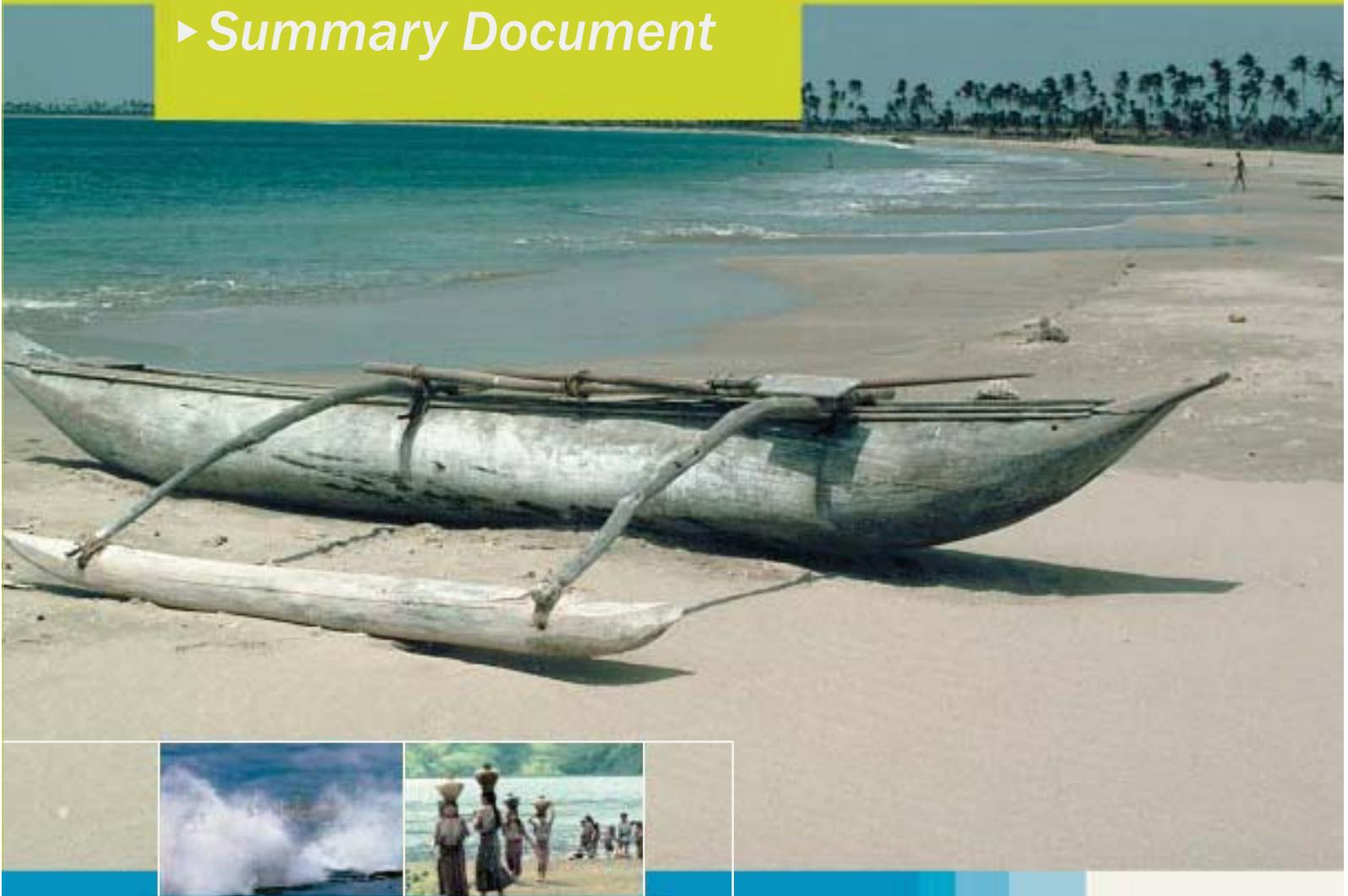


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1. Frederick M. Lorenz, *The protection of water facilities under international law*, UNESCO-IHP, 46 p.
2. Sergel Vinogradov, Patricia Wouters and Patricia Jones, *Transforming potential conflict into cooperation potential: The role of international water law*, UNESCO-IHP, 106 p.
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5. Ali M. Vall, Sree N. Sreenath and Gundo Susiarjo, *An educational tool to examine the development constraints in the Limpopo river basin*, UNESCO-IHP, 50 p.
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31. Janos Bogardi and Saskia Castelijn (eds.), *Selected papers of the International Conference From Conflict to Co-operation in International Water Resources Management: Challenges and Opportunities*, UNESCO-IHE Delft, The Netherlands, 20-22 November 2002, UNESCO-IHP, 600 p.



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1. PROTECTION OF WATER FACILITIES UNDER INTERNATIONAL LAW

Frederick M. Lorenz

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Water has often been used as a strategic target in war since at least the time of the siege of Tyre in 596 B.C. Even when water facilities are not targeted, they are often among the first casualties of the violence. At the end of the twentieth century, conflicts in Africa, the Balkans, and the Middle East caused tremendous suffering to the civilian populations after disruption of the water supply. This article focuses on the extent to which water facilities are protected under international law. It outlines principles of customary law and the existing international conventions and protocols in this area, including principles of naval warfare.

At a time of increasing world concern over the quality and availability of water, we face the prospect of disputes, sometimes violent, over limited freshwater resources. International efforts to sustain supplies have focused on management rather than conflict prevention, and international legal regimes have received too little attention. This article focuses on protection of water facilities under international law, defining such facilities in broad terms to include all retention and delivery facilities. These issues become wide-ranging, as urbanization increases the need to import water from further afield, as in the current plan to transfer water to Israel from Turkey. Moreover, the increasing complexity of delivery systems, and their relationship to power supplies, increase their vulnerability to conflict.

International law has evolved as the nature of conflict has changed, but has yet to respond to the increasing phenomenon of intra- rather than interstate conflict, or to the rise of terrorism. Little attention has been given to the implications of possible terrorist attacks on water facilities, especially in view of the development of chemical and biological threats. The article considers current problems and weaknesses in existing law, and includes discussion of a hypothetical terrorist attack on a city water supply in Turkey. It considers the present state of international law, and provides recommendations for legal regimes that will better protect the civilian population and the supply of fresh water.

2. TRANSFORMING POTENTIAL CONFLICT INTO COOPERATION POTENTIAL

The Role Of International Water Law

Sergei Vinogradov, Patricia Wouters and Patricia Jones

University of Dundee - UK

International river basins cover more than half of the land's surface. With close to 300 major watercourses shared by two or more states and an ever-increasing

demand on the world's diminishing water resources, there may be some justification in the assertion by certain commentators that "water wars" are imminent. The UN forecasts that more than half of the world's population will suffer direct consequences of water scarcity if the current development patterns continue. The situation is particularly critical in developing countries, leading the world's governments to commit themselves to "halve by 2015, the proportion of people without access to safe drinking water and basic sanitation," and also to "develop integrated water resources management and water efficiency plans by 2005" (UN Summit on Development, Johannesburg, 2002). Commendable as these plans may be, what solutions will states find in their competition over shared water resources? This is particularly crucial for states that depend on water supplies that cross their national borders.

This study discusses the relevance and role of international water law in the promotion of cooperation over shared transboundary watercourses. With its focus on actual case studies and through examination of contemporary state practice and detailed analysis of the 1997 UN Watercourses Convention, this work aims to provide water resource experts from all disciplines with an overview of the rules of international law that govern interstate relations over water.

3. INSTITUTIONS FOR INTERNATIONAL FRESHWATER MANAGEMENT

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Legal Office - Italy

This report describes selected bi- and multilateral institutions for the management of international river basins, lakes, and aquifers. It provides comparative information on various institutional aspects such as scope of authority, internal structure, decision-making procedures, and dispute settlement mechanisms. The aim of the report is to support and complement the PCCP Desk Study *Conflict and Cooperation in the Management of International River Basins, Lakes, and Aquifers: A global Review*, which identifies the state of the art concerning conflict and cooperation in managing international water resources. In addition, the information contained in this report may be a source of inspiration for policy makers, decision makers, legal advisors, and negotiators, and lead to a better understanding of institutions for international freshwater management in general.

The treaties, conventions, and agreements, which established and created the various institutions, have been the primary source of information for this report. In addition, other – mostly electronic – sources have been used to obtain information on the various institutional frameworks and their current basin development plans, programs, and policies. It should be noted, though, that there is no pretence to exhaustiveness. In fact, the Development Law Service will be grateful for suggestions on how to improve the accuracy and completeness of coverage.

4. STATE-OF-THE-ART REPORT ON SYSTEMS ANALYSIS METHODS FOR RESOLUTION OF CONFLICTS IN WATER RESOURCES MANAGEMENT

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Slobodan P. Simonovic

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Water is an important factor in conflicts among stakeholders at the local, regional, and even international level. Water conflicts have taken many forms, but they almost always arise from the fact that the freshwater resources of the world are not partitioned to match the political borders, nor are they evenly distributed in space and time. The watersheds of 261 major rivers are shared by two or more countries and nearly half of the land area of the world is in international river basins. Water has been used as a military and political goal. Water has been a weapon of war. Water systems have been targets during war.

The role of a systems approach is investigated in this report as a method for the resolution of conflicts over water. A review of the systems approach provides some basic knowledge of tools and techniques as they apply to water management and conflict resolution.

This report provides a classification and description of water conflicts by addressing issues of scale, integrated water management, and the role of stakeholders. Four large-scale examples are selected to illustrate the application of systems approach to such conflicts:

1. Hydropower development in Canada.
2. Multipurpose use of the Danube River in Europe.
3. International water conflict between the United States and Canada.
4. The Aral Sea in Asia.

The water conflict resolution process involves various sources of uncertainty. Section 5 of the report provides some examples of systems tools that can be used to address objective and subjective uncertainties with special emphasis on the utility of the fuzzy set theory. Systems analysis is driven by the development of computer technology. The final section provides one view of the future and systems tools that will be used for water resources management. The role of virtual databases and computer and communication networks is investigated in the context of water conflicts and their resolution.

5. AN EDUCATIONAL TOOL TO EXAMINE THE DEVELOPMENT CONSTRAINTS IN THE LIMPOPO RIVER BASIN

Ali Vali, Sree N. Sreenath and Gundo Susiarjo

Case Western Reserve University, Cleveland, Ohio - USA

The primary goal of our approach is to develop an educational tool for use in capacity building in the Limpopo basin region and train policy making staff. Exercises based on this tool could be put together to develop policy targets for multinational negotiations training and for regional or national vision validation. Consequently, in this work we are interested in understanding the development constraints of the Limpopo River basin in southeastern Africa covering the important countries of South Africa, Zimbabwe, Botswana, and Mozambique. A scenario-based approach is used to understand possible development scenarios of these basin countries. Conceptual and mathematical models have been built (for population, economy, food supply and demand, and water demand, supply, and use) with data from credible sources. This has been incorporated for use in the decision support system Globesight to look into possible futures. Multiple hypothetical scenarios were created and are discussed in this report. Such scenarios may be evaluated then for effectiveness based on conservation effectiveness, cost effectiveness, and desirability of implementation.

6. HISTORY AND FUTURE OF SHARED WATER RESOURCES

6.1. WATER FOR PEACE: A CULTURAL STRATEGY

Fekri A. Hassan

Institute of Archaeology UCL - UK

We are embedded in culture to the extent that we are often unaware that no fundamental change in the way we live can be sustained without drastic changes in the way we view the world, others, and ourselves. We cannot therefore hope to resolve conflicts over water and mobilize water for peaceable relations among neighbours without a clear cultural strategy. In such a strategy we are guided by a transcultural set of ethics that extol sharing, equity, and justice that have a long evolutionary history. We are moving toward a higher state of social integration, bringing together as nation-states peoples from different ethnic, religious, and occupational backgrounds. The cultural means for water for peace include effective communication and a socially acceptable and feasible plan of action with visible rewards in successive stages to win trust and support. Well-trained and informed individuals placed in the right social circles are key ingredients as ferment for change. Professionals have a critical role to play as mediators between the public and policy makers. They should be motivated to transcend the trap of technocracy, narrow specialization, and dissociation from social engagement. Genuine dialogue with the public to encourage people to participate fully in water management and in

transnational cooperative undertakings is the only long-term guarantee for successful water for peace. Water, with its transcultural symbolic signification, not only has the power to unite us to resolve conflicts over water, but also to provide the basis for a new world of global cooperation for peace and prosperity.

6.2. UNTYING THE “KNOT OF SILENCE”: MAKING WATER POLICY AND LAW RESPONSIVE TO LOCAL NORMATIVE SYSTEMS

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Contemporary water management regimes in many developing countries have been unable to meet the expectation of efficiency and sustainability. This is despite the specific incorporation of principles into national law that are intended to promote social equity, support increased opportunity for poor people, and promote management based on ecological considerations and “sound science.” It seems that these evolving state-initiated water management regimes, like other recent attempts in natural resource management, are ill equipped to contain conflict and disputes. The literature suggests that at the crux of this is the failure to develop appropriate governance regimes that can address the full complexity at the user level (Murombedzi, 2001; Campbell et al., 2001; Mohamed-Katerere, 2001a). Although the improvement of governance regimes has been a key concern, little attention has been paid to the potential role of customary law and other locally developed legal or normative systems. This is so notwithstanding the increasing recognition of the value of traditional water management.² Against this reality we look at how such systems can be used to support the development of improved managerial regimes.

Our main focus in this article is on Zimbabwe; however we also draw on case studies from elsewhere in Africa and beyond. We begin by explaining why it is important to consider customary law approaches in developing and improving governance regimes. In the second section, through a focus on colonially imposed law, we consider the interaction between state law and locally driven normative and value systems, and the implications of this for practice. We find that despite the formal marginalization of such systems, they have remained an important aspect of local practice. In the third section, we then look at how customary law approaches tally with new developments in state-driven water law reform, and find that customary law approaches have not been adequately accommodated. In the fourth section, we consider whether the institutional frameworks for participation, under the newly reformed water law of Zimbabwe, increase the opportunity for alternative norms to be taken into account, and hence their relevance. In the fifth section, we argue that policy and law development is more likely to be successful if it can face local normative systems head on; we consider approaches to policy- and law-making as well as conflict resolution that might take us through this impasse and assist in untying the knot of silence.

6.3. HISTORICAL EXPLANATION AND WATER ISSUES

Martin Reuss

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Historical analysis of transboundary water conflicts enlarges perception and supplies necessary context. It offers a critical correction to the prescriptive solutions of politicians and engineers. History shows that humans do not always perform rationally or in their best interests; indeed that is a major reason why conflicts occur in the first place.

Historical analysis also supplies a useful cautionary note to statistical analysis. Correlations between two or more series of events give the investigator useful leads for further study, but they never offer empirically valid conclusions about cause and effect. They are descriptive, not explanatory, devices. Negotiators of transboundary river conflicts must understand the unique historical, geographical, and cultural context that characterizes a particular basin or body of water. It is precisely history's emphasis on the unique that separates the discipline from the more generic analyses of the social sciences. Historians suggest which forces may be critical in specific circumstances and often test the normative assumptions that underpin technical standards and specific solutions. Historical analysis not only supplies us with the stories that explain the past but the perspective to understand the present. It reminds us of the emotional and aesthetic significance of both technological objects and the physical world. It shows the stability within change and the change within stability.

History suggests that in the postmodern world planners must be sensitive to values and to group identities and not simply to academic models of river basin management. Indeed, to be successful, political and technological responses to water disputes must embrace identifiable values that, if modified, must be dealt with justly.

The use of history is often neglected or at least misunderstood. At its core is the ability to distinguish between fad and trend, between significant shifts and momentary aberrations. This article elaborates this point in the hope of stimulating more discussion and insight.

6.4. THE NEED FOR MULTISCALAR ANALYSES IN THE MANAGEMENT OF SHARED WATER RESOURCES

Julie Trottier

University of Oxford - UK

In recent years, the water war and water peace discourses have focused on whether or not interstate wars will be (or have been) waged over water. Restricting the analysis of water conflicts to the international scale can be quite misleading. It prevents us from observing and analyzing the intricate array of competitions and

cooperations that are woven around water over many widely different scales by a great variety of social actors. The mechanisms at work within this intricate set of relations are driving water conflicts and/or their resolution. Understanding them necessarily requires a multiscale analysis. Such an approach allows us to understand how the competition to “spell out the rules” concerning water use, water allocation, and water access affect various sectors, various industries, and various social groups differently, whether these be defined along ethnic, linguistic, religious, economic, or gender lines. The alliances and the power plays existing among these social actors drive international water conflicts. The resolution of such conflicts requires first and foremost a clear understanding of such mechanisms so that they may be altered.

This article will identify four mechanisms that deeply affect water conflicts or their resolution: gender, territorialization, ethnicity, and uneven economic development. They are by no means the only mechanisms contributing to the creation of second-order water scarcity and the generation of water conflicts.¹ They are generally judged to be irrelevant by those studying water war and water peace. This article will explore how such mechanisms do in fact structure international water relations for the better or for the worse. It will finally turn to the question of how to identify these mechanisms in order to develop multiscale methodologies to research water conflict potential as well as the potential for the resolution of such conflicts.

6.5. PCCP PROCESSES IN HISTORY: THE MODEL OF THE UPPER RHINE REGION

Christoph Bernhardt

Institute for Regional Development and Structural Planning - Germany

The article addresses some of the problems and conflicts that human uses of the Rhine have caused over the last 200 years. It also analyses new forms of cooperation that were developed to combat these problems. In six sections, paradigmatic examples of PCCP processes along the Rhine over a period from 1800 up to 2004 are presented. Nineteenth century, problems and concepts of agriculture, flood defense, and navigation are analysed. The twentieth century history of water pollution, shipping, and hydropower policies, concepts for flood defense including biodiversity, and the project of a transboundary “garden across the river” between the cities of Strasburg and Kehl are discussed.

Section 1 shows the problems that the project of straightening the upper Rhine in the early nineteenth century had to overcome. It is shown how the plans were realized against widespread protests, and were successful in terms of drainage and improvements of health conditions, although floods continued.

The Section 2 deals with problems of navigation in the nineteenth century. It focuses on the famous example of the first Rhine Navigation Convention of 1831, which provided a legislative framework for the work of the Central Rhine Commission.

The convention and the commission represent the first true supranational organization and international court in this area and a nucleus of twentieth-century European unification.

The water pollution problem, which Section 3 deals with, shaped the twentieth-century debates on the river, calling very early for environmental interventions. Massive pollution was caused by rapid industrialization and urbanization, provoking serious conflicts among users of the Rhine water and a decline in the number of fish species. This pollution was only reduced from 1945 onwards. The article analyses the role of hazards and of the International Commission for the Protection of the Rhine against Pollution (ICPR) in combating pollution, and of the implementation of programs to improve water quality and restore biodiversity, such as the international Aktionsprogramm Rhein and the action plan Salmon 2000.

In Section 4, the consequences of nationalist policies in the fields of shipping and hydropower are demonstrated, taking the two competing water engineering projects of the so-called "regulation" of the river and the constructing of the Rhine side channel as examples. After the side channel had caused serious land degradation and nationalist resentments, negotiations between French and Germany after 1945 led to far-reaching modifications and close cooperation: a very prominent example of a successful PCCP-process.

Nevertheless, the interventions in the riverbed caused massive loss of floodplains and serious flooding up the 1990s, which called for large programs for floodplain restoration. These programs are presented in Section 5. Ambitious plans to restore floodplains and promote biodiversity met with serious and long-lasting resistance from riparians. The same happened on a local level in a different way to the "garden of the two riversides" that the German city of Kehl and the French city of Strasbourg are jointly planning to complete in 2004. Changes to the plans that a new local government of Strasbourg asked for provoked stagnation in transboundary cooperation and changes of plans, so that the project will only be realized on a smaller scale than had been intended.

The article argues that the history of the Rhine can teach us much about the serious problems that humanity's uses of water have provoked, as well as about the dynamics and successes that transboundary cooperation can achieve.

6.6. CONFLICT AND COOPERATION: SURVEY OF THE PAST AND REFLECTION FOR THE FUTURE

Aaron T. Wolf

Oregon State University - USA

More than 260 watersheds cross the political boundaries of two or more countries. They cover about 45 per cent of the land surface of the earth, contain about 40 per

cent of the world's population, and account for well over half the global river flow (Wolf et. al., 1999). Management of these basins is especially difficult, not least as regional politics often exacerbates the already difficult task of understanding and managing complex systems. Disparities between riparian nations add further complications. Furthermore, riparian relations occurring at multiple scales often influence each in disparate ways. Development, treaties, and institutions are often seen as inefficient and occasional, as a new source of tension themselves. Nevertheless, riparians have shown tremendous creativity in approaching regional development, often through preventive diplomacy, and the creation of "baskets of benefits" that allow for positive-sum allocations of joint gains. One interesting pattern that emerges is that while many international water negotiations begin with differing legal interpretations of rights, whether measured by hydrography or chronology, they often shift rather to needs-based criteria for water allocations, as measured by some mutually agreeable parameter such as irrigable land or population. Mostly, one is struck by the creativity of the negotiators in addressing specific language to each very specific local setting and concerns.

6.7. WATER MANAGEMENT AND EARLY CIVILIZATIONS: FROM COOPERATION TO CONFLICT

Fekri A. Hassan

Institute of Archaeology UCL - UK

Water scarcity is a function of cultural activities. Throughout our long journey from the dim past of prehistory to the present our demand for water has spiraled, and on balance our needs have often exceeded water availability in the successive stages of our cultural evolution.

The transition from hunting-gathering to agriculture signaled a major change in our relationship with water as irrigation canals transported water beyond its natural setting. As cities emerged, the need to supply them with water climbed as they grew more crowded and bigger. Industry not only created more demands for water but also began to modify and pollute water resources in an unprecedented way.

The means for dealing with the relative scarcity of water created by increasing demands relative to water available when and where it is needed have included (1) technical innovations, (2) social transformations, and (3) normative and ethical formulations.

Our current situation, which involves local scarcities to certain users, cannot be resolved solely by technical fixes or economic measures (e.g., pricing) without implanting social institutional changes and a common vision based on transcultural ethical considerations.

6.8. WATER WARS: THE RISE OF A HEGEMONIC CONCEPT EXPLORING THE MAKING OF THE WATER WAR AND WATER PEACE BELIEF WITHIN THE ISRAELI–PALESTINIAN CONFLICT

Julie Trottier

University of Oxford,- UK

Hegemonic concepts exist within every society. They structure our cognitive maps and therefore contribute to shape our perception of the world, our definition of the issues we face and the analyses we can achieve. The idea of wars being waged for water has grown over the last twenty years to the point that it could become a new hegemonic concept. This idea is now widely contributing to shaping the perceptions of many present international situations. This article will investigate the issue of water wars as a hegemonic concept. It will first detail what a hegemonic concept is, how it is constructed and propagated. It will then turn to the issue of water wars and examine the pre-existing hegemonic concepts that provided the background enabling the emergence of this new hegemonic belief. It will then examine the manner in which the water war concept has been challenged over the last decade and how this matches a war of position as Gramsci defined it. It will tentatively identify the categories of social actors who benefit from either the water war or the water peace discourse and the categories of social actors who propagate these concepts.

Most of the water war literature has focused on the Middle East. This article will therefore explore the mechanisms whereby the water war has been constructed and propagated in Israel and in the Palestinian Territories as a case study.

6.9. SUMMARY: THE HISTORY AND FUTURE OF INTERNATIONAL RIVER BASINS

Aaron T. Wolf

Oregon State University- USA

In the most recent attempt to delineate international river basins, Wolf et al. (1999) found there to be 261 international transboundary basins that together cover 45.3 per cent of the earth's land surface, encompass 40 per cent of the world's population, and provide 60 per cent of the earth's entire freshwater volume. A total of 145 countries' land areas fall partially or completely within international basins. Access to water is essential for the survival and prosperity of every culture. Although water wars are not common, the diminishing of water quality or quantity destabilizes regions, especially within transboundary basins (Wolf, 2002). As time goes on, water resources in fact are becoming progressively diminished while population is increasing, leading to greater scarcity of water (Hassan, 2002b). A number of

researchers and politicians predict an increase in conflicts over water. Kofi Annan in 2001 stated "if we are not careful, future wars are going to be about water and not about oil." However, others believe that water, by its nature, requires rational decision making and cooperation (Trottier, 2002; Wolf, 2002). This paper summarizes the results from investigations conducted by six researchers involved with the PCCP program on the history of the interaction of people with water and the possibilities for the future of international water issues.

7. ALTERNATIVE DISPUTE RESOLUTION APPROACHES AND THEIR APPLICATION

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Alternative Dispute Resolution comprises various approaches for resolving disputes in a non-confrontational way, ranging from negotiation between the two parties, a multi-party negotiation, through mediation, consensus building, to arbitration and adjudication

The article introduces the key skills required, with particular attention to their important role in the process of negotiation and mediation, with examples of their application in national and international water conflicts.

Conflict is endemic to human society, among individuals and groups, and it is important to manage it. We find stories in the Bible, in the Islamic culture, among Native Americans, First Nations in Canada, and many other traditions that describe processes that have been used from the earliest times to find peaceful solutions to various disputes, and much can be learned from the past.

In recent decades, the various conflict resolution approaches have become a widely accepted field both of academic study and of practice, with official and/or legislative functions in many countries. In international relations, they play an increasing role in containing, managing and resolving potential sources of conflict.

The article reviews its complex development. While conflict can be dangerous, it also carries the possibility of producing creative cooperation in a win-win solution. The key to this is for participants to engage as joint problem solvers, seeking to resolve the dispute, and to try and "enlarge the pie" rather than acting as adversaries and aggravating the situation.

A mediator can play a valuable role in this process, facilitate a negotiation process which has come to a dead end, helping the parties concerned to focus on their essential interests rather than defend (or attack) fixed positions. The principles and procedures of consensus building are dealt with in some detail.

The article outlines the principles of negotiation, based on interests and needs of the parties, the use of proper communication, and maintenance of a working relationship as an essential component for reaching a durable agreement.

It lists and considers the essential skills needed by negotiators and mediators, and points the different cultural expectations (national, regional, religious, or

professional) and the psychological aspects that affect perceptions and communications. It outlines a range of strategies for and approaches to mediation, and the ethical problems that may arise.

8. NEGOTIATIONS IN THE CONTEXT OF INTERNATIONAL WATER-RELATED AGREEMENTS

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The article describes the results of a study to identify, analyse, and discuss negotiation processes taking place in the context of international water-related agreements and conventions.

An introduction is given to the role of legal arrangements in fostering cooperation in transboundary water basins, with special emphasis on the economic, environmental, and security dimensions of integrated water management. The study concentrates on the analysis of lessons learnt from a limited number of test cases. The focus is on agreements addressing water allocation and pollution control, thus excluding the issue of navigation.

The paper introduces a life-cycle model of negotiating agreements, and in this context reviews selected water-related agreements at the global, regional, and water-basin level. The role of negotiations is highlighted for the initiation, adoption, and implementation phases. Special attention is given to the negotiations leading to the relevant agreements established under the UN Economic Commission for Europe (the Helsinki and Espoo Conventions and corresponding guidelines). The negotiations leading to, and in the context of, some basin agreements (Rhine, Danube, Aral Sea) are also analysed and compared.

Some experiences in negotiating international water-related agreements are identified, analysed, and generalized. Aspects and factors that determine the prospects, progress, and products of the negotiation process include:

- initiating development leading to formal negotiation
- organizational setting, procedural rules, and negotiation culture
- balancing of interests (upstream–downstream, intersectoral) in the negotiation process
- windows of opportunity that promote and accelerate negotiations
- relationship and synergy with other, legally binding and non-binding, instruments as a source of synergy in the negotiation process
- role of technology, research and monitoring in the negotiation process
- negotiation on implementation and compliance
- role of human rights, transparency, and participation/role of the stakeholders/public in the negotiation process

- role of management and financing issues in the negotiation process.

The study makes use of various sources of information, including (where available and accessible) the texts of agreements, reports of negotiation sessions, secondary literature, and in some cases, oral reporting (interviews with actors and witnesses of negotiations).

The study summarizes the findings and formulates conclusions and recommendations on lessons learnt and how to improve processes in the practice of future negotiations.

9. SOCIETE CIVILE ET RESOLUTION DES CONFLITS HYDRIQUES

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avec les contributions de Yannick Barret (France) et Céline Olivier (France)

L'accès à l'eau et à ses bénéfices a toujours été une préoccupation centrale des sociétés humaines qui cherchent à disposer de la quantité et de la qualité d'eau dont elles ont besoin. Cette préoccupation ne devient source de conflit que lorsque certains groupes sociaux ne peuvent satisfaire leurs besoins.

Les conflits entre groupes ont augmenté à cause des processus de désertification et de changement climatique ou, tout simplement, à cause de la croissance démographique et de la surexploitation des nappes phréatiques.

Ces conflits s'expriment de différentes manières, en fonction du contexte; notamment, en fonction des conditions locales et régionales de développement, des caractéristiques culturelles et, bien sûr, des données hydrogéologiques et écologiques. Il n'est donc pas facile de décrire l'ensemble des mécanismes à l'œuvre. Ce document tente de rassembler et de classer les différentes modalités que les auteurs ont pu rencontrer dans leur expérience personnelle ou lors de la recherche bibliographique.

Le chapitre 1 propose une classification des conflits et indique, de manière générale, comment chaque type de conflit est abordé par les acteurs concernés.

Les chapitres 2, 3 et 4 détaillent différentes modalités de prévention ou de résolution des conflits, où la société civile joue un rôle plus ou moins important. Ces trois chapitres renvoient à la description résumée des cas, qui constitue la deuxième partie.

Le chapitre 5 résume la démarche de médiation utilisée et diffusée par chacun des deux auteurs.

La troisième partie dresse la liste des documents utilisés.

10. MEKONG CASE STUDY

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in cooperation with Apichart Anukularmphai (Thailand), Do Hong Phan (Vietnam), Khammone Ponekeo (Lao PDR), Pech Sokhem (Cambodia) and Zhang Hai-Lun (China)

The Mekong River Basin has been the subject of several books, a number of doctoral dissertations, and many research papers. In each case, the Mekong was viewed from different perspectives for various purposes. It is usually the case that a river basin organization is established after water use conflicts have occurred and direct communication among riparian countries has failed to solve the conflicts. In the case of the Mekong River Basin, cooperation began when the potential for conflicts over water was still very low, but the cooperation initiative came from national development aspirations based on global experiences and support. The current Mekong case study – carried out within the framework of cooperation between the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) and the United Nations Educational, Scientific and Cultural Organisation (UNESCO) – is part of the global efforts coordinated in a UNESCO programme aimed at reviewing lessons learnt and providing possible best practices for international river basins in order to turn *potential conflicts* into *potential cooperations* (PCCP). In the context of the UNESCO PCCP program, the current case study, which because of time constraints focuses mainly on the Lower Mekong Basin and its upper part in the Yunnan Province of China, is primarily expected to provide information for integration into four subsequent thematic studies under the following categories:

- legal aspects
- historical context
- negotiation and mediation
- system analysis.

While aiming at serving these primary purposes, an attempt is made here to also present the Mekong case study as a stand-alone coherent paper for future reference in the context of cooperation among riparian countries of international river basins.

11. LESSONS ON COOPERATION BUILDING TO MANAGE WATER CONFLICTS IN THE ARAL SEA BASIN

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The Aral Sea Basin became notorious as an example of the rapacious attitude to nature of the Soviet command system of water management. There are many similar

examples in the “western world,” even in such powerful countries as the United States, which cannot rehabilitate the deltas of the Colorado and San Khoakin rivers, or Lake Mono and others to restore them to their original natural condition.

During the past ten years Central Asia has established conditions for independent development on the basis of mutual respect, mutual cooperation, and the clear political will of the presidents and governments of the five states concerned to preserve and strengthen joint water management. The framework for this was based on earlier Soviet practice and principles, which should be transformed under new economic conditions. The water authorities of the five countries facilitate cooperation under the umbrella of the ICWC – Interstate Commission for Water Coordination – which celebrated its ten-year anniversary in February 2002. This cooperation is progressing in spite of complexities and differences in the social, political, and environmental conditions in the different states and their different levels of development. It carries the promise of future success, giving objective appraisal to achievements and setbacks as well as finding ways of survival.

These commitments have led to the belief, reflected in official documents of UNESCO, OSCE, and other international agencies, that the ICWC as a body of five states, even in such conditions, can find ways to develop well-controlled and progressive collaboration. This experiment is unique, because five states are not only working together in planning, but also in operating and managing transboundary rivers in real time. For these reasons the Aral Sea Basin has been selected as an acceptable case study for the PCCP program. The expected outcomes of the case study are the lessons to be learned from the difficult and complex conditions that followed the break-up of the Soviet Union. That collapse led to an intricate environmental problem, and the countries of the basin are working through cooperation to find an effective way to manage water resources.

12. INTERNATIONAL MANAGEMENT IN THE COLUMBIA RIVER SYSTEM

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Various approaches to international water management have been practiced in the Columbia River system for almost eight decades. The hydrography of the upper part of the system results in both Canada and the US being upstream and downstream coriparians. The Kootenay River has been particularly significant in this respect. Negotiations have stressed equality rather than equity despite the asymmetry in the size of populations and economies. Equality stems from the Boundary Waters Treaty of 1909 and has been fostered by the International Joint Commission (IJC). The coriparians have enjoyed a long history of relatively harmonious relations, but irritants over use of boundary waters occasionally develop, most of which have been successfully addressed through the IJC.

This success was not the rule, however, through much of the 1950s. Disagreements over the proposed Libby Dam and the principle of sharing downstream benefits were exacerbated by a proposed hydropower project (the McNaughton Plan), which would have diverted part of the Columbia River in Canada

into the Fraser System. During this period interests in both countries invoked water management principles in support of their positions, including: equitable utilization, historic use, riverine integrity, and absolute sovereignty. Disagreements were reduced near the end of the decade by US acceptance of sharing downstream benefits and completion of the IJC report affirming the feasibility of international development of the Columbia River.

By 1961 the federal governments had negotiated and signed the Columbia River Treaty (CRT), but the refusal of British Columbia to sign until concessions to its plans were made delayed ratification of the treaty until 1964. The CRT features equal sharing of downstream benefits for hydropower and flood control in the US that result from development and use of 19 km³ of usable storage in Canada. The United States prepaid Canada's share of the value of benefits from 60 years of flood control and 30 years of hydropower, a sum sufficient to pay for the construction of the CRT dams. The CRT also allowed the US to build Libby Dam and disallowed the McNaughton Plan by limiting diversions out of the Columbia to consumptive uses.

The CRT's hydropower and flood control objectives have been met, but the coriparians are challenged to successfully deal with the increased value society places on endangered biota, environmental quality, and sustainability.

The report concludes, among other things, that successful international water management is more likely when coriparian states have a history of harmonious relations and have created a permanent legal/administrative framework designed to address problems from use of boundary waters.

13. DANUBE CASE STUDY (To be published)

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14. SHARING THE INCOMATI WATERS:

Cooperation And Competition In The Balance

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This case study deals with the Incomati river basin, which is relatively small but has some interesting features, both in terms of socio-political developments and water use.

The basin is situated in a part of Africa that over the last forty years has

experienced a dynamic, sometimes turbulent and volatile, political history. Water use is intense, with at least 50 per cent of the water generated in the basin being withdrawn, in a context of recurring droughts sometimes alternated by dramatic floods. These factors might have led to confrontations over water between the three countries sharing the basin, namely Mozambique, South Africa and Swaziland, yet these did not materialise. The central question raised is: why did cooperation prevail? To answer it, the case study presents information about the natural characteristics of the basin, its political history, water developments, the legal framework, and the negotiations that took place during the period 1964–2002.

It is concluded that cooperation prevailed, first, because there is an apparent pressure on neighbouring countries to behave as good neighbours, even when political ideologies diverge. This is possibly linked to the fact that such countries comprise people who share a common space and a common history. Furthermore, there are outside pressures on nation-states to act responsibly, and to honour regional and international conventions. A second cause relates to the particular political developments in both Mozambique and South Africa. Just when the need for an agreement was highest, the cold relations between the two countries started to thaw, allowing an important agreement to be reached in 1991. Third, there was a third riparian country whose role as broker was accepted by the other two due to its particular political and hydrological position vis-à-vis them. Finally, potential conflicts were evaded by allowing more water to be abstracted and more dams to be built.

The negotiations so far can therefore be considered non-zero sum games. However, as the Incomati basin fast approaches closure this situation is bound to change. Water sharing will increasingly be a delicate balancing act between cooperation and competition.

The hypothesis that water drives peoples and countries towards cooperation is supported by the developments in the Incomati basin. Increased water use has indeed led to rising cooperation. When the next drought comes and Mozambique, South Africa, and Swaziland enforce the new agreement of 2002 and voluntarily decrease those water uses deemed less essential, then the hypothesis will have to be accepted.

15. JORDAN CASE STUDY

Two authors prepared the Jordan case study. Each one focused on a particular aspect related to the basin's management.

PART 1: THE JORDAN RIVER BASIN: WATER CONFLICT AND NEGOTIATED RESOLUTION

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The conflict over the waters of the Jordan basin dates back to the late 1800s when the Zionist Organization chose Palestine to establish a national home for the Jews.

Several water plans were prepared to harness those waters for the benefit of the side that prepared them. The Zionist Organization had plans prepared as early as 1899 and continued working until Israel was established and the new state took over the chores of more detailed planning and implementation. The indigenous societies, primarily the Hashemite Kingdom of Jordan, came up with competing plans starting in 1939 and had a Master Plan prepared for the development of the Jordan Valley.

The creation of Israel created a strong tremor in the region. Ever since its establishment, Israel had been rejected by the states of the region. The Jordan River waters became an additional reason for escalating the conflict between Israel and the other riparian parties. Border clashes became frequent at a time when the cold war was escalating, and the communist "threat" was becoming apparent in the Middle East. Added to the other conflicts in the world at the time, the Middle East conflict caused concern for the leader of the "Free World", the United States of America.

To counter the threat of communist infiltration in the Middle East, and to induce the Arab states to tacitly accept the new state of Israel, the President of the United States dispatched a presidential envoy to the Middle East equipped with a water plan for the utilization of the waters of the Jordan basin by the riparian parties including Israel. The water plan was prepared by US consultants, Chas T. Main, under contract with the Tennessee Valley Authority. Ambassador Johnston made four separate trips to the region between October 1953 and October 1955. During these trips he conducted "shuttle diplomacy" between Israel and a technical committee formed by the Arab League. In each of the four shuttle trips, Johnston met with technical and political representatives of the countries in the region, and introduced amendments to his original water plan. His mission was made more difficult by political developments in the region, and, more importantly, by Arab fears that the water plan had covert objectives such as Arab recognition of and cooperation with Israel, and the resettlement of the Palestinian refugees, victims of the creation of Israel, in the host countries.

Ambassador Johnston reached agreement with the Arab Technical Committee in September 1955, and with the Israelis. Although he put a good defense of the final water plan to the concerned Arab Ministers, the Arab League Council decided, in October 1955, to have more detailed studies done and did not issue the approval that Ambassador Johnston was hoping for.

The final water plan that Johnston negotiated with the Arab Technical Committee and with Israel, known as the "Unified Plan for the Development of the Jordan Valley", became the basis for the implementation of water projects in the Jordan Valley thereafter. The United States made compliance with the provisions of that plan a condition for US financial support to the parties. The East Ghor Canal Project in Jordan (now the King Abdallah Canal) was started and extended with grant contributions from the United States, and so were the Tiberias-Beit Shean project and the National Water Carrier project in Israel. The provisions of the Unified Plan were, to some extent, observed by Jordan and Israel until the two riparian parties resolved their water conflict during the peace negotiations under the Middle East Peace Process. Major elements of the water agreement between the two countries were based on the Unified Plan worked out by Ambassador Johnston.

PART 2: THE NEGOTIATIONS AND THE WATER AGREEMENT BETWEEN THE HASHEMITE KINGDOM OF JORDAN AND THE STATE OF ISRAEL

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Israel and Jordan signed a Treaty of Peace on October 26 1994. Article 6 and Annex II of the treaty (included in an appendix) constitute an agreement on water. The paper opens with some background on the arrangements made by the parties for sharing of water in the Yarmouk River since the early 1980s, details and explains the process of negotiations that ensued in the 1990s, analyses the water agreement signed in 1994, and concludes with a series of observations on its salient points.

The negotiation process is analysed according to a set of dimensions:

- the use of two arenas – bilateral and multilateral – and their intended and actual roles
- the venues and environment in which the negotiations took place
- working with a single negotiated text (SNT)
- how issues relating to the other regional party (the Palestinians) were considered
- confidence building measures (CBMs)
- how the agreement covers many topics, and why this is important
- the fact that water rights are not mentioned in the agreement, and “rightful allocations” are used instead
- why Lake Kinneret (Sea of Galilee) is not mentioned in the agreement .

The main aspects of the water agreement are presented and discussed:

- its permanent nature, captured in the opening statement: “With the view to achieving a comprehensive and lasting settlement of all the water problems between them . . .”
- the permanent Joint Water Committee (JWC) that is set up to deal with implementation and any items relating to water that may arise with time
- cooperation as a principle to be followed; definition of the quantities, timing, qualities, and costing of the components of the “rightful allocations” of each side
- priority given to existing uses
- “increasing the pie” by jointly developing new sources of water to overcome the shortages that both parties are facing
- dealing with hydrologic variability in the sources
- the need to increase storage
- issues of water quality.

The paper concludes with some reflections on the water agreement and its implementation.

16. THE NILE: MOVING BEYOND COOPERATION

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This paper examines the development of cooperation on the River Nile. The challenge of creating a more cooperative environment for the management of Nile waters has existed for centuries. In recent years political conditions have emerged in basin countries that have provided a window of opportunity for taking forwards cooperative development of the shared waters. With the support of external agencies, since the late 1990s nine of the 10 Nile riparian countries have been setting in train a process of institutional development that has cemented cooperation and charted a way forward for future development in the Nile Basin. Yet the challenge remains to put this institutional development and cooperative thinking into practice through the development of projects of mutual benefit that are both sustainable and able to deliver benefits to the poorest. This key challenge is now being faced by the states party to the Nile Basin Initiative. Based in Entebbe, Uganda, the NBI comprises representatives of all basin states except Eritrea and is helping to coordinate separate Vision and Subsidiary Action programs with broad development agendas. The implementation of these projects now presents the key challenge. With success in processes of cooperation, the transition to development activities needs to be made. This process has to become the mainstay of the NBI.

The paper outlines key aspects of the Nile Basin's history, geography and politics before looking at some of the legal, socioeconomic and development challenges that lie ahead. Exploring the challenges inherent in shifting from cooperation to development, the paper concludes by suggesting that a further – perhaps even more important challenge lies ahead – in terms of ensuring that development processes set in train require clear links to poverty reduction within the basin. Without these, there would be a disconnection between the goals of dispute resolution, the move to cooperation, the transition to development and the achievement of benefits for all throughout the basin.

17. RHINE CASE STUDY

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Experience with conflicts and cooperation in the Rhine basin proves the usefulness of river basin organizations.

The major Rhine basin organizations deal with only one specific aspect of the

river. The most important organizations are described, with their legal background, their tasks and duties, and their development.

The theoretical aspects of conflict prevention and resolution are illustrated with water-related conflicts along the river Rhine. These cases deal with flooding, navigation, fisheries, water pollution, salt discharge, and accidental spills.

Special emphasis is placed on the possibilities and implementation of public participation in water management.

The lessons learned indicate, that a sound technical scientific cooperation strongly supports the basis for transboundary water management policy.

18. THE CASE OF THE TRIFINIO PLAN IN THE UPPER LEMPA: OPPORTUNITIES AND CHALLENGES FOR THE SHARED MANAGEMENT OF CENTRAL AMERICAN TRANSNATIONAL BASINS

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The upper watershed of the Lempa River is shared by Guatemala, El Salvador, and Honduras, as outlined in the Trifinio Plan. Its management represents a novel experience for Central America. It reveals the advances made in the management of the natural resources of a trans-national watershed, through the political will of the countries at the highest level, institutionalized through an international treaty, making way for a new form of organizational management. The watershed was considered from a territorial planning perspective, rather than one of water management. The Trifinio experience shows the limits to processes that are stimulated from above and therefore not accompanied by strategies designed by the local actors, whose support is necessary to ensure long-term functioning and sustainability.

Lessons Learned

1. The case reveals that, in order to advance towards the integrated management of the hydrological resources of trans-national watersheds in Central America, political will (at the highest levels) of the participating countries is essential.
2. It is necessary to establish common institutional frameworks for managing the territory of the shared watershed.
3. Coordinated mechanisms for information gathering, conceptualization, and interventions are needed.
4. Efficient mechanisms are needed to ensure local participation throughout the process – from planning to decision making and carrying out actions.

5. There should be investment in processes of building up local capacities associated with the management of natural resources.
6. This case reflects a series of limitations related to the lack of efficiency and sustainability of actions that are planned from the top down, as well as a centralized approach to management in which resources have been exhausted in carrying out actions by the ministries involved.
7. The pattern of intervention needs to change to allow a natural resources management that is possible through an integrated management of watersheds.
8. The study shows the limitations of merely incorporating risk and vulnerability management, as associated with land use and flooding, into the management of a shared watershed.
9. The Trifinio Commission is not financially viable and has not achieved the establishment of its own coordinating inter-sectoral planning mechanism among local institutions, municipalities, environmental funds, and the private sector.

Relevance of the Case for Integrated Management of Hydrological Resources

This case reflects the importance of political will in advancing the building of frameworks for institutional trans-national watersheds. At the same time, it reveals the obstacles in the transition from those processes that are stimulated by a top-down approach towards a process involving strategies arising from the local actors. Strategies by local actors inherently lend the necessary support to the functioning and sustainability of actions, and in the long run tend towards the integrated management of trans-national watershed hydrological resources.

Finally, the case reveals the predominant focus to be on natural resource management for watersheds on behalf of the principal actors of participating institutions within the region, rather than integrated management of water.

19. CONFLICT AND COOPERATION IN THE MANAGEMENT OF INTERNATIONAL FRESHWATER RESOURCES: A GLOBAL REVIEW

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This report contains the results of a desk study on conflict and cooperation in international freshwater management. The study was conducted as part of the UNESCO PCCP project. The PCCP project, which stands for "From Potential Conflict to Cooperation Potential," examines and fosters the potential for international water resources to become a catalyst for regional peace and development through

dialogue, cooperation, and participative management of the resource. It tries to find an answer to why with some international freshwater resources conflicts develop, and with others there is cooperation.

The aim of the desk study was threefold:

- to complement the in-depth case studies prepared in the PCCP project by a more in-breadth coverage of international freshwater management
- to show the wide variety of issues, contexts, and solutions chosen
- to identify general "lessons" on conflict prevention/resolution and cooperation.

First, in order to obtain an overview of the solutions chosen, nineteen institutions for managing international freshwaters were described. The individual descriptions were made by the FAO and are reported in a separate report by Melvin Spreij, titled *Institutions for International Freshwater Management*. Section 4 of this report contains an overview. The overview shows that most institutions studied have a broad scope in terms of water uses covered. Many also have a broad geographical scope and cover complete basins. The organizations set up range from extremely simple to very elaborate. They usually have no broad ranging decision-making powers and decision making in the organizations is usually by unanimity; countries apparently want to keep control. In many cases conflict resolution procedures have been established, but there is not much evidence that they are actually used; often they do not have to be used because cooperation is good. Public participation is with a few significant exceptions still very limited.

Second, a literature study was made of the question of how institutions for international freshwater management actually develop and how effective these institutions are. Some twenty-three freshwater resources or groups of resources were covered. In these cases it usually took ten years or more to develop effective institutions. The main obstacles were conflicting interests, bad international relations and lack of trust, and sometimes controversies over the facts. Several strategies were used to overcome these differences, such as issue linkage. The most common and most effective strategy was to develop and maintain good relations and to compromise on the basis of reciprocity on points that were important for the other countries. In the long run such a strategy benefits all parties concerned (see Section 3).

Relatively little information could be found on the effectiveness of the institutions. Nonetheless, the picture is relatively positive. Some international agreements are not complied with and others are simply not implemented, but many are implemented correctly. In a few cases serious negative side effects occurred because the interests and knowledge of the local population had been ignored when developing the institution concerned. In other cases significant improvements in the basin took place, and the institutions are at least partly responsible for this. It has proved possible to resolve many contentious issues in the framework of international commissions that have been set up, which – if not actually improving international relations – at least prevented deterioration (see Section 5).

It seems that institutions for international freshwater management do matter.

The main challenge is to know what an effective institution looks like and how agreement on such institutions can be reached. The desk study resulted in many suggestions for that. These are listed in Section 6 in the form of fifty-four “lessons” on promoting cooperation and preventing conflicts. They are summarized in the form of seven “key messages” (see Section 7.2 for more detail).

Key messages on promoting cooperation and preventing conflicts in international freshwater management

1. International freshwater management is becoming increasingly important for meeting basic water needs and providing food security.
2. There is no single best way to manage international freshwaters.
3. Commissions or other platforms should be constructed internationally and nationally where the main actors can meet – national governments, lower level governments, water users, local populations, and NGOs.
4. International agreements should have a sufficiently broad scope.
5. The single most effective strategy for reaching agreement is the wish to develop and maintain good relations and reciprocity.
6. Joint or internationally coordinated research can improve the scientific-technical quality of international agreements; unilateral research usually cannot.
7. All stakeholders should participate in institutional development.

During the desk study several limitations in the available data were encountered. These can be overcome by future research describing the management of individual international freshwater resources in detail, using different perspectives and a comparative approach. Additionally, more research is needed on how to organize public participation in large international river or lake basins. As it is, the desk study constitutes the state of the art of international freshwater management as seen by the author. No doubt, our knowledge will continue to develop, as will international freshwater management itself. The author hopes that this report will provide inspiration for all involved in international freshwater management.

20. INTERNATIONAL WATERS: INDICATORS FOR IDENTIFYING BASINS AT RISK

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Despite the growing literature on water and conflict in international river basins, little empirical work has been done to bolster common conclusions that are so widely reported. In order to address this gap, we set out to assess *all* reported events of either conflict or cooperation between nations over water resources over the last fifty

years and to use these events to inform the identification of basins at greatest risk of dispute in the near future (five to ten years). The study is divided into two components:

1. Compilation and assessment of relevant biophysical, socioeconomic, and geopolitical data in a global Geographic Information System (GIS), and use of these factors to determine history-based indicators for future tensions along international waterways.
2. Using these indicators, identification of basins at risk for the coming decade.

In general, we find that most of the parameters regularly identified as indicators of water conflict are actually only weakly linked to dispute, but that institutional capacity within a basin, whether defined as water management bodies or treaties, or generally positive international relations, is as important, if not more so, than the physical aspects of a system. It turns out, then, that very rapid changes, either on the institutional side or in the physical system, are at the root of most water conflict, as reflected in two sets of indicators:

1. "Internationalized" basins, that is, basins which include the management structures of newly independent states.
2. Basins that include unilateral development projects and the absence of cooperative regimes.

By taking our parameters of rapid change as indicators – internationalized basins and major planned projects in hostile and/or institution-less basins – we are able to identify the basins with settings which suggest the potential for dispute in the coming five to ten years. These basins include the Ganges-Brahmaputra, Han, Incomati, Kunene, Kura-Araks, Lake Chad, La Plata, Lempa, Limpopo, Mekong, Ob (Ertis), Okavango, Orange, Salween, Senegal, Tumen, and Zambezi.

We then identify "red flags," or markers related to these indicators, which might be monitored in the future.

21. WATER RESOURCE SCARCITY AND CONFLICT: REVIEW OF APPLICABLE INDICATORS AND SYSTEMS OF REFERENCE

Pal Tamas

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In considering water conflicts we should also note the importance of intra-state water tensions, which are related to inter-state conflicts. Water conflicts are related to a wide range of other socio-political tensions, such as border disputes or mega-projects such as dams and reservoirs, environmental problems, or political identity. A range of instruments may be deployed, including: lobbying, open and hidden negotiations, violence, network building, recourse to international organizations, and the actions of elites.

The abundance or scarcity of resources decides the direction a society will take in development. Imbalances, not only of scarcity but of abundance, may distort environmental and socioeconomic policies, leading to social friction, though newer approaches to social problems do not see scarcity as leading necessarily to conflict. Problems may be mitigated by factors such as leadership and social capital, but it is not easy to identify the factors which lead to a spiral of degradation. Other studies indicate how conflict may arise through the efforts of elites to capture scarce resources, or through the debilitating effect on innovation that scarcity entails. Countries heavily dependent on exports of primary commodities are more liable to conflict. The "honey pot" of abundant resources may be a focus for greed that determines civil conflict.

In rentier states, which receive substantial rents from external sources, it is claimed that fewer people tend to be involved in the production of wealth, and more in its utilization or distribution. Democratic development and economic growth are both likely to be slowed down. To what extent can this model be applied also to water distribution?

The article considers conflict resolution capabilities, in particular the institutional dimensions, comparing the capacities in developed and developing countries. While most of the items presented in the article are tools for large-scale change, the relevance of incremental advances is also considered. Early warning models to predict the likelihood of conflict are compared, as are risk-assessment models such as that of the Minorities at Risk Project, and conflict prevention trajectories to identify "preventors" of conflict.

22. PARTICIPATION, CONSENSUS BUILDING AND CONFLICT MANAGEMENT TRAINING COURSE

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The world has changed for water resources managers, planners and decision makers. Today, especially in the context of new demands for integrated water resources management (IWRM), water managers and planners often work in teams involving multiple disciplines, not just engineering and associated technical fields. Increasingly they work in multi-agency teams, which involve a variety of public, NGO, and private sponsors. Today's water managers and decision makers must consult with a broader range of stakeholders, publics, and NGOs – locally, regionally, and often internationally. And, they must do all this while operating in a world of increasing demands on water.

Technical excellence remains necessary for creating sustainable water management decisions, perhaps even more so than ever. People all over the world

need technical engineering competence more than ever before. However, it is not sufficient in itself. The ability to put that competence at the service of those who need it depends, in many cases, on changing the relationship between the experts and those whom they are serving. This course aims at helping to build, to modify, or to create such new functional relationships.

The new water resources decision-making environment requires at least two sets of skills. First, it requires excellent and broad technical skills that reach across disciplines to consider alternatives that in the past were often not evaluated. In addition, today's water decisions often rest on a scientific basis that is itself incomplete. This sometimes means that water decision makers must first get agreement on what studies need to be conducted and what data should be collected, to ensure that decisions are based on science, not rhetoric. As a result, water planners and managers need a breadth of technical knowledge that goes beyond the traditional excellence in engineering.

Second, water planners and managers need another set of skills: the skills of designing and conducting processes that draw together partners, stakeholders, and publics, resulting in decisions that enjoy broad cross-sectoral, and often transboundary, public support. The era where water planners and managers decide–announce–defend is rapidly disappearing. In this new era, water management is done with (as opposed to being done “for” or “to”) potentially affected agencies, public and private organizations, individuals, and others.

This course teaches this second set of skills. These are the skills that will help water resources decisions makers avert conflict, deal with conflict should it arise, and use water decisions as a venue for dialog when others are closed to parties locked in various types of non-water conflicts. In short these are tools to help water resources decision makers take the PCCP road.

23-24. BASICS OF WATER RESOURCES

Course book and Reader

WaterNet, in collaboration with **The Centre of Conflict Resolution CCR (South Africa)**, the **Instituto Superior de Relações Internacionais ISRI (Higher Institute of International Relations) (Mozambique)**, **Catalic (The Netherlands/Mozambique)**, **IHE Delft (The Netherlands)** and **the University of Zimbabwe (Zimbabwe)**

The aim of the course is to introduce the basics of water resources to non-water managers, in order for them to be able to communicate more meaningfully with water engineers, hydrologists etc.

The specific objectives of the course are:

- a. to introduce the basics of water resources
- b. to improve communication between non-water professionals and water professionals.

The subjects addressed include:

- Concepts and definitions
- Water resources
- Water allocation principles
- Urban water demand
- Agricultural water demand
- Environmental water requirements

The course is targeting non-water professionals and stakeholder representatives.

Course content "Basics of Water Resources":

Part 1: Concepts and definitions

- 1.1. The water cycle
- 1.2. Three characteristics of water
- 1.3. Integrated water resources management
- 1.4. Policy principles
- 1.5. Sustainability of water resources
- 1.6. Institutional aspects
- 1.7. Strategic issues

Part 2: Water resources

- 2.1. The water balance
- 2.2. Groundwater resources
- 2.3. Surface water
- 2.4. Catchment yield
- 2.5. The rainbow of water revisited
- 2.6. The water balance as a result of human interference

Part 3: Water allocation principles

- 3.1. Introduction
- 3.2. Balancing demand and supply
- 3.3. Issues in water allocation

Part 4: Urban water demand

- 4.1. Estimation of urban water demand
- 4.2. Pricing of urban water

Part 5: Agricultural water demand

- 5.1. Yield response to water
- 5.2. Crop water requirements
- 5.3. Yield reduction due to water shortage

Part 6: Environmental water requirements

- 6.1. Introduction
- 6.2. Quantifying environmental water requirements

25-26-27. CONFLICT PREVENTION AND COOPERATION IN INTERNATIONAL WATER RESOURCES

Course book, Reader and Hand Outs

WaterNet, in collaboration with **The Centre of Conflict Resolution CCR (South Africa)**, the **Instituto Superior de Relações Internacionais ISRI (Higher Institute of International Relations) (Mozambique)**, **Catalic (The Netherlands/Mozambique)**, **IHE Delft (The Netherlands)** and the **University of Zimbabwe (Zimbabwe)**

The aim of the course "Conflict prevention and cooperation in international water resources" is to contribute to regional water security and peace through strengthening water diplomacy. The course therefore emphasises that water can and will bring peoples and countries together, and aims to debunk the myth that water may be a cause of conflict. The course imparts insights and skills that aim to unlock the cooperation potential in water resources management.

The specific objectives of the course are:

- a. to enhance the understanding of conflict transformation and impart negotiation skills
- b. to enhance insights in Integrated Water Resources Management
- c. to strengthen regional water diplomacy.

The subjects addressed include:

- Theory and practice of conflict prevention
- Conflict management tools
- Skills training in communication, mediation and negotiation
- Shared vision development
- International water law
- Water allocation issues in the context of integrated water resources management
- Water diplomacy

The course is designed to give participants hands-on experience with conflict management in the context of water resources. The course includes an extended near real-life interactive roleplay.

The course is targeting participants with a natural science/engineering background and participants with a more sociological/legal/public administration/economic background.

The course materials consist of:

- a course book (in 6 parts)
- a course reader
- suggestions for further reading (reference documents provided in electronic form on CD Rom)
- additional hand outs (for exercises etc.)

Course content "Conflict prevention and cooperation in international water resources":

Part 1: Water

- 1.1. Introduction to Integrated Water Resources Management
- 1.2. Water allocation
- 1.3. Water quality issues in international rivers
- 1.4. Floods and droughts in international rivers

Part 2: Issues

- 2.1. Human rights and conflict management
- 2.2. Water security and peace
- 2.3. International water law regimes
- 2.4. Game theory
- 2.5. SADC and international waters
- 2.6. Implementing conventions and protocols
- 2.7. Institutional and critical perspectives on shared rivers
- 2.8. Personal lessons by senior negotiators

Part 3: Conflict

- 3.1. Understanding conflict
- 3.2. Conflict analysis
- 3.3. Approaches to conflict resolution

Part 4: Practice

- 4.1. Trust-building
- 4.2. Communication skills
- 4.3. Interest-based processes: negotiation and mediation
- 4.4. Collaborative decision-making; including gender aspects
- 4.5. Team building / role clarification
- 4.6. National negotiation preparation

Part 5: Strategy

- 5.1. Public participation
- 5.2. Networking and lobbying
- 5.3. Shared vision development

Part 6: Roleplay

Part 7: Evaluation

28. ADVANCED MEDIATION SKILLS

Course Book

WaterNet, in collaboration with **The Centre of Conflict Resolution CCR (South Africa)**, the **Instituto Superior de Relações Internacionais ISRI (Higher Institute of International Relations) (Mozambique)**, **Catalic (The Netherlands/Mozambique)**, **IHE Delft (The Netherlands)** and the **University of Zimbabwe (Zimbabwe)**

The aim of the course is to contribute to regional water security and peace through strengthening water diplomacy.

The specific objectives of the course are:

- a. to deepen the understanding of conflict transformation and impart advanced mediation skills
- b. to strengthen regional water diplomacy

The subjects addressed include:

- Power-based mediation versus confidence building
- Enhanced self-understanding with respect to conflict
- Dynamics of communication
- Process facilitation skills
- Facilitating the mediation process
- Mediated negotiations in practice

The course is designed to give participants hands-on experience with conflict management, facilitated by highly qualified trainers of the Centre of Conflict Resolution.

Course content "Advanced Mediation Skills":

Part 1: Mediation

1.1. Introduction

1.2. Power-based mediation vs confidence building

Part 2: Conflict and communication

2.1. Personal responses to conflict

2.2. Communication

2.3. Facilitating good process

Part 3: Advanced mediation concepts

3.1. The mediation process

3.2. Advanced mediation concepts and techniques

Part 4: Case-study and Roleplay

Part 5: Evaluation

29. WATER SECURITY AND PEACE

A synthesis of studies prepared under the PCCP–Water for Peace process

Compiled by William J. Cosgrove

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The PCCP - Water for Peace program has been designed with the overall objective of helping the parties involved in potential water conflicts to negotiate the way towards cooperation. It analyzed historical experiences and reviewed legal, negotiation, and systems analysis tools and their ability to solve water-related conflicts. Case studies of successful cooperation and other educational material were developed.

Some say that future wars will be fought over water, not oil. Others, more optimistically, say that history teaches us that people cooperate over water rather than fight over this life-giving resource. This report analyses many dimensions of the issue, and in conclusion sides cautiously with the optimists

The report is organized to provide its main messages in sequence as described below.

Chapter 2, "A History of Humanity and Water," illustrates the assertion made in the background section above that humans have indeed always had water problems. This has led to the hegemonic definition of water wars as inevitable. Sometimes there has been conflict in the short term, but humans have always adapted in the long term. Now the scale of challenges faced is at least an order of magnitude greater than any known in the past. Yet history shows cases of great looming disasters that were resolved by wise men and women.

The following chapter, "Ethics: The Ideal and Only Long-Term Solution," describes how ethics influence our behavior. It proposes that societies adopt and teach their children a system of moral principles for individual, community, and international behavior based on the shared fundamental human values of justice and equity.

"Legal Approaches: A Sound Framework" (Chapter 4) recognizes that legal principles are ultimately based on moral principles. But they are difficult to apply and do not always lead to sustainable solutions. Those related to water are still in their infancy. Yet they do provide a framework against which negotiations to find cooperative mechanisms and solutions may take place.

In Chapter 5, "Trends: Emerging Issues and Opportunities for Cooperation," we look at the many emerging trends in today's world. There is a tendency to look at them as negative, but they also bring opportunities. For example, unregulated free markets can hurt poor countries and poor people if they are driven by the sole

interest of corporate profits; or they can ensure that those living in poor water-scarce countries have access to food they can afford by ensuring that they have access to markets where they can sell the goods they can produce to earn the needed foreign exchange to buy the food. Other trends that similarly have two sides to them are international relations in the post cold war era, changing technologies, societal changes (social and economic order), transcultural and transnational civil society, climate change, and environmental and human crises (floods, droughts). The migration of production sites to lower-cost economies can also provide opportunities for developing countries, but must be properly managed to prevent negative side effects. The optimal benefits of all of these opportunities will only occur in a world of peace and trust.

One of the most important trends affecting the management of water is the theme of Chapter 6, "Emerging Trends: Public Participation and the Role of Civil Society." Citizen groups all over the world are demanding and sometimes gaining the right to participate in decision making that directly affects their lives and livelihoods. As a consequence, the principle of subsidiarity, under which decisions are made and actions are implemented at the lowest level capable of carrying them out, is becoming widely accepted. This is of great importance when it comes to water, which can only be managed locally.

The foregoing would seem to point to the approach we should take, but it will not be easy. Chapter 7, "Obstacles to Cooperation," notes that the challenges faced include potential for socioeconomic political disturbances; poverty and socioeconomic underdevelopment; lack of information; inequalities in water allocation, knowledge, and military force; geographic advantages; and the weakness of globally ratified laws and conventions, especially enforcement mechanisms. The water sector also suffers from weak institutions (including lack of democracy and good governance, lack of political will, relative lack of trained human capacity, and lack of financing and other support for the development of institutions).

Decision makers cannot act everywhere at once. It will therefore be useful to identify those places where action can head off potential conflict and build the capacity of enduring institutions. Much research has already been done to identify the factors that should be included in such indicators. These are discussed in Chapter 8, "Indicators of Potential for Cooperation."

"What We Have Learned from Recent Experience" is the subject of Chapter 9. Examination of experience in sharing water, especially transboundary waters, has taught us many lessons. Examples from several basins studied show that cooperation is an iterative process that begins with sharing information and getting to know each other in order to build trust and confidence. In the end, though, institutions with clear mandates must be created for efficiency, effectiveness, and sustainability.

Institutions are more than organizations. They consist of all the formal and informal practices that determine our behavior. They exist from the community to the national and international level. They reflect the ethics that are shared at each

level. These are discussed in Chapter 10, "The Critical Role of Institutions." Changing institutions means changing value systems and therefore takes time, perhaps generations. Some of the problems faced cry out for faster solutions.

The PCCP-WfP exercise has identified several tools and mechanisms that can be used to develop trust and build institutions that can secure cooperation. These are described in Chapter 11, "Means and Tools for Managing Shared Water Resources." Some of these are related to developing shared values that support justice and equity. Some are related to improving processes of conflict avoidance and resolution. They include mixtures of building human skills and using the latest technology.

History and a review of experience in the past century both demonstrate that it is possible to manage the scarce resource that is water so that all benefit in a just and equitable manner. There are still many challenges ahead that emerge from changing global physical systems and evolving socioeconomic and political systems. However, as seen above, the PCCP-WfP process has identified a number of tools and mechanisms that will build the capacity and resilience needed to cope with these challenges. The exercise has also identified future actions to add to our toolbox. Chapter 12, "Epilogue," demonstrates that there is every reason to hope that the next generation will live in a world with water peace.

The report concludes with a chapter listing selected reference material that served for preparation of the volumes in the PCCP Series.

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Constitution of UNESCO (excerpt)

London, 16 November 1945

The Governments of the States Parties to this Constitution on behalf of their peoples declare:

That since wars begin in the minds of men, it is in the minds of men that the defences of peace must be constructed;

That ignorance of each other's ways and lives has been a common cause, throughout the history of mankind, of that suspicion and mistrust between the peoples of the world through which their differences have all too often broken into war;

That the great and terrible war which has now ended was a war made possible by the denial of the democratic principles of the dignity, equality and mutual respect of men, and by the propagation, in their place, through ignorance and prejudice, of the doctrine of the inequality of men and races;

That the wide diffusion of culture, and the education of humanity for justice and liberty and peace are indispensable to the dignity of man and constitute a sacred duty which all the nations must fulfil in a spirit of mutual assistance and concern;

That a peace based exclusively upon the political and economic arrangements of governments would not be a peace which could secure the unanimous, lasting and sincere support of the peoples of the world, and that the peace must therefore be founded, if it is not to fail, upon the intellectual and moral solidarity of mankind...



International
Hydrological Programme



World Water
Assessment Programme
www.un.org/development/desa/wwap