, then a separate notification of the project for such state, or states, is required.[26]

Thus, the Policy requires ascertaining if any agreement has been entered into, or any institutions are established, and determining whether the issues involved are covered by an appropriate agreement or arrangement between the beneficiary state and the other riparians. Moreover, in case the project meets the criteria of the exception to the notification requirement dealing with rehabilitation of existing schemes, the Bank is

[26] The 1995 Agreement on the Cooperation for the Sustainable Development of the Mekong River Basin which has established the Mekong Commission is signed and ratified only by Cambodia, Lao Peoples Democratic Republic, Thailand and Vietnam. Both China and Myanmar are not parties to this Agreement, and as such are not members of the Mekong Commission. If the Commission is notified of projects involving the Mekong River, China and Myanmar would also have to be notified separately.

required to secure compliance with the requirements of any agreement or arrangement between the riparians. If the agreement between the riparians requires notification or exchange of information on this type of projects, then this requirement would still have to be met, notwithstanding the Bank policy that requires no notification for this type of project. In essence, the Bank Policy would in no way supersede the parties' obligations under agreements concluded by them.

Conclusion

The large and diversified number of projects that the Bank financed on international waterways has resulted in a rich and extensive experience on the various, intricate and difficult issues that surround such projects. Indeed, the Bank is the only institution with a policy dealing with such projects that has been widely operationalized. The Policy, no doubt, has provided a major and important contribution to the emerging principles of international water law.

One important feature of the Bank Policy is that harm can result from projects and activities of downstream riparians in as much as it can result from projects and activities of upstream riparians. This theory emanated from the Bank practical experience and is based on the concept of foreclosure of future uses of the waters of the shared rivers. The theory is being met with gradual understanding and acceptance, and as we have seen, is now reflected in some international water treaties. It is a fair theory, and can be attributed to the principle of equitable and reasonable utilization, which is the cardinal principle of international water law. And although the Bank Policy is based on the obligation not to cause appreciable harm, the application of this principle under the Bank Policy has clearly shown that the two principles – equitable and reasonable utilization and the obligation not to cause harm - do indeed intersect. The quantitative aspects of harm can not be determined without taking into consideration, one way or another, equitable and reasonable utilization.

Another feature of the Policy is that it allows the Bank to undertake notification on behalf of the beneficiary state if the latter indicates to the Bank that it does not wish to give notification. This usually happens when the relationship between the beneficiary state and some of the riparians is facing some problems, making direct contacts difficult. The Bank would undertake notification in such cases only when the beneficiary state indicates to the Bank that it has no objection to the Bank doing that. The UN Watercourses Convention has also recognized that such situations can arise, and directed the states, under such circumstances, to fulfill their obligations under the Convention, including notification, through any indirect procedures acceptable to them.

However, there are areas where the Policy faces criticism. One such criticism is the absence of a threshold for notification, which would require notification even when the project impacts on the shared waterway are minimal, or even when there are no impacts. The justification for a notification, as a general rule, stems from the fact the Bank is an international financial cooperative institution with a duty to all its members. As such, those members should be aware of its activities on their shared waterways

regardless of the effects such activities may have. However, the Policy could still be aligned with other international legal instruments which establish a threshold for notification, and at the same time the Bank could still make arrangements for informing, and not notifying, other riparians of projects that fall below such a threshold. Information about the projects that do not trigger notification could be provided to the Executive Director representing such riparian states in the Bank Board.

Another criticism of the Policy relates to the failure of the Policy to include transboundary groundwater in the definition of international watercourses, and only doing that through interpretation of the Policy provisions. Any future revisions of the Policy will need to address this matter by including an explicit reference to transboundary groundwater.

Thus, it can be concluded that following sixty years of operational experience with projects on international waterways, the Bank has developed an extensive and rich experience in this field. The current policy, and the manner in which it has been interpreted and applied, have affected and been affected by the emerging principles of international water law, and have contributed significantly to the development of such principles.

OP 7.50 – Projects on International Waterways

OP 7.50 - Projects on International Waterways

These policies were prepared for use by World Bank staff and are not necessarily a complete treatment of the subject. **OP 7.50 June, 2001**

Note: OP and BP 7.50 replace OP and BP 7.50, dated October 1994. Questions may be addressed to the Chief Counsel, Environmentally and Socially Sustainable Development and International Law.

Applicability of Policy

1. This policy applies to the following types of international waterways:
(a) any river, canal, lake, or similar body of water that forms a boundary between, or any river or body of surface water that flows through, two or more states, whether Bank1 members or not;
(b) any tributary or other body of surface water that is a component of any waterway described in (a) above; and
(c) any bay, gulf, strait, or channel bounded by two or more states or, if within one state, recognized as a necessary channel of communication between the open sea and other states--and any river flowing into such waters.
2. This policy applies to the following types of projects:

(a) hydroelectric, irrigation, flood control, navigation, drainage, water and sewerage, industrial, and similar projects that involve the use or potential pollution of international waterways as described in para. 1 above; and
(b) detailed design and engineering studies of projects under para. 2(a) above, including those to be carried out by the Bank as executing agency or in any other capacity.

Agreements/Arrangements

3. Projects on international waterways may affect relations between the Bank and its borrowers and between states (whether members of the Bank or not). The Bank recognizes that the cooperation and goodwill of riparians is essential for the efficient use and protection of the waterway. Therefore, it attaches great importance to riparians' making appropriate agreements or arrangements for these purposes for the entire waterway or any part thereof. The Bank stands ready to assist riparians in achieving this end. In cases where differences remain unresolved between the state proposing the project (beneficiary state) and the other riparians, prior to financing the project the Bank normally urges the beneficiary state to offer to negotiate in good faith with the other riparians to reach appropriate agreements or arrangements.

Notification

4. The Bank ensures that the international aspects of a project on an international waterway are dealt with at the earliest possible opportunity. If such a project is proposed, the Bank requires the beneficiary state, if it has not already done so, formally to notify the other riparians of the pro-posed project and its Project Details (see **BP 7.50, para. 3**). If the prospective borrower indicates to the Bank that it does not wish to give notification, normally the Bank itself does so. If the borrower also objects to the Bank's doing so, the Bank discontinues processing of the project. The executive directors concerned are informed of these developments and any further steps taken.

5. The Bank ascertains whether the riparians have entered into agreements or arrangements or have established any institutional framework for the international waterway concerned. In the latter case, the Bank ascertains the scope of the institution's activities and functions and the status of its involvement in the proposed project, bearing in mind the possible need for notifying the institution.

6. Following notification, if the other riparians raise objections to the proposed project, the Bank in appropriate cases may appoint one or more independent experts to examine the issues in accordance with **BP 7.50, paras. 8-12**. Should the Bank decide to proceed with the project despite the objections of the other riparians, the Bank informs them of its decision.

Exceptions to Notification Requirement

7. The following exceptions are allowed to the Bank's requirement that the other riparian states be notified of the proposed project:
(a) For any ongoing schemes, projects involving additions or alterations that require rehabilitation, construction, or other changes that in the judgment of the Bank (i) will not adversely change the quality or quantity of water flows to the other riparians; and (ii) will not be adversely affected by the other riparians' possible water use. This exception applies only to minor additions or alterations to the ongoing scheme; it does not cover works and activities that would exceed the original scheme, change its nature, or so alter or expand its scope and extent as to make it appear a new or different scheme. In case of doubt regarding the extent to which a project meets the criteria of this exception, the executive directors representing the riparians concerned are informed and given at least two months to reply. Even if projects meet the criteria of this exception, the Bank tries to secure compliance with the requirements of any agreement or arrangement between the riparians.
(b) Water resource surveys and feasibility studies on or involving international waterways. However, the state proposing such activities includes in the terms of reference for the activities an examination of any potential riparian issues.
(c) Any project that relates to a tributary of an international waterway where the tributary runs exclusively in one state and the state is the lowest downstream riparian, unless there is concern that the project could cause appreciable harm to other states.

Presentation of Loans to the Executive Directors

8. The Project Appraisal Document (PAD) for a project on an international waterway deals with the international aspects of the project, and states that Bank staff have considered these aspects and are satisfied that
(a) the issues involved are covered by an appropriate agreement or arrangement between the beneficiary state and the other riparians; or
(b) the other riparians have given a positive response to the beneficiary state or Bank, in the form of consent, no objection, support to the project, or confirmation that the project will not harm their interests; or
(c) in all other cases, in the assessment of Bank staff, the project will not cause appreciable harm to the other riparians, and will not be appreciably harmed by the other riparians' possible water use. The PAD also contains in an annex the salient features of any objection and, where applicable, the report and conclusions of the independent experts.

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1. "Bank" includes IDA; "loans" include credits; and "project" includes all projects financed under Bank loans or IDA credits, but does not include adjustment programs supported under Bank loans and IDA credits; and "borrower" refers to the member country in whose territory the project is carried out, whether or not the country is the borrower or the guarantor.

BP 7.50 – Projects on International Waterways

BP 7.50 - Projects on International Waterways

These policies were prepared for use by World Bank staff and are not necessarily a complete treatment of the subject.

BP 7.50 June, 2001

This Bank Procedures statement was revised in August 2004 to reflect the term "development policy lending" (formerly adjustment lending), in accordance with OP/BP 8.60, issued in August 2004.

Note: OP and BP 7.50 replace OP and BP 7.50, dated October 1994. Questions may be addressed to the Chief Counsel, Environmentally and Socially Sustainable Development and International Law.

1. A potential international water rights issue is assessed as early as possible during project identification[1] and described in all project documents starting with the Project Information Document (PID). The task team (TT) prepares the project concept package, including the PID, in collaboration with the Legal Vice Presidency (LEG) to convey all relevant information on international aspects of the project. When the TT sends the project concept package to the Regional vice president (RVP), it sends a copy to the Vice President and General Counsel (LEGVP). Throughout the project cycle the Region, in consultation with LEG, keeps the managing director (MD) concerned abreast of the international aspects of the project and related events.

Notification

2. As early as possible during identification, the Bank[2] advises the state proposing the project on an international waterway (beneficiary state) that, if it has not already done so, it should formally notify the other riparians of the proposed project giving available details (see para. 3). If the prospective borrower indicates to the Bank that it does not wish to give notification, normally the Bank itself does so. If the beneficiary state also objects to the Bank's doing so, the Bank discontinues processing of the project. The Region informs the executive directors concerned of these developments and of any further steps taken.

3. The notification contains, to the extent available, sufficient technical specifications, information, and other data (Project Details) to enable the other riparians to determine as accurately as possible whether the proposed project has potential for causing appreciable harm through water deprivation or pollution or otherwise. Bank staff should be satisfied that the Project Details are adequate for making such a determination. If adequate Project Details are not available at the time of notification, they are made available to the other riparians as soon as possible after the notification. If, in exceptional circumstances, the Region proposes to go ahead with project appraisal before Project Details are available, the country director (CD), via a memorandum prepared in consultation with LEG and copied to the LEGVP, notifies the RVP of all relevant facts on international aspects and seeks approval to proceed. In making this decision, the RVP seeks the advice of the MD concerned.

4. The other riparians are allowed a reasonable period, normally not exceeding six months from the dispatch of the Project Details, to respond to the beneficiary state or Bank.

Responses/Objections

5. After giving notice, if the beneficiary state or Bank receives a positive response from the other riparians (in the form of consent, no objection, support to the project, or confirmation that the project will not harm their interests), or if the other riparians have not responded within the stipulated time, the CD, in consultation with LEG and other departments concerned, addresses a memorandum to the RVP. The memorandum reports all relevant facts, including staff assessment of whether the project would (a) cause appreciable harm to the interests of the other riparians, or (b) be appreciably harmed by the other riparians' possible water use. The memorandum seeks approval for further action. In making this decision, the RVP seeks the advice of the MD concerned.

6. If the other riparians object to the proposed project, the CD, in collaboration with LEG and other departments concerned, sends a memorandum on the objections to the RVP and copies it to the LEGVP. The memorandum addresses

(a) the nature of the riparian issues;

(b) the Bank staff's assessment of the objections raised, including the reasons for them and any available supporting data;

(c) the staff's assessment of whether the proposed project will cause appreciable harm to the interests of the other riparians, or be appreciably harmed by the other riparians' possible water use;

(d) the question of whether the circumstances of the case require that the Bank, before taking any further action, urge the parties to resolve the issues through amicable means such as consultations, negotiations, and good offices (which will normally be resorted to when the other riparians' objections are substantiated); and

(e) the question of whether the objections are of such a nature that it is advisable to obtain an additional opinion from independent experts in accordance with paras. 8-12.

7. The RVP seeks the advice of the MD concerned and the LEGVP, and decides whether and how to proceed. On the basis of these consultations, the RVP may recommend to the MD concerned that the Operations Committee consider the matter. The CD then acts upon either the Operations Committee's instructions, which are issued by the chairman, or the RVP's instructions, and reports the outcome in a memorandum prepared in collaboration with LEG and other departments concerned. The memorandum, sent to the RVP and copied to the LEGVP, includes recommendations for processing the project further.

Seeking the Opinion of Independent Experts

8. If independent expert opinion is needed before further processing of the project (see OP 7.50, para. 6), the RVP requests the Vice President, Environmentally and Socially Sustainable Development (ESDVP) to initiate the process. The Office of the ESDVP maintains a record of such requests.

9. The ESDVP, in consultation with the RVP and LEG, selects one or more independent experts from a roster maintained by ESDVP (see para. 12). The experts selected may not be nationals of any of the riparians of the waterways in question, and also may not have any other conflicts of interest in the matter. The experts are engaged and their terms of reference prepared jointly by the offices of the ESDVP and the RVP. The latter finances the costs associated with engaging the experts. The experts are provided with the background information and assistance needed to complete their work efficiently.

10. The experts' terms of reference require that they examine the Project Details. If they deem it necessary to verify the Project Details or take any related action, the Bank makes its best efforts to assist. The experts meet on an ad hoc basis until they submit their report to the ESDVP and the RVP. The ESDVP or RVP may ask them to explain or clarify any aspect of their report.

11. The experts have no decision-making role in the project's processing. Their technical opinion is submitted for the Bank's purposes only, and does not in any way determine the rights and obligations of the riparians. Their conclusions are reviewed by the RVP and ESDVP, in consultation with the LEGVP.

12. The ESDVP maintains, in consultation with the RVPs and LEG, the roster of highly qualified independent experts, which consists of 10 names and is updated at the beginning of each fiscal year.

Maps

13. Documentation for a project on an international waterway includes a map that clearly indicates the waterway and the location of the project's components. This requirement applies to the PAD, the Project Information Document (PID), and any internal memoranda that deal with the riparian issues associated with the project. Maps are provided for projects on international waterways even when notification to riparians is not required by the provisions of OP 7.50. Maps are prepared and cleared in accordance with Administrative Manual Statement 7.10, Cartographic Services , and its annexes.

14. However, the inclusion of maps in the cited documents, except internal memoranda, is subject to any general instruction or decision of the Regional vice president, taken in consultation with the Vice President and General Counsel, to omit maps of the beneficiary state in their entirety or in part.

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1. See BP 10.00, *Investment Lending: Identification to Board Presentation.*

2. "Bank" includes IBRD and IDA; "loans" include IDA credits and IDA grants; and "projects" includes all projects financed under Bank loans or IDA credits, but does not include development policy lending programs supported under Bank loans and IDA credits; and "borrower" refers to the member country in whose territory the project is carried out, whether or not the country is the borrower or the guarantor.

PART 2

INSTRUCTOR/FACILITATOR MANUAL

HOW TO USE THE INSTRUCTOR/ FACILITATOR MANUAL

STRUCTURE OF THE MANUAL

The workbook is designed to be an effective aid for teaching students and professionals, and for collaborative learning exercises amongst co-riparians, where a skills-building course can act as an effective vehicle to enhance negotiations. In this latter case, the riparians' actual basin can be substituted for the hypothetical basin (or not, as the **instructor/facilitator** deems best – the IW Core Team has done both, depending on the setting), although if the actual basin is used, it is probably best if participants play roles and nationalities other than their own. Notes specifically for the **instructor/facilitator** are inserted as appropriate throughout the workbook.

The workbook is written to be equally relevant for the participant **(Part 1)** and for the instructor/facilitator **(Part 2)**. Since we anticipate that most "participants" will need the background and training materials provided for the instructor/facilitator immediately after the course, either for their own professional or personal knowledge or because they are being trained as trainors, we include both sets of material within this same text.

The IW course on which this workbook is based lasted four full eight-hour, consecutive days (mixing lectures and exercises), with each module lasting one day (modules 2 and 3 were done in one day, but many exercises listed here were not included), and can accommodate anywhere between six and seventy participants (the World Bank courses generally enrolled 40-50). With some modifications, the course can be spread out over two weeks consecutively, or over a semester if so desired. It is designed to stand alone, for basic understanding of the issues and processes involved, or to supplement other texts. Relevant supplemental readings are included at the end of each module in Part 1, the Participant Workbook, and extensive citations are listed in the bibliography (Appendix A) to assist the **instructor/facilitator** in preparing lectures and discussions, and to guide the participants in further inquiry. The exercises can be worked straight through or they can be selected individually, as the **instructor/facilitator** deems appropriate.[1]

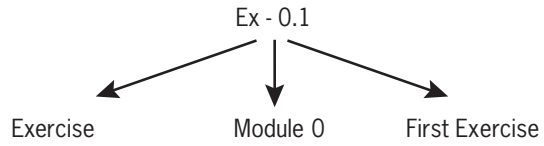
In a very general sense, the process of building to effective transboundary water resources management can be thought of in four non-linear, iterative stages of negotiation – adversarial, reflexive, integrative, and action – around which this workbook is designed:

- **Module 0:** Introduction to Hydropolitics and Conflict Transformation
- **Module I:** Initial State: Basins and Boundaries – Scale is interpersonal, focus is on trust-building, and analysis is of parties, positions and interests. Negotiations are often *adversarial*, with an emphasis on *rights*.
- **Module II:** Changing Perceptions: Basins without Boundaries – Scale is intersectoral, focus is on skills-building, and analysis is on the gap between current and future states. Negotiations move to the *reflexive* stage, and parties define *needs*.
- **Module III:** Enhancing and Sharing Benefits – Scale moves beyond the basin, focus is on consensus-building, and analysis is on benefits of cooperation. Negotiations are *integrative*, where parties define *benefits*.
- **Module IV:** Putting it all Together: Institutional Capacity – Scale is international, focus is on capacity-building, and analysis is on institutional capacity. Negotiations are in the *action* stage, where *equity* is defined and institutionalized.

In this **instructor/facilitator** manual, each of the modules includes general setting information, overview material, and detailed skills-building exercises. Exercises, handouts, and overheads are included within the main body of the manual (with the exception of the Sandus Basin simulation which is only in the appendix) for easy reading, and larger versions of the overheads are in the appendices for copying. ***All supplemental reading materials are only located at the end of each module in Part 1 (the participant version of the workbook).***

1. For excellent supplemental course material, including a "water message" game, see Van der Zaag, *et al.* 2003.

Exercises (Ex), handouts (H), and overheads (Ov) are coded, for example, as follows:



In other words, Ex-0.1 is the first exercise in Module 0; H-I.2 is the second handout in Module I; and so on.

Finally, a note on scale: The IW Window was developed specifically to address issues related to international waters – those waterways which cross the political boundaries of two or more countries. But the framework developed in this workbook is applicable for any transboundary waterway, whether surface- or groundwater, quality or quantity, or whether the boundaries are those of nations, states, provinces, economic sectors, or even individual users.

HIGHLIGHTED MATERIAL FOR THE PARTICIPANT (I)

This workbook is written to be equally relevant for the participant and for the **instructor/facilitator**. Ideally, everyone involved in the course would have their own copy of the workbook. Material which is in Part A, and that the **instructor/facilitator** will want to share immediately throughout the course is highlighted by a vertical line in the right-hand margin ( ). Material surrounding this marked text is explanatory and also useful for the participant, but the **instructor/facilitator** may want to think out when this material is best shared. The **instructor/facilitator** will need to decide how much of the rest of the explanatory text to share with the students, and at what point. Nonetheless, we recommend that the instructor/facilitator skim these sections to see how the information is presented.

CHOREOGRAPHY OF ACTIVITIES

The "choreography" is occasionally complicated, so the **instructor/facilitator** should read the entire document carefully well in advance, and plan out the logistics of the exercises in detail, depending on the number of participants and time available. This is tremendously important, since participants will be moved around a good bit and will appreciate confidence on the part of the **instructor/facilitator**. Note that you will need *lots* of time for regular debriefs (as noted through the workbook). This is a critical, but often underutilized, component of many exercises. Participants will want the time, and you will want to make sure that plenty is blocked out.

One major reading needs to be done by the participants at the equivalent of the end of Days 1 and 2. There are supplemental readings (in the appendices) available either for the participants' preparation or to assist the **instructor/facilitator** in crafting lectures to intersperse with the exercises, or both. In general, we have found that the pedagogy is more effective if the details of each module are taught in depth *after* the corresponding exercises, i.e., principles are experienced before they are taught.

MATERIALS REQUIRED

The exercises begin with pairs of participants, then "scale up" to where all the participants are involved in one large exercise. Generally, participants will be divided into groups of six or seven – the **instructor/facilitator** can divide them as appropriate. Any "loose" participants can act as observer/commentators, team up with others, or help with the facilitation.

The instructor/facilitator will need to have:

- an electronic (e.g., PowerPoint) or overhead projector versions of the lecture/discussions
- module handouts
- copies of exercises, as appropriate (the **instructor/facilitator** should read through carefully and figure out which copies are necessary for the size and makeup of the group)

- one or two large poster-board easels
- pads of easel paper
- felt tip markers of different colors to capture participant thoughts and ideas
- an electronic or overhead projector version of the Sandus Basin maps (if the maps can be printed in large format, all the better)
- hardcopies and transparencies for overhead projectors of blank maps, both with and without national boundaries
- yellow, blue, and green (or any other three colors) Post-It notes or colored paper (and tape);
- table name-plates (e.g., tent cards) labeled as: Water Supply & Sanitation; Irrigation & Drainage; Energy Resources; Environmental Services; Industry & Navigation; Local & Indigenous; Gambo; Sandus Republic; South Zwabili; Itaga; Kigala; Nature Conservation Union & NGO Community.

MEETING SPACE

The workspace should have plenty of room to accommodate all participants to work both as one large group and in small groups. Ideally, seating and tables should be flexible and movable (i.e., preferably not "auditorium" style).

Finally, be prepared to roll with however the course develops. Regardless of how carefully one organizes, the ultimate success of the course will depend heavily on the attitude, flexibility, and sense of humor of the **instructor/facilitator**.

MODULE 0
ENHANCING AND SHARING BENEFITS

Overall Goal(s)	To introduce the concept that shared waters not only create potential conflicts but also create opportunities for cooperation
Duration	2-6 hours
Important Background Information	For supplemental reading, see Part 1, Module 0, Section H, page 14
Sections	A. General Setting: Introduction to Hydropolitics B. Conflict and Cooperation: The Challenge of International Waters C. Stages of Water Conflict Transformation D. Basic Definitions for Dispute Resolution E. Understanding Conflict F. Introducing Water Disputes G. Introducing the Sandus Basin Simulation
Exercises	Ex-0.1 Understanding Conflict Ex-0.2 Water Disputes Ex-0.3 Parties, Issues, and Interests
Handouts	H-0.1 Role for Roland: Ugli Orange H-0.2 Role for Jones: Ugli Orange H-0.3 Basic Definitions for Dispute Resolution H-0.4 Sandus Basin Country Overviews H-0.5 Instructions for Small Group Tasks H-0.6 Negotiations Planning Chart H-0.7 Chart Definitions and Explanations H-0.8 Generic invitation to Sandus Basin Negotiations H-0.9 Country-specific Briefing Points Tabletop Nameplates: Countries (Appendix D) Tabletop Nameplates: Water Use Sectors (Appendix E)
Overheads	Ov-0.1 International Basins of the World Ov-0.2 Four Stages of Water Conflict Transformation Ov-0.3 Old/Young Woman Ov-0.4 Styles of Conflict Management Ov-0.5 The IWRM “Comb” Ov-0.6 Articles 5 and 7 of the 1997 Convention Ov-0.7 Article 6 of the 1997 Convention

SECTION A: GENERAL SETTING: INTRODUCTION TO HYDROPOLITICS

Water management is, by definition, conflict management. Water, unlike other scarce, consumable resources, is used to fuel all facets of society, from biology to economies to aesthetics and spiritual practice. Moreover, it fluctuates wildly in space and time, its management is usually fragmented, and it is often subject to vague, arcane, and/or contradictory legal principles. There is no such thing as managing water for a single purpose – *all* water management is multi-objective and based on navigating competing interests. Within a nation these interests include domestic users, agriculturalists, hydropower generators, recreators, and environmentalists – any two of which are regularly at odds – and the chances of finding mutually acceptable solutions drop exponentially as more stakeholders are involved. Add international boundaries, and, without careful recrafting of the issues involved, the chances decrease exponentially yet again.

Surface and groundwater that cross international boundaries present increased challenges to regional stability because hydrologic needs can often be overwhelmed by political considerations. While the potential for paralyzing disputes is especially high in these basins, history shows that water can catalyze dialogue and cooperation, even between especially contentious riparians. There are 263 rivers around the world that cross the boundaries of two or more nations, and untold number of international groundwater aquifers. The basin areas that contribute to these rivers (Figure 1) comprise approximately 47% of the land surface of the earth, include 40% of the world's population, and contribute almost 80% of freshwater flow (Wolf *et al.* 1999).

Within each international basin, demands from environmental, domestic, and economic users increase annually, while the amount of freshwater in the world remains roughly the same as it has been throughout history. Given the scope of the problems and the resources available to address them, avoiding violent water conflict is vital. Conflict is expensive, disruptive, and interferes with efforts to relieve human suffering, reduce environmental degradation, and achieve economic growth. Developing the capacity to monitor, predict, and preempt transboundary water conflicts, particularly in developing countries, is key to promoting human and environmental security in international river basins, regardless of the scale at which they occur. Yet conflict can yield positive results as well, providing opportunities for dialogue and integrated planning.

A general pattern has emerged for international basins over time. Riparians of an international basin implement water development projects unilaterally first on water within their territory, in attempts to avoid the political intricacies of the shared resource. At some point, one of the riparians, generally the regional power, will implement a project which impacts at least one of its neighbors. This might be to continue to meet existing uses in the face of decreasing relative water availability. This project which impacts one's neighbors can, in the absence of relations or institutions conducive to conflict resolution, become a flashpoint, heightening tensions and regional instability, and requiring years or, more commonly, decades, to resolve.

There is some room for optimism, though, notably in the global community's record of resolving water-related disputes along international waterways. For example, the record of acute conflict over international water resources is overwhelmed by the record of cooperation. Moreover, the most vehement enemies around the world either have negotiated water sharing agreements, or are in the process of doing so as of this writing, and once cooperative water regimes are established through treaty, they turn out to be impressively resilient over time, even between otherwise hostile riparians, and even as conflict is waged over other issues. Violence over water does not seem strategically rational, hydrographically effective, or economically viable. Shared interests along a waterway seem to consistently outweigh water's conflict-inducing characteristics.

Lessons for the International Community

Despite their complexity, the historical record shows that water disputes do get resolved, and that the resulting water institutions can be tremendously resilient. The challenge for the international community is to get ahead of the "crisis curve," to help develop institutional capacity and a culture of cooperation in advance of costly, time-consuming crises, which in turn threaten lives, regional stability, and ecosystem health.

One productive approach to the development of transboundary waters has been to examine the benefits in a basin from a multi-resource perspective. This has regularly required the riparians to get past looking at the water as a commodity to be divided, and rather to develop an approach which equitably allocates not the water, but the benefits derived there from.

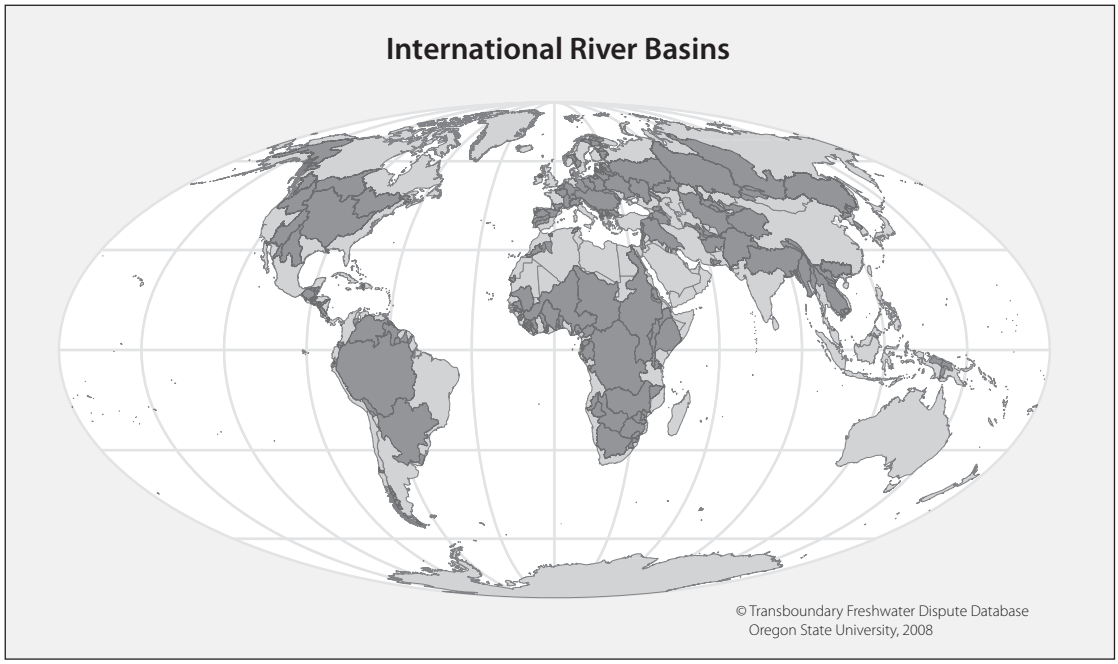


Figure 1: International Basins of the World
Overhead (Ov-0.1)

The most critical lessons learned from the global experience in international water resource issues are as follows:

a. Water crossing international boundaries can cause tensions between nations which share the basin. While the tension is not likely to lead to warfare, early coordination between riparian states can help ameliorate the issue.
b. Once international institutions are in place, they are tremendously resilient over time, even between otherwise hostile riparian nations, and even as conflict is waged over other issues.
c. More likely than violent conflict occurring is a gradual decreasing of water quantity or quality, or both, which over time can affect the internal stability of a nation or region, and act as an irritant between ethnic groups, water sectors, or states/provinces. The resulting instability may have effects in the international arena.
d. The greatest threat of the global water crisis to human security comes from the fact that millions of people lack access to sufficient quantities of water at sufficient quality for their well being.

SECTION B: SUMMARY – CONFLICT AND COOPERATION: THE CHALLENGE OF INTERNATIONAL WATERS[2] (WOLF, BACKGROUND DOCUMENT)

Context

Surface and groundwater that cross international boundaries present increased challenges to effective water management, because hydrologic needs can often be overwhelmed by political considerations. While the potential for paralyzing disputes are especially high in these basins, history shows that water can catalyze dialogue and cooperation, even between especially contentious riparians. Moreover, as we move from thinking about rights to thinking in terms of equitably sharing "baskets of benefits", the opportunities of cooperation become palpable.

2. Aaron T. Wolf; Oregon State University. See p. 14 for more detail.

Key Lessons

- Approx. 40% of the global population relies upon international waters, while 90% live in countries with international basins.
- Unilateral action by one country to develop its share of an international basin can lead to or exacerbate international tensions.
- Get ahead of the curve – use preventive diplomacy and institutional capacity building to forestall conflict, and optimize shared benefits from shared waters.

Background to International Waters

There are 263 basins, and countless aquifers, which cross the political boundaries of two or more countries. International basins cover 45.3% of the land surface of the earth, affect about 40% of the world's population, and account for approximately 80% of global river flow. Managing these basins is complicated by the involvement of regional politics, in an already difficult task of understanding and managing complex natural systems.

Disparities (economic development, infrastructural capacity, political orientation) between riparian nations further complicate international water resources management. The result is that development projects, treaties and institutions are regularly perceived as ranging from inefficient to ineffective, to even causing new tensions themselves. Yet, despite these tensions inherent to the international setting, riparians have engaged in preventive diplomacy, and created "baskets of benefits" leading to positive-sum, integrative allocations of joint gains.

Traditional Chronology: Development, Crisis, Conflict Resolution

A general pattern has emerged for international basins, whereby riparians first unilaterally develop their shared waters. At some point, one riparian, generally the regional power, implements a project which impacts on at least one of its neighbors. In the absence of relations or institutions conducive to conflict resolution, this project can become a flashpoint, heightening tensions and regional instability, and require years or, more commonly, decades, to resolve (e.g. the Indus Treaty took 10 years, the Ganges 30 years, and the Jordan 40 years). In the meantime, water quality and quantity degrade, negatively impacting upon the health of dependent populations, and ecosystems. This problem only worsens as the dispute intensifies.

Getting Ahead of the Curve: Preventive Diplomacy and Institutional Capacity Building

Despite their complexity, water disputes *do* get resolved, and the resulting institutions can be very resilient, even among bitter enemies who are fighting over other issues. The resultant treaties and management bodies have often survived subsequent hostilities. The challenge for riparians and the international community is to get ahead of the "crisis curve," to facilitate institutional capacity and cooperation in advance of costly, time-consuming crises which, in turn, exacerbate poverty, threaten lives, regional stability and ecosystems. One successful approach has been to help riparians shift focus away from allocating fixed *quantities* of water, to the overall gains of allocating the *benefits* of cooperative water resources management.

SECTION C: STAGES OF WATER CONFLICT TRANSFORMATION

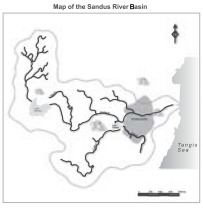
As mentioned in the Rationale, there are no "blueprints" for water conflict transformation. There does seem to be, however, general patterns in approaches to water conflict which have emerged over time. "Classic" disputes between, for example, developers and environmentalists, rural and urban users, or upstream and downstream riparians, suggest zero-sum confrontations where one party's loss is another's gain where confrontation seems inevitable. Yet such "intractable" conflicts are regularly and commonly resolved, as creative thinking and human

ingenuity allow solutions which draw on a more intricate understanding of both water and conflict to come to the fore.

This workbook offers one path to the transformation of water disputes from zero-sum, intractable disputes to positive-sum, creative solutions, and centers on a migration of thought generally through four stages. Note that all stages exist simultaneously, and need not be approached in sequence, and no stage be achieved necessarily for "success." In today's world, many disputes never move beyond the first or second stage, yet are tremendously resilient, while a few have achieved the fourth stage and are fraught with tension. Nevertheless, like any skill, it is useful to understand the structure of an "ideal" path, in order to perfect the tools required for any individual situation.

The generalized path described here, is structured around an understanding of each of the four stages through any of four perspectives, as described in Figure 2.

In Stage 1, in its initial, *adversarial*, setting, regional geopolitics often overwhelms the capacity for efficient water resources management. Metaphorically, the political boundaries on a map at this stage are more prevalent than any other boundaries, either of interest, sector, or hydrology. Dialogue is often focused on the past, based on the *rights* to which a country feels it is entitled, and a period of expressing pent-up grievances can be necessary. As a consequence of these initial tensions, the collaborative learning emphasis is on *trust-building*, notably on active and transformative listening, and on the process of conflict transformation. By focusing primarily on the rights of *countries*, inefficiencies and inequities are inevitable during this stage of negotiations.

Negotiation Stage*	Common Water Claims**	Collaborative Skills***	Geographic Scope
Adversarial	Rights	Trust-building	 Nations
Reflexive	Needs	Skills-building	 Watersheds
Integrative	Benefits	Consensus-building	 "Benefit-sheds"
Action	Equity	Capacity-building	 Region

* These stages build primarily on the work of Jay Rothman, who initially described his stages as ARI – Adversarial, Reflexive, and Integrative (Rothman 1989). When ARI become ARIA, adding Action, Rothman's terminology (1997) also evolved to Antagonism, Resonance, Invention, and Action. We retain the former terms, feeling they are more descriptive for our purposes.

** These claims stem from an assessment of 145 treaty deliberations described in Wolf (1999). Rothman (1995) too uses the terms rights, interests, and needs, in that order, arguing that "needs" are motivation for "interests," rather than the other way round as we use it here. For our purposes, our order feels more intuitive, especially for natural resources.

*** These sets of skills draw from Kaufman (2002), who ties each set of dynamics specifically to Rothman's ARIA model in great detail, based on his extensive work conducting "Innovative Problem Solving Workshops" for "partners in conflict" around the world.

Figure 2: Four Stages of Water Conflict Transformation

Overhead (Ov-0.2)

As the adversarial stage of negotiations plays out, occasionally some cracks can be seen in the strict, rights-based, country-based positions of each side (although in actual water negotiations, this process can last decades). Eventually, and sometimes painfully, a shift can start to take place where the parties begin to listen a bit more, and where the interests underlying the positions start to become a bit apparent. In this Stage 2, a

reflexive stage, negotiations can shift from *rights* (what a country feels it deserves), to *needs* (what is actually required to fulfill its goals). Conceptually, it is as if we have taken the national boundaries off the map and can, as if for the first time, start to assess the needs of the watershed as a whole. This shift, from speaking to listening, from rights to needs, and from a basin with boundaries to one without, is a huge and crucial conceptual shift on the part of the participants, and can be both profoundly difficult to accomplish, and absolutely vital to achieve for any movement at all towards sustainable basin management. To help accomplish this shift, the collaborative learning emphasis is on *skills-building*, and we approach the (boundary-less) basin by sector rather than by nation.

Once participants have moved in the first two stages from mostly speaking to mostly listening, and from thinking about rights to needs, the problem-solving capabilities which are inherent to most groups can begin to foster creative, cooperative solutions. In this Stage 3, an *integrative stage*, the needs expressed earlier begin to coalesce together to form group interests – the "why" underlying the desire for the resource. Conceptually, we start to add benefits to the still boundary-less map, and in fact to think about how to enhance benefits throughout the region, primarily by adding resources other than water, and geographic units other than the basin. The collaborative learning emphasis is now on the *consensus-building* of the group, and we begin to move in "benefit-shed" rather than being restricted by the basin boundaries.

Finally, while tremendous progress has been made over the first three stages, both in terms of group dynamics, and in developing cooperative benefits, Stage 4, the last, *action* stage helps with tools to guide the sustainable implementation of the plans which have been developed, and to make sure that the benefits are distributed *equitably* amongst the parties. The scale at this stage is now *regional* where, conceptually, we need to put the political boundaries back on the map, reintroducing the political interest in seeing that the "baskets" which have been developed are to the benefit of all. The collaborative learning emphasis is on *capacity-building*, primarily of institutions.

It is critical not to think of these "stages" as a linear process, where the further along the better. Most basins ebb and flow back and forth over time, finding the level that meets a particular set of hydropolitical needs for a given place and time – there is no "right" set of answers. One might think of these all existing in parallel "universes" simultaneously, each with its own set of approaches or tools, any of which may be useful at any given time, or conceptually as a helix or set of spheres rather than strictly linear. We break them apart here only for the purposes of explanation.

SECTION D: BASIC DEFINITIONS FOR DISPUTE RESOLUTION[3]

Competitive

Competitive negotiators want to "beat" their opponents; they use high demands, threats, and make few concessions. They generally try to undermine their opponent's confidence and seek the maximum for themselves. This traditional style of negotiating goes by a number of different terms such as positional, win-lose, adversarial, power negotiating, hardball, and hard bargaining.

Cooperative

Cooperative negotiators want to "work with" their opponents; they use reasonable opening offers, show good faith, and initiate the exchange of mutual concessions. They seek a fair and just settlement. This style of negotiating is also called win-win, interest-based bargaining, and problem solving.

Distributive Bargaining

In distributive bargaining the parties think of the items being negotiated as fixed and each party tries to get the most for himself. Usually there is just one issue for negotiation and more for me means less for you. Negotiators are bargaining over the distribution of profit on the bargaining range. This is a "zero sum" negotiation. Although the goals of the parties are in direct conflict, a negotiator can be either competitive or cooperative in a distributive bargaining situation.

3. From Barkai (1996).

Integrative Bargaining

During integrative bargaining, the parties are working together to increase the amount of resources and to maximize mutual gain. Integrative bargaining requires two or more issues so that trades can be made. Creating the additional resources is sometimes referred to as "expanding the pie". Some would call this "win-win" negotiating. The theory here is that the parties have different interests which can be integrated (reconciled) to create joint gains. Joint gains are an improvement for all parties to a negotiation.

Interest-based

Interest-based bargaining attempts to shift the nature of negotiations to a more collaborative basis. Instead of moving from position to counter-position to compromise, negotiators try to identify their interests PRIOR to the development of solutions. Once interests are identified, the negotiators then jointly develop a wide-ranging set of alternatives, and then choose the best alternative.

Positions

Positions are "what" the negotiators say they want. They are really solutions which have been proposed by the negotiators. Positions are based upon the interests of the parties; interests are usually not disclosed, at least not in competitive negotiations. In most negotiations people take, and then give up, a series of positions. Behind every position lie many interests.

Interests

Interests are "why" the negotiators want the positions they take. Interests lie behind the positions of the negotiators. Interests represent the basic needs to be met. Money and price are not interests in themselves. Money represents purchasing power, the ability to acquire other needs, status, or power itself. Understanding interests is the key to understanding "win-win" negotiating. In many negotiations the interests are never explicitly discussed. In fact, interests are usually kept secret. Successful "win-win" negotiating requires finding a way to disclose interests without being taken advantage of.

SECTION E: UNDERSTANDING CONFLICT

Introductory Exercise 1 (Ex-0.1): Understanding Conflict

General Information	
Context	This is a three-part exercise. The **instructor/facilitator** can insert them at an appropriate point of a lecture/discussion on the general topic of transboundary waters.
Objectives	To stimulate participants thinking about the complications of conflict in general
Duration	Part 1: 5-10 minutes Part 2: 5-10 minutes Part 3: 15-20 minutes
Important Information	There are three parts to this exercise

Part 1: Optical Illusion

Objective: To introduce how *misperceptions* can exacerbate conflict

Materials: Old/Young Woman Overhead (Ov-0.3)

Figure 3: Old/Young Woman Overhead (Ov-0.3)

Instructions: Show the Old/Young Woman overhead (Ov-0.3) and ask ***"What do you see?"*** Allow for some discussion. After some discussion, note how misperceptions can exacerbate conflict, for instance when we say "water" or "rights" or "own" it can mean different things to different people. Note to instructor/facilitator: As with all exercises, ask those who have seen this before not to call out. Generally about 40% see one of the two images in the picture, and about 20% are able to see both images right away.

Part 2: Scoring Points

Objective: To introduce how *entrenched thinking* can put us automatically in a conflict posture where often better results can be obtained through cooperation. This also points to *listening* as a key skill in conflict transformation (e.g., listening to the details of the directions of the game).

Materials: A watch or clock with a second hand for keeping time

Instructions: Ask participants to pair off across a table and grasp each other's right hand (as if for an arm-wrestling match, but don't use the term). Suggest that the participants are to play a game where the goal is to get the most points within 60 seconds. A team gets a point when the back of the other player's hands touches the table.

Note to instructor/facilitator: Be careful of cultural sensitivities; some cultures frown on contact between genders, or senior participants may be uncomfortable "playing" with junior or hostile participants – having said that, this exercise is an excellent ice-breaker. Most participants will arm wrestle out of habit for what generally happens when they are in this position. Some will "get it", and cooperate to allow each side to put their hand down as often as possible.

Part 3: Ugli Orange Case

Objective: To point to the exacerbating role *miscommunications* play in conflict

Materials: Handouts, the role of Roland (H-0.1) and the role of Jones (H-0.2) [both are in Appendix C] Watch or timer (for each pair for the Level 2 Option) flipchart, pens, and tape

Instructions:
Level 1 Option: While the participants are paired off, have them spread out in pairs where they are not within earshot of other pairs. Within each pair, give one participant the handout for the role of Roland, and the other the handout for the role of Jones. Participants should not show their role handout to each other. The exercise is self-explanatory – give participants around 10-15 minutes to read their roles and negotiate unassisted.[4]

Level 2 Option: For an added and important twist to this introductory exercise, offer half the negotiating pairs one additional instruction, out of earshot of the other half. Allow each participant in the pair two minutes of uninterrupted monologue in their discussions, while the other listens intently. They should actually use a timer or watch for this. If the group is typical, those pairs with this instruction will "get it" at a much higher rate than those dialoguing "normally". This illustrates the immense value of "transformative listening," which will be covered later, to help understand a party's underlying interests.

Note to instructor/facilitator: The "trick" of this exercise is that Roland needs the rinds, while Jones wants the juice – cooperation should have been possible from the beginning. You may need several attempts to call the pairs back to the larger group.

Debrief:
Ask ***"What happened in the exercise?"*** Allow for some discussion.
Ask ***"What lessons can be learned from the exercise?"*** Draw out and capture participants' responses on a flipchart. After some discussion, if the following topics have not been discussed, you might raise them:
- the role *miscommunications* play in conflict
- the difference between *positions* (what someone wants) and *interests* (why they want it)
- how emotionally attached we get in negotiations

Lecture Notes:
Positions and Interests – The difference between *positions* (what someone wants) and *interests* (why they want it), which will come up regularly in the exercises. In general, transforming conflict from distributive, or zero-sum, to integrative, or positive-sum, requires understanding the interests which underlie the positions of a party – often incredibly difficult to determine (see Figure 4 for conflict management styles). While the position of each was that they wanted the oranges, their divergent interests would have allowed for cooperation had they been clearly identified.

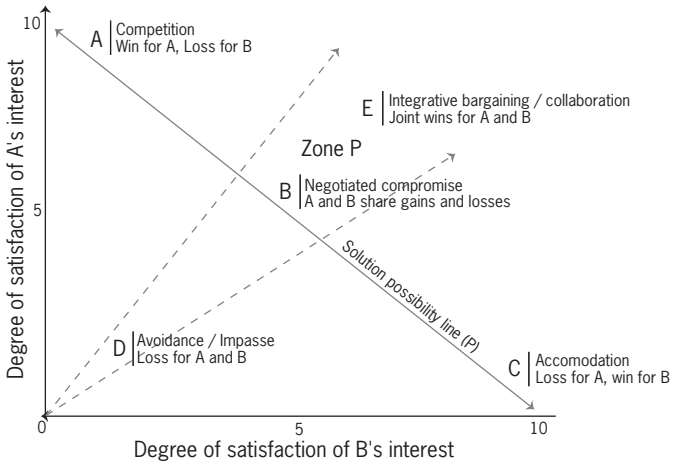


Figure 4: Styles of Conflict Management[5]
Source: Delli Priscoli (1992)
Overhead (Ov-0.4)

4. See John Barkai. 1996. Teaching Negotiation and ADR: The Savvy Samurai Meets the Devil. *Nebraska Law Review* 704 for more information on using this exercise, and related principles.
5. See "Basic Definitions" on p. 7 for more information.

How emotionally attached we get in – Chances are that emotions ran high amongst some participants during these "negotiations," and that these were *fictional* negotiations over *non-existent* oranges! How much more so are emotions when we actually negotiate over the "life-blood" of a nation, or the very foundation of a country's economy or ecosystem health.

SECTION F: INTRODUCING WATER DISPUTES

Introductory Exercise 2 (Ex-0.2): Introducing Water Disputes

	General Information
Context	Now that we have looked at the issue of conflict in general, we begin to assemble the dimension of conflict within water resources
Objectives	To introduce the complications of competing demands and understandings of water to the difficulties of conflict
Duration	30-90 minutes
Important Information	There are three parts to this exercise

Part 1: Water Uses

Objective: To introduce the multiple and often competing uses of water

Materials: Flipchart, pens, and tape
Overhead of the IWRM "comb" (Ov-0.5)

Instructions:
1) Ask ***"What do we use water for?"*** Capture the responses on a flipchart. A list will probably include some subset of: drinking, sanitation, irrigation, ecosystem protection, municipal uses, industry, hydropower, transportation, recreation, esthetics, and religion.
It is worth mentioning to the participants that, worldwide, only 5% goes to personal uses, 70% to agricultural irrigation, and the rest to municipal and industry (M & I). It is also useful to note the distinction between "consumptive" (e.g., drinking and irrigation) and "non-consumptive" (i.e., transportation and aesthetics) uses, and how the percentages of each differ wildly between developed and developing countries or regions, and between those in arid and humid zones.

2) Next, think together about which categories are potentially conflictive, for example ask, ***"Which two categories of use can impede on each other?"*** Allow for some discussion. The classic example is agriculture (or any consumptive use) and ecosystem protection, but after some discussion, it will probably be concluded that any two uses are potentially in conflict.

3) Next, ask, ***"Which two sets of uses can potentially improve each other, if managed cooperatively?"*** Allow for some discussion. One example is that an upstream hydropower dam can be managed so that the agricultural production downstream is increased. Again, after some discussion, it will be noticed that almost any two uses can be managed to mutual benefit.

4) Present the IWRM "comb" (Ov-0.5) either as an overhead or as handouts

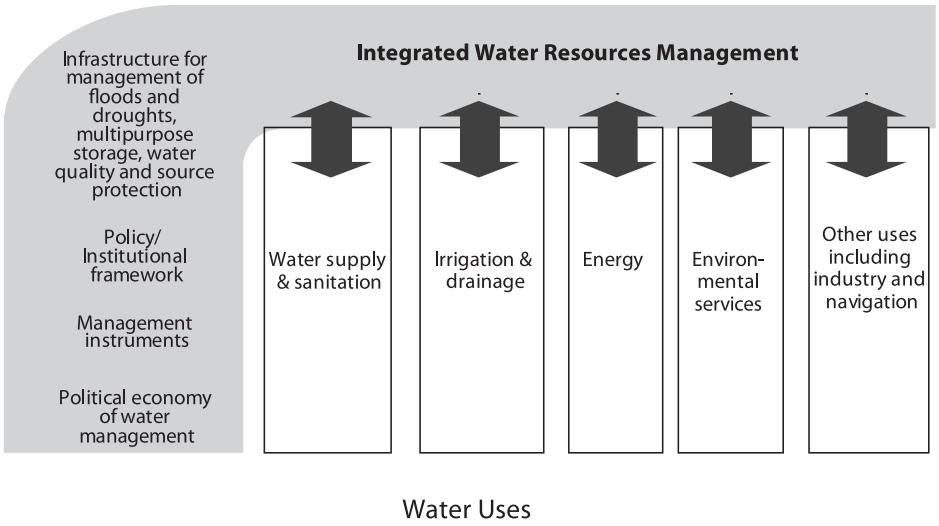


Figure 5: The IWRM "Comb" Overhead (Ov-0.5)

Lecture Notes: At the World Summit on Sustainable Development (WSSD) held in Johannesburg in 2002, the international community took an important step towards more sustainable patterns of water management by including, in the WSSD Plan of Implementation, a call for all countries to "develop integrated water resource management and water efficiency plans by 2005, with support to developing countries".

The Global Water Partnership's Integrated Water Resource Management (IWRM) "comb" was developed as a useful framework for visualizing and categorizing the uses to which water is put: Water Supply & Sanitation; Irrigation & Drainage; Energy Resources; Environmental Services; Industry & Navigation. Interestingly all of the categories of use in the "comb" are economic uses. Aesthetics, religious, and indigenous uses are not included.[6]

Note to instructor/facilitator: Later in the exercise, we add a sixth category – Local & Indigenous.

Instructions: Re-divide the categories according to Maslow's (1954) hierarchy of needs, which categorizes and ranks basic human needs to their level of motivating behavior. From most basic to higher needs, these are:

- physiological needs – e.g., drinking water, irrigated basic foods
- safety needs – fire prevention, moats, national boundaries
- belongingness and love (best to leave this one to the participants' imaginations)
- esteem – fountains, pools, green lawns
- self-actualization – water is used in most spiritual traditions as a purifier

Note to instructor/facilitator: This points to the fact that water conflicts, unlike those of other resources, impact on us at all levels of our psyches, economies, and survival mechanisms, as well as on the health of our surrounding ecosystems.

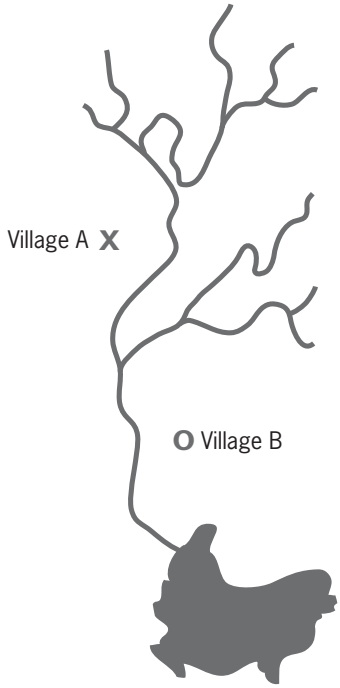
Part 2: Issues in Water Allocation

Objective: To introduce the difficulties of water allocation

Materials: Flipchart, pens, and tape

6. Jønch-Clausen, Torkil. 2004. «Integrated Water Resources Management (IWRM) and Water Efficiency Plans by 2005: Why, What and How?" Stockholm, Sweden: Global Water Partnership.

Instructions:
1) Draw the following basic river system on the flipchart, and tell this story:



"Due to a natural disaster, these two villages have suddenly lost their water supply. You have access to an alternate supply, which needs to be brought in by truck. The villagers are grateful, but tell you that they have no formula for allocating water from these new supplies, and they ask you, as the supplier, to help them develop the principles for allocating the water."

Allow for an open-ended discussion, which can last for some time, and then some guided discussion.

Note to instructor/facilitator: All participants will be quick to agree that personal uses should be allocated to everyone first. Since that usually is about 5% of supply, you can point out that that solves very little about where the bulk of the water should go. Note that in the course of discussions, they will probably forget about in-stream needs and the lake or wetland downstream of the villages.

2) After some guided, but challenging, discussion, offer the following guidelines for vote and/or consideration:

- Provide for those with the greatest need
- Provide for those with the greatest chance of success
- Provide for those with the best history of use
- Provide for those with the ability to pay
- Provide by lottery

Note to instructor/facilitator: These principles, for example, were developed at a conference on another set of natural resources entirely. You can let the participants guess as to which at the end of the exercise.

3) See who is most in favor of each principle, and why. After some guided discussion about the difficulty of developing and operationalizing principles, ask ***"Out of interest, where (or from what organization) do you think this list was generated?"*** Answer: an American Medical Association Conference on organ transplants! The point is that all scarce resources go through this process, with some being more difficult than others, and water being amongst the most difficult.

Part 3: Principles in International Law

Objective: To introduce the principles embodied in international law, as reflected in the 1997 Convention on the Law of the Non-Navigational Uses of International Watercourses (see the McCaffrey article, and the text of the 1997 Convention, in Section IV for more information).

Materials: Flipchart, pens, and tape
Overhead of Articles 5 and 7 of the 1997 Convention (Ov-0.6)
Overhead of Article 6 of the 1997 Convention (Ov-0.7)

Instructions:
1) Continue the story of the water allocation on the drawn river system above. The villages have regained their natural supply of water; present overhead "Articles 5 and 7 of the 1997 Convention" (Ov-0.6) and ask ***"If the two villages had an international boundary between them, how might each view these principles? Would there be a difference in outlook from upstream or down?"***

Article 5: Equitable and reasonable utilization and participation
Watercourse States shall in their respective territories utilize an international watercourse in an equitable and reasonable manner.

Article 7: Obligation not to cause significant harm
Watercourse States shall, in utilizing an international watercourse in their territories, take all appropriate measures to prevent the causing of significant harm to other watercourse States.

Figure 6: Articles 5 and 7 of the 1997 Convention on the Law of the Non-Navigational Uses of International Watercourses Overhead (Ov-0.6)

2) Ask, ***"How would you operationalize the "factors relevant to equitable and reasonable utilization" from Article 5?"*** Allow for some discussion, then present the "Article 6 of the 1997 Convention" overhead (Ov-0.7) and continue discussion.

Article 6: Factors relevant to equitable and reasonable utilization:
a) geographic, hydrographic, hydrological, climactic, ecological and other factors of a natural character;
b) social and economic needs of the States;
c) population dependent on the watercourse in each State;
d) effects of the use of the watercourse in one State on other States;
e) existing and potential uses of the watercourse;
f) conservation, protection, development and economy of use of the water resources and the costs of measures taken to the effect; and,
g) availability of alternatives, of corresponding value, to a particular or planned or existing use.

Figure 7: Article 6 of the 1997 Convention on the Law of the Non-Navigational Uses of International Watercourses Overhead (Ov-0.7)

Lecture Notes: Several points can be made here: First, as soon as an international boundary is introduced, all the natural complications of conflict and of water are exacerbated profoundly. Second, an entity's economy, geographic location, culture, climate and other factors all impact one's outlook on principles for managing water resources. For instance, upstream riparians generally initially favor Article 5 over 7, while downstream riparians tend to lean in the opposite direction. Third, principles for allocation and management need to be negotiated directly by riparians of a given water system; international law is not meant to act as a formula for allocations, but rather as an overarching framework for a process of conflict resolution or management.

Note to instructor/facilitator: The 1997 Convention was adopted by the UN General Assembly, on the basis of a draft prepared over the course of twenty years by the International Law Commission, by a vote of 103 to 3 (with 33 absent and 27 abstentions).[7] Some votes did reflect a difference between upstream and down: several countries that either were absent or abstained were upstream on basins with a certain level of tension, and the three "no" votes are all upstream on major international waterways: China, Turkey, and Burundi. Nevertheless, and despite the fact that the process of ratification is moving extremely slowly, the Convention's common acceptance, and the fact that the International Court of Justice referred to it in its 1997 decision in a case between Hungary and Slovakia concerning the *Gabčíkovo–Nagymaros* Project on the Danube, gives the Convention increasing standing as an instrument of customary law. Other instruments do exist, however, notably the International Law Association's "Helsinki Rules" of 1966, updated in its "Berlin Rules" of 2004.[8] The ILC has likewise taken up the complex issue of transboundary groundwater aquifers, work which is currently underway (See Section IV for more detail on international law).

SECTION G: INTRODUCING THE SANDUS BASIN SIMULATION

Introductory Exercise 3 (Ex-0.3): Parties, Issues, and Interests

	General Information
Context	We're now ready to introduce the Sandus Basin simulation, on which the rest of the exercises will be based.
Objectives	To introduce how parties, issues, positions, and interests begin to influence how groups (countries) approach water perspectives and negotiations
Duration	3 to 4 hours
Important Information	Depending on the structure of the course, participants should be given only the "Country Overviews" (*not* the Briefing Notes) for either about an hour now or, better, overnight, to read through the details of the basin and its riparian countries. There are three parts to this exercise.

7. To date, thirteen years after its adoption by the UN General Assembly, only 14 countries are party to the UN Convention, well below the requisite 35 instruments of ratification, acceptance, accession, or approval needed to bring the Convention into force. As noted later, regardless of the Convention's ratification status, it is widely viewed, and treated, as being largely a codification of existing rules of customary international law on the subject. It has also been used and relied on at least as a starting point (and often as an ending point when the parties can't reach agreement on another text) in negotiations between riparian states. For the full text of the Convention, see: http://www.un.org/law/ilc/texts/nonnav.htm

8. http://www.asil.org/ilib/WaterReport2004.pdf

Part 1: Country Perspective

Objective: To identify parties, issues, and position/interests for a simulated water negotiation

Materials: 6 large format maps of the Sandus Basin
Plenty of Post-it notes (or paper) in three colors
Rolls of tape (at least 3, preferably one per group)
Plenty of pens for participants
Sandus Basin Country Overviews (H-0.4)
Instructions for Small Group Tasks (H-0.5)
Negotiation Planning Chart (H-0.6)
Chart Definitions & Explanations (H-0.7)
6 sets of "Tabletop Nameplates: Countries" (Appendix D)
6 sets of "Tabletop nameplates: Water Use Sectors" (Appendix E)

Instructions:
1) When the group reconvenes, several large format maps of the Sandus Basin map should be visible. Ideally this would be six hard copy versions, but an overhead projection or PowerPoint will also work, as long as the projection is on a surface to which Post-its can be affixed. Plenty of Post-it notes in three colors and plenty of pens should be available.

2) Divide the group into smaller groups, ideally six. Ideally, each of the groups would represent one of the following countries (Gambo, Itaga, Kigala, Sandus Republic, and South Zwabili) and one group would represent regional/global third parties and the NGO community. Though each group will do the exercise for only one country, the number of groups is restricted by the number of wall maps.

3) Suggest the following:
"You (the participants) are each an expert group called together by the (fictional) Global Bank for Sustainable Development (or any other interested real or fictional third party), to help with the establishment of a cooperative framework for managing the Sandus River watershed."

"Your first task, as regional experts, is to help identify the parties who should be invited to negotiate such a framework. Given your expertise, would you be kind enough to conduct the following exercise on Identifying Possible Parties, Decidable Issues, and Positions/ Interests for the country to which you have been assigned (one group should think specifically about regional/global third parties and the NGO community."

4) Provide each group with one copy of the handout "Instructions for Small Group Tasks" (H-0.5), copies of the handouts "Negotiation Planning Chart" (H-0.6) and "Chart Definitions and Explanation" (H-0.7). Allow plenty of time for the groups to complete the exercise.

5) Ask each country team to design a national flag which depicts their national values, aspirations and history, and be prepared to present the flag and the rationale behind it to the group. This has the effect of building identity of the groups, helping them to "bond" and develop a sense of "patriotism" for their country.

Debrief: Once each group has filled out the "Negotiation Planning Charts" for their country, it is worth having two debriefing discussions focusing on who should come to the negotiations and what they will want, as well as on the very specific point of how the interests of each will be manifested in their positions:

a) a debrief within each small group, and then

b) one with the group at large,

Note to instructor/facilitator: Remember, a "position" is what someone wants and an "interest" is why they want it. It is also worth thinking about the concept of "power" (political, economic, geographic location, military, gender, etc.) and how that may manifest itself, either within the room or without. [9]

9. Identifying parties to negotiations is, of course, more complex than this. See Shmueli (2003) for a thorough description, with other excellent online sources referenced.

Instructions for Small Group Tasks[10] [Handout (H-0.5)]

- Using the Yellow Post-its, identify Parties that may become involved in the discussion-negotiations over Sandus River basin. These Parties may be individuals, organizations, or agencies in any of the five countries within the basin, or from anywhere else.

  Post your results at the appropriate places on the walls. You should aim for at least 20 such parties.

- Using the Blue Post-Its, identify "Decidable Issues" that are likely to be addressed within and/or among these parties now and in the near future.

  Post your results at the appropriate places on the walls. You should aim for at least 10 such issues.

- Choose at least three key Parties and Issues for each country, and identify at least five key Positions/ Interests for each Party as it considers those issues.

  Write those Position/Interests on the Green Post-Its and post them at the appropriate places on the walls.

- It may help to fill out the following type of form, expanded out for however many parties are identified:[11]

10. This exercise is based on one developed by CMI Washington/Carolina.
11. From Barkai (1996).

Negotiation Planning Chart [Handout (H-0.6)]

Fill in the name of the party and then blocks with information you know. You will need three of these charts (one for each key party, as noted in the instructions).

Party: _____

People	Relationship	Issues	Positions	Interest	Options
Who:	Past:	1.	Estimated initial position:	1.	1.
				2.	2.
	Current:	2.	Estimated bottomline position:	3.	3.
Negotiation Styles:				4.	4.
	Desired:	3.	Estimated BATNA:	5.	5.
				6.	6.

Chart Definitions and Explanations [Handout (H-0.7)]

People: What are the past histories and present feelings of the people involved in this negotiation? What are their goals and objectives? Who is more powerful and what is the source of that power? What influences can they bring to bear on this negotiation? What do you know about their negotiating style?

Relationship: Do the negotiators or their constituents have any history together? What was that prior relationship like? How are they getting along now during the negotiation? Do they have a good relationship? Is it strained? Have they just met for the first time? Will the parties have a continuing relationship or will this be a "one-shot" negotiation? Even if the parties are not likely to work together in the future, will reputations be made in this negotiation that will follow the negotiators in the community?

Issues: The issues involved in the negotiation are the topics to be negotiated. They are also the questions and concerns that each party raises during the negotiation. It is usually very helpful to frame the issues as questions to be answered rather than statements that are made.

Positions: The positions in the negotiation are the solutions that each person has in mind. Positions are the "what" that the negotiators want. Many different positions are considered during a negotiation including, the opening position (demand), a fall back position, a bottom line, and a BATNA (Best Alternative to a Negotiated Agreement).

Interests: Interests are the basic needs that negotiators seek to be met in any agreement. If you know the interests, you know "why" the negotiators take the positions they do during the negotiations. Maslow's hierarchy of needs is helpful here.

Options: Options are the full range of possibilities on which the parties might conceivably reach agreement. Options are, or might be, put "on the table." An agreement is better if it is the best of many options, especially if it exploits all potential mutual gain in the situation.

BATNA: Alternatives are the walk-away possibilities that each party has *if an agreement is not reached*. In general, neither party should agree to something that is worse than its "**BATNA**" – its **B**est **A**lternative **t**o a **N**egotiated **A**greement – "away from the table".

<u>Part 2:</u> Role Play – Party Representatives Duration: 30-60 minutes (plus debrief)

Objective(s): To illustrate that countries are not monolithic, autonomous entities, but are rather made up of their constituents

To illustrate that foreign policy and domestic policy are inextricably linked

Materials: No new material needed

Instructions:
1) Once the concerns have been thought through, and while the participants are still seated at their country-table, have each participant take on the role of a representative of one of the parties within their country, as identified in their "Negotiations Planning Charts" (H-0.6). You may need to group either participants or parties depending on the number of participants you have.

2) Ask one participant at each table to act as the representative of that country's Water Ministry (or Foreign, Agricultural, or Environment Ministry, or military, or neutral party), and to "convene" a meeting within their country in advance of the upcoming negotiations to start to formulate a unified country position. Have them focus on the interests of the party they are representing, and when discussing positions, suggest that they define both initial and fallback positions, as well as "red-line" issues, which are non-negotiable. Also, have the participants spend some time thinking about their collective BATNA – what would the alternative be to negotiations.

Debrief: Allow for some open debriefing time (out-of-character) for the room at large. Questions to ask could be: ***"What went on?"; "What was the tenor of discussions?"; "What interesting exchanges took place?"; "What were some of the lessons learned, both for the participants, and for their characters?"***

Note to instructor/facilitator: As the representatives of each country set out to negotiate (Part 3 of this exercise), they will need to remember their mutual relationship with all of the parties, issues, and interests which make up their constituency.

Part 3: Preparation for Stage I

Objective: To set the stage for the opening of the Sandus Basin negotiations

Materials: 6 flipcharts
6 sets of "Tabletop Nameplates: Countries"
6 sets of "Tabletop Nameplates: Water Use Sectors"
Several blank hardcopy and overhead copies of the Sandus Basin map (in back pocket)
Sandus Basin Negotiation Invitation (H-0.8)
Country-specific briefing notes (H-0.9A-E)

Instructions:
1) Re-divide the participants in a way that, ideally, each participant from a country will now represent that country in negotiations, regardless of the role they played. In other words, in the next phase there will be several "parallel universes" of Sandus Basins, each with ideally six parties (one for each of the five countries, plus one representing third parties), and one facilitator/mediator. For example, a participant who took part in formulating Itaga's country position (regardless of which role they played), will now "play" the role of Itaga in one of the sets of parallel negotiations.

Note to Instructor/facilitator: This is tricky, and some manipulation of numbers will be necessary. Essentially, there should be six parties (countries) represented at each set of negotiations, of no more than a couple of participants each, plus one instructor/facilitator where desired.

2) One *flip chart*, one set of "Tabletop Nameplates: Countries", and one set of "Tabletop Nameplates: Water Use Sectors" for each "universe" should be prepared in advance for the next stage, as well as several *blank hard copy and overhead maps* of the basin. Each "universe" should have available nameplates for: [12]

- For Stage I: Gambo; Itaga; Kigala; Sandus Republic; South Zwabili; Nature Conservation Union & NGO Community.
- For Stage II: Water Supply & Sanitation; Irrigation & Drainage; Energy Resources; Environmental Services; Industry & Navigation; Local & Indigenous; NGO Community; and Facilitator/Mediator.

3) Distribute to each country representative one generic invitation (H-0.8) and country-specific briefing points for *their own country only* (H-0.9A-E). They should not share the contents of either with anyone else. Those representing Nature Conservation Union & NGO Community will receive an invitation but will have no specific instructions, but they should be able to figure out their role intuitively.

Note to Instructor/facilitator: Gauge your participants. These preliminary exercises should have helped break the social ice, and the participants should already be engaged in the process. If not, you may want to add this exercise to the evening's activities:

12. Available to photocopy in Appendices D & E.

BREAK/END OF MODULE 0
Supplemental Reading for Module 0 starts on p. 14 in Part 1:

Wolf, A. T., Annika Kramer, Alexander Carius, and Geoffrey D. Dabelko. "Managing Water Conflict and Cooperation." Chapter 5 in Worldwatch Institute. *State of the World 2005: Redefining Global Security.* Washington DC: Worldwatch Institute, 2005.

End of Day Questions for the Participants

Ask participants to answer the following questions on a piece of paper:

- What was the most important thing you learned during this day?
- What important question remains unanswered?

The instructor/facilitator should collect the responses and do an overview of the responses at the beginning of the next day.

MODULE I
INITIAL STATE – BASINS AND BOUNDARIES
OVERVIEW

Negotiation Stage	Common Water Claims	Collaborative Skills	Geographic Scope
Adversarial	Rights	Trust-building	 Nations

Stage 1 of Water Conflict Transformation

Module Goal(s)	To focus the collaborative learning process on *trust-building*
Duration	7-10 hours
Important Background Information	For supplemental readings, see Part 1, Module I, Section E, page 45
Sections	A. General Setting: The Adversarial Stage of Negotiation B. Summary: The Seven Elements of Conflict Resolution C. Active, Transformative, and Intercultural Listening D. The Sandus Basin: Negotiating by Country
Exercises	Ex-I.1 Listening Skills Ex-I.2 Negotiating by Country
Handouts	H-I.1 Top secret letter to Itaga H-I.2 Top secret letter to the Sandus Republic Tabletop Nameplates: Countries (Appendix D)
Overheads	Ov-I.1 Characteristics of Cultural Differences

SECTION A: GENERAL SETTING

In its initial, *adversarial* setting, regional geopolitics often overwhelms the capacity for efficient water resources management. Metaphorically, the political boundaries on a map at this stage are more prevalent than any other boundaries, either of interest, sector, or hydrology. Dialogue is often focused on the past, based on the *rights* to which a country feels it is entitled, and a period of venting of pent-up grievances can be necessary. As a consequence of these initial tensions, the collaborative learning emphasis is on *trust-building*, notably on active and transformative listening, and on the process of conflict transformation. By focusing primarily on the rights and interests of countries, inefficiencies and inequities are inevitable during this stage of negotiations.
Initial positions in advance of water negotiations are often extreme, and usually based either on hydrography, i.e. from where a river or aquifer originates and how much of that territory falls within a certain state, or on chronology, i.e. who has been using the water the longest. The “doctrine of absolute sovereignty” is often initially claimed by an upstream riparian. This principle, often referred to as the Harmon Doctrine (for the US attorney-general who

suggested this stance in 1895 regarding a dispute with Mexico over the Rio Grande), argues that a state has absolute rights to water flowing through its territory.[13] Considering this doctrine was immediately rejected by Harmon's successor and later officially repudiated by the US (McCaffrey 1996), was never implemented in any water treaty (with the rare exception of some internal tributaries of international waters), was not invoked as a source for judgment in any international water legal ruling, and was explicitly rejected by the international tribunal over the Lac Lanoux case in 1957, the Harmon Doctrine is wildly over-emphasized as a principle of international law.[14]

The downstream extreme claim often depends on climate. In a humid watershed, the extreme principle advanced is "the doctrine of absolute riverain integrity," which suggests that every riparian is entitled to the natural flow of a river system crossing its borders. This principle has reached acceptance in the international setting as rarely as absolute sovereignty. In an arid or exotic (humid headwaters region with an arid downstream) watershed, the downstream riparian often has older water infrastructure which is in its interest to defend. The principle that rights are acquired through older use is referred to as "historic rights" (or "prior appropriations" in the US), that is, "first in time, first in right".

These conflicting doctrines of hydrography and chronology clash along many international rivers, with positions usually defined by relative riparian status.[15] Downstream riparians often receive less rainfall than their upstream neighbors and therefore have depended on river-water for much longer historically. As a consequence, modern "rights-based" disputes often take the form of upstream riparians arguing in favor of the doctrine of absolute sovereignty, with downstream riparians taking the position of historic rights.

These extreme and contradictory positions are neither tenable nor sustainable, and parties almost invariably move beyond their insistence on their own "rights" at the expense of other parties, as will be seen below. In order to move from this adversarial, rights-based positioning, we focus on interpersonal skills and relationships, developing trust-building, and identifying and analyzing parties, positions, and interests.

SECTION B: SUMMARY – THE SEVEN ELEMENTS OF CONFLICT RESOLUTION [16] (BARNETT, BACKGROUND DOCUMENT)

Alternatives

Alternatives are the walk-away possibilities that each party has *if an agreement is not reached*. In general, neither party should agree to something that is worse than its "**BATNA**" – its **B**est **A**lternative **T**o a **N**egotiated **A**greement – "away from the table."

Interests

Interests are not positions; positions are parties' demands. Underlying the positions are the reasons they are demanding something: their needs, concerns, desires, hopes and fears. The better an agreement satisfies the parties' interests, the better the deal.

Options

Options are the full range of possibilities on which the parties might conceivably reach agreement. Options are, or might be, put "on the table." An agreement is better if it is the best of many options, especially if it exploits all potential mutual gain in the situation.

13. "The fundamental principle of international law is the absolute sovereignty of every nation, as against all others, within its own Territory" (cited in LeMarquand 1993, 63). Harmon was making the hydrologically preposterous argument that upstream water diversions within the territorial US would not legally affect downstream navigation on international stretches of the Rio Grande since the diversions were to be carried out by individuals, not States (McCaffrey 1997).
14. As far back as 1911, the Institut de Droit International had asserted that the dependence of riparian states on each other precludes the idea of absolute autonomy over shared waters (Laylin and Bianchi 1959, 46).
15. The inherent conflict between upstream and downstream riparian occurs in most settings and scales. Crawford (1988, 88-90) describes such disputes along the traditional acequia canal systems in New Mexico.
16. Terry Barnett; CMI Washington/Carolina. See p. 45 for more detail.

Legitimacy

Legitimacy refers to the perceived fairness of an agreement. An agreement will leave both parties feeling fairly treated to the extent that it is based on external benchmarks, criteria, or principles beyond the will of either party. Such external standards of fairness include laws and regulations, industry standards, current practice, or some general principle like reciprocity or precedent.

Commitments

Commitments are oral or written statements about what a party will or won't do. They may be made during the course of a negotiation or may be embodied in an agreement reached at the end of the negotiation. In general, an agreement will be better to the extent that the promises made have been well planned and well-crafted so that they will be practical, durable, easily understood by those who are to carry them out, and verifiable if necessary.

Communication

The quality of communication in a negotiation depends on both the level of mutual understanding and the efficiency of the process. In high quality communication, the messages understood by the receivers carry the meaning intended by the senders. That is, the parties understand each other – even if they disagree. High-quality communication is also efficient in that negotiators minimize the resources expended in coming to agreement or deciding to discontinue negotiations.

Relationship

Most important negotiations are with people or institutions with whom we have negotiated before and will negotiate again. In general, a strong working relationship empowers the parties to deal well with their differences. Any transaction should improve, rather than damage, the parties' ability to work together again.

SECTION C: ACTIVE, TRANSFORMATIVE, AND INTERCULTURAL LISTENING

Module I: Exercise 1 (Ex-I.1): Listening Skills

General Information	
Context	The most difficult leap in negotiations (or in most discussions, for that matter), is to get past *positions* (what someone is saying) to understanding their *interests* (why they are saying it). Yet understanding interests is critical to effective dialogue. The single most effective way to accomplish this leap is to listen – truly listen – to the speaker. Listening at depth is not an easy skill, especially in many western cultures where power seems to be associated with how much is said (and sometimes with how loudly).
Objectives	To offer two skill-sets for listening: active listening, which is a set of ground rules for polite, constructive discourse; and transformative listening, which allows for deeper work, useful especially when powerful emotion is present.*
Duration	3 to 4 hours
Important Information	This exercise should be done at the equivalent of the beginning of Module II, before formal negotiations begin.

* There is also a school called, "dialogic" listening, which argues that both styles presented here put too much emphasis on the speaker, and not enough on the group. "Dialogic listening" focuses on group processes, utilizing metaphor and mutual encouragement, to develop mutual interests. See John Stewart and Milt Thomas, "Dialogic Listening: Sculpting Mutual Meanings," in John Stewart (ed), Bridges Not Walls. 6th edition, (New York: McGraw- Hill, 1995), pp. 184-201.

Opening Notes:
Q: What is commonly considered the opposite of speaking?
A: Waiting to speak.

The most difficult leap in negotiations (or in most discussions, for that matter), is to get past *positions* (what someone is saying) to understanding their *interests* (why they are saying it). Yet understanding interests is critical to effective dialogue. The single most effective way to accomplish this leap is to listen – truly listen – to the speaker. Listening at depth is not an easy skill, especially in many western cultures where power seems to be associated with how much is said (and sometimes with how loudly).

Part 1: Active Listening — Duration: 30-90 minutes

Context: In advance of any formal or informal negotiations, it is worth talking in a group about ground rules. These should be suggested by the participants (although an instructor/facilitator can help with suggestions), adopted by consensus, and posted in a visible place as a "touch-stone" document. The group which is reconvening is about to enter into negotiations.

Objective(s): To facilitate healthy dialogue

Instructions:
1) When the group reconvenes, ask them for help in crafting a list of ground rules for the negotiations.[17] If typical, the group will come up with a set similar to:

- One speaker at a time, signaled by, e.g. upturned name-plates, a speakers list, etc.;
- Every speaker gets to finish uninterrupted;
- No direct accusations; "generic" examples can be used instead;
- All should try to participate fully;
- Others?

2) The next step is to focus on active listening skills, including (more skills are listed in Table 1):

- ***Repeat main points.*** Repeat the main points of the speaker (this lets the speaker know that they have really been heard, a powerful psychological message, as well as helping to focus the dialogue);
- ***Ask.*** Ask (non-threatening) questions. Useful both to better understand the speaker, and also to reassure them that you are really listening;
- ***"I" not "you" statements.*** When speaking, speak in the first person – "I" not "you" – setting a tone which is more reflective and less confrontational;
- ***Future, not history.*** Speak in the future or present tense, not the past. This further reduces the possibility of accusations, and allows for greater cooperation to build for a common future. [In many settings, a period of venting of past grievances does need to be set aside – that, after all is a main reason why some negotiators initially participate. It should be done in as productive a way as possible, and then put aside for the duration.]

17. There is a vast literature on communication, facilitation and mediation skills. See the bibliography in Barnett's background material, p. 51, as well as Beer, J. and E. Stief. The Mediator's Handbook. Gabriola Island, BC: New Society Publishers, 1997; Moore, Chris. The Mediation Process: Practical Strategies for Resolving Conflict. 3rd Ed. Jossey-Bass, 2003.; Rosenberg, Marshall B. Nonviolent Communication: A Language of Life. Encinitas, CA: PuddleDancer Press, 2005; and Schoenhaus, Robert. Conflict Management Training: Advancing Best Practices. Washington, DC: 2001. All have good sections on intercultural experience as well.

Paying Attention
- Face the person who is talking.
- Notice the speaker's body language; does it match what he/she is saying?
- Listen in a place that is free of distractions, so that you can give undivided attention.
- Don't do anything else while you are listening.

Eliciting
- Make use of "encourages" such as "Can you say more about that?" or "Really?"
- Use a tone of voice that conveys interest.
- Ask open questions to elicit more information.
- Avoid overwhelming the speaker with too many questions.
- Give the speaker a chance to say what needs to be said.
- Avoid giving advice, or describing when something similar happened to you.

Reflecting
- Occasionally paraphrase the speaker's main ideas, if appropriate.
- Occasionally reflect the speaker's feelings, if appropriate.
- Check to make sure your understanding is accurate by saying "It sounds like what you mean is...Is that so?" or "Are you saying that you're feeling..."

Source: Kaufman (2002), p. 220

Figure 8: Techniques of Active Listening

3) For practice, the **instructor/facilitator** can redistribute the Ugli Orange exercise and allow participants some time to exercise their communication skills. Alternately, pairs can pick any topic at all (avoiding very sensitive or emotional ones) for practice. The speaker should be able to speak entirely without interruption, while the listener should do their best to truly listen to what's being said, practicing "active listening" in the process.

Part 2: Transformative Listening[18] Duration: 60-90 minutes

Note to instructor/facilitator: You will want to evaluate carefully whether or not to do this next exercise with your group. Since it can touch on raw emotions and/or political sensitivities, you will want to be confident with the group's attitude and with your own comfort level before you proceed.

Context: When a participant is clearly distraught, and "objective" problem-solving seems not to be viable, it may be worth stepping back for a few moments, giving the participant the space and time to work through their issue. In such a setting, a listener should take over (often the mediator or facilitator), in a process of "transformative listening".

Objective(s): To engage in and understand transformative listening

Materials: None

Opening Notes: When real emotion is present, classic problem-solving approaches to dialogue are generally not practical. Water, as we have seen, can be tied in to all levels of existence, from basic survival to spiritual transformation. Often, water negotiations are tied inextricably to regional conflicts, including in some of the most contentious regions in the world, and negotiators carry the weight of those disputes with them into the dialogue setting.

18. This part of the exercise was developed by the Harvard Negotiation Project and taught by Erica Fox, director of the Harvard Negotiation Insight Initiative at the Program on Negotiation: http://www.pon.harvard.edu/. Used here with permission.

When a participant is clearly distraught, and "objective" problem-solving seems not to be viable, it may be worth stepping back for a few moments, giving the participant the space and time to work through their issue. In such a setting, a listener should take over (often the mediator or facilitator), in a process of "transformative listening". Here, in contrast to "active listening", the listener is not trying to facilitate a healthy dialogue, but rather making him- or herself absolutely present for the speaker to get deeply into their issues.

Instructions:
1) In the exercise, pairs should be divided between speaker and listener. Together, they should draw up a list of sensitive topics about which they feel strongly.

2) The designated listener goes first, picking a topic which is important to them, and asking the speaker to argue passionately the *opposite* of the listener's position. The speaker should go on uninterrupted for two minutes, after which the listener may interject *only* to enquire (ask for more information), summarize, paraphrase, or acknowledge. This should go on for another 5-10 minutes.

3) Have the participants switch roles, and repeat the exercise for 5-10 minutes.

Debrief: Ask ***"What did you observe regarding the emotions and non-verbal communications of the speaker and the listener during the exercise?"*** Allow for time for an extensive and guided debrief.

Note to instructor/facilitator: Typically, the listener will go from anger and dismissal, to intellectual curiosity, to some level of empathy for the other position. The speaker, in turn, will likewise typically move from absolute conviction to some recognition of the legitimacy of the opposite side, or even to a bit of empathy for the opposite position the longer he or she is allowed to speak (this is the "transformation" in transformative listening).

Part 3: Intercultural Negotiations[19] Duration: 60-90 minutes

Context: Shared basins are often defined by crossing political boundaries, but even more profoundly, they cross cultures – those of societies and ethnic groups, of religions and professions, of language and of class. The concept of a problem-solving workshop such as this has been described over time in western academic literature (and, possibly overly, much of the terminology and assumptions in this manual draw from this world), but the ideas have deep roots in cultural traditions throughout the world. A facilitator/mediator, however, needs to be acutely aware of, and sensitive to, how cross-cultural dynamics can impact the flow of communication and ideas, as well as their own inherent assumptions.[20]

The whole concept of analytic problem-solving, for example, is fraught with cultural assumptions. Abu-Nimer (1996) describes the premises of North American mediators from a Middle Eastern and Muslim perspective, and Lederach (1995) describes his experiences acting as a mediator in Central America:

"Why is it...that in the middle of listening to someone give their side of a problem, I have a natural inclination to make a list, to break their story down into parts such as issues and concerns? But when I ask them about issues, they seem to have a natural inclination to tell me yet another story. The difference...lies in the distinction between analytical and holistic thinking. Our North American conflict resolution approaches are driven by analysis; that is the breaking of things down into their component parts. Storytelling...keeps the parts together. It understands problems and events as a whole." [21]

Avruch sums up: "Even while acknowledging that the capacity to reason is a human universal, we face the other fact that the representations of the worlds about which humans bring their reason to bear can differ profoundly from one another. (p. 94)...To try to suppress this variance, even in the powerful setting of a conflict resolution problem-solving workshop, seems to be an invitation to failure." (p. 94)

19. LeBaron, Michelle (2003) is a comprehensive introduction to culture and negotiations in general, and Faure & Rubin eds. (1993) focuses on culture and its role in water negotiations.
20. The western, academic development of the problem-solving workshop, and culture's impact, can be found in Avruch 1998, pp. 84-100.
21. Lederach, *Preparing for Peace*, p. 81

He cites Cohen (in Faure and Rubin 1993) for a good model of culturally aware mediators, who are neither specialists nor globalists: "First, these individuals are aware of the gamut of cultural differences and do not naively assume that "underneath we are all pretty much the same." Second, they perceive the potency of religious and other cultural resonances. Third, [they] grasp that Western "rationality" is based on culture-bound values and assumptions. Finally, they do not take for granted that an expedient (such as face-to-face negotiation) that works for one culture necessarily works for another." (p. 104)

Nevertheless, Zartman (in Faure and Rubin) suggests that "culture" is too often used as an excuse for failure, while Lowi and Rothman (in Faure and Rubin) use the water negotiations over the Jordan Basin to show how cultural differences can actually be harnessed to induce more effective dialogue. Lederach agrees (1995), "Culture is rooted in social knowledge and represents a vast resource, a rich seedbed for producing a multitude of approaches and models in dealing with conflict." (p. 120)

Objective(s): To understand differences in terms of one's own personal style, the generalized style of one's culture, and/or the style of other cultures

Materials: Overhead "Characteristics of Cultural Differences" (Ov-I.1)

Opening Notes: There are many ways to characterize cultural differences. Brooks Peterson (2004),[22] for example, has pulled together a number of models to describe differences along five axes based on the relative importance of particular characteristics.

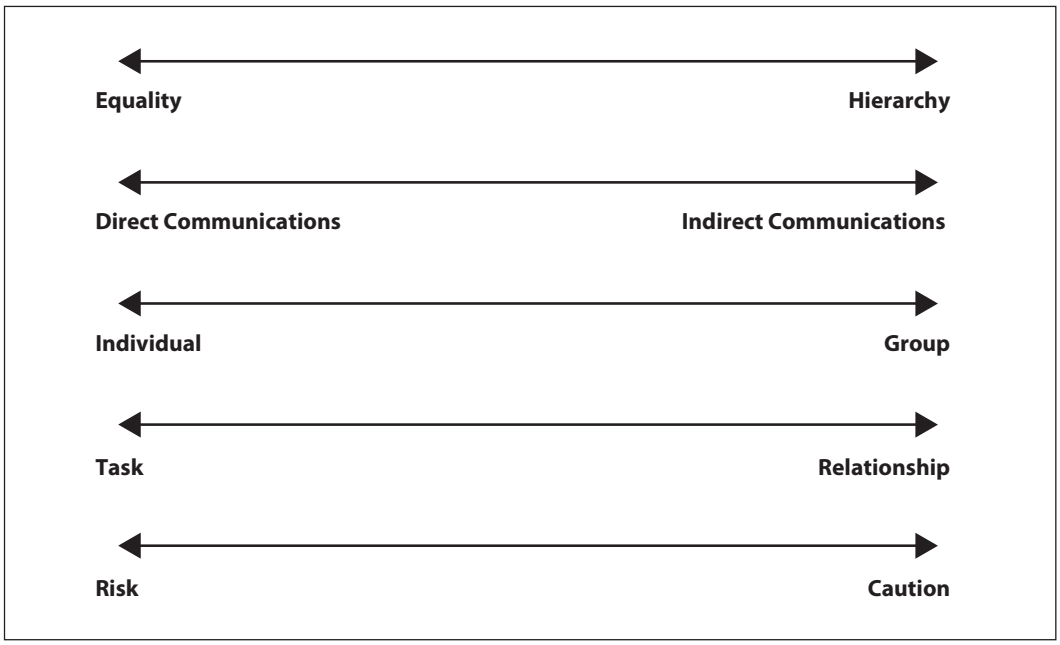


Figure 9: Characteristics of Cultural Differences
Overhead (Ov-I.1)

Another common set of distinctions, characterized by Hall (1977)[23] is that between "high context" and "low context" cultures. In very general terms, lower context cultures would fall towards the left of the axes above (e.g. US, Western Europe), while higher context cultures would tend towards the right side (e.g. much of Asia and the Middle East).

Instructions:

1) Display overhead OV-I.1 and in a large group discuss these characteristics in terms of one's own

22. Peterson, Brooks. *Cultural Intelligence: A Guide to Working with People from Other Cultures.*Yarmouth, Maine: 2004.

23 Hall, Edward T. *Beyond Culture.* New York: Doubleday, 1977.

personal style, the generalized style of one's culture, and/or the style of other cultures within which participants may have worked or traveled.

Note to instructor/facilitator: Be careful of overgeneralizations, and note especially how broad differences are between individuals within what is considered by outsiders to be one "culture." Other similarities or differences might be brought into the discussions, for example, how people view: eye contact; personal space & touch; time; gender issues; the distinction between one's secular and spiritual life; meeting & greeting (e.g. appropriateness of a handshake); gift-giving; the basis of the relationship (e.g. business versus personal); the importance of information in negotiations, and, general negotiation styles. Notice especially the potential for someone taking or giving offense where none is intended.

SECTION D: THE SANDUS BASIN: NEGOTIATING BY COUNTRY

Module I: Exercise 2 (Ex-I.2): Negotiating by Country

	General Information
Context	Sets the stage for negotiations, and points to importance of crafting the initial direction, including shared vision exercises, and the difficulty of cooperating across boundaries.
Objectives	To illustrate the difficulty of negotiating water issues by country
Duration	3 to 4 hours
Important Information	Actually setting up a room for negotiations can be a very elaborate process. Beer and Stief (1997), for example, have several pages (pp. 27-30) just on the implications of table shapes and seating arrangements. It may be worth investigating and describing these issues, either here or in the debrief.

Materials:
Tabletop Nameplates: Countries
Top Secret Memo for Itaga (H-I.1)
Top Secret Memo for Sandus Republic (H-I.2)

Instructions:
1) Set up the parallel "universes" of Sandus Basins, as described above in the "Preparation for Stage 1 Exercise". As mentioned, each table should have six parties represented, each by no more than a couple of participants: Gambo; Itaga; Kigala; Sandus Republic; South Zwabili; Nature Conservation Union & NGO Community. In addition, assign one "facilitator/mediator" to each table. Make sure that each party has received and read their Briefing Points (again, the Nature Conservation Union & NGO Community does not have formal briefing notes, but they should be able to play their role intuitively).

Note to instructor/facilitator: To give a powerful lesson in the difference in process between "assisted" and "unassisted" negotiations (those with and without facilitation/mediation), only assign a "facilitator/mediator" to a portion of the "universes." Remember to come back to discuss this difference in the debrief.

2) The instructions for the beginning of negotiations are actually quite simple:

"Welcome to this opening session of discussions on the sustainable development of the Sandus River Basin. We (whomever you have designated as hosts from p. x) welcome you and offer you any assistance you may require. We understand that this round of negotiations is to develop a regional plan for the Sandus River Basin, and we look forward to evaluating your basin proposals at the conclusion of these discussions. Good luck!"

3) The **instructor/facilitator** has many options at this point:

Level 1 Option: Actively help set the tone for negotiations. For example, personal introductions can be made, with each participant sharing a story about the watershed in which they were raised, thus pointing to common values and themes universal to all. One might also introduce a skill called the "shared vision" exercise,[24] to help set the stage and tone for productive dialogue. In this exercise, participants (while in-role) are asked to, first, ***"Picture the region in 20 years time if we are successful in this process. Describe the landscape, the look on the people's faces. What is the economy like, and the environment? What are the headlines on the newspapers as you walk by?"*** Capture the key words on the flip-chart (probably something like: peaceful, clean, health people and economies, pretty, happy, etc.).

Then go around again, asking them to, ***"Now picture the region in 20 years if we are not successful here. What do we see as we look around in this case?"*** Capture the key words (chaos, pollution, disease, etc.) side by side with the first list.

Note the commonalities in the terms used by all the participants, regardless of where they come from. Offer these two visions of the future as "touch-stones," both for the facilitators/mediators and the participants, to come back to when the short-term discussions get difficult, to remind everyone of their common long-term goals.

Level 2 Option: Help structure the discussions a bit before letting them loose. Help them formalize ground rules, remind them of their "active listening skills", facilitate a bit of dialogue. While less-jarring, and a bit "safer", this option allows the participants a bit less freedom to find their own way.

Level 3 Option: Simply let the "negotiations" run for a time, at least an hour. You can roam between the universes/groups and note for later debrief the different group dynamics, especially if you have divided between assisted and unassisted processes; whether or not the universes/groups called on the ground rules that they had worked out; whether they were using "active listening", etc.

4) Whichever opening the **instructor/facilitator** chooses, allow some time for this negotiating round to take place. After about 30 minutes, deliver the "Top Secret" memos to the Itaga team representative (H-I.1) and to the Sandus Republic team representative (H-I.2) in each of the parallel universes. With about 30 minutes left, ask the participants to start to design their plan for sustainable development, with explicit projects,[25] and to draw them out on a transparency map. Keep calling off time every 10 minutes. When 10 minutes are left, ask those universes/groups who are not successful in developing a plan to allow each party two projects, and that the plan which they submit will be a conglomeration of all 12 projects (most universes/groups will probably fall to this option).

Debrief: First, start with 10-20 minutes debrief for the participants **in-character**. ***How are negotiations going? Is each party achieving its goals? What strategies have they been finding effective, and which less-so? Did anyone invoke international law? In what way? Have they kept their BATNA's in mind?***

Then have the participants **drop character** for a more-intensive debrief. ***What happened in each group? Is the process productive or not? How is power manifesting itself? Was the time crunch useful or not? Did participants practice their skills, or abandon them to most aggressively represent their country?***

24. Drawn from Kaufman (2002) pp. 205-206.

25. Note that "projects" can include "soft" projects like training facilities, national parks, and protected areas, as well as "hardware" such as dams and irrigation projects.

Instructions:
5) Ask each universe/group to present their plans to the other participants, and ask for an honest evaluation of how efficient each plan is. Chances are high that not only will each plan be inefficient, but many sets of projects will actually make other sets impractical or impossible.

Lecture Notes: The key message here is that negotiating by country is tremendously difficult, and generally opens with parties focusing on their own rights often at the expense of the good of the basin; that without cooperation, basin management is, at best, inefficient and, at worst, a conflict waiting to happen; and that the aims of political decision making and integrated basin management can be (apparently) diametrically opposed (we will see techniques in Stage IV to reconcile the needs of state and of basin).

Note to instructor/facilitator: If time permits, a nice transition to the next stage is to move directly from this exercise to the next, which will be on negotiating by sector (Ex-II.1).

Instructions:
6) Take away the country tabletop nameplates, and distribute to each universe/group instead the water use sector tabletop nameplates: Water Supply & Sanitation; Irrigation & Drainage; Energy Resources; Environmental Services; Industry & Navigation; Local & Indigenous. Now move directly into Ex-II.1.

BREAK/END OF MODULE I
Supplemental Reading for Module 1 starts on p. 45 in Part 1:

The Seven Elements of Conflict Resolution[26]
Terry Barnett

End of Day Questions for the Participants

Ask participants to answer the following questions on a piece of paper:

- What was the most important thing you learned during this day?
- What important question remains unanswered?

The instructor/facilitator should collect the responses and do an overview of the responses at the beginning of the next day.

MODULE II
CHANGING PERCEPTIONS – BASINS WITHOUT BOUNDARIES

OVERVIEW

Negotiation Stage	Common Water Claims	Collaborative Skills	Geographic Scope
Reflexive	Needs	Skills-building	 Watersheds

Stage 2 of Water Conflict Transformation

Module Goal(s)	To focus the collaborative learning process on *skills-building* as we approach the boundary-less basin by sector rather than by nation
Duration	5-8 hours
Important Background Information	For supplemental readings, see Part 1, Module II, Section D, page 45
Sections	A. General Setting: The Reflexive Stage of Negotiation B. Summaries: Based on Kjellen C. Taking the Boundaries Off the Map: Negotiating by Sector
Exercises	Ex-II.1 Negotiating by Sector (without boundaries) Ex-II.2 Negotiating by Country
Handouts	Tabletop Nameplates: Water Use Sectors (6 sets)
Overheads	Ov-II.1 Map of Sandus River Basin with Country Boundaries

SECTION A: GENERAL SETTING: THE REFLEXIVE STAGE OF NEGOTIATION

As the adversarial stage plays out, occasionally some cracks can be seen in the strict, rights-based, country-based positions of each side (although in actual water negotiations, this process can last decades). Eventually, and sometimes painfully, a shift can start to take place where the parties begin to listen a bit more, and where the interests underlying the positions start to become a bit apparent. In this *reflexive stage*, negotiations can shift from *rights* (what a country feels it deserves), to *needs* (what is actually required to fulfill its goals). Conceptually, it is as if we have taken the national boundaries off the map and can, as if for the first time, start to assess the needs of the watershed as a whole. This shift, from speaking to listening, from rights to needs, and from a basin with boundaries to one without, is a huge and crucial conceptual shift on the part of the participants, and can be both profoundly difficult to accomplish, and absolutely vital to achieve for any movement at all towards sustainable basin management. To help accomplish this shift, the collaborative learning emphasis is on *skills-building*, and we approach the (boundary-less) basin by sector rather than by nation.

As described above, many sets of negotiations surveyed begin with parties basing their initial positions in terms of *rights* – the sense that a riparian is entitled to a certain allocation based on hydrography or chronology of use. Upstream riparians often invoke some variation of the principle of "absolute sovereignty," claiming that water rights

originate where the water falls. Downstream riparians often claim absolute river integrity, claiming rights to an undisturbed system or, if on an exotic stream, historic rights based on their history of use. In most disputes which have actually been resolved, however, particularly on arid or exotic streams, the paradigms used for negotiations have not been "rights-based" at all – neither on relative hydrography nor specifically on chronology of use, but rather "needs-based." Needs are defined by irrigable land, population, or the requirements of a specific project.[27]

One might speculate as to why negotiations move from rights-based to needs-based criteria for allocation. The first reason may have something to do with the psychology of negotiations, and the natural trajectory through the four levels of negotiations mentioned here. Where each negotiator may initially see him- or herself as a national first and foremost, where the rights of one's own country are paramount, over time one must empathize to some degree to notice that even the entity on the other side of the table, regardless of the level of enmity, requires the same amount of water for the same use with the same methods as oneself.

The second reason for the shift from rights to needs may simply be that rights are not quantifiable and needs are. We have seen the vague guidance that the 1997 Convention provide for allocations – a series of occasionally conflicting parameters which are to be considered as a whole. If two nations insist on their respective rights of upstream versus down, for example, there is no spectrum along which to bargain; no common frame of reference. One can much more readily determine a needs-based criterion – irrigable land or population, for example – and quantify each nation's needs. Even with differing interpretations, once both sides feel comfortable that their minimum quantitative needs are being met, talks eventually turn to straightforward bargaining over numbers along a common spectrum.

Finally, taking the borders "off the map" allows for thinking about water needs by *sector*, rather than purely by political entity. Shifting that emphasis allows for greater cross-boundary efficiencies in *all* sectors, and provides greater opportunities for integrated management.

While the allocation of water, particularly in international systems, is often contentious, the underlying interests of most riparians are to secure the benefits of water use. Focusing on the benefits derived from the use of water in a river system, rather than the physical water itself, provides many more opportunities for defining cooperative management arrangements that are acceptable to all parties. Benefit sharing provides riparians with the flexibility to separate the physical distribution of river development (where activities are undertaken), from the economic distribution of benefits (who receives the benefits of those activities.) This allows riparians to focus firstly on generating basin-wide benefits, and secondly on sharing those benefits in a manner that is agreed as fair. One fundamental lesson of universal experience is that a river is best managed as a basin unit, as any action in one part of the basin has impacts in another. Just as good water resource management practices can increase the availability of water in a river system, integrated planning that maximizes the benefits derived from water can clearly increase the overall productivity of a river system. Furthermore, a focus on sharing the benefits derived from the use of water, rather than the allocation of water itself, provides far greater scope for identifying mutually beneficial cooperative actions.

SECTION B: SUMMARY – ENVIRONMENTAL DIPLOMACY: HOLDING INFORMED MULTILATERAL NEGOTIATIONS [28] (KJELLÉN, BACKGROUND DOCUMENT)

Context

Environmental diplomacy is a new branch of diplomacy that demands of its practitioners a technical understanding of the issues being negotiated, as well as the standard skills usual to a diplomat working in a multilateral setting. Developing a technical understanding of issues surrounding environmental threats to a nation, and placing them within the national context, necessitates a dialogue between a number of communities within a country – the political, the technical and society at large.

27. Here we distinguish between "rights" in terms of a sense of entitlement, and legal rights. Obviously, once negotiations lead to allocations, regardless of how they are determined, each riparian has legal "rights" to that water, even if the allocations were determined by "needs."

28. See p. 54 for more detail.

Observations

These observations stem from personal involvement in climate change negotiations as a senior environmental diplomat, with which parallels are drawn to international waters.

Negotiating science and national political interests

Negotiating competently on the environmental matters necessitates negotiators having a technical understanding of the issues. Scientific evidence and awareness first lead to the understanding that one country alone cannot contend with the emerging environmental issues. Scientific knowledge can thus formulate the impetus for, and agreement on, international negotiations. Environmental diplomats, however, cannot rest with merely understanding the subject matter. Thus, alongside with a technical understanding, environmental diplomats also need to have a keener understanding of economics and other factors.

Building capacity within developing countries (LDCs)

It is imperative that the capacity within the scientific communities in the developing countries is enhanced, so that international negotiations are more of a level playing field. Even with modest resources, scientists from developing countries can provide their societies and negotiators with a more balanced and up-to-date understanding of the potential environmental, economic, and social costs and benefits that could result from the discussions in the global environmental arena. Developing countries often suffer from three main limitations: (I) knowledge limitations which means that they often have to rely on information and analyses supplied by the more developed countries; (II) economic limitations; and (III) commitment limitations in that the environment is often low on the political agenda.

How to include different communities

Informing negotiators of the scientific issues is insufficient, as the outcomes of any negotiations will impact on current economic and technical systems. Thus, civil society needs to be involved. The challenge is, therefore, to integrate civil society into developing policies that focus on long-term sustainability of natural resource use. Institutions cannot alter the basic fact that important areas of policy are involved and major economic actors outside government are strongly affected. But just as politics can change institutions, institutions can influence politics.

SECTION C: TAKING THE BOUNDARIES OFF THE MAP: NEGOTIATING BY SECTOR

Module II: Exercise 1 (Ex-II.1): *Negotiating by Sector*

General Information	
Context	With all probability, the group saw the inefficiencies and inequities which are manifested when country positions overwhelm the needs of the basin. But, what happens conceptually when the national boundaries come off the map. This exercise aims to answer this.
Objectives	To reinforce the concept of a boundary-less basin
Duration	3 to 4 hours
Important Information	Choreography here is quite elaborate; it is worth rehearsing the logistics carefully before launching

Materials:
Overhead of map of Sandus Basin with country boundaries (Ov-II.1)
Overhead of map of Sandus Basin without country boundaries (Ov-II.2)
6 sets of "Water Use Sector" tabletop nameplates

Instructions:
1) Ask, ***"What happens conceptually when the national boundaries come off the map?"***, and open up discussion.

Note to instructor/facilitator: A good graphic tool for this discussion is to contrast on overhead or PowerPoint the first two Sandus maps – one with boundaries delineated, and the one without. Open discussion around the question above can lead to how perceptions can shift profoundly. With the boundaries gone, we can, at least conceptually, move from thinking by country to thinking of the basin as a whole; from insisting on rights we "deserve" to thinking about what we actually need; from speaking to listening.

Depending on the participants and the direction of the discussion, it may also be worth reassuring them that: **a)** We are not naive enough to think that national interests could, or should, be dissolved or even subsumed to basin interests. We know the political world is much larger than water, we'll get back to integrating the political and water worlds in Stage IV; and, **b)** We realize that the real world is also bigger than basins; that "problemsheds" are not restricted to basin boundaries. We'll address problemsheds in Stage III, when we investigate ways to "enlarge the pie." But let's use the boundary-less basin as a planning unit for now, to see where it leads. (Note: this exercise has actually been used to tremendous effect on some of the world's most contentious basins.)

2) To reinforce the concept of a boundary-less basin, take away the country nameplates behind which participants were sitting at the last exercise, and distribute to each universe/group instead the water-use sector nameplates: Water Supply & Sanitation; Irrigation & Drainage; Energy Resources; Environmental Services; Industry & Navigation; Local & Indigenous. **The instructor/facilitator** can do this in one of two ways.

> *Level 1 Option:* The participants can just sit where they are and, instead of representing a country, they will now represent a sector.
>
> *Level 2 Option:* Alternately, the participants can be rearranged by the sectors they represented back in Ex-0 (The logistics of this option is often not worth the effort. People tend to be able to represent sectors fairly intuitively, and it is much easier just to let them sit where they were in the last exercise. You will, however, want to think about whether to let the instructor/facilitators continue to facilitate, or whether to mix their roles up with the others.)

3) Give each universe/group blank maps, without country boundaries, and ask them to prepare a plan for sustainable basin management, as before. Without the imposition of national boundaries, it is also possible to introduce some basic strategic planning techniques.[29] Ask each universe/group to describe briefly:

a. Where we are now.
b. Where we want to be in 20 years.
c. What are the major obstacles to getting there?
d. How can those obstacles best be overcome?

Note to instructor/facilitator: The participants are, by now, seasoned negotiators and active listeners, and they should be able to move forward with little guidance. One twist: in this case, give them substantively less time than in Ex-I.2, and allow only one project[30] per sector (six, total) rather than the two per country (12, total) from the last round. Make observations and call out time, as before.

29. This is based on the Four Quadrant Approach to Problem Solving, as described in Fisher & Ury (1981, p. 70), and in Fisher *et al.* (1994, pp. 68-71).
30. Note again that "projects" can include "soft" projects like training facilities, national parks, and protected areas, as well as "hardware" such as dams and irrigation projects.

Debrief: Again, start with 10-20 minutes debrief for the participants **in-character**. ***What was the difference between the two rounds? Is each party achieving its goals? What sets of sectors seem to complement each other, and which do not? Are there ways to overcome these differences?***

Again have the participants **drop character** for a more-intensive debrief. ***What happened in each group? Did the process change given this new mandate? What skills were necessary? Is power manifesting itself here as well? In what way? How did the goals change?***

Again, ask each universe/group to present their plans to the group, and ask for an honest evaluation of how efficient each plan is. Chances are high that these plans will not be ideal, but that they will be inordinately more efficient than those of the last round, also with fewer projects in potential conflict with each other. Notice that this is true despite there being less time available, and that they only had half the number of projects to develop!

Lecture Notes: So taking away the political boundaries allows for a tremendously efficient planning of a basin, *if planning a basin were the only set of interests to consider*. They emphatically are not! We have dealt with efficiency but not with equity – notice that benefits accrue disproportionately to certain regions (probably the center – what was Gambo – if typical). "Hydropolitics" is made up of two factors – water *and* politics – and these negotiators will have to go home to "sell" their plan also to their constituents, who will probably care less about the benefits for the basin as a whole than about what was brought "home."

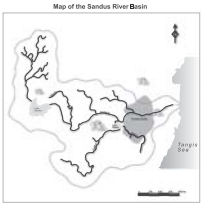
Instructions:
4) Guide some discussion to how we might resolve these conflicting needs – those of country equity and those of basin efficiency – and capture what is noted. (The next two stages will deal with these issues, first by enhancing the benefits, then by developing mechanisms for managing and sharing them equitably. But it is probably best not to "give" these solutions just yet.)

Preparation for Stage III:
It is worth having participants read the material by Sadoff & Grey (supplement to Module III on p. X) to prepare for the next two modules.

BREAK/END OF MODULE II
Supplemental Reading for Module II starts on p. 54 in Part 1:

Environmental Diplomacy: Holding Informed Multilateral Negotiations
Bo Kjellén

MODULE III
ENHANCING AND SHARING BENEFITS
OVERVIEW

Negotiation Stage	Common Water Claims	Collaborative Skills	Geographic Scope
Integrative	Benefits	Consensus-building	 "Benefit-sheds"

Stage 3 of Water Conflict Transformation

Module Goal(s)	To focus the collaborative learning process on the *consensus-building* of the group
Duration	7-10 hours
Important Background Information	For supplemental readings, see Part 1, Module III, Section D, page 62
Sections	A. General Setting: The Integrative Stage of Negotiation B. Summaries: Sadoff and Grey (2002), and Whittington, *et al.* (2005) C. Enhancing Benefits: Beyond the Basin, Beyond the Water
Exercises	Ex-III.1 Beyond the Basin, Beyond Water
Handouts	No new handouts
Overheads	Ov-III.1 Four Types of Benefits of International Waters Cooperation Ov-III.2 Map of Sandus Basin without Country Boundaries

SECTION A: GENERAL SETTING: THE INTEGRATIVE STAGE OF NEGOTIATION

Once participants have moved in the first two stages from mostly speaking to mostly listening, and from thinking about rights to needs, the problem-solving capabilities which are inherent to most groups can begin to foster creative, cooperative solutions. In this third, *integrative stage*, the needs expressed earlier begin to coalesce together to form group interests – the "why" underlying the desire for the resource. Conceptually, we start to add *benefits*[31] to the still boundary-less map, and in fact to think about how to enhance benefits throughout the region, primarily by adding resources other than water, and geographic units other than the basin. The collaborative learning emphasis is now on the *consensus-building* of the group, and we begin to move in "benefit-shed" rather than being restricted by the basin boundaries.

At the heart of this framework is the potential to move from national agendas that are unilateral, to national agendas that incorporate significant cooperation, and to converge upon a shared cooperative agenda. The

31. Finding an international symbol for "benefits" has been a challenging task. We settled on the cornucopia, especially given its origin in mythology, as described by Ovid: In a battle for his wife, Deianira, Hercules defeated the god of the river Achelous. In this contest, the left fork of the river was wrenched off from the main body, and snatched up into heaven, where it was turned into a cornucopia pouring out a wealth of fruit and flowers upon the reclaimed valley and enriching the entire kingdom.

extent to which this will occur will be determined by each party's perception of the benefits it can secure from cooperation. Convergence towards a cooperative agenda will be facilitated by several important and practical steps. First, the perception of the range and extent of potential benefits needs to be expanded to the extent possible, from the obvious to the less apparent. Second, the distribution of benefits, and benefit-sharing opportunities to redistribute the costs and benefits of cooperation, need to be explored to enable the definition of a cooperative agenda that will be perceived as fair by all parties. Third, alternative modes of cooperation need to be recognized and appropriate types of cooperation identified to secure the greatest net benefits. Each of these steps is examined below.

A first step in motivating cooperation is to recognize the widest possible range of potential benefits that cooperation could bring. There will be no cooperation if benefits are perceived to be insufficient relative to the costs of cooperation. Benefits are broadly defined here to include economic, social, environmental and political gains. Integrated, basin-wide water resources management is increasingly recognized as the ultimate goal for ensuring the sustainability and productivity of river systems and is a challenge in any setting, as the priorities and concerns of myriad users must be reconciled. In the context of international rivers, moves toward integrated management cannot be made without international cooperation. The complexity and costs of international cooperation can be very great, and must be achieved in the absence of any ultimate entity with the mandate and authority to impose a solution.

A useful framework for broadening the range of recognized benefits of cooperation proposes the identification of four types of cooperative benefits.[32] The first type of benefit derives from cooperation that enables better management of ecosystems, providing *benefits to the river*, and underpinning all other benefits that can be derived. The second type of benefit derives from the efficient, cooperative management and development of shared rivers, yielding major *benefits from the river*, in increased food and energy production, for example. The third type of benefit derives from the lessening of tensions because of cooperation, resulting in the *reduction of costs because of the river*, as tensions between co-riparian states will always be present, to a greater or lesser extent, and those tensions will generate costs. And finally, as international rivers can be catalytic agents, cooperation that yields benefits from the river and reduces costs because of the river can yield a fourth type of benefit derived from greater cooperation between states, even economic integration among states, generating *benefits beyond the river*.

SECTION B: SUMMARY – BEYOND THE RIVER: THE BENEFITS OF COOPERATION ON INTERNATIONAL RIVERS (SADOFF AND GREY, BACKGROUND DOCUMENT)

Context

Managing rivers for the common good is a societal goal in countries around the world. All international rivers, without exception, create some degree of tension among the societies that they bind. Where rivers flow between sovereign nations there is rarely an institutional structure with ultimate authority. One fundamental lesson of universal experience is that a river is best managed as a basin unit, as any action in one part of the basin has impacts in another. The choice between cooperation and conflict regarding the management of international rivers will be determined, in large part, by their perceived relative benefits. In this paper, Sadoff and Grey seek to broaden the range of perceived benefits – some obvious, some not – by exploring the dynamics driving the choice between conflict and cooperation (i.e., incentives, catalyst, and linkages). The authors offer a framework for examining the extent of potential benefits that could underlie these choices, and present the challenges and opportunities of each type of benefit.

Main Points

The framework categorizes four types of cooperative benefits. First, cooperation will enable better management of ecosystems, providing *benefits to the river* (environmental benefit), and underpinning all other benefits that

32. See Claudia W. Sadoff and David Grey. 2002. Beyond the river: The benefits of cooperation on international rivers. *Water Policy* 4 (5):389-403.

can be derived. Second, efficient, cooperative management and development of shared rivers can yield major *benefits from the river* (economic benefit). Third, cooperation on an international river will result in *the reduction of costs because of the river* (political benefit), as tensions between co-riparian states will always be present, to a greater or lesser extent, and those tensions will generate costs. While costs because of the river are not always readily seen or quantified, they can be very real and substantial, and can compound other tensions leading to higher costs still. And finally, as international rivers can be catalytic agents, cooperation that yields benefits from the river and reduces costs because of the river can pave the way to much greater cooperation between states, even economic integration among states, generating *benefits beyond the river* (indirect economic benefit).

Though each of these types of benefits has the potential to be obtained in all international river basins, the range of political, geographic, economic, and cultural circumstances of a basin will shape the extent and relative importance of each type of benefit. The broader the range of benefits under discussion, the more likely riparians will be able to find a configuration of benefits that is mutually acceptable. While some benefits are difficult to share or compensate, in general the optimization of benefits should be more robust and more flexible than the optimization of physical water resources, because benefits tend to be more easily monetized and compensated and they have less political and psychological significance.

Identifying and understanding the range of often inter-related benefits derived from the cooperative management and development of international rivers is central both to better management of the world's rivers and to relations among the nations sharing those rivers.

SUMMARY – WATER RESOURCES MANAGEMENT IN THE NILE BASIN: THE ECONOMIC VALUE OF COOPERATION (WHITTINGTON, *ET AL.*, BACKGROUND DOCUMENT)

Context

To argue that "water is an economic good" is now part of the international water resource community's lexicon. Though this means different things to different people, it calls for the recognition that water has an economic value and that that value must be a central consideration in water resources management. Since 1999, the Nile Basin Initiative has been underway among the Nile Riparian countries to explore opportunities for maximizing the benefits of the river's waters through cooperative development and management of the basin. However, there has been virtually no explicit discussion of the economic value of cooperative water resources development. A serious discussion about the economics of Nile cooperation is inevitable and will not lessen the importance of environmental, social, or cultural issues.

Concepts of the "Economic Value of Water"

User value – Water has an economic value to a user at a specific time and location. The user value is the amount of money a user will be willing to pay to obtain more water and is determined by the specific use of the water and the amount of money the user has.

System value (shadow value) – This is defined as the total value generated by the water within the river system, the sum of all benefits and costs to the riparians as a whole. From the systems perspective how changes in water availability affect all water users and thus the cumulative value of the water system is important.

Four Economic Pressures at Play in the Nile

1. Withdraw water for irrigation as far upstream as possible – before you lose it through evaporation and seepage

2. Withdraw water for irrigation as far downstream as possible in order to take full advantage of hydroelectric power generation facilities

3. Store water upstream to reduce evaporation losses

4. Withdraw water where its user value is greatest

Balancing Economic Pressures in a Systems Context: The Nile Economic Optimization Model (NEOM)

NEOM provides a framework for integrating hydrological and economic information to consider the effect of the four economic pressures. Thirteen key findings resulted from the NEOM analysis. Results show that in most scenarios, the total direct economic benefits are generated "relatively" evenly in Ethiopia, Sudan, Egypt, and the Equatorial States, though the composition of benefits vary by country. A systems perspective, focusing on cooperative system-wide development and management of Nile waters instead of unilateral investment planning, should enable riparians to better sustain the ecosystem and generate greater economic benefits for all people in the Nile basin.

SECTION C: ENHANCING BENEFITS: BEYOND THE BASIN, BEYOND WATER

Module III: Exercise 1 (Ex-III.1): *Beyond the Basin, Beyond Water*

	General Information
Context	In the last two modules, the participants were able to (presumably) craft basin plans of increasing efficiency simply by moving from planning by country to planning by sector – by "taking the boundaries off the map." But chances are that benefits were concentrated in specific geographic locations, which will cause problems of inequity when the boundaries are brought back into play, as they inevitably must.
Objectives	To think together about how to enhance the benefits to *all* the parties, by both moving beyond the basin to think in "benefit-sheds" and beyond water to incorporate other benefits, enlarging the overall "basket of benefits."
Duration	2-3 hours
Important Information	The concept of "benefits" seems intuitive, but is filled with nuance and complexity. Working through the principle allows stakeholders to move beyond the zero-sum exercise of simply trying to divide water.

Note to instructor/facilitator: You might have the participants read the Sadoff and Grey (2002) article in advance, to help facilitate the discussion of the next two stages.

Type 1: Environmental Increasing Benefits	*To the river*	Improved ecosystem sustainability, conservation and water quality
Type 2: Economic Increasing Benefits	*From the river*	Improved productivity, and flood and drought management
Type 3: Political Decreasing Costs	*Because of the river*	Policy shift to cooperation and development
Type 4: Indirect Economic Increasing Benefits	*Beyond the river*	Broader regional cooperation and integration

Figure 10: Four Types of Benefits of International Waters Cooperation
Overhead (Ov-III.1)

Materials: Overhead of Sandus Basin without country boundaries (Ov-II.1)
Sector-driven regional plans that the participants developed in Module II, Exercise I

Instructions:
1) Project the "boundary-less" map on a wall.

2) Open discussion with the group on the two conceptual shifts introduced here: watersheds to problemsheds; and, beyond water to enhance benefits. [33]

a) Watersheds to "problemsheds". The watershed is the most efficient unit of management if water management were the only concern of the parties involved. What else is on the parties' minds as they negotiate? Clearly, their geographic borders are of concern, probably much superseding those of the watershed. What other units are of issue? Road-networks? Electricity grids? Ecosystems and flyways? Climatic patterns? Strategic interests? What are the geographic units of each of these "problemsheds" and how are they expressed in negotiating strategy?

b) Beyond water to enhance benefits. If we begin to understand the interconnectivity of these overlapping problemsheds, we can now start to think about enhancing the "basket of benefits" by thinking beyond water to "benefit-sheds." Which of the issues raised in a), above, can be introduced to a discussion of enhancing benefits?

3) Hand back the sector-driven regional plans from the Stage II exercise, and ask the participants to think "beyond the river" to add to the region's "basket of benefits." You might disband one or two of the universes/groups and ask those participants to act as representatives of sectors beyond strictly water, e.g., the Minister of Energy, the Environment, Transportation, or Defense, as they are invited by the other universes. Also, remind the participants to think about benefits broadly, and not just in terms of hardware projects (e.g., protected flyways and regional nature reserves).

4) Ask each universe/group to prepare a regional plan for sustainable development, which will extend the sustainable basin management plan of the last round, by going both beyond the basin and beyond water. Allow participants to call on other ministries, as needed.[34]

Debrief: Start again with a short debrief for participants **in character**. Ask ***"How were dynamics changed as we added participants and interests?"***

Instructions:
5) Have each universe/group present their new plan.
Debrief: After all presentations have been done guide the debrief around the following questions: ***Do the plans look similar or different from each other? Why? What were the especially creative approaches to "beyond the river"? How much larger do the "baskets of benefits" get when we move beyond water?***

33. See Sadoff and Grey, for more information.
34. If a more formal approach to planning would be useful, see the material on structured decision making, in "Supplemental Reading," p. 103.

Have participants **drop character**. ***What happened, both positive and negative, when we went beyond the river?*** On the positive side, benefits were probably enhanced throughout the region. ***But, what about the negotiating dynamics? Were they made more complicated as soon as other interests joined the room?*** This points yet again to the balance between economic efficiency and political expediency, and to a truism of negotiations: the complexity of negotiations rises exponentially with the number of people and interests involved. Guide discussion on these apparent contradictions between efficiency and equity. ***Now that we've got a larger basket of benefits, what are the mechanisms we might use to guarantee that they are distributed equitably?***

BREAK/END OF MODULE III
Supplemental Reading for Module III starts on p. 62 in Part 1:

Sadoff, Claudia W. and David Grey. 2002. Beyond the river: The benefits of cooperation on international rivers. *Water Policy*. 4(5):389-404.

Whittington, Dale, Xun Wu, and Claudia Sadoff. 2005. Water resources management in the Nile Basin: The economic value of cooperation. *Water Policy*. 7(3):227-252.

Robertson, Kyle. 2007. Structured Decision Making. Adapted from: Failing, L. 2007. Structured Decision Making: A Framework for Water Management and Investment Decisions. Draft Manuscript. The World Bank.
http://www.structureddecisionmaking.org

End of Day Questions for the Participants

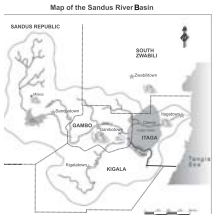
Ask participants to answer the following questions on a piece of paper:

- What was the most important thing you learned during this day?
- What important question remains unanswered?

The instructor/facilitator should collect the responses and do an overview of the responses at the beginning of the next day.

MODULE IV
PUTTING IT ALL TOGETHER – INSTITUTIONAL CAPACITY

OVERVIEW

Negotiation Stage	Common Water Claims	Collaborative Skills	Geographic Scope
Action	Equity	Capacity-building	 Region

Stage 4 of Water Conflict Transformation

Module Goal(s)	To focus the collaborative learning process on *capacity-building*, primarily of institutions
Duration	3-5 hours
Important Background Information	For supplemental readings, see Part 1, Module IV, Section E, page 112
Sections	A. General Setting: The Action Stage of Negotiation B. Summary: The Law of International Watercourses C. Institutional Capacity and Sharing Benefits D. One-minute Evaluation
Exercises	Ex-IV.1 Crafting Institutions
Handouts	H-IV.1 Development of the Sandus River Basin Commission Exercise H-IV.2 Aquifer Exercise H-IV.3 Guidelines for Going Home H-IV.4 One-minute Evaluation
Overheads	Ov-IV.1 Sharing Benefits: Possible Mechanisms Ov-IV.2 Cooperation Continuum

SECTION A: GENERAL SETTING: THE ACTION STAGE OF NEGOTIATION

While tremendous progress has been made over the first three stages, both in terms of group dynamics, and in developing cooperative benefits, this last, action, stage helps with tools to guide the sustainable implementation of the plans which have been developed, and to make sure that the benefits are distributed *equitably* amongst the parties. The scale at this stage is now *regional* where, conceptually, we need to put the political boundaries back on the map, reintroducing the political interest in seeing that the "baskets" which have been developed are to the benefit of all. The collaborative learning emphasis is on *capacity-building*, primarily of institutions

Sharing benefits and costs. A "fair" distribution of benefits and costs is central to achieving sustained cooperation. If significant benefits accrue in one country, while significant costs are borne by another, it is possible that a project providing net benefits on a basin-wide scale could actually generate net losses in any one country. If benefits are simply secured where they are generated under an optimal cooperative scenario (e.g., at the most productive hydropower or irrigation sites), the distribution of benefits this creates may well be perceived as unfair by some riparians. Where this initial distribution of benefits from a cooperative management and development scenario is seen as unfair, benefit-sharing mechanisms can play a pivotal role in motivating and sustaining cooperation. Benefit sharing can be defined as any action designed to affect the allocation of costs and benefits. Benefit sharing provides riparians with the flexibility to separate the physical distribution of river development (where activities are undertaken), from the economic distribution of benefits (who receives the benefits of those activities). This allows riparians to focus firstly on generating basin-wide benefits, and secondly on sharing those benefits in a manner that is agreed as fair.

Tools for sharing benefits and costs. Opportunities and mechanisms for benefit sharing should be considered from the earliest stages of project identification and design. The form it takes will be highly situation specific, but could involve monetary transfers, granting of rights to use water, financing and ownership of investments, or the provision of non-related goods and services. The range of benefits under discussion is also a critical issue. The broader the range of benefits under discussion, the more likely riparians will be able to find a configuration of benefits that is mutually acceptable. While some benefits are difficult to share or compensate, in general the optimization of benefits should be more robust and more flexible than the optimization of physical water resources, because benefits tend to be more easily monetized and compensated.

SECTION B: SUMMARY – THE LAW OF INTERNATIONAL WATERCOURSES: THE GLOBAL CONTEXT [35] (MCCAFFREY, BACKGROUND DOCUMENT)

Context

May take either of two forms, either treaty law or customary international law. If states sharing international freshwater resources are not parties to an applicable treaty, their rights and obligations are governed by customary international law. The best evidence of the customary international law of international watercourses is the 1997 United Nations Convention on the Law of the Non-Navigational Uses of International Watercourses. The Convention is based on a text prepared by the UN International Law Commission that was negotiated in the UN and adopted by the General Assembly. It is cited as evidence of customary law by the World Court in the *Danube* case (1997) even though it is not in force.

General Principles of International Watercourse Law

There are three main general principles of the customary law of international watercourses that are widely accepted:

1. Equitable and reasonable utilization

2. Prevention of significant harm

3. Prior notification of potentially harmful planned activities

An emerging principle is the protection of ecosystems of international watercourses from harm through pollution and other human activities.

Equitable and reasonable utilization – This means that each state must use an international watercourse in

35. Stephen McCaffrey; University of the Pacific. See p. 112 for more detail.

a manner that is equitable and reasonable vis-à-vis other states sharing the watercourse. What constitutes "equitable and reasonable utilization" must be determined on a case-by-case basis, taking into consideration all relevant factors; such factors include both natural and human-related phenomena.

Prevention of significant harm – A basic principle of international law is that one state must not harm another. In the field of international watercourses this means that states must do their best to prevent uses within their territories from causing significant harm to other states. Perhaps the most controversial issue in the field is that of the relationship between this principle and that of equitable utilization, in that can one state's use cause some harm to another state and still be justified as equitable? The UN Convention seems to answer this question in the affirmative.

Prior notification – A state must notify other states of planned activities that may adversely affect those other states. Potentially affected states must be permitted to comment on and consult with the notifying state concerning the plans.

Protection of watercourse ecosystems – There is general recognition of the importance of protecting and preserving the ecosystems of international watercourses. In the Danube and Nuclear Weapons cases, the World Court has strongly endorsed the obligation not to harm the environment of other states or areas beyond the limits of national jurisdiction.

SUMMARY – COOPERATION ON INTERNATIONAL RIVERS: A CONTINUUM FOR SECURING AND SHARING BENEFITS (SANDOFF AND GREY, BACKGROUND DOCUMENT)

Achieving international cooperation is always a long and complex journey, for which there is no single path and few short cuts. Instead, there are many routes that can be followed and many steps that can be taken, with various options to consider and choices to be made. This paper explores the practicalities of achieving cooperation on international rivers and presents a framework of options and choices to consider. At the heart of it is the potential to move from national agendas that are unilateral, to national agendas that incorporate significant cooperation, and to converge upon a shared cooperative agenda. The extent to which this will occur will be determined by each party's perception of the benefits it can secure from cooperation. Convergence towards a cooperative agenda will be facilitated by several important and practical steps.

- First, there is the perception of the range and extent of potential benefits that needs to be expanded to the extent possible, from the obvious to the less apparent.
- Second, the distribution of benefits, and benefit-sharing opportunities to redistribute the costs and benefits of cooperation, need to be explored to enable the definition of a cooperative agenda that will be perceived as fair by all parties.
- Third, alternative modes of cooperation need to be recognized and appropriate types of cooperation identified to secure the greatest net benefits.

Cooperation on an international river can bring many benefits that may allow the whole to be greater than the sum of the parts – not least because treating the river basin as one system allows optimized management and development (the ultimate goal of integrated water resources management). There are many different types of benefits (social, economic, environmental, and political) that can be secured through the cooperative management of international waters, with each individual basin offering different potential cooperative benefits with different associated costs. A useful framework for broadening the range of recognized benefits of cooperation proposes the identification of four types of cooperative benefits (benefits to the river, benefits from the river, benefits because of the river, and benefits beyond the river).

For each international basin the optimal mode of cooperation will depend on a mix of factors including: hydrologic characteristics, the economics of cooperative investments, numbers and relationships of riparians, and the costs of parties coming together. However, a continuum of cooperation can be conceived from *unilateral action* (independent, non-transparent national plans), to *coordination* (communication and information on national

plans), to *collaboration* (adaptation of national plans for mutual benefits), to *joint action* (joint plans, management or investment). The continuum is non-directive, *dynamic, and iterative*. Different modes of cooperative effort will create different options for benefit sharing (Figure 12) and similarly different benefit-sharing mechanisms will require different levels of cooperation.

Cooperative Regional Assessments are tools specifically designed to promote cooperation on international rivers. The uniqueness of each international basin will offer a different set of potential cooperative benefits, calling for different modes of cooperation and a different set of cooperative and benefit sharing mechanisms.

SECTION C: INSTITUTIONAL CAPACITY-BUILDING AND SHARING BENEFITS

Module IV: Exercise 1 (Ex-IV.1): *Crafting Institutions*

	General Information
Context	While participants should feel justifiably pleased at their progress in developing programs for regional sustainable development, they now have to think about the difficult task of re-entering the "real world" outside of the negotiations. The colleagues and constituents who were not "in the room" will probably be more skeptical of the results than the participants, and the political boundaries will once again play a critical role in regional acceptance.
Objectives	To think clearly about the types of characteristics that ought to be included in the concept of a "benefit," and how these concepts get institutionalized.
Duration	3-5 hours
Important Information	The three critical tasks in preparation for "re-entry" are: 1) develop guidelines for the equitable distribution of benefits; 2) develop the institutional capacity to implement and sustain the regional development goals; and, 3) brainstorm about what might have been missed in the process, and how to mitigate whatever might go wrong in the future.

Lecture Notes: Guidelines for Equitable Distribution of Benefits. Putting the borders back on the map reminds us of the critical national interests at stake in negotiations. It is not enough, politically speaking, to sustainably develop a region for its own sake – constituents will want to know, justifiably, "what's in it for us?" Chances are, when the plans for regional development were crafted in the last stage, the benefits were distributed unequally across space. Now with the borders back on the map, it is clear that this inequity translates to nations – some countries and regions will gain greater benefits, and some fewer.

In many agreements, principles of international law are called upon to help guide equity. Recall from Stage I, however, that law offers general guidelines rather than specific formulae for allocating either water or benefits (see McCaffrey material for more information). In the few water treaties which define and allocate benefits rather than water (see Wolf 1999 for examples), benefits are usually defined economically, and mechanisms such as side payments are developed for their equitable distribution.

To summarize the problem:

- Regional planning can identify "optimal" (productivity maximizing) development;
- If benefits are captured at the natural, physical location of benefit generation, the distribution of benefits among riparians may be perceived as unfair;

- Principles and mechanisms are needed to create "fair" distributions
  - based on international "standards" and law
  - subjective & situation specific
- Political decisions – not just legal or economic

Instructions: Brainstorm with the group about, **a)** how benefits should be measured, making sure that a value is also developed for "intangibles," and, **b)** mechanisms for guaranteeing the equitable distribution of benefits (Ov-IV.1 is offered for comparison). Break up into existing universes/groups and allow each one to develop their own mechanism for distributing benefits, then come back to the group and discuss.

Water Sharing	Benefit Sharing
Assigning rights	**Direct payment for water use** e.g., municipal or irrigation supplies (rights already assigned)
	Direct payment for benefits e.g., fisheries, watershed management or compensation for costs (inundated land, pollution) **Purchase agreements** e.g., power, agriculture products (benefit transfer through terms/price) **Financing and ownership agreements** e.g., power infrastructure (benefit transfer through deal structure) **Broadened bundle of benefits** e.g., including provision of unrelated goods and services and less tangible benefits

Figure 11: Sharing Benefits: Possible Mechanisms
Overhead (Ov-IV.1)

Lecture Notes: **Institutional Capacity for Sustainable Development.** Figuring out in theory what benefits will be developed and how they will be distributed has been a tremendous exercise, but still leaves missing who will manage the effort and how. Institutional capacity should be increased to ensure that institutions have: (1) a clear and strong mandate to promote and enhance the institutionalization of good water management and water use throughout all levels of society, (2) an organizational system conducive to effective and efficient management decisions with good incentives, accountability and control, and (3) improved decision support mechanisms through research on lessons learned and the use of indigenous knowledge. Again, crafting institutions requires a balance between the efficiency of integrated management with the sovereignty-protection of national interests. Along with greater integration of scope and authority may come greater efficiency, but also comes greater potential for disagreements, greater infringement on sovereignty, and greater transaction costs (see Feitelson and Haddad (1998) for more information). Simultaneously, bearing in mind the often limited financial and manpower resources of governments, some circumstances may prove that effective and efficient service delivery can be achieved by empowering and strengthening the capabilities of local communities and user groups to assume part of the management responsibility and authority over infrastructure and the resource itself. Such empowerment can often be established simply by providing a formalized platform that allows all interested parties to voice their concern and contribute to the decision making process. Some possible institutional models are offered in Ov-IV.2, below. Nevertheless, for every set of political relations, there is some possible institutional arrangement which will be acceptable (even if it is only to collect data separately but in a unified format, in the hopes that they may one day be merged) and, if its management is iterative and adaptive, responsibility can be regularly "re-crafted" to adapt or even lead political relations.

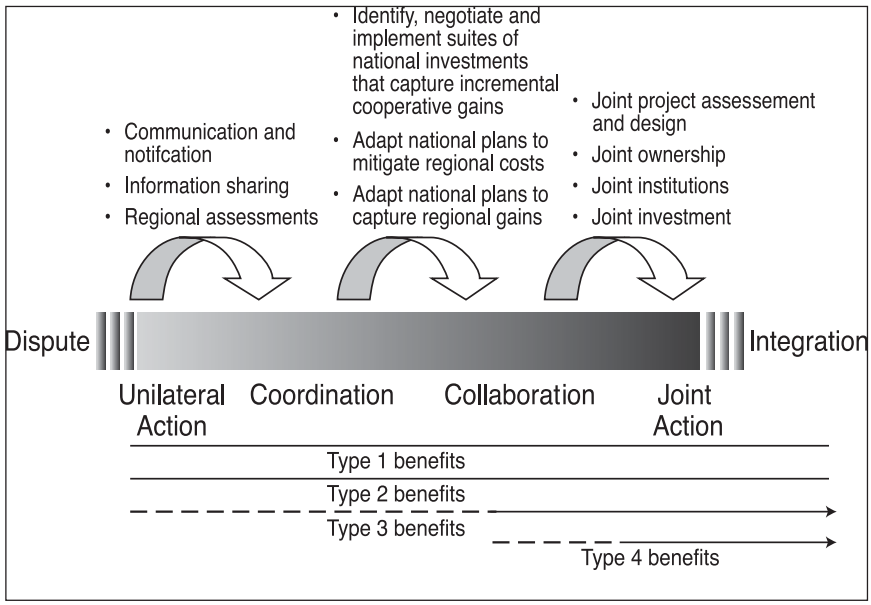


Figure 12: Types of Cooperation – the Cooperation Continuum
Overhead (Ov-IV.2)

Instructions:
1) While still in universes/groups, distribute the exercise on the development of the Sandus River Basin Commission (H-IV.1), and allow some time for each group to explore the responsibilities of the new Sandus River Basin Coordinating Unit (SARBaCU).

Debrief:
1) Come back to the group for discussion: ***Were conclusions similar between universes? Different? How were political interests and power expressed? Were dynamics any different now that substantively more benefits are on the table than in previous iterations?*** It may be of interest to identify the proposed financing structure of the institution (i.e. $1, 1 vote, or 1 nation/1 vote, etc.)

Note to instructor/facilitator: There is a clear dynamic at the end of intense negotiations which mixes relief, pride, and exhaustion. It is this last which endangers much of the accomplishments of the group, and it is worth stopping just at the end and asking for a fresh look at what was agreed to.

2) Brainstorm "Adaptive Management". Open discussion to address these critical questions. Ask ***"What issue was possibly missed?", "What could possibly go wrong with the agreement down the line?"***

Lecture Notes: An agreement or institution may be thought of as a sociopolitical analogue to a vibrant ecosystem, and thus vulnerable to the same categories of stresses which threaten ecosystem sustainability. Will the agreement and institutions which were crafted in the exercise sustain themselves through:

- Biophysical stresses? Are there mechanisms for droughts and floods? Shifts in the climate or rivercourse? Threats to ecosystem health?
- Geopolitical stresses? Will the agreement survive elections or dramatic changes in government? Political stresses, both internal and international?
- Socioeconomic stresses? Is there public support for the agreement? Does it have a stable funding mechanism? Will it survive changing societal values and norms?

Similar to an ecosystem, the best management is adaptive management, i.e., the institution has

mechanisms to adapt to changes and stresses, and to mitigate their impact on its sustainability. [36]

Instructions: As a test of the resilience of the institutions which were crafted, distribute the SARBaCU Aquifer Exercise (H-IV.2) to each universe/group and allow for some time to negotiate, then come back to the group and discuss.

Debrief: Finally, there is a natural, human dynamic to "re-entry," as the participants face the stresses of colleagues and constituents who were not involved in crafting the agreement. If fostered, however, the bonding that took place in the process can be retained and strengthened, to help reinforce the commitment to making the agreement work. As a final discussion, address the pressures the group is likely to face as they break up and go home, and some mechanisms for reinforcing the bonds that were forged over the negotiations (H-IV.3).

Guidelines for Going Home [Handout (H-IV.3)]

These 11 guidelines are but a few of the areas that need to be reviewed periodically. Be sensitive with yourself and others, and you will find that re-entry brings opportunities which you never even dreamed of.

1. The more intense the experience has been, the greater the chance for distress or dissatisfaction with any questioning about the "new you" when you return. You may need additional time to re-acclimate yourself back home. Adjustment may be aided or hampered by close relationships, personality issues and work stress. Allow more time than you think will be necessary before judging success or failure.

2. Because of the closeness established with other participants in a relatively short period of time, there may be an additional sense of loss when you return home, as well as a sense of jealousy from those close to you upon your return. Be gentle with yourself as well as with people at home. Also keep contact if possible with someone from your new network. They will probably be experiencing some of the same things.

3. Although you have had time to process what you've learned, those at home have not. Remember how skeptical you were initially. Allow the same period of skepticism for colleagues and friends at home. It's a classical case of lag time between learning something in a cognitive way and experiencing it as reality.

4. As you describe what you've learned, be aware of oversimplifying or under-simplifying. Descriptions of past happenings bring visions to you that are inaccessible for those who were not there. Set a scene and then fill in the activity only to the level that you think is of interest. Monitor how others receive your information and modify your descriptions accordingly. If you want to successfully incorporate what you've learned, you don't want to bore people or set unrealistic expectations with any proposed changes.

5. The thing that you are bringing back home will be questioned. Avoid defending them or the whole experience as the "right way of life." It may help to share some negative aspects of your experiences as well as the positive ones. It keeps your eye on reality and puts the whole experience in a more acceptable light.

6. Feedback is valuable. People will be more comfortable with you if they can tell you how your stories about your experience sound to them. It also provides an excellent way to modify any ideas that aren't accurately reflected.

7. Learning continues long after presentation of material. It is not at all unusual to have "aha" experiences after returning home. This kind of realization is particularly likely after laboratory or experiential learning. It's refreshing to know that learning of this kind is continuous and may be triggered at any time.

8. Seek colleagues and friends who share your concerns and values. It is with these people that you will find the support necessary to implement change. Using allies to best advantage will spread excitement for your ideas farther than you can.

9. The culture of experiential learning is not accepted or understood globally. Be prepared to explain things

36. See Lee (1995) for the classic text on adaptive management

in a very concrete sense. Avoid buzzwords or phrases and remember that some of the more insignificant aspects of the experience for you might be quite powerful for others. Respect others' learning process as the leaders of your group respected yours.

10. There is never enough time to practice things that you've learned. If you can share, try learning by teaching others. Expect some mistakes, realizing that practice makes perfect.

11. Learning in a classroom or laboratory is temporary and needs to be both nurtured and reinforced before it becomes permanent or institutionalized.

Source: Kaufman (2002), p. 234

SECTION D: ONE-MINUTE EVALUATION **[Handout (H-IV.4)]**

Please answer the following questions. Your responses will help the instructor/facilitator to improve how he/she conducts future workshops.

1. What worked well during this course?

2. What aspects needed work?

3. What specific improvements would you make?

4. What grade (A-F) would you give the course? The instructor?

Many thanks!

END OF MODULE IV AND COURSE
Supplemental Reading for Module IV starts on p. 112 in Part 1:

The Law of International Watercourses: *The Global Context*
Stephen McCaffrey

McCaffrey, Stephen. *The UN Convention on the Law of the Non-Navigational Uses of International Watercourses: Prospects and Pitfalls*, in Salman M.A. Salman & Laurence Boisson de Chazournes, eds., International Watercourses: Enhancing Cooperation and Managing Conflict, Proceedings of a World Bank Seminar, World Bank Technical Paper No. 414, pp. 17-28 (1998).

World Bank Policy for Projects on International Waterways
Salman M. A. Salman

OP 7.50 – Projects on International Waterways

and

BP 7.50 – Projects on International Waterways

PART 3

APPENDICES AND SUPPLEMENTAL MATERIAL

APPENDIX A
LITERATURE CITED

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For coverage of a wide range of water topics and data, see Peter Gleick's *The World's Water: The Biennial Report on Freshwater Resources* (Washington, DC: Island Press, 1998 and 2000), as well as the website of the Pacific Institute for Development, Environment, and Security at www.pacintst.org and the World Resources Institute's environmental information portal at www.earthtrends.wri.org.

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APPENDIX B
COMPILATION OF FULL-SIZED OVERHEADS

OVERHEAD (OV-O.1)

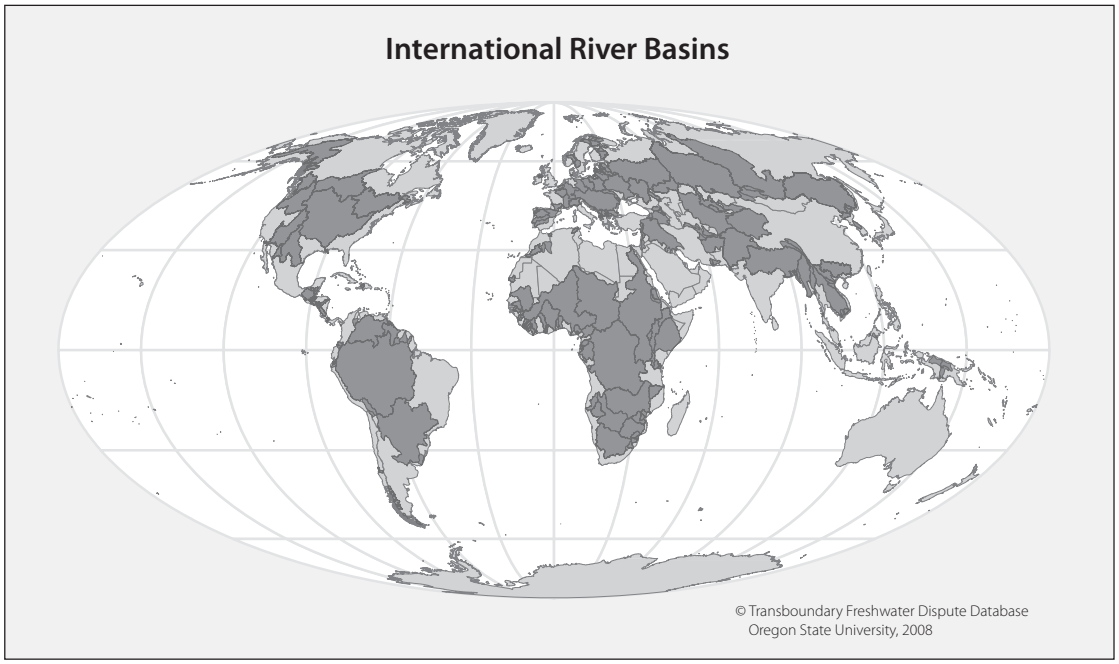


Figure 1: International Basins of the World

OVERHEAD (Ov-O.2)

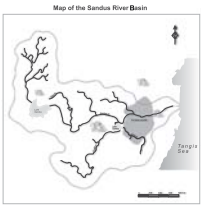
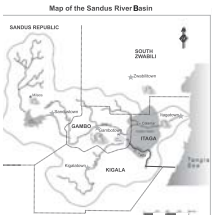
Negotiation Stage	Common Water Claims	Collaborative Skills	Geographic Scope
Adversarial	Rights	Trust-building	 Nations
Reflexive	Needs	Skills-building	 Watersheds
Integrative	Benefits	Consensus-building	 "Benefit-sheds"
Action	Equity	Capacity-building	 Region

Figure 2: Four Stages of Water Conflict Transformation

OVERHEAD (OV-O.3)

Figure 3: Old/Young Woman

OVERHEAD (Ov-O.4)

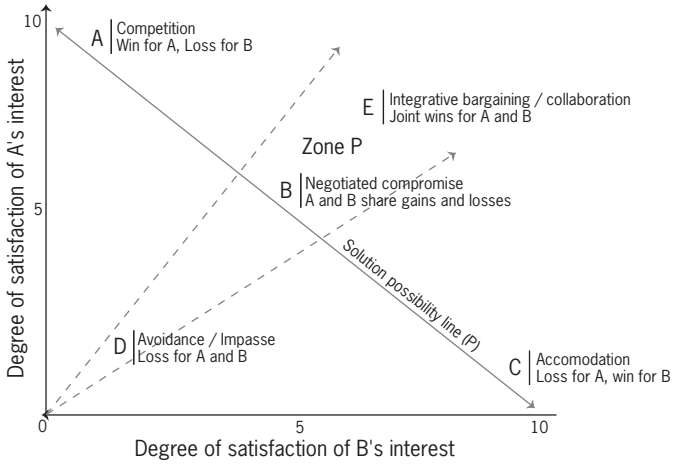


Figure 4: Styles of Conflict Management
Source: Delli Priscoli (1992)

OVERHEAD (OV-0.5)

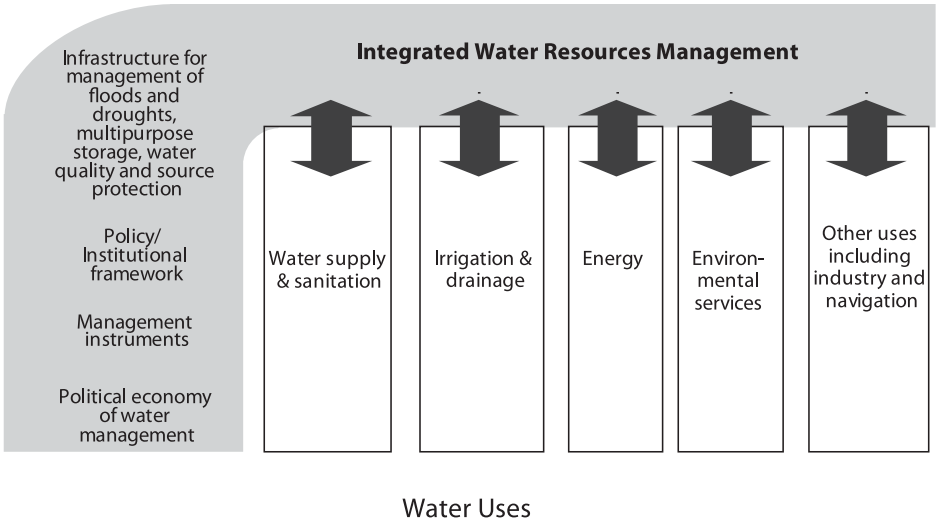


Figure 5: The IWRM "Comb"

OVERHEAD (Ov-0.6)

Article 5: Equitable and reasonable utilization and participation
Watercourse States shall in their respective territories utilize an international watercourse in an equitable and reasonable manner.

Article 7: Obligation not to cause significant harm
Watercourse States shall, in utilizing an international watercourse in their territories, take all appropriate measures to prevent the causing of significant harm to other watercourse States.

Figure 6: Articles 5 and 7 of the 1997 Convention on the Law of the Non-Navigational Uses of International Watercourses

OVERHEAD (OV-0.7)

Article 6: Factors relevant to equitable and reasonable utilization:

a) geographic, hydrographic, hydrological, climactic, ecological and other factors of a natural character;
b) social and economic needs of the States;
c) population dependent on the watercourse in each State;
d) effects of the use of the watercourse in one State on other States;
e) existing and potential uses of the watercourse;
f) conservation, protection, development and economy of use of the water resources and the costs of measures taken to the effect; and,
g) availability of alternatives, of corresponding value, to a particular or planned or existing use.

Figure 7: Article 6 of the 1997 Convention on the Law of the Non-Navigational Uses of International Watercourses

OVERHEAD (Ov-0.8)

Paying Attention

- Face the person who is talking.
- Notice the speaker's body language; does it match what he/she is saying?
- Listen in a place that is free of distractions, so that you can give undivided attention.
- Don't do anything else while you are listening.

Eliciting

- Make use of "encourages" such as "Can you say more about that?" or "Really?"
- Use a tone of voice that conveys interest.
- Ask open questions to elicit more information.
- Avoid overwhelming the speaker with too many questions.
- Give the speaker a chance to say what needs to be said.
- Avoid giving advice, or describing when something similar happened to you.

Reflecting

- Occasionally paraphrase the speaker's main ideas, if appropriate.
- Occasionally reflect the speaker's feelings, if appropriate.
- Check to make sure your understanding is accurate by saying "It sounds like what you mean is...Is that so?" or "Are you saying that you're feeling..."

Source: Kaufman (2002), p. 220

Figure 8: Techniques of Active Listening

OVERHEAD (OV-I.1)

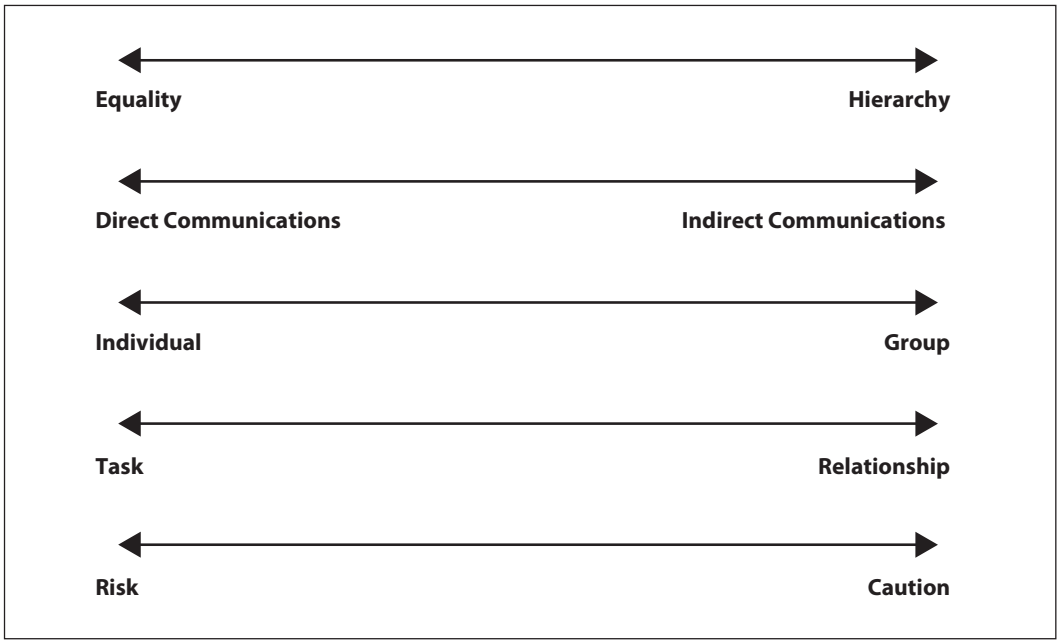
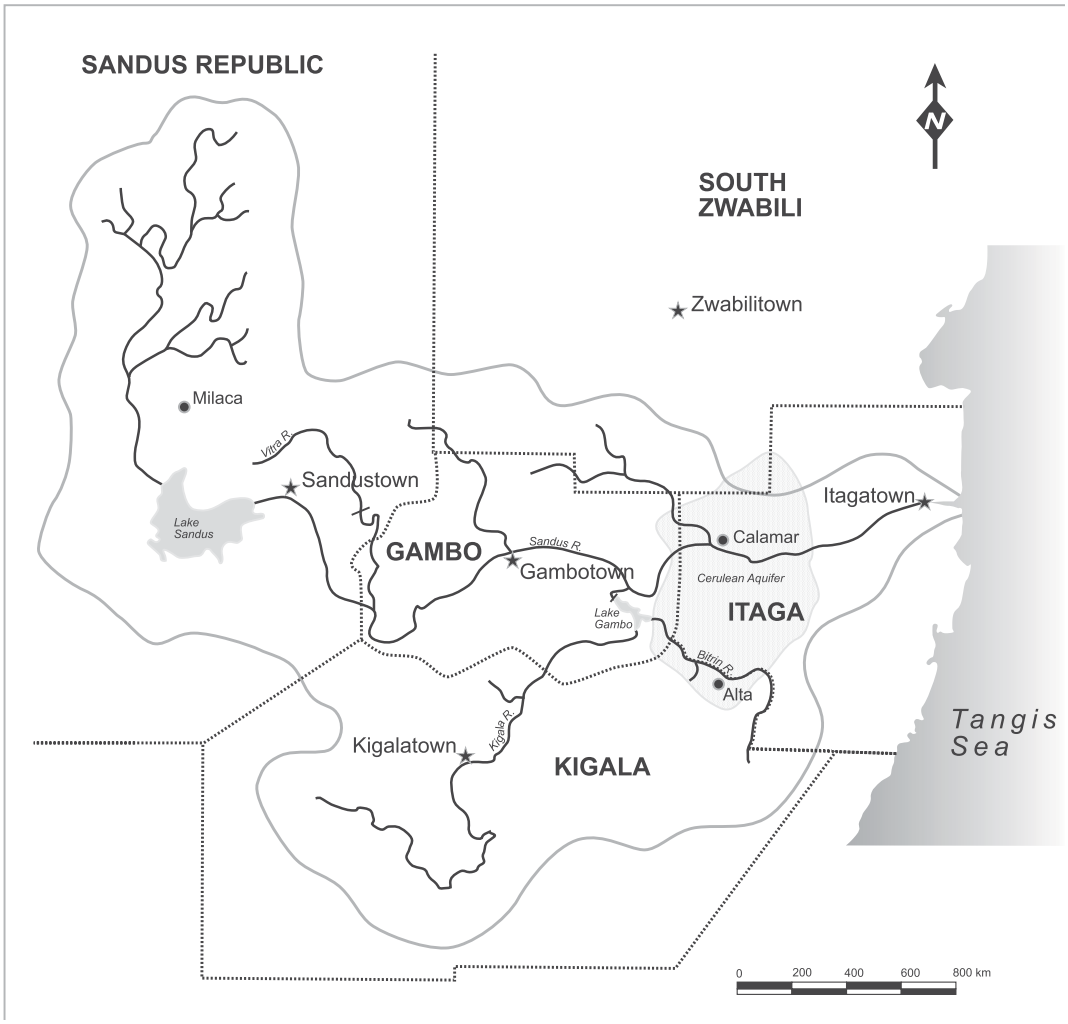


Figure 9: Characteristics of Cultural Differences

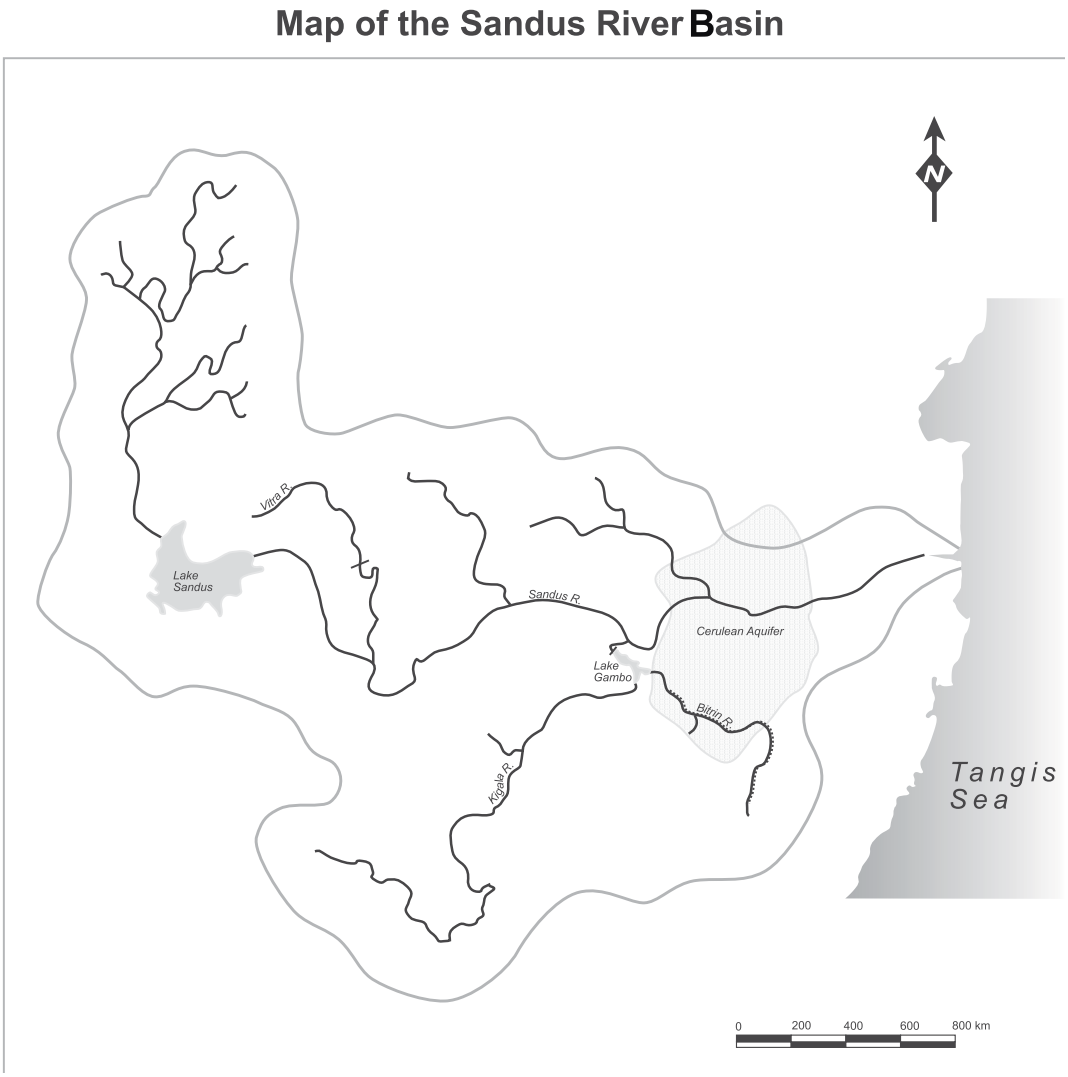
OVERHEAD (Ov-II.1)

Map of the Sandus River Basin



Map 1: Map of the Sandus River Basin with Boundaries

OVERHEAD (OV-I.1)



Map 2: Map of the Sandus River Basin without Boundaries

OVERHEAD (Ov-III.1)

Type 1: Environmental Increasing Benefits	*To the river*	Improved ecosystem sustainability, conservation and water quality
Type 2: Economic Increasing Benefits	*From the river*	Improved productivity, and flood and drought management
Type 3: Political Decreasing Costs	*Because of the river*	Policy shift to cooperation and development
Type 4: Indirect Economic Increasing Benefits	*Beyond the river*	Broader regional cooperation and integration

Figure 10: Four Types of Benefits of International Waters Cooperation

OVERHEAD (OV-IV.1)

Water Sharing	Benefit Sharing
Assigning rights	**Direct payment for water use** e.g., municipal or irrigation supplies (rights already assigned)
	Direct payment for benefits e.g., fisheries, watershed management or compensation for costs (inundated land, pollution) **Purchase agreements** e.g., power, agriculture products (benefit transfer through terms/price) **Financing and ownership agreements** e.g., power infrastructure (benefit transfer through deal structure) **Broadened bundle of benefits** e.g., including provision of unrelated goods and services and less tangible benefits

Figure 11: Sharing Benefits: Possible Mechanisms

OVERHEAD (Ov-IV.2)

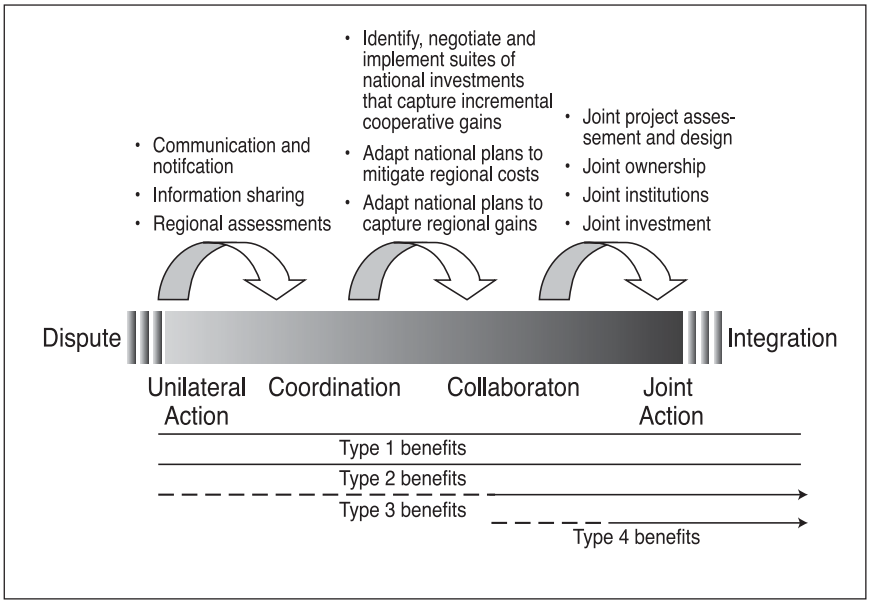


Figure 12: Types of Cooperation – the Cooperation Continuum

APPENDIX C.1
UGLI ORANGE CASE HANDOUTS

Instructor/Facilitator Only
(for distribution to participants as noted in the workbook)

Role for Roland: Ugli Orange Case [Handout (H-0.1)]

You are Dr. Roland. You work as a research biologist for a pharmaceutical firm. The firm is under contract with the World Health Organization for development of a vaccine against anthrax.

Recently several World War II experimental anthrax bombs were being moved to a small island just off the U.S. coast in the Pacific. In the process of transporting them, two of the bombs developed a leak. The leak is presently controlled, but the government scientists believe that the gas will permeate the bomb chambers within two weeks. They know of no method of preventing the gas from getting into the atmosphere and spreading to other islands and very likely to Los Angeles as well. If that occurs, it is highly likely that several thousands of people will incur lung damage or die.

You've developed a synthetic vapor which will neutralize the nerve gas if it is injected into the bomb chamber before the gas leaks out. The vapor is made from a chemical taken from the rind of the Ugli orange, a very rare fruit. Unfortunately, only 4000 of these oranges were produced this season.

You've been informed, on good evidence, that a Mr. R. Cardoza, a fruit exporter in South America, is in possession of 3000 Ugli oranges. The chemicals from the rinds of this number of oranges would be sufficient to neutralize the gas if the serum is developed and injected efficiently. You have also been informed that the rinds of these oranges are in good condition.

You have also been informed that Dr. J. W. Jones is also urgently seeking purchase of Ugli oranges and he is aware of Mr. Cardoza's possession of the 3000 available. Dr. Jones works for a firm with which your firm is highly competitive. There is a great deal of industrial espionage in the pharmaceutical industry. Over the years, your firm and Dr. Jones' firm have sued each other for violation of industrial espionage laws and infringement of patent rights several times. Litigation of two suits is still in progress.

The Federal Government has asked your firm for assistance. You've been authorized by your firm to approach Mr. Cardoza to purchase the 3000 Ugli oranges. You have been told he will sell them to the highest bidder. Your firm has authorized you to bid as high as $25,000 to obtain the rinds of the oranges.

Before approaching Mr. Cardoza, you have decided to talk to Dr. Jones to influence him so that he will not prevent you from purchasing the oranges.

Source: Barkai, John. 1996. Teaching Negotiation and ADR: The Savvy Samurai Meets the Devil. 75 *Nebraska Law Review* 704

Role for Jones: Ugli Orange Case [Handout (H-0.2)]

You are Dr. Jones, a biological research scientist employed by a pharmaceutical firm. You have recently developed a synthetic chemical useful for curing and preventing rudosen. Rudosen is a disease contracted by pregnant women. If not caught in the first four weeks of pregnancy, the disease causes serious brain, eye and ear damage to the unborn child. Recently there has been an outbreak of rudosen in your state and several thousand women have contracted the disease. You have found, with volunteer victims, that your recently developed synthetic serum cures rudosen in its early stages. Unfortunately, the serum is made from the juice of the Ugli orange, which is a very rare fruit. Only a small quantity (approximately 4000) of these oranges was produced last season. No additional Ugli oranges will be available until next season, which will be too late to cure the present rudosen victims.

You've demonstrated that your synthetic serum is in no way harmful to pregnant women. Consequently, there are no side effects. The Food and Drug Administration has approved of the production and distribution of the serum as a cure for rudosen. Unfortunately, the present outbreak was unexpected and your firm had not planned on having the compound serum available for six months. Your firm holds the patent on the synthetic serum and it is expected to be highly profitable when the product is generally available to the public.

You have been recently informed, on good evidence, that Mr. R. Cardoza, a South American fruit importer, is in possession of 3000 Ugli oranges in good condition. If you could obtain the juice of all 3000, you would be able to both cure the present victims and provide sufficient inoculation for the remaining pregnant women in the state. No other state currently has a rudosen threat.

You have frequently been informed that Dr. P. W. Roland is also urgently seeking Ugli oranges and is also aware of Mr. Cardoza's possession of the 3000 available. Dr. Roland is employed by a competitor pharmaceutical firm. He has been working on a biological warfare research project for the past several years. There is a great deal of industrial espionage in the pharmaceutical industry. Over the past several years, Dr. Roland's firm and your firm have sued each other for infringement of patent rights and espionage law violations several times. Litigation on two suits is still in progress.

You've been authorized by your firm to approach Mr. Cardoza to purchase the 3000 Ugli oranges. You have been told he will sell them to the highest bidder. Your firm has authorized you to bid as high as $25,000 to obtain the juice of the 3000 available oranges.

Before approaching Mr. Cardoza, you have decided to talk to Dr. Roland to influence him so that he will not prevent you from purchasing the oranges.

Source: Barkai, John. 1996. Teaching Negotiation and ADR: The Savvy Samurai Meets the Devil. 75 *Nebraska Law Review* 704

APPENDIX C.2
COMPILATION OF ALL NON-SANDUS BASIN HANDOUTS

Instructor/Facilitator Only
(for distribution to participants as noted in the workbook)

Basic Definitions for Dispute Resolution [Handout (H-0.3)]

Competitive
Competitive negotiators want to "beat" their opponents; they use high demands, threats, and make few concessions. They generally try to undermine their opponent's confidence and seek the maximum for themselves. This traditional style of negotiating goes by a number of different terms such as positional, win-lose, adversarial, power negotiating, hardball, and hard bargaining.

Cooperative
Cooperative negotiators want to "work with" their opponents; they use reasonable opening offers, show good faith, and initiate the exchange of mutual concessions. They seek a fair and just settlement. This style of negotiating is also called win-win, interest-based bargaining, and problem solving.

Distributive Bargaining
In distributive bargaining the parties think of the items being negotiated as fixed and each party tries to get the most for himself. Usually there is just one issue for negotiation and more for me means less for you. Negotiators are bargaining over the distribution of profit on the bargaining range. This is a "zero sum" negotiation. Although the goals of the parties are in direct conflict, a negotiator can be either competitive or cooperative in a distributive bargaining situation.

Integrative Bargaining
During integrative bargaining, the parties are working together to increase the amount of resources and to maximize mutual gain. Integrative bargaining requires two or more issues so that trades can be made. Creating the additional resources is sometimes referred to as "expanding the pie". Some would call this "win-win" negotiating. The theory here is that the parties have different interests which can be integrated (reconciled) to create joint gains. Joint gains are an improvement for all parties to a negotiation.

Interest-based
Interest-based bargaining attempts to shift the nature of negotiations to a more collaborative basis. Instead of moving from position to counter-position to compromise, negotiators try to identify their interests PRIOR to the development of solutions. Once interests are identified, the negotiators then jointly develop a wide-ranging set of alternatives, and then choose the best alternative.

Positions
Positions are "what" the negotiators say they want. They are really solutions which have been proposed by the negotiators. Positions are based upon the interests of the parties; interests are usually not disclosed, at least not in competitive negotiations. In most negotiations people take, and then give up, a series of positions. Behind every position lie many interests.

Interests
Interests are "why" the negotiators want the positions they take. Interests lie behind the positions of the negotiators. Interests represent the basic needs to be met. Money and price are not interests in themselves. Money represents purchasing power, the ability to acquire other needs, status, or power itself. Understanding interests is the key to understanding "win-win" negotiating. In many negotiations the interests are never explicitly discussed. In fact, interests are usually kept secret. Successful "win-win" negotiating requires finding a way to disclose interests without being taken advantage of.

Instructions for Small Group Tasks[1] [Handout (H-0.5)]

- Using the Yellow Post-its, identify Parties that may become involved in the discussion-negotiations over the Sandus River basin. These Parties may be individuals, organizations, or agencies in any of the five countries within the basin, or from anywhere else.

  Post your results at the appropriate places on the walls. You should aim for at least 20 such parties.

- Using the Blue Post-Its, identify "Decidable Issues" that are likely to be addressed within and/or among these parties now and in the near future.
  Post your results at the appropriate places on the walls. You should aim for at least 10 such issues.

- Choose at least three key Parties and Issues for each country, and identify at least five key Positions/ Interests for each Party as it considers those issues.

  Write those Position/Interests on the Green Post-Its and post them at the appropriate places on the walls.

- It may help to fill out the following type of form, expanded out for however many parties are identified:[2]

1. This exercise is based on one developed by CMI Washington/Carolina.
2. From Barkai (1996).

Negotiation Planning Chart [Handout (H-0.6)]

Fill in the name of the party and then blocks with information you know. You will need three of these charts (one for each key party, as noted in the instructions).

Party: _____

People	Relationship	Issues	Positions	Interest	Options
Who:	Past:	1.	Estimated initial position:	1.	1.
				2.	2.
	Current:	2.	Estimated bottomline position:	3.	3.
Negotiation Styles:				4.	4.
	Desired:	3.	Estimated BATNA:	5.	5.
				6.	6.

Chart Definitions and Explanations [Handout (H-0.7)]

People: What are the past histories and present feelings of the people involved in this negotiation? What are their goals and objectives? Who is more powerful and what is the source of that power? What influences can they bring to bear on this negotiation? What do you know about their negotiating style?

Relationship: Do the negotiators or their constituents have any history together? What was that prior relationship like? How are they getting along now during the negotiation? Do they have a good relationship? Is it strained? Have they just met for the first time? Will the parties have a continuing relationship or will this be a "one-shot" negotiation? Even if the parties are not likely to work together in the future, will reputations be made in this negotiation that will follow the negotiators in the community?

Issues: The issues involved in the negotiation are the topics to be negotiated. They are also the questions and concerns that each party raises during the negotiation. It is usually very helpful to frame the issues as questions to be answered rather than statements that are made.

Positions: The positions in the negotiation are the solutions that each person has in mind. Positions are the "what" that the negotiators want. Many different positions are considered during a negotiation including, the opening position (demand), a fall back position, a bottom line, and a BATNA (Best Alternative to a Negotiated Agreement).

Interests: Interests are the basic needs that negotiators seek to be met in any agreement. If you know the interests, you know "why" the negotiators take the positions they do during the negotiations. Maslow's hierarchy of needs is helpful here.

Options: Options are the full range of possibilities on which the parties might conceivably reach agreement. Options are, or might be, put "on the table." An agreement is better if it is the best of many options, especially if it exploits all potential mutual gain in the situation.

BATNA: Alternatives are the walk-away possibilities that each party has *if an agreement is not reached*. In general, neither party should agree to something that is worse than its "**BATNA**" – its **B**est **A**lternative **t**o a **N**egotiated **A**greement – "away from the table".

Guidelines for Going Home [Handout (H-IV.3)]

These 11 guidelines are but a few of the areas that need to be reviewed periodically. Be sensitive with yourself and others, and you will find that re-entry brings opportunities which you never even dreamed of.

1. The more intense the experience has been, the greater the chance for distress or dissatisfaction with any questioning about the "new you" when you return. You may need additional time to re-acclimate yourself back home. Adjustment may be aided or hampered by close relationships, personality issues and work stress. Allow more time than you think will be necessary before judging success or failure.

2. Because of the closeness established with other participants in a relatively short period of time, there may be an additional sense of loss when you return home, as well as a sense of jealousy from those close to you upon your return. Be gentle with yourself as well as with people at home. Also keep contact if possible with someone from your new network. They will probably be experiencing some of the same things.

3. Although you have had time to process what you've learned, those at home have not. Remember how skeptical you were initially. Allow the same period of skepticism for colleagues and friends at home. It's a classical case of lag time between learning something in a cognitive way and experiencing it as reality.

4. As you describe what you've learned, be aware of oversimplifying or under-simplifying. Descriptions of past happenings bring visions to you that are inaccessible for those who were not there. Set a scene and then fill in the activity only to the level that you think is of interest. Monitor how others receive your information and modify your descriptions accordingly. If you want to successfully incorporate what you've learned, you don't want to bore people or set unrealistic expectations with any proposed changes.

5. The thing that you are bringing back home will be questioned. Avoid defending it or the whole experience as the "right way of life". It may help to share some negative aspects of your experiences as well as the positive ones. It keeps your eye on reality and puts the whole experience in a more acceptable light.

6. Feedback is valuable. People will be more comfortable with you if they can tell you how your stories about your experience sound to them. It also provides an excellent way to modify any ideas that aren't accurately reflected.

7. Learning continues long after presentation of material. It is not at all unusual to have "aha" experiences after returning home. This kind of realization is particularly likely after laboratory or experiential learning. It's refreshing to know that learning of this kind is continuous and may be triggered at any time.

8. Seek colleagues and friends who share your concerns and values. It is with these people that you will find the support necessary to implement change. Using allies to best advantage will spread excitement for your ideas farther than you can.

9. The culture of experiential learning is not accepted or understood globally. Be prepared to explain things in a very concrete sense. Avoid buzzwords or phrases and remember that some of the more insignificant aspects of the experience for you might be quite powerful for others. Respect others' learning process as the leaders of your group respected yours.

10. There is never enough time to practice things that you've learned. If you can share, try learning by teaching others. Expect some mistakes, realizing that practice makes perfect.

11. Learning in a classroom or laboratory is temporary and needs to be both nurtured and reinforced before it becomes permanent or institutionalized.

Source: Kaufman (2002), p. 234

One-Minute Evaluation [Handout (H-IV.4)]

Please answer the following questions. Your responses will help the instructor/facilitator to improve how he/she conducts future workshops.

1. What worked well during this course?

2. What aspects needed work?

3. What specific improvements would you make?

4. What grade (A-F) would you give the course? The instructor?

Many thanks!

APPENDIX D
SANDUS BASIN EXERCISE: COUNTRY TABLETOP NAMEPLATES

Instructor/Facilitator Only
(for distribution to participants as noted in the workbook)

Gambo

Itaga

Kigala

Sandus Republic

South Zwabili

Nature Conservation Union and NGO Community

APPENDIX E
SANDUS BASIN EXERCISE: WATER USE SECTOR TABLETOP NAMEPLATES

Instructor/Facilitator Only
(for distribution to participants as noted in the workbook)

Water Supply & Sanitation

Irrigation & Drainage

Energy Resources

Environmental Services

Industry & Navigation

Local & Indigenous

NGO Community

Facilitator/ Mediator

APPENDIX F
SANDUS BASIN EXERCISE HANDOUTS

Instructor/Facilitator Only
(for distribution to participants as noted in the workbook)

MANAGING TRANSBOUNDARY WATER RESOURCES

Len Abrams
Water Policy Africa

Simulation Exercise

Introduction

This simulation exercise has been used in several contexts with adjustments to meet different circumstances. The following important notes apply to the scenario:

1. This scenario is entirely fictitious, as are the countries it portrays. Some attempt has been made, however, to mirror the major issues related to transboundary waters in order for the exercise to be useful.
2. The data are approximate and should be used as a guideline only. Where there is insufficient data this should be intelligently made up.
3. Two maps of the Sandus Basin should be read with the scenario profiles. These can be found on pages 217 and 218.

Regional Overview

The area forms the part of the eastern coastal region of the continent. The main features of the region are the coastal plain which is arid and which stretches in a north-south direction. The average width of the plain is 900km with a Mean Areal Precipitation (MAP) of 50mm. The coastal plain rises to a plateau with an average height above sea level of 800m. The plateau enjoys a temperate climate with a rainfall varying from about 450mm in the east to 800mm in the west. The “high country”, which is a range of hills and low mountains, stretches across the region in a west-east direction. This has a relatively high rainfall varying from 1200mm in the west to 600mm in the east. Whilst the precipitation in the high country is relatively reliable, the rainfall on the plateau is highly variable from year to year and from season to season. There are lengthy periods of drought and occasional flash flooding. Migrating fish have passage up the Sandus River until their spawning grounds north of Lake Sandus, and up the Kigala River until the Lake Gambo Dam (which does not have fish ladders). The river is navigable to vessels from the Tangis Sea to the border of Itaga and Gambo, where a steep escarpment prohibits further passage.

Country Overviews **[Handout (H-0.4)]**

MANAGING TRANSBOUNDARY WATER RESOURCES

Simulation Exercise: Country Details

Map of the Sandus River Basin

Designed and prepared by Len Abrams of *Water Policy Africa*

Name:	**SOUTH ZWABILI**
Population:	75 340 000
GNP:	150 bn $
Annual per capita income:	2 000 $
Present usage of Sandus River water:	0.0 billion m^3 per year

Geographical profile: The country is the largest in the region. It has only a small part of its land mass within the catchment of River Sandus. This is an important part of the catchment; however, as it contains a large indigenous forested area.

Political profile: In 1928 the country had a military coup and the resulting military council began a period of political destabilization of its neighbors Sandus, Gambo, Kigala and Itaga, encouraging the establishment of similar military dictatorships in each country although these were little more than puppet regimes to South Zwabili. After a lengthy civil war which impoverished the country and necessitated the intervention of the United Nations, elections were held in 1987 and since then the country has been slowly recovering.

Economic profile: The liberation wars from 1935 to 1987 decimated the country's infrastructure and ruined its economy. However, since the elections, the country has adopted progressive economic policies which have been successful in creating sustained economic growth to the point that the country is now one of the richest in the region. It does not have a great deal of interest in the Sandus River Basin because it occupies a remote and unpopulated hilly area which is densely forested. Recently foreign logging companies have been seeking concessions to fell large tracts of the forest which the government has approved despite opposition being raised by some environmentalist groups and other countries in the catchment.

Hydrological profile: South Zwabili does not depend greatly on the Sandus River Basin and it forms only a small portion of the countries area. The country does, however, have a major international river basin – River Timkati – for which it is at present preparing a development plan. The rainfall varies from 800 mm per annum in the west to 600mm in the east in the upper hill country but drops off sharply towards the plateau in the south.

Name:	**SANDUS REPUBLIC**
Population:	42 000 000
GNP:	12.6 bn $
Annual per capita income:	300 $
Present usage of Sandus River water:	0.4 billion m^3 per year

Geographical profile: The country is the second largest in the region. Most of the country is situated on the plateau with the High Country in the northern extreme. The Sandus River flows from the upper catchment areas in the north to the central plateau. The dominating feature in the region is Lake Sandus. The country is rich with natural resources. These include minerals, savannah plains and fertile valleys of both the Sandus River and its numerous tributaries.

Political profile: After a protracted period of instability during the 1930s, sponsored by South Zwabili, the country was ruled by a military junta which was a thinly disguised family dynasty for forty years. Although the country has great wealth, this was used almost exclusively for the benefit of the ruling family. In the early 1970s a resistance movement developed which was supported by a foreign superpower. This movement was ultimately successful in 1978 in creating a revolution which, in effect, replaced one form of central command economy with another, although the second was not dominated by the military but by the New Revolutionary Council.

In 1991 the military again took power but on this occasion through a bloodless coup. The new military junta has established a number of National Committees which involve a variety of civilian representatives in the running of the country. Although the corruption of the previous two regimes has been largely reformed, the present government is weighted down with bureaucracy and has been unable to achieve the renewal of the economy which it has promised.

There is a rebel movement in the east of the country which is fighting for partition and unification with Gambo. It is suspected that Gambo is assisting the rebels with logistics and supplies.

Economic profile: Although Sandus is rich with natural resources, these have remained largely unutilized and underdeveloped. What wealth has been created has been used for the self-enrichment of successive governments and the vast majority of the population has remained very poor. There is sufficient rainfall for un-irrigated subsistence agriculture in most parts of the country. Although there are a few large farms, mostly producing cash crops for export and owned almost exclusively by ex-patriots from the superpower, most of the agricultural activity is undertaken by peasant farmers on many small farms. During dry years the country generally has to rely on international food aid to avoid widespread crisis and famine. There is a great deal of potential for hydro-electric generation and one hydro-power station was built during the 1980s with assistance from the foreign superpower. Much of this power is sold to South Zwabili.

There are plans to build further hydro-power stations and to develop heavy industries and mining operations at several key points in the country. There is concern regarding the environmental impact of these developments, particularly regarding quality impacts on the waters of the Sandus River.

Hydrological profile: Most of the country's water comes from the high rainfall area in the upper hilly part of the country in the north, which has an average rainfall of 1200mm per annum. The rainfall for the remainder of the plateau averages 800mm per year. Sandus does not utilize a great deal of its water resources. This is largely because of the relatively low level of development of the country as a whole. The average annual flow of the Sandus as it enters Lake Sandus is 48 billion m^3 per year. The exit flow is 51 billion m^3 per year. The flow at the border of the country is 52 billion m^3 per year. The planned development of new industry and mining operations will use an estimated 38 billion m^3 per year. In order to provide for these plans, several storage dams are proposed. These proposed water uses are, however, in excess of the amounts provided for in the existing water treaties between the countries of the Sandus basin (see "International water treaties" below).

Name:	**GAMBO**
Population:	12 000 000
GNP:	7.8 bn $
Annual per capita income:	650 $
Present usage of Sandus River water:	9.8 billion m^3 per year

Geographical profile: The country is the smallest in the region. Gambo is landlocked and is situated entirely within the catchment of River Sandus which flows from west to east. The country is situated on the plateau with its eastern border along the escarpment which drops sharply to the coastal plain. The country is in the transition zone from the temperate climate of the west to the arid climate of the east. Most of the country is flat with undulating hills in the western regions. The country is covered predominantly with grassland suitable for pastoral activities.

Political profile: The political history of Gambo closely mirrors that of its neighbors. After years of quiet harmony and development, the country was invaded by the military regimes of South Zwabili, Sandus and Itaga in 1941. Although there was little resistance to the process, there was a great deal of loss of life which has created a legacy of resentment and tension in the region. A puppet government to South Zwabili was established.

In July 1978 the country evicted the vassals of South Zwabili and appointed an interim government to prepare for democratic elections which were held, after a number of delays, in 1985. Since that time the country has returned to its former harmony and enjoyed consistent but slow economic growth.

There is some dispute regarding the western border of the country with neighboring Sandus. The government of Gambo is sympathetic towards the call of the rebels in the area who are advocating for certain traditional lands to be incorporated into Gambo.

Economic profile: Whilst Gambo is not a wealthy country, its relative stability has enabled its economy to grow steadily, if modestly, during the past few years. The main exports have been agricultural, predominantly beef. In recent years increasing foreign exchange has been earned through diamond mining in the centre of the country. Lake Gambo is a dam which was built in 1965, on the Kigala and Bitrin tributaries, largely for the generation of hydro-electricity and to assist in regulating the flow of River Sandus. The dam was built largely at the insistence of Itaga during the previous military era and most of the electricity is sold to Itaga and Kigala. There are plans to extend existing irrigation schemes in several places in the country.

Hydrological profile: The flow of the Sandus River, just below the junction with the Vitra tributary, is 61 billion m^3 per year. The flow as the river leaves the country and flows into Itaga is 86 billion m^3 per year. The average rainfall over the country is 700 mm per year. There is growing concern over the effects of logging in the South Zwabili forests. This is causing a great deal of silt to be washed into the rivers during the wet season.

Name:	**KIGALA**
Population:	28 000 000
GNP:	16.2 bn $
Annual per capita income:	580 $
Present usage of Sandus River water:	3.7 billion m^3 per year

Geographical profile: Kigala occupies the southern portion of the Sandus River catchment. It is relatively flat and featureless. The Kigala River, which is a tributary of the Sandus, flows north towards Gambo and is home to most of the country's small farmer population. The eastern border with Itaga runs along the Bitrin River (which is a seasonal river) where the remainder of the population resides, mainly as semi-nomadic cattle and goat farmers. The eastern part of the country is very dry and sparsely populated.

Political profile: Kigala escaped the worst of the military period of the region and the territorial objectives of South Zwabili during the first half of the century, largely through maintaining a low profile politically and economically. The country has, however, seen bitter rivalry between different factions. The tensions have mainly been as a result of land shortages. This has led to an unstable political environment where the balance of power has shifted often. The present one party state is ruled by a number of powerful persons from one of the warring factions.

Economic profile: Kigala is a poor country with a largely agrarian population. The west is not as poor as the east as a result of a larger natural resources base. The basis of the economy is agriculture. There are plans to develop light industry and to open new areas of irrigation on the Kigala River in the north of the country.

Hydrological profile: The average rainfall varies widely from 700 mm per year in the west to about 100 mm in the east. The rainfall is very variable and the country is subject to periodic droughts. There are plans to build a dam on the Kigala River to provide storage for bad years. Kigala would also like to build a dam on the Bitrin River. Itaga is opposed to both dams.

Name:	**ITAGA**
Population:	18 000 000
GNP:	16.66 bn $
Annual per capita income:	870 $
Present usage of Sandus River water:	43.0 billion m^3 per year

Geographical profile: Itaga occupies the eastern portion of the Sandus River catchment. From the border in the west with Gambo, the country side drops sharply from the escarpment to the arid coastal plain. The coastal plain is semi-desert covered for the most part by rocky outcrops and rugged stonelands. The Sandus River provides the main source of livelihood for the country with 98% of the population living along the banks of the river. This makes the county almost totally socially and economically dependent upon the river.

Political profile: Itaga was incorporated into the expansionist programs of South Zwabili from an early stage with a military council taking over control of the country in 1931. The over-riding concern of the country, whether under military dictatorship or civilian democratic rule, has been the security of the flow of the River Sandus. Itaga took advantage of the political instability caused by South Zwabili to further its agenda of securing its future control of the Sandus basin.

The country exchanged cooperation with South Zwabili for leverage in the Sandus Basin, particularly in Gambo. It was through these arrangements that Itaga was able to promote the construction of Lake Gambo Dam to both generate electricity and to balance the flow of the river to a degree. This period also enabled Itaga to engineer favorable treaties for the use of the Itaga waters. The country had its first democratic elections in 1984 and adopted a new constitution in 1989.

Economic profile: Itaga is a country of contrasts. Whilst most of the citizens are employed in agriculture along the banks of the Sandus and are largely poor, the country has a highly developed industrial base situated near the coast at the mouth of the river which is also dependant on the security of flow in the Sandus. The strategic position of the country and its main port give it considerable regional and international leverage.

Hydrological profile: The only hydrological feature of note in the country is the nearly 1000 km of the Sandus River which flows into the Tangis Sea. There are deep aquifers of fossil water under laying some parts of the country but these are expensive to exploit. The average natural inflow of the Sandus and its tributaries into the west of the country is 94 billion m^3 per year. Current utilization stands at 43 billion m^3 per year and planned utilization will reach 72 billion m^3 per year. The river is subject to recurrent low flow years in cycles of up to seven years when the flow can be as low as 47 billion m^3 per year.

Sandus River Agreements

In 1961, Itaga and Gambo entered into an agreement for the apportionment of the waters made available by the construction of the Gambo Lake Dam.

The specific amounts of water allocated were: Gambo: 10 Billion m^3 per year, Itaga: 68 billion m^3 per year.

In addition to this agreement, relations among the Sandus River Basin states are governed by the provisos of the 1997 United Nations Framework Convention on the Non-Navigational Uses of International Water Courses, which all of the Sandus River Basin countries voted for.

The present peoples and governments of the Sandus Republic, Gambo and Kigala do not consider the treaty, signed when they were essentially occupied territories, as binding on them, a view which is not shared by Itaga.

Invitation **[Handout (H-0.8)]**

United Nations Building
132 Okwalo Street
Haripo
North Zwabili
Phone *(354)-43-28 9007*
Fax *(354)-43-27 9729*

SARBaCU
Sandus River Basin Coordinating Unit

February 20XX

Director General / Permanent Secretary
Ministry of Water Resources
_____
_____
_____

Joint Meeting on the Management of the Sandus River Basin

Dear colleagues

I am pleased to be able to extend to you an invitation to attend the first round of discussions and negotiations on the use and management of the water of the Sandus River, as instructed by the Summit of Nations which met in May 20XX in Geneva.

We are very grateful to be able to announce that the World Bank has agreed to host the meeting as a neutral.

The meeting details are as follows:
Venue: World Bank, Washington, DC.
Date: 24 February 20XX
Time: 08h30

Please come prepared with a plan indicating how you intend to use the waters of the Sandus River Basin for your national development. On the basis of these plans an attempt will be made to reach agreement on the development of the water resources.
We look forward to the meetings.

With best regards

_____
Dr. A.T. Mwazimbi
Coordinator

Sandus Briefing Points [Handout (H-0.9A)]

The Minister's Note

As attached. This is very important – the negotiators' jobs are at stake. You may communicate with and seek further direction from your Minister through the designated Resource Person. KEEP THE MINISTER'S NOTE HIGHLY CONFIDENTIAL. It is clear that the issues to do with the terrorist activities on the border with Gambo must be addressed before a settlement related to water can go ahead.

Irrigation Scheme

The proposed irrigation scheme on the Vitra and Sandus Rivers is of great interest and has great potential for growth. You need to promote it but the relationships with Gambo are clearly a problem.

Logging contract potential

Interest has been expressed by a large international company in logging concessions in the upper catchment areas of the country. This will bring substantial foreign earnings into the country but it will mean the loss of the forests on which a large number of communities depend and it will have a detrimental effect on the catchment, increasing silt loads and the threat of floods. You are aware that downstream riparian countries are concerned but you may be able to use the issue to your advantage in the negotiations.

Lake Sandus problems

There are a number of problems just beginning to appear in Lake Sandus. These include the problem of aquatic vegetation, eutrification and pollution from a variety of sources. These problems threaten the viability of fish stocks in the lake and the downstream reaches of the river which form the staple diet of a large proportion of the population. You need international assistance with the problem before disaster strikes.

Gambo Briefing Points [Handout (H-0.9B)]

General

You do not trust your neighbors. Problems have arisen in the past after expressions of good faith. You do not want the political issues related to the land disputes with Sandus to get in the way of development; the disputes have nothing to do with water.

Economic growth

Growth is what interests you. You have had a difficult past but recent years have been greatly improved with stability and steady but modest growth. What you need now is accelerated growth – you are ready for it and the poor need it. You need to create employment and develop communications, transport and power infrastructure. One of the ways to promote growth may be to encourage the notion of an economic block in the region but extreme care is needed because the other countries may not be trustworthy.

You are very keen that all of the projects should proceed. You must plan how much water is needed.

Environmental issues

You are very worried about the degradation of the catchment. There is extensive logging in the north in South Zwabili which is causing much greater silt loads in the rivers and increasing the threat of floods. Pollution from agriculture, mining and industry is causing poor water quality throughout and in Lake Gambo in particular.

Access to water resources

In order to ensure future growth, you need to secure your water rights. You do not accept the 1961 agreement which was made in the past and is unfair and unacceptable. It was made when you were occupied by a foreign force. You want your equitable share – water allocations in the basin need to be agreed upon.

Kigala Briefing Points [Handout (H-0.9C)]

General

You need to develop but you lack capacity. You want to build relationships with all of the countries because it is better to cooperate and put the past behind.

Development

You think that what you need are dams. You have asked a consulting firm to undertake a pre-feasibility plan for dams on the Kigala and Bitrin rivers. Possible sites have been identified. Your objective is to get on with these developments. You have not identified yet exactly how the water will be utilized – you need to develop a basic plan.

None of the proposals on the table for discussion at the negotiations affect you directly but you may support the other developments if you can be guaranteed of support in the future for your proposed dam construction. You need to be very strategic how you present this – perhaps you should "keep it up your sleeve" for use later in the negotiations.

You do not accept the existing agreements for water sharing in the basin. It is your sovereign right to use your resources in the interest of your country. You have had correspondence from the Minister in Itaga regarding water quality issues but you do not accept their suggestions for water quality standards – it will be too expensive and who pays? They are a rich country by comparison and they are polluting the river downstream much more than you are.

South Zwabili Briefing Points [Handout (H-0.9D)]

General

Your delegation is not very concerned with water issues and the Sandus River. You are however concerned about the power relations in the region. In past years you virtually controlled the entire region but have lost control in recent years. You have a concern that the other countries in the Sandus River Basin do not form a strong economic block which South Zwabili would not be part of. If you cannot be part of the process then you would rather it was not formed at all.

Environmental issues

For the past few years you have granted extensive logging concessions to foreign logging concerns which have brought in large amounts of foreign exchange. This has caused serious degradation in the upper catchment regions but this is not a very important part of the country – it is remote and did not contribute to the national economy in any real way.

The countries in the Sandus River Basin are not happy with the logging. They say that it causes more silt in the river and that flash flooding is worse than in the past, however, they cannot prove this with actual figures. A number of international NGOs are making a lot of noise about the issue and one or two UN agencies have raised the problem. Some transnational companies and certain bilateral aid agencies are beginning to say that addressing the issue of upper-catchment degradation must be addressed as a condition for further relations.

You are concerned about who will have to pay for rehabilitation and what will replace the foreign exchange income from the logging concessions. People should not meddle in your internal affairs without providing alternatives.

Itaga Briefing Points [Handout (H-0.9E)]

The Minister's Note

As attached. This is very important – the negotiators' jobs are at stake. You may communicate with and seek further direction from your Minister through the designated Resource Person.

KEEP THE MINISTER'S NOTE HIGHLY CONFIDENTIAL.

You can expect further briefing notes to come.

Top Secret Letter, Itaga **[Handout (H-I.1)]**

Ministry of Foreign Affairs
Government Centre
Independence St
Itagatown
Itaga

February 2003

TOP SECRET: Itaga

Memorandum to Director General: Water Resources
Sandus River Negotiations

After consultation with my colleague, his Excellency, the Minister of Water Resources, you are hereby instructed regarding the forthcoming negotiations on the Sandus River.

You are mandated to take part in the negotiations and to take any decisions on behalf of the government which are in the interests of our country. You will be held responsible for any decisions you make but you must make it clear to all concerned that any decisions will need to be ratified by Cabinet in due course.

In particular we must maintain our rightful share of the waters of the Sandus River. Treaties and agreements made in good faith in the past are legally binding. For many thousands of years these waters have flowed to the sea with nobody utilizing them. We rely entirely on this water for our well-being and in fact need further water to continue to develop.

We are very concerned about the water quality in the river and have notified our concerns to all of the countries. We must all be responsible to our neighbors. We should help with further studies and modeling of the basin so that everybody understands the impact of all possible actions and proposed development. You should push for the establishment of a river basin organization and the gathering of information. It makes sense that these activities should be undertaken *before* countries begin to develop the water resources of the Sandus River, otherwise we (all the countries of the Basin) do not really know what we are doing.

Major General F. R. Tegwila
Minister of Foreign Affairs and International Relations

Top Secret Letter, Sandus Republic **[Handout (H-I.2)]**

Ministry of Water Resources
Capital Buildings
Freedom St
Sandustown
Sandus Republic

February 2003

TOP SECRET: Sandus Republic

Memorandum to Director General: Water Resources
Sandus River Negotiations

You are hereby instructed by his Excellency, the Minister of Water Resources, regarding the forthcoming negotiations on the Sandus River.

You are mandated to take part in the negotiations but you have no authority to take any decisions on behalf of the Republic which may bind the government in the future. If called upon to make such a decision, you are instructed to first get clearance directly from my office endorsed by me in person.

Although we are not a rich country, we have abundant natural resources which we will be in a position to develop in the future. We must make sure that we maintain our full rights to the water of the Sandus River so that when we are in a position to do so, we will be able to utilize the water to bring wealth, development and prosperity to our own people. This is our birth-right.

Be particularly careful with Gambo. You know that they support the terrorist factions which are trying to split our great republic. They must not be allowed to gain any information which may assist them – remember "a loose tongue is a dangerous tongue." If you can show our friends in other countries what the real aims of Gambo are, and gain their support, you will be serving your country.

Because of the threats which face us we must ensure that we are able to feed ourselves as a country. We must build our industries and mines. Development is our priority – we are very concerned about the environment but not to the detriment of our economic and industrial development. I am told that we have great potential to generate electricity on the Sandus River and to sell this to our neighbors – please include this in our national plans.

Prof. G B Assail, MP
Minister of Water Resources

A Sandus River Basin Commission? [Handout (H-IV.1)]

Based on the results of your earlier negotiation efforts, the Presidents of the five Sandus River Basin countries have decided to explore forming a Sandus River Basin Coordinating Unit (SARBaCU). They have decided that the SARBaCU would consist of a Council of Ministers (COM), and a Technical Support Committee (TSC), each of which would have a representative from each country, with a rotating chair. There would also be a professional Secretariat. The precise authority and functions of the SARBaCU must now be determined. Your task is to consider the following possible functions of the SARBaCU and to prepare a list of recommended functions for the consideration of the five Presidents. The Presidents would appreciate a joint recommendation from as many representatives as possible, preferably all. Please note that you may add any clarifications, modifications, or additions to the following list of options (which was prepared by an outside consultant).

"We hereby recommend that the SARBaCU have the following authority, functions, and responsibilities:

No.	Item	Recommend Yes/No?	Comments (Interests, drawbacks)
1	Promote and coordinate studies related to the development of the SARBaCU.		
2	Implement development plans approved by the COM.		
3	Monitor and publish rates of flow of the Sandus River at each national boundary plus any other points agreed by COM.		
4	Monitor levels of pollution at each national boundary, and other points in the river, lakes, or aquifer.		
5	Monitor and publish each riparian country's contribution to, and withdrawal from, the waters of the SRB.		
6	Annually determine and publish report on the equitable use of SRB waters by riparian states.		
7	Monitor adherence by each riparian state to equitable use regimes and recommend any appropriate adjustments.		
8	Determine if requested by any state, whether that state has sustained significant harm and the source of the harm.		
9	Grant or deny permits for uses or development projects in one riparian state that may cause significant harm in another riparian state or states.		
10	Resolve, by mediation or arbitration, any disputes between riparian states regarding SRB waters		

Please meet with your fellow representatives. You have a limited amount of time, but the Presidents have great expectations of your productivity.

SARBaCU Aquifer Exercise [Handout (H-IV.2)]

It has been five years now since the Sandus River Basin Coordinating Unit (SARBaCU) was established, pursuant to your recommendation. Now, acting on a complaint by Gambo and Itaga, the SARBaCU's staff has determined that the Cerulean Aquifer has been contaminated by heavy metals. Research conducted for the SARBaCU and its Technical Support Committee (TSC) by outside experts determined that the origin of the heavy metals was waste discharged into the Sandus River from an Industrial Park established seven years ago in Kigala. (A significant portion of the aquifer's recharge comes from the Bitrin River.) A large amount of Itaga's population relies on water from the Cerulean Aquifer for drinking and other domestic uses. The outside experts, after reviewing the facts and the authority of the SARBaCU and consulting with the TSC, recommended the following actions:

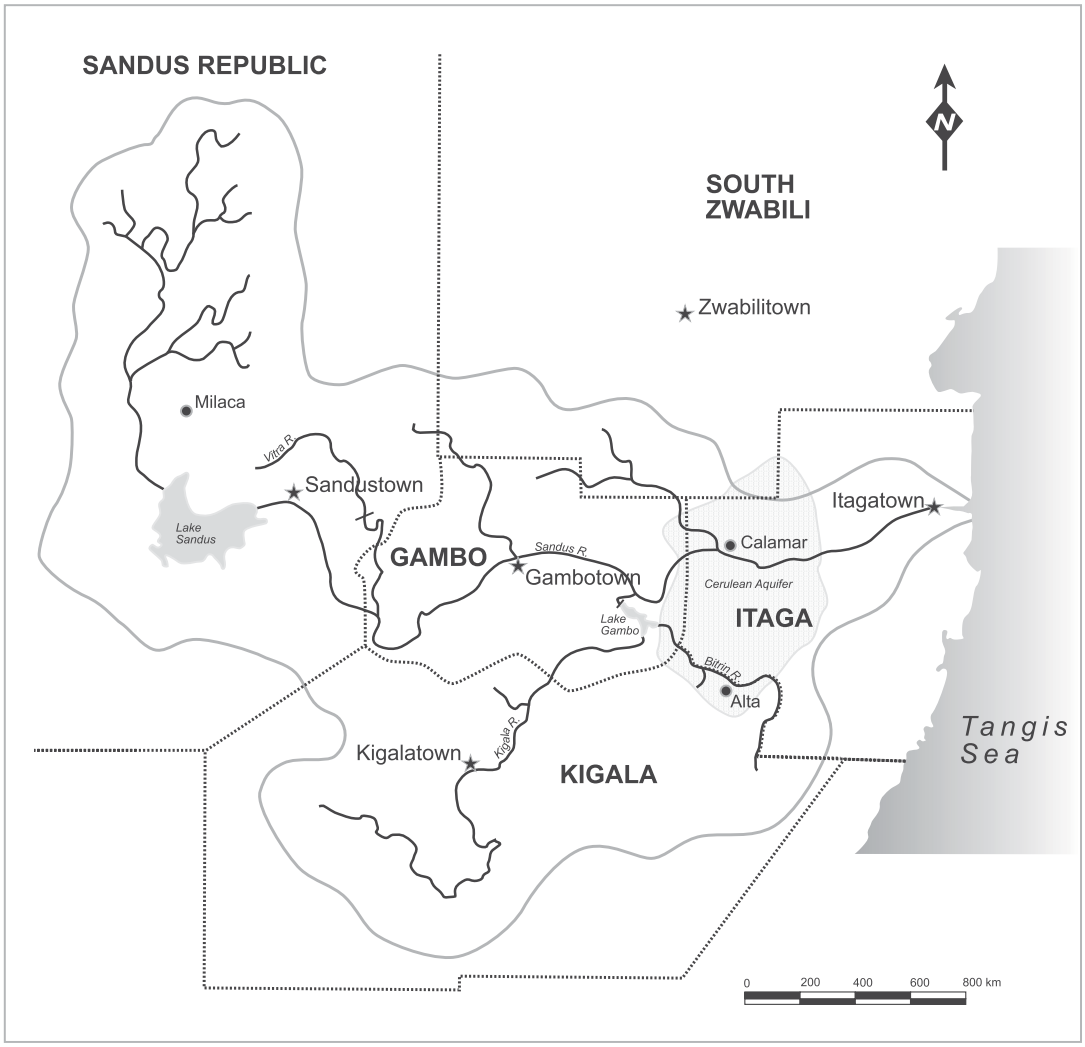
(1) Kigala must compensate Gambo and Itaga for the harm sustained.
(2) Kigala must require all activities in its territory utilizing the Bitrin River for waste disposal to take cost-effective measures to treat their waste before discharging it into the river so as to remove heavy metals.
(3) Itaga must ensure that any water withdrawn from the aquifer for domestic use is treated prior to such use to ensure that harmful heavy metals are removed.

The COM has scheduled a meeting to decide whether or not to approve any or all of these recommendations. Because of your superb work during the negotiations establishing the SARBaCU, your President appointed you to the COM last year. Please attend the meeting, and represent your country well. As you know, in an act unusual at the time, the Presidents agreed that only four votes would be needed to approve any action by the SARBaCU.

Recommendation Number	Approve or Disapprove?	Comments
1		
2		
3		

APPENDIX G
SANDUS BASIN MAPS

Map of the Sandus River Basin

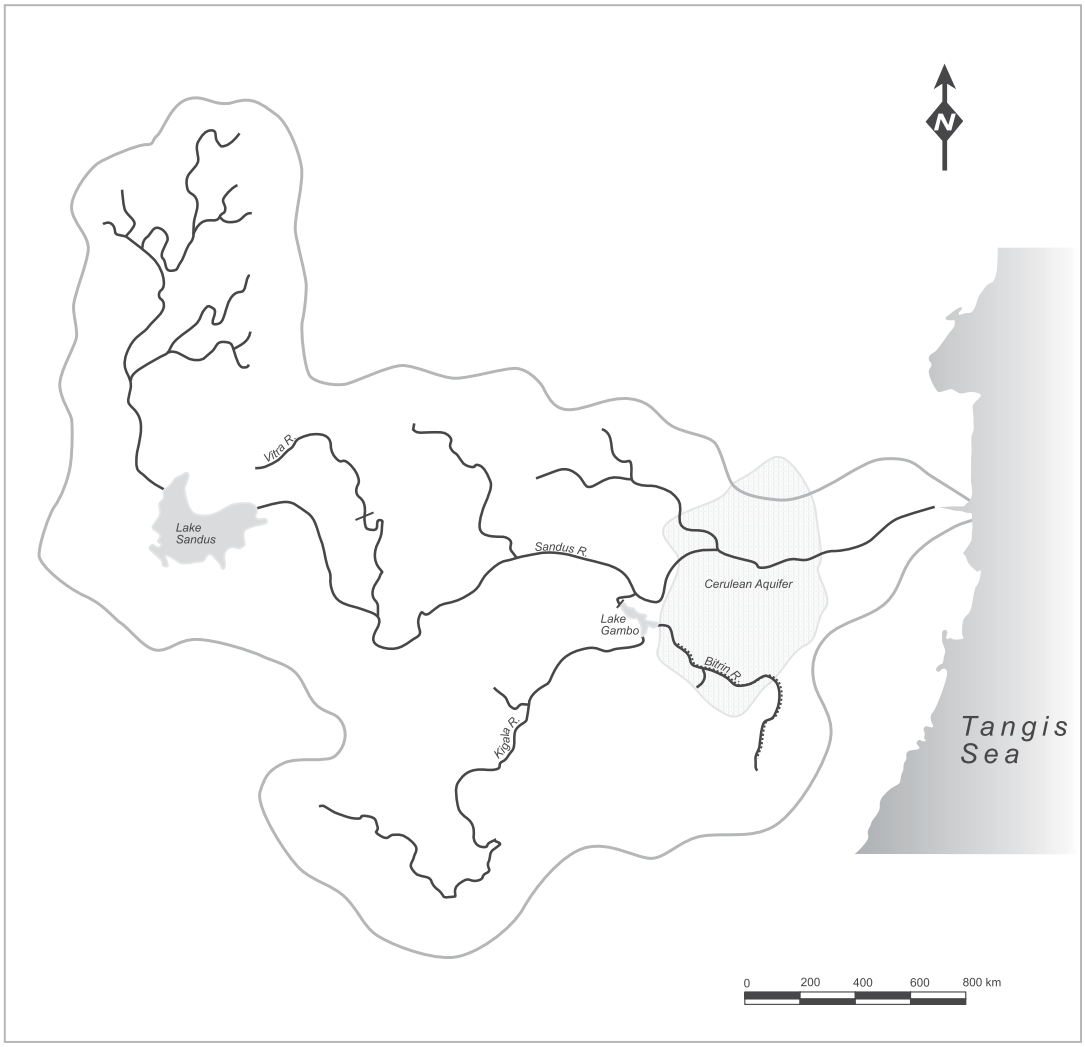


Map 1: Sandus River Basin with Country Boundaries

Map of the Sandus River Basin, with Mean Annual Precipitation (MAP)

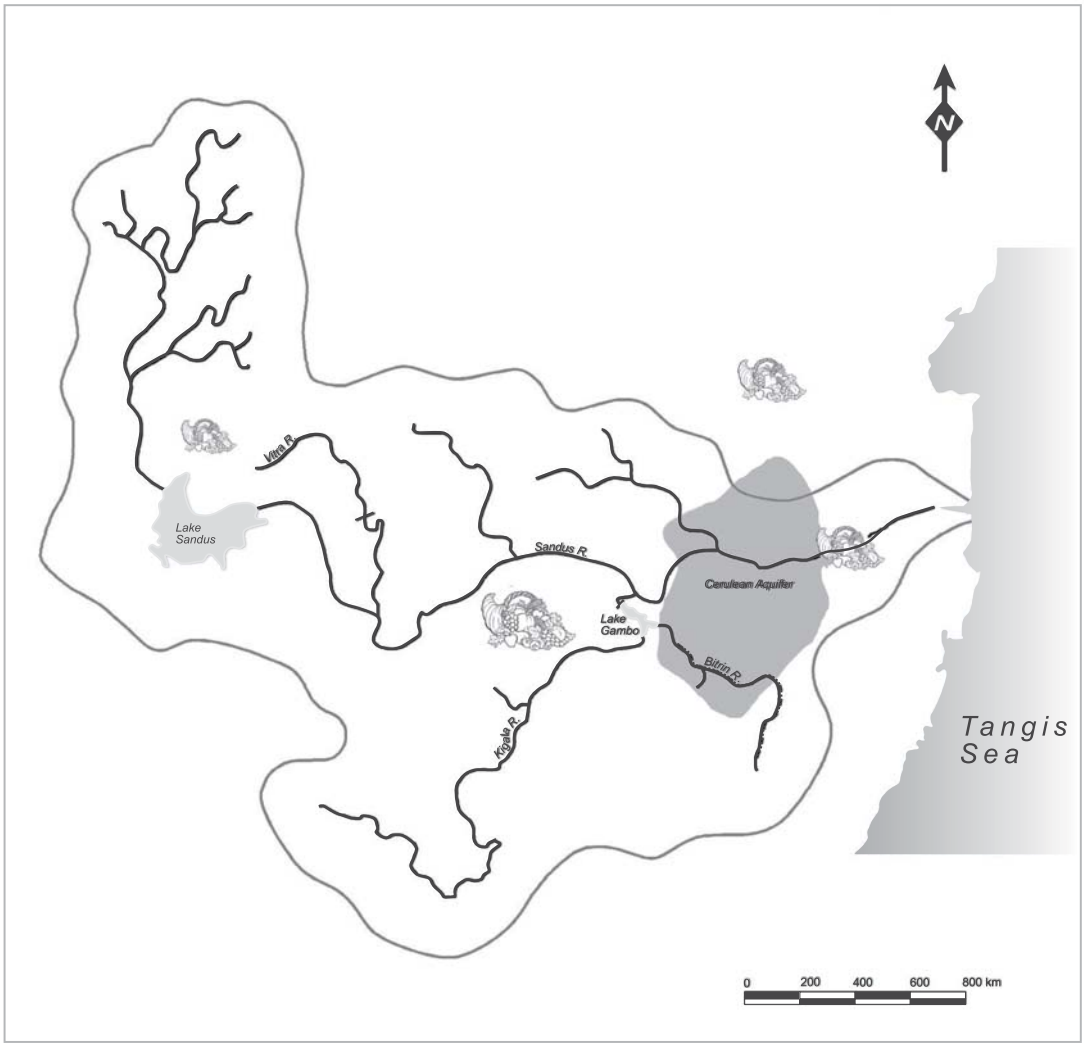
Map 2: Sandus River Basin Mean Annual Precipitation

Map of the Sandus River Basin



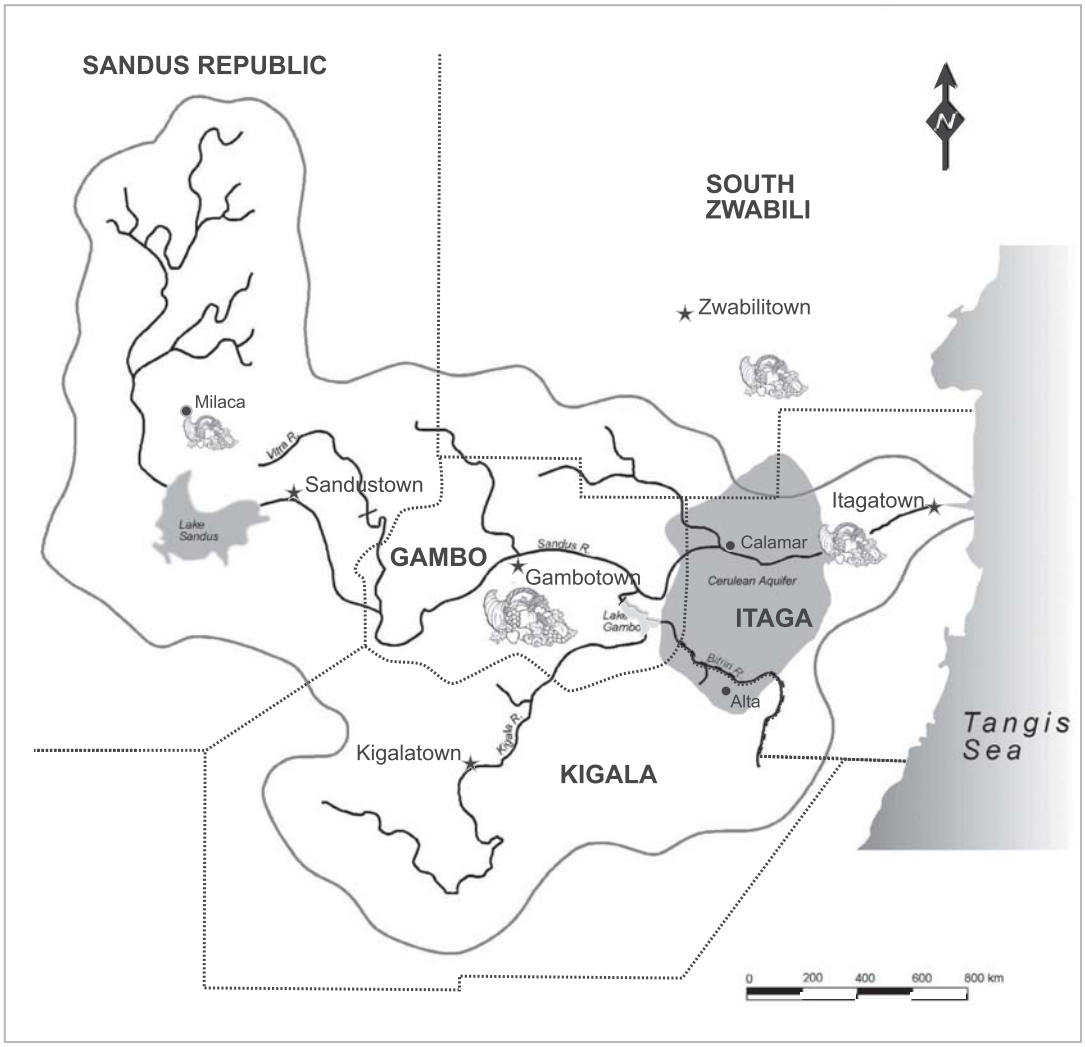
Map 3: Sandus River Basin

Map of the Sandus River Basin



Map 4: Sandus River Basin with Baskets of Benefits (no country boundaries)

Map of the Sandus River Basin



Map 4: Sandus River Basin with Baskets of Benefits (with country boundaries)

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