

# INTERNATIONAL RIVER BASINS: MANAGEMENT AND CONFLICT PERSPECTIVES

Samuel Luzi

*'Water management' and 'water conflict' are two distinct perspectives on water utilization challenges in transboundary river basins. The discourse on 'water management' has evolved from engineering approaches to increase supply towards a more holistic understanding that gives priority to environmental protection, efficiency concerns and political as well as institutional aspects of cooperative and integrated water planning and management. As inter-state water war is not found to be a very likely scenario, 'water conflict' approaches increasingly emphasize local level water disputes and negative impacts of non-violent tensions on 'human security' in international river basins. Water management' and 'water conflict' narratives have converged in that they both 1) stress the importance of improving water services for the most vulnerable groups of society and of protecting the environment, 2) call for stakeholder participation in the design of management strategies and cooperative frameworks, and 3) increasingly recognize that political processes governing water utilization on different levels are inter-linked. The conflict perspective has contributed to ongoing efforts to integrate water management in shared river basins by bringing water issues on the agenda of high level policy makers as well as international organizations concerned with security issues, and by introducing specific frameworks to address conflictive relations between stakeholder groups on different levels.*

## Introduction

Societal developments have been linked with the management of ecosystems, and among them transboundary rivers, throughout human history. Evolving water management paradigms of the last century have reflected both intensifying human-nature interactions and increasing awareness regarding sustainability and stakeholder concerns. While transboundary aspects of river management have always affected international relations, the scholarly and public discourse on 'environmental conflicts' and 'water wars' has gained prominence only in the last two decades. Under conditions of growing demand, water as an essential resource for ecosystem health and human activities is increasingly associated with local and inter-state conflict (e.g. Gleick 1993). Many of the worlds 263

international river basins (Wolf et al. 2003) are located in areas that suffer from water scarcity and have a history of international conflict, e.g. in the Middle East, Western Africa, as well as Central and Southern Asia. Provision of 'water security', therefore, is increasingly understood as including both the supply of sufficient water of appropriate quality and the prevention or transformation of water related conflicts' (e.g. Dinar 2002).

The emerging emphasis on the security dimensions of water utilization is likely to influence strategies of water management institutions on the local, national, watershed and global level. This article traces the discourses on 'water management' and 'water conflict' as distinct starting points for the analysis of international river basins. The conceptual relations in time between the two approaches are analyzed, focusing particularly on the following three dimensions: 1) the issues addressed and interventions proposed, 2) actors and institutions involved, and 3) the spatial foci of the approaches. As both 'water management' and 'water conflict' narratives have conceptually broadened with regard to the range of issues considered and deepened to focus on the protection of interests of individual water users, a convergence between the two approaches is observable. The challenges of water utilization are increasingly seen as political rather than technical issues. Therefore, reflections of how water management relates, or should relate, to social and political processes on different levels are essential to design effective interventions. In this context, the statements that "water management is, by definition, conflict management" (Wolf et al. 2005) and "conflict prevention is in the first place an issue of good water governance" (Böge 2006) will be reflected in the concluding section.

The delineation between 'water management' and 'water conflict' approaches depends on the definition of the respective terms<sup>2</sup>. The concepts used in this article are illustrated in Figure 1. 'Water management' mainly denominates the evolving strategies of water professionals contemporarily reflected in the principles of Integrated Water Resources Management IWRM (Global Water Partnership 2006). 'Water management' thus includes physical and socio-economic approaches seeking to harmonize water supply and quality with demands of different users, sectors and the

<sup>1</sup> Note that the term 'water security' is also used in the context of attacks, e.g. by terrorists, on water supply systems (Gleick 1993).

<sup>2</sup> For the sake of clarity, the term 'conflict management' is avoided in this article.

environment. The specific scholarly field dealing with 'international regimes' in transboundary river basins is considered as the watershed perspective on 'water management' in this paper. However, even though many 'regime' researchers stage their arguments without explicitly referring to 'conflict', the importance of their field of study with regard to conflict transformation is obvious. 'Water conflict' concepts have been developed mainly by scholars of political sciences and relate to the broader field of 'environmental conflict' research. Conceptual approaches investigating causes, characteristics and impacts of conflicts in river basins are distinguished from studies dealing specifically with the transformation of water conflicts.

The overlap between the 'management' and 'conflict' perspectives is mirrored by the fact that a number of leading scholars have contributed to both fields, e.g. Allan (2002; 2003), Gleick (1993; 2000), Ohlson (2000), or Turton (Turton 1999; Turton and Ohlsson 1999).

**Responses to evolving river utilization challenges: Towards integrated water management**

In early human history, man-made modifications of river flows have been geographically limited, and yet were crucial for the rise of civilizations particularly in arid regions. Runoff variability resulting in drought and floods were the major threats originating from transboundary rivers. Increased capability to modify river flows both offered new perspectives to mitigate these problems and created new water management challenges. Between 1950 and 2000, some 40000 large dams were constructed worldwide (WCD 2000) with tremendous impacts on river flow patterns and human water utilization. Unprecedented pollution levels put pressures on many rivers affecting both local water supply and international relations between co-riparian states.

Towards the end of the 20th century, populations growing beyond the water scarcity benchmark in numerous countries, persistent lack of access to water supply and sanitation in the developing world and growing concern for the ecological and financial sustainability of water services provision led observers and policy makers to proclaim a global water crisis (Gleick 1993). At international gatherings like the 1992 'International Conference on Water and the Environment' in Dublin and the 2002 Johannesburg 'World Summit on Sustainable Development', the fundamental importance of water utilization challenges in relation to human health, food production and environmental conservation was highlighted (e.g. Allan 2003).

Water management, broadly understood as the planned development, distribution and utilization of water resources, has evolved as a concept from a rather narrow technical notion into a complex framework in response to the evolving challenges. Allan (2003) illustrates the development of 'water management' narratives in the light of several successive paradigms. While in most of the 20th century states pursued the 'hydraulic mission' to increase and control river flows through large scale engineering work, three emerging perspectives fundamentally transformed modern water management approaches. The growing awareness of the environmental value of water raised criticism towards large-scale infrastructure projects particularly in the 1980s. In the 1990, the emphasis on the economic nature of water produced initiatives to strengthen the role of the private sector and stressed the importance of cost recovery. In the 2000s, the political and institutional issues of 'water management' –increasingly termed 'water governance' - were highlighted in 'holistic' approaches such as Integrated Water Resources Management IWRM. Gleick (2000)

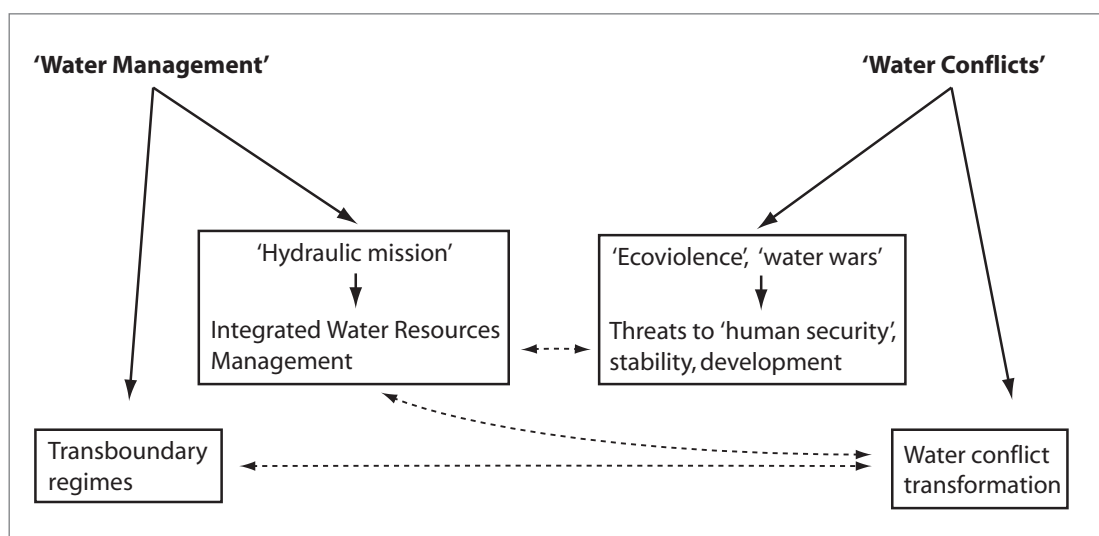


Figure 1: Components of 'water management' and 'water conflict' approaches discussed in this article. Dotted lines indicate convergence elaborated on in the concluding section.

explains the emergence of the contemporary water management principles pointing at the changing nature and flexibility of demand, the role of the environmental movement, and economic advantages of non-infrastructural strategies to mitigate water scarcity and pollution. Ohlsson (2000) approaches the interactions between water scarcity and the human response using the metaphor of the 'turning of a screw' for recurring tasks in different stages of water development, i.e. identifying bottlenecks, designing mitigation measures, and dealing with the impacts of these measures. Accordingly, river engineering in the first 'turn' seeks to increase water availability through large scale supply projects. When supply management becomes uneconomic or reaches physical or political water availability limits, demand side management through efficiency increase at the end user level is pursued to alleviate water scarcity. In a third phase, when end-user efficiency still cannot compensate for increasing demand, a re-allocation of water towards the most profitable sectors must be pursued. Usually this implies a shift away from agriculture hence a potentially increased dependency on 'virtual water' imports<sup>3</sup>. In this context it is important to note that water pollution is tightly linked to issues of water quantity, polluted water is not suitable for many uses and therefore decreases water availability. 'Water scarcity' is thus a relative concept and depends on the water management strategy in place. According to Ohlsson's argument, 'social resources scarcity' denominates the inability of a state or community to transform the water utilization system so as to evade water scarcity. Currently, Integrated Water Resources Management IWRM is the widely accepted ideal for water resources development interventions and management. The IWRM framework specifies guidelines for diverse issues such as governance, education, health, disaster prevention, finance and planning. The central pillars of IWRM are the principles of demand management, basin-wide planning, integration of water uses in different sectors and the environment, subsidiarity and stakeholder participation (Global Water Partnership 2006). In addition to the IWRM principles, guidelines and recommendations that influence contemporary water management were produced by a number of international institutions such as the United Nations (1997 Convention on the Law of the Non-navigational Uses of International Watercourses), the World Commission on Dams or the World Water Council, to name but a few. Furthermore, the UN Millennium Development

Goals and 'universal access' programs in 'developing' countries particularly emphasize the poverty alleviation function of water management.

The ambitious targets of IWRM are also a major point of criticism (Biswas 2004; Jeffrey and Geary 2006). The fact that water policies do not fully endorse IWRM principles in western countries either raises the question about the universal applicability of the guidelines and the need for different approaches in the 'developing' and 'developed' regions (Rahaman et al. 2004). Van der Zaag (2002) and Swatuk (2005) emphasize the fundamental challenges to existing power relations that arise with the new institutions proposed by IWRM e.g. for decision-making, cost recovery or conflict resolution. Accordingly, Allan (2003) further stresses the importance to more explicitly acknowledge 'integration', 'water allocation' and 'water management' as political processes. Specific local conditions determine the degree and pattern of adoption of IWRM principles – or 'localization' of the guidelines – and therefore need to be conceptually integrated in water management reform framework (Swatuk 2005; Jeffrey and Geary 2006). Furthermore, Allan (2003) notes that the planning focus on the level of river basins tends to overlook the full potential of global 'virtual water' trade.

Even though many countries have formally adopted an IWRM plan, strategies for water development on the ground continue to diverge. As different 'paradigms' dominate in different basins, many states aspire to reap the benefits of large scale projects despite their potentially harmful impacts. While IWRM is mainly proliferated through national water policies, the framework also has implications on international river management both by changing national water use and by offering guidelines for negotiating states and mediating third parties. The imperative to plan water resources development according to hydrological boundaries calls upon riparian states to cooperate. Priority given to demand management and water quality control potentially decreases the impact of water scarcity and therefore relieves pressure from the question of international water allocation in arid regions. Integration and coordination between water uses in different sectors opens up opportunities for win-win-solutions through the exploitation of comparative advantages of different areas of the basin. The principles of stakeholder participation and institutional capacity building are applicable also on the transboundary level. And finally, IWRM also offers conflict resolution provisions for disputes at different levels.

---

<sup>3</sup> The concept of virtual water is based on the idea that certain productive sectors exhibit higher returns per drop of water than agriculture. It thus is economically desirable to re-allocate water from agriculture to these sectors in water scarce regions, and import food instead of domestically producing it (Allan 2003).

### **Transboundary water management through international regimes**

The field of international regimes in transboundary river basins analyses the factors that determine inter-state cooperation regarding freshwater management. Transboundary regime formation is primarily an issue of bilateral or multilateral negotiations between the riparian states, possibly supported by third parties. In the absence of effective enforcement mechanisms, international water law remains too vague and its application too controversial to offer a blue-print for cooperative river basin regimes (e.g. Benvenisti 1996; Mechlem 2003). Transboundary regimes, understood as all measures and institutions to coordinate national water development and management, relate in their substance to the predominant water management paradigms in a basin. They may therefore focus on different issues, e.g. technical cooperation on infrastructure projects, joint water quality control, or country quotas for the allocation of the water flow.

While most qualitative insights on international regimes were gained from single case studies, Bernauer (2002) reviewed four contributions that in his view particularly furthered the conceptual grounds for understanding the formation of transboundary freshwater regimes (i.e. LeMarquand 1977; Durth 1996; Wolf 1997; Marty 2001). The success of transboundary management depends both on the nature of the transboundary problem and the design features of negotiated agreements or regimes. A “plethora of explanatory variables” (Bernauer 2002) has been identified by regimes scholars to explain or predict the formation of regimes in international river basins. One basic insight is that regime formation is most difficult in clear upstream-downstream cases of all possible constellations, i.e. when externalities of water development in one part of the basin, the upstream, are felt mainly in a geographically distant region, the downstream, but not vice versa (Bernauer 2002). Other scholars find a higher likelihood for negotiated treaties in basins with riparians with countervailing economic and political power, or basins located in the ‘western’ countries (Song and Wittington 2004). Strong economic and political integration between riparian states is assumed to result in specific conditions that foster transboundary cooperation on shared rivers (Durth 1996). Analysts applying game theory (e.g. Barrett 1994) postulate a higher likelihood for the formation of a regime in cases with only few riparians and the existence of possibilities for issues linkages. Compatible notions of equity and fairness, top-level political commitment, the relation of local level interests and governmental policies, the role of information exchange and the existence of transboundary institutions to reduce transaction costs are among the other variables that

have been postulated to influence the likelihood of a transboundary agreement (Bernauer 2002).

With regards to critical ‘design’ features, most authors agree that compensation of the more unwilling party is an essential component of transboundary regimes. Ideally, such compensations can be derived from win-win projects. Compensation and further incentives for cooperation may also be achieved through issue linkages, though there is disagreement among analysts on the usefulness of expanding the range of issues under negotiations (Brunnee and Toope 1997; Bernauer 2002). Other analysts critically discuss the ‘optimal’ scope of cooperation and conclude that maximum cooperation on all possible issues is neither a necessary nor a realistic goal in every basin (Waterbury 1997; Sadoff and Grey 2005). In order to broaden the perceived spectrum of potential gains, Sadoff and Grey (2005) propose to consider benefits that may be achieved to, from, because of and beyond the river. ‘Feasibility’, ‘flexibility’ or ‘openness’ are further design features of international river regimes that are mentioned on the literature (e.g. Milich and Varady 1999; Marty 2001).

As pointed out by Bernauer (2002), indicators for successful basin cooperation that only evaluate the existence of a signed treaty between the riparian states are of limited value. Measures that assess the ability of a regime to furnish the targeted benefits (i.e. ‘problem solving’ qualities) better evaluate success, yet are methodologically more difficult to frame. In practice, obviously, such ‘problem solving’ approaches reach far beyond the diplomatic level of international relations, and relate fundamentally to national water management policies and paradigms. The challenge for diplomats and water professionals is thus to trade off and harmonize benefits from water utilization for all domestic stakeholders through simultaneous domestic water management reform and international cooperation.

### **Water conflicts: water wars and threats to human security**

The narrative of looming ‘water conflicts’ in international river basins surfaced through ‘sensationalist’ (Homer-Dixon 1995) statements by prominent policy makers and scholarly publications on the threat of ‘water wars’ (e.g. Starr 1991). While the storyline of inter-state warfare among co-riparian states attracts most public interest, the discourse among academics and policy makers on ‘water conflict’ has grown far more diverse. The spectrum of reported ‘water conflicts’ includes protests of consumers against private or governmental water suppliers or corporate users, violent clashes between communal water users in arid regions, resistance of local communities against large-scale infrastructure projects, political

disputes between regional states on the allocation of shared water resources and international dispute on quality or quantity issues. Gleick (1993) accounts for different roles of water in violent conflicts other than as being itself the issue of contention, and specifically refers to cases where water acted as a military or political tool, a military target, or was subject to terrorism.

The issue of 'water conflicts' is embedded in a wider discourse on 'environmental conflicts', 'ecoviolence' or 'resources conflicts'. Efforts to develop a theory of 'environmentally induced conflict' have met numerous challenges on the conceptual and methodological level (see Hagmann 2005 for a review). Different types of resources under study, different conceptions of 'scarcity', different geographical scales, and different escalation levels considered blurred the conceptual boundaries of 'environmental conflict' approaches. Early studies focusing on conflicts related to renewable resources concluded that scarcity and/or degradation of natural resources are the major causes of resource disputes (Baechler and Spillmann 1996; Homer-Dixon 1999). Growing demand for a finite and vulnerable resource base, according to a Malthusian logic, will increasingly lead to fierce struggles between user groups. An expansion of the 'resource conflict' discourse to include non-renewable and/or lootable resources such as oil and diamonds led other scholars to postulate other causes and mechanisms of resources conflict related to resource abundance (De Soysa 2000; Gleditsch 2004). In parallel to the conceptual broadening of the concept of 'environmental conflict', the early findings were subjected to greater scientific scrutiny through several comparative large-N studies, the analysis of 'null' cases where resource use did not result in conflict or resulted in cooperation, and by expanding the range of explanatory variables (Hagmann 2005). These conceptual and methodological refinements supported early criticism against the explanatory power of the postulated causal linkages between resources scarcity and conflict.

Concerning the discourse on water conflicts, we can learn from environmental conflict research that linkages between resources utilization and inter-group conflicts are complex and escape simple cause-effect relationships (Salman 2006). While conflicts of interests between water users holding competing claims for finite water resources under conditions of population growth may be unavoidable or even necessary for reform, the likelihood that such conflicts turn harmful or violent is not only a function of the status of water resources. Environmental conflict researchers have described further 'intervening' variables such as the socio-economic and political situation, the existence of religious, ethnical, or cultural fault lines, the existing capacity for conflict transformation as

explanatory variables for the occurrence of violence in 'resources' disputes (Baechler and Spillmann 1996; Homer-Dixon 1999; Gleditsch 2001). Competing uses of water resources are thus often only one among multiple interlinked causes of the so called 'resource' conflicts, and (violent) conflict is but one possible consequence of contested resource use. Rather than directly sparking open conflict, disputed resource management may also result in unsustainable development and destabilization by threatening people's livelihoods and their development opportunities, and possibly as such increase the occurrence of violence indirectly (Homer-Dixon 1999). Potential negative effects of disputes over water resources other than violent conflict can be food shortage, poverty, disease or migration.

Despite the ongoing debate on the role of water resources in local and regional conflicts, early 'environmental conflict' researchers were quick to raise doubts with regard to the 'water war' hypothesis in its generality (Homer-Dixon 1995). Later studies analyzing a large number of shared river basins supported such criticism (Wolf 1998; Tose et al. 2000) and led analysts to conclude that local level violent conflicts over water resources, for instance between pastoralists and farmers in arid regions, are much more likely than inter-state use of force. Hardly ever has an international war been fought primarily for the control of water resources (Wolf 1998). Inter-state "war over water is neither strategically rational, hydrographically effective, nor economically viable" (Wolf 1998). Quite on the contrary, the riparian countries in many shared river basins have concluded agreements on the joint use of the resources, and many of these agreements have proved very resilient even during conflictive periods in the basin (Wolf 1998). While this led analysts to highlight the role of shared river basins as a source of cooperation rather than conflict (Allan 2002; Wolf et al. 2005), less highly escalated disputes in water stressed river basins continue to affect inter-riparian relations and hinder the efficient use of water resources (Wolf et al. 2005; Mason et al. forthcoming 2007). Slow and ineffective water development due to conflict can lead to unnecessary grievance from lack of access to water supply and sanitation, food insecurity, and absence of measures for environmental protection. Scholars analyzing causes for conflict and cooperation in international river basins point at the higher conflict potential in basins with clear upstream-downstream constellations, lack of cooperative international relations and occurrence of rapid physical or political change (Tose et al. 2000; Wolf et al. 2003). The absence of institutional capacity in a basin, i.e. cooperative transboundary regimes, is found to be a main factor increasing the risk of inter-state water conflict (Wolf et al.

2003). Ohlsson's (2000) metaphor of the 'turning of the screw' again provides a helpful illustration of different types of first and second order conflicts related to water utilization. Accordingly, international water conflicts are more likely when riparian states are unable or unwilling to address water scarcity by adapting their water management strategies in the light of potential second order conflict on the national level. Under predominance of the 'hydraulic mission' (first turn of the screw), first order conflicts over quota allocation between basin states are most obvious as all riparian strive to increase their share of a finite resource. Second order conflicts on a local scale may arise when large-scale projects commonly implemented under a supply paradigm lead to forced resettlement or the destruction of livelihoods. Demand management strategies that aim at increasing end user efficiency (second 'turn of the screw') may incite conflicts between the government pursuing water management reform and previously subsidized water users. Efforts to re-allocate water from less to more profitable sectors ('third turn') may necessitate dramatic social restructuring which holds the potential for substantial conflict. International disputes over the allocation of shared water resources can at least partly be explained with the reluctance of riparian states to confront domestic water sector reform and instead try to maximize their water share on the international level.

Despite the fact that little evidence was found so far to support the 'water war' hypothesis, shared water bodies remain a widely cited global security concern. This can be partly explained in the light of a changing conceptualization of 'security' that shifted the focus from inter-state warfare to other water related threats to welfare and stability. After the Cold War, the dominance of state-centered security concepts focusing on military inter-state conflicts was challenged by emerging perspectives emphasizing sub-national violent conflicts on the one hand and socio-economic dimensions of 'security' on the other. In reaction to the observation that people's freedom from threats did not significantly increase with the worldwide decrease of international warfare, approaches focusing on 'security' of individuals rather than the nation state emerged. The concept of 'human security' highlights the mutual interdependence of national security and the individual's freedom from both 'immediate' threats, i.e. violent attempts to physical integrity or other sudden and hurtful disruptions in the patterns of daily life, and chronic threats such as hunger, disease and repression (UNDP 1994). The approach thus conceptually links the issue of development, e.g. of water resources, and security notions (Brunnee and Toope 1997; Dinar 2002). While the 'human security' concept has been criticized for being analytically un-focused

and "a loose synonym for 'bad things that can happen'" (see also Paris 2001; Krause 2004), many water conflict researchers probably endorse the expansion of the analytical focus from 'water wars' to the less spectacular interactions between water utilization, development and security. Their finding that conflictive interests in water resources more often lead to suffering from lack of food security, water borne diseases, environmental degradation, migration and local clashes than casualties in 'water wars' parallels the trend towards 'human security' in the security discourse.

### **Transforming water conflicts**

Another branch of 'water conflict' studies looks at conflict dynamics and negotiation processes. These studies assume that the process of negotiation over resource use determines the outcome regarding cooperation or conflict. Some of them use conflict transformation approaches developed outside the specific field of 'resources conflicts'. Three broad approaches can be distinguished: 1) the Harvard negotiation approach that focuses on interests (i.e. the reasons why actors want something) instead of positions (i.e. what actors want), and seeks to develop mutually acceptable criteria for allocating resources (Fisher et al. 1991), 2) the Human Needs approach argues that all conflicts can be resolved if basic human needs are satisfied (Burton 1990), and 3) the conflict transformation approach gives priority to values, language and the social construction of a conflict, or resource use type (Lederach 2005). Application of these concepts to land and water conflicts are discussed by Baechler et al. (2002), Trondalen (2004) and Mason et al. (forthcoming 2007). Others studies have focused on the role of institutions, national policies and third party interventions (Nakayama 1997; Wolf 1997; Postel and Wolf 2001). Findings from these studies again highlight linkages between the 'water management' and 'water conflict' approaches. The imperative to address the interests and needs of conflict parties inevitable brings up issues of 'water management'. Principles of sound water management, such as joint river planning, equitable provision of appropriate water services or strengthening of demand management both foster confidence building and offer answers to the grievances of water users. Hostile perceptions and seemingly incompatible values driving a conflict can be attached to a particular management paradigm and may thus be transformed in a debate on adequate water management strategies.

### **Conclusions: converging perspectives**

Water professionals striving for effective and efficient water utilization systems and security

agencies committed to avoid human casualties from conflicts have little in common on the first look. Yet the paradigmatic developments in the fields of 'water management' and 'water conflict' have increasingly driven them closer to work on the same topics, in the same regions, and with the same stakeholder groups and third parties. The linkages between the two perspectives can be analyzed according to three different levels: 1) issues and proposed measures, 2) actors and institutions, and 3) spatial focus.

Figure 2 illustrates the expanding range of issues of interest in both the 'water management' and 'water conflict' approaches. 'Water management' strategies as described above have broadened to include provisions for environmental protection, economic efficiency as well as institutions and political processes in the water sector. Addressing social, political and economic relations between stakeholders became a central element of 'water management' on all levels. The 'water conflict' perspective on the other hand evolved from mainly focusing on large-scale water wars to emphasizing local level resource disputes and negative effects of non-violent water use conflicts on the sustainable development in a river basin. Driven by both the observed absence of inter-state water wars and a paradigm shift in the security discourse, this trend led conflict researchers and security agencies to move beyond questions of diplomatic relations on the level of governments to deal more with the water management challenges on the ground. Therefore, beyond aiming solely at targets such as sufficient water supply or the absence of violence, both the 'management' and the 'conflict' approaches have recognized their potential and responsibility to contribute to poverty alleviation, food security, health improvements, and protection of environmental services.

This convergence in term of issues is also mirrored in the emphasis on local level water users as the addressees of water management interventions as well as water conflict transformation. The right

of individual water users to reliable, sufficient and clean water supply and protection from harm from water development projects has a higher priority in contemporary water management policies at least in theory. This trend coincides with the increasing concern for the security of the individual rather than the nation state in parts of the security community. The well-being of individual water users is thus increasingly guiding water management and water conflict transformation approaches alike. At the same time, the range of actors involved in water resources planning and management and water conflict transformation has broadened. National water authorities increasingly share the competences they had monopolized in times of the 'hydraulic mission' both with other government sectors and with non-state actors. Decentralized bodies of water governance and water user associations, NGOs, and the private sector have gained importance in the process of water policy making. National governments are held responsible to ensure that water development is integrated with other sectors, i.e. agriculture, health, environment, industry, and that trade-offs are considered on both the national (comparative advantages in different sectors), basin-wide (comparative advantages in different sub-regions) and global level (virtual water trade). It is evident that the task of fostering 'human security' also exceeds the capabilities of traditional security agencies. Processes to mitigate international water conflicts increasingly include actors from outside the national water and foreign affairs agencies. Both IWRM and human security approaches have in common that they advocate the empowerment and involvement of water user and stakeholder groups in the process of designing water utilization policies and cooperative societal and political frameworks respectively.

Linkages between processes on different geographical levels are increasingly recognized in the efforts to both optimize water management and prevent water conflicts (Mason et al. forthcoming 2007). To avoid negative impact of large-scale supply projects that were commonly planned with national development objectives in mind, solutions for water utilization challenges are increasingly sought at the local (e.g. rainwater harvesting, end user efficiency through pricing), basin-wide (exploiting comparative advantages) and global level (e.g. 'virtual water' trade). The Malthusian hypothesis of states eventually clashing over water resource use has lost ground to a more refined picture of the inter-dependencies between local, national and basin-wide or global aspects of water utilization. As Ohlsson (2000) and Mason et al. (forthcoming 2007) point out, international water disputes may be caused when national level reforms to adapt to water scarcity seem too costly relative to attempts to make allocative gains on the international level. Vice

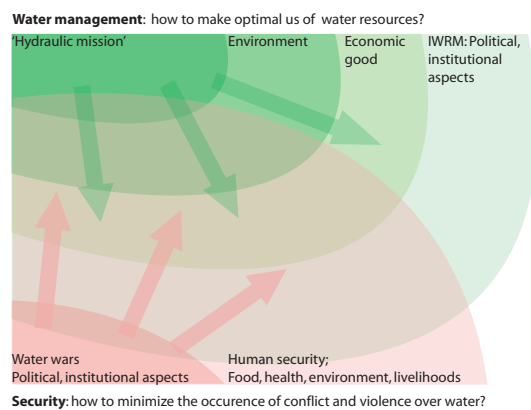


Figure 2: Convergence of 'water management' and 'water conflict' perspectives in terms of issues addressed in analysis and practice

versa, negotiated treaties to appease international tensions may come at the cost of local level conflicts or environmental damage if interests of local water users and environmental concerns are ignored for the sake of international cooperation. Keeping the spatial dimension in mind is thus crucial when designing water policy or trading off interest if water user groups in dispute and institutions for 'water management' and 'water conflict resolution' increasingly pay reference to this imperative.

In summary, the question whether "water management is, by definition, conflict management" (Wolf et al. 2005), or "conflict prevention is in the first place an issue of good water governance" (Böge 2006) is increasingly becoming elusive with the broadening of the notions of 'management', 'governance' and 'conflict'. Conflict management is becoming an integral part of water management tools, and water conflict resolution efforts increasingly endorse the strategies of sound water management. The benefit of looking at water management challenges through the lenses of conflict and security approaches may thus not primarily lie in the prevention or resolution of (unlikely) water wars. Rather than that, the following tangible impacts of the 'water conflict' discourse on the practice of water management can be highlighted: 1) The 'water conflict' narrative has brought the water management challenges onto the agenda of international organizations concerned with security, a wider range of top level national decision-makers, and political science researchers.

This has resulted in increased commitment and international support to establish basin-wide river management regimes that potentially create basin wide benefits to, from, because and beyond the river. Based on the narrative of 'water conflict' transformation, such institutions can serve as vehicles for regional development initiatives that aim to address a range of less spectacular effects of water scarcity than war, i.e. food insecurity, poverty, or migration. 2) Issues of conflictive water utilization and dispute resolution at the local level have received more attention by water policy makers, and conflict resolution provisions have been included in water management guidelines and policies. 3) Tense relations between co-riparian states over the utilization of shared water resources have been addressed with specific conflict transformation tools, such as third party mediation, confidence building, in depth analysis of positions, interest, needs and perceptions. Such interventions are likely to support the process of international regime formation which can be used to manage water resources more efficiently.

The nature of water utilization challenges prohibits a too narrow focus on resolving inter-state 'water conflict' in transboundary river basins. Giving equal weight to improving international relations on the one hand and the water management institutions and practices on the other is imperative. The ongoing establishment of river basin initiatives working on both tracks simultaneously, therefore, is an encouraging development.

---

Samuel Luzi is a Ph.D. researcher at the Center for Security Study of the Swiss Federal Institute of Technology in Zurich. This article was prepared with the support of the Swiss National Centre of Competence in Research North-South (NCCR North-South).

---



## References

- Allan, J. A. (2002). *Hydro-Peace in the Middle East: Why no Water Wars? A Case Study of the Jordan River Basin*. SAIS Review of International Affairs 22 (2): 255-272.
- Allan, J. A. (2003). *Virtual water - the water, food, and trade nexus useful concept or misleading metaphor?* Water International 28 (1): 106-113.
- Allan, T. (2003). *IWRM/IWRMA: a new sanctioned discourse?*, London, SOAS Water Issues Study Group, King's College London.
- Baechler, G. and K. R. Spillmann, Eds. (1996). *Environmental Degradation as a Cause of War*. Chur and Zürich, Rüegger.
- Baechler, G., K. R. Spillmann and M. Suliman (2002). *Transformation of Resource Conflicts: Approach and Instruments*. Bern, Peter Lang.
- Barrett, S. (1994). *Conflict and Cooperation on Managing International Water Resources*. Policy Research Working Paper, Washington D.C., The World Bank.
- Benvenisti, E. (1996). *Collective Action in the Utilization of Shared Freshwater: The Challenges of International Water Resources Law*. The American Journal of International Law 90 (3): 384-415.
- Bernauer, T. (2002). *Explaining success and failure in international river management*. Aquatic Sciences 64: 1-19.
- Biswas, A. K. (2004). *Integrated Water Resources Management: A Reassessment*. Water International 29 (2): 248-256.
- Böge, V. (2006). *Water Governance in Southern Africa – Cooperation and Conflict Prevention in Transboundary Basins*. Bonn International Center for Conversion.
- Brunnee, J. and S. J. Toope (1997). *Environmental Security and Freshwater Resources: Ecosystem Regime Building*. The American Journal of International Law 91 (1): 29-59.
- Burton, J. (1990). *Conflict: Human Needs Theory*. New York, St. Martin's Press.
- De Soysa, I. (2000). *The Resource Curse: Are Civil Wars Driven by Rapacity or Paucity? Greed and Grievance: Economic Agendas in Civil Wars*. M. Berdal and D. M. Malone. Boulder and London, Lynne Rienner.
- Dinar, S. (2002). *Water, Security, Conflict, and Cooperation*. SAIS Review of International Affairs 22 (2): 229-253.
- Durth, R. (1996). *Grenzüberschreitende Umweltprobleme und regionale Integration: Zur politischen Ökonomie von Oberlauf-Unterlauf-Problemen an internationalen Flüssen*. Baden-Baden, Nomos Verlagsgesellschaft.
- Fisher, R., W.L. Ury and B. Patton (1991). *Getting to Yes: Negotiating Agreement Without Giving In*. New York, Penguin.
- Gleditsch, N. P. (2001). *Armed Conflicts and the Environment*. In: Environmental Conflict. P. F. Diehl and N. P. Gleditsch. Boulder, Westview Press: 251-272.
- Gleditsch, N. P. (2004). *Beyond Scarcity vs. Abundance: A Policy Research Agenda for Natural Resources and Conflict. Understanding Environment, Conflict, and Cooperation*. U. N. E. Programme: 16-18.
- Gleick, P. H. (1993). *Water and Conflict – Fresh Water Resources and International Security*. International Security 18 (1): 79-112.
- Gleick, P. H. (1993). *Water in Crisis: A Guide to the World's Fresh Water Resources*. New York etc., Oxford University Press.
- Gleick, P. H. (2000). *The changing Water Paradigm - A Look at Twenty-first Century Water Resources Development*. Water International 25 (1): 127-138.
- Global Water Partnership (2006). *IWRM toolbox*. <http://www.gwptoolbox.org>.
- Hagmann, T. (2005). *Confronting the Concept of Environmentally Induced Conflict*. Peace, Conflict and Development 6 (January 2005).
- Homer-Dixon, T. (1995). *The Myth of Global Water Wars*. November 9, Toronto Globe and Mail.
- Homer-Dixon, T. (1999). *Environment, Scarcity, and Violence*. Chichester, Princeton University Press.
- Jeffrey, P. and M. Geary (2006). *Integrated Water resources management: lost on the road from ambition to realization?* Water Science & Technology 53 (1): 1-8.
- Krause, K. (2004). *The Key to a Powerful Agenda, if Properly Delimited*. Security Dialogue 35 (3): 367-368.
- Lederach, J. P. (2005). *The Moral Imagination – The Art and Soul of Building Peace*. Oxford, Oxford University Press.
- LeMarquand, D. (1977). *International rivers: The politics of cooperation*. Vancouver, University of British Columbia, Westwater Research Centre.
- Marty, F. (2001). *Managing International Rivers: Problems, Politics and Institutions*. Bern, Peter Land AG.
- Mason, S. A., T. Hagmann, C. Bichsel, E. Ludi and Y. Arsano (2007). *Linkages Between Sub-national and International Water Conflicts: the Eastern Nile Basin*. In: Facing Global Environmental Change: Environmental, Human, Energy, Food, Health and Water Security Concepts. H. G. e. a. Brauch. Berlin, Springer-Verlag.

- Mechlem, K. (2003). *Water as a Vehicle for Inter-State Cooperation: A Legal Perspective*. FAO Legal Papers Online #32, FAO Development Law Service.
- Milich, L. and R. G. Varady (1999). *Openness, Sustainability, and Public Participation: New Designs for Transboundary River Basin Institutions*. *Journal of Environment and Development* 8 (3): 258-306.
- Nakayama, M. (1997). *Successes and Failures of International Organizations in Dealing with International Waters*. *Water Resources Development* 13 (3): 367-381.
- Ohlsson, L. (2000). *Water Conflicts and Social Resource Scarcity*. *Phys. Chem. Earth (B)* 25 (3): 213-220.
- Paris, R. (2001). *Human Security - Paradigm Shift or Hot Air?* *International Security* 26 (2): 87-102.
- Postel, S. and A. T. Wolf (2001). *Dehydrating Conflict*. *Foreign Policy* (September/October 2001): 60-67.
- Rahaman, M. M., O. Varis and T. Kajander (2004). *EU water framework directive vs. integrated water resources management: The seven mismatches*. *International Journal of Water Resources Development* 20 (4): 569-579.
- Sadoff, C. W. and D. Grey (2005). *Cooperation on International Rivers*. *Water International* 30 (4): 420-427.
- Salman, S. M. A. (2006). *International Water Disputes: A new breed of Claims, Claimants and Settlement Institutions*. *Water International* 31 (1): 2-11.
- Song, J. and D. Wittington (2004). *Why have some countries on international rivers been successful negotiating treaties? A global perspective*. *Water Resources Research* 40 (5).
- Starr, J. R. (1991). *Water wars*. *Foreign Policy* 82: 17-34.
- Swatuk, L. A. (2005). *Political challenges to implementing IWRM in Southern Africa*. *Physics and Chemistry of the Earth* 30 (11-16): 872-880.
- Toset, H. P. W., N. P. Gleditsch and H. Hegre (2000). *Shared rivers and interstate conflict*. *Political Geography* 19 (8): 971-996.
- Trondalen, J. M. (2004). *Growing controversy over wise international water governance*. *Water Science and Technology* 49 (7): 61-66.
- Turton, A. R. (1999). *Water and conflict in an African context*. *Conflict Trends* 5: 24-27.
- Turton, A. R. and L. Ohlsson (1999). *Water Scarcity and Social Adaptive Capacity: Towards an Understanding of the Social Dynamics of Managing Water Scarcity in Developing Countries*. MEWREW Occasional Paper No. 9, SOAS Water Issues Study Group.
- UNDP (1994). *Human Development Report 1994*. United Nations Development Program.
- Van der Zaag, P., I. M. Seyam and H. H. G. Savenije (2002). *Towards measurable criteria for the equitable sharing of international water resources*. *Water Policy* 4: 19-32.
- Waterbury, J. (1997). *Between unilateralism and comprehensive accords: Modest steps toward cooperation in international river basins*. *Water Resources Development* 13 (3): 279-289.
- WCD (2000). *Dams and Development: A New Framework for Decision-Making*. World Commission on Dams.
- Wolf, A. T. (1997). *International water conflict resolution: Lessons from comparative analysis*. *Water Resources Development* 13 (3): 333-365.
- Wolf, A. T. (1998). *Conflict and cooperation along international waterways*. *Water Policy* 1 (2): 241-265.
- Wolf, A. T., A. Kramer, A. Carius and G. D. Dabelko, Eds. (2005). *Managing Water Conflict and Cooperation. State of the World 2005: Redefining Global Security*. Washington D.C., Worldwatch Institute.
- Wolf, A. T., S. B. Yoffe and M. Giordano (2003). *International waters: identifying basins at risk*. *Water Policy* 5 (1): 29-60.