

Water as a security concern – conflict or cooperation?

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Panel: Reconceptualising Security

This contribution to the panel on reconceptualising security focuses on issues of conflict and cooperation linked to the degradation and depletion of water resources. In order to assess the impact of this evolution on human development, different dimensions and levels of water security are identified. The analysis of inter-group disparities and polarisation induced by water insecurity will then provide a first step to understand not only the conflict but also the cooperation potential linked to water insecurity, especially at the local level. Alternative means for assessing water security in order to facilitate an approach to conflict transformation will be outlined in the conclusion.

1. Introduction

The debates on *reconceptualising security* and integrating non-military threats like factors of human development into its definition have evolved significantly during the past 15 years. Especially since the UNDP adopted the term “Human Security” in 1994, various concepts and perspectives from different professional, cultural and geographical background have enriched the discussions. Environmental and social criteria have found their way into a concept that used to be restricted to the quantity and quality of military equipment. International organisations like NATO¹ and the UN integrate environmental factors into their threat analyses and the control over natural resources (not only petrol and diamonds but increasingly also water) became a strategic goal of national security policies. Within these debates, the status of freshwater resources is a recurring issue and we are already getting used to the regular alarming environmental reports on their further depletion and degradation. The important role this element plays as a key factor of human development at the household as well as at a wider political and economic level explains its strategic value. At the same time, water resources lie at the heart of many processes of the ecosystem and are therefore particularly vulnerable to environmental degradation (Falkenmark and Lindh 1993; UN 2003; UNESCO 2003). The increasing demand, combined with a diminishing supply of freshwater resources, justifies particular attention to this element within the debates on environmental security.

After the prevalence of scenarios on coming “water wars” (Starr 1991) it has, at least within the scientific community, been generally recognised that water resources become a security issue today mainly at the intrastate level and do not frequently lead to violence between states (Falkenmark and Lindh 1993; Wolf, Shira et al. 2003; Dabelko, Carius et al. 2004). At the national or local level, environmental change can, in combination with other factors, exacerbate existing rivalries and trigger violent conflict by sharpening distinctions among groups (Bächler 1994; Bächler 1996; Biermann, Petschel-Held et al. 1998; Homer-Dixon 1999).

A general critique of the research on environmental security argues that the study of environmental issues leading to cooperation as well as the analysis of local conflict management strategies have been neglected (Diehl and Gleditsch 2001). Although empirical

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¹ Cf. the reports of the NATO- Committee on the Challenges of Modern Society

studies conducted since - especially those undertaken by the Swiss Peace research group² - contributed to tackle this problem, this critique remains true for a large number of issues related to water security.

The basic aim of this paper is not to simply be one more statement of fact, but to identify exemplarily the impact the current evolution of water security has on the socio-political stability at the local level of a society due to exacerbating disparities or by encouraging constructive conflict transformation. For this purpose, we will identify (i) various dimensions of water security and (ii) the impact these evolutions can have on inter-group conflict and cooperation at different levels of a society. These analyses will help to identify potential root causes and underlying structural patterns of conflicts related to water security. The third step will then consist in combining specific qualitative factors of conflict and cooperation processes in order to better understand the dynamics of this evolution and its institutional links. The overall approach will then facilitate building a framework for a process of conflict transformation and constructive change. “Conflict” is understood here as a ‘modulator’ of change and not merely as the outcome of a process. This should help us to conceive not only the conflict potential linked to water scarcity but at the same time a conceptualisation of security issues as catalysts of innovative change.

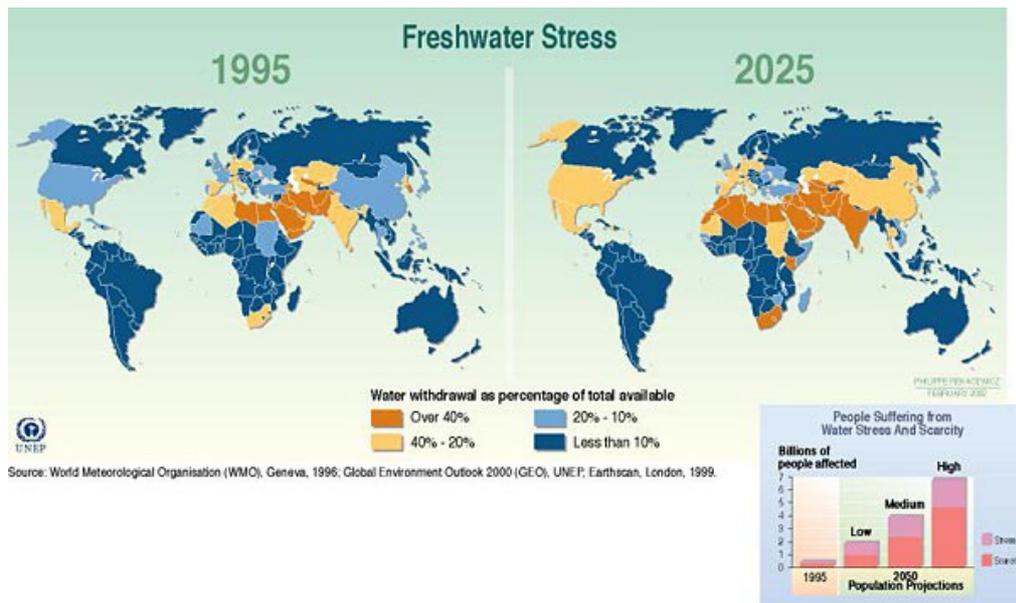
2. How freshwater resources can become security issues: Implications of (i) various dimensions on (ii) inter-group conflict and cooperation

(i) Dimensions of water security

Many of the factors relevant for human wellbeing and development are directly or indirectly linked to freshwater resources. The intersection of these factors shows that the significance of water scarcity is even multiplied by these interdependent evolutions and that the depletion and degradation of the resource has therefore far-reaching consequences. We distinguish here between different *dimensions* such as the demographic and the urban, the sanitary, the agricultural and the climatic one. This list of dimensions of water security is certainly not exhaustive. Its aim is to point to examples of how freshwater resources already have an important impact on human development and how such a categorisation can help to the understanding of structural roots of antagonistic interests related to water security. Thereby sustainable approaches in dealing with these structural causes of conflicts and cooperation can be developed

The map below visualises the recent status of freshwater withdrawal (in percentage of the total available) and the evolution of the situation in 20 years.

² Bächler, G., Ed. (2002). Transformation of Resource Conflicts: Approaches and Instruments. Bern.



If we compare this map to an overview of the world’s poorest nations, we see that these

- “ (i) are located where water is scarce for part of the year,
- (ii) experience intermittent drought years and
- (iii) experience a high evaporative demand, which prevents much rainfall from being used in human activities since most of it returns to the atmosphere.” (Falkenmark and Lindh 1993)

The effects of natural and anthropogenic climate change will further restrain the availability of water in these regions, for example, due to an increased evaporation of water caused by higher temperatures. Overall 10 to 30% less water will be available due to such processes. (IPCC 2001) Desertification, soil erosion and salinisation are other consequences characterising this *climatic dimension*.

Additionally, many of the world's poorest regions are also the ones where demographic growth and urbanisation rates are highest (*demographic and urban dimensions*).³ In the rapidly growing urban but also in the rural areas the low percentage of safe water access and wastewater treatment, combined with poor household and community sanitary conditions, is a major contributor to disease and malnutrition, particularly among children (*sanitary dimension*). One billion people do not have access to clean drinking water, and 1.7 billion have inadequate sanitation facilities.

Most of the countries where the situation of freshwater is critical today or expected to be critical within the next 20 years belong to the developing world. Their GDP and employment rates are highly dependent on agricultural production and therefore highly sensitive to climatic change.⁴ What we call here the *agricultural dimension* of water security is therefore often a delicate political topic. Agricultural production has been considerably increased in recent years through investment in large-scale irrigation projects. Up to 90% of the total water consumption is spent for agriculture in many developing countries, while this proportion has decreased to an average of 30% in the industrialised world (see map below). Still, many countries had to restrain from their strategic goal of self-sufficiency in food production.

³ For the case of the Northern African region we can see that the population has doubled within the last 30 years and is still growing at an average rate of 2%. 64% of this population already live in cities; their part will increase to 70% according to the estimations of UNEP. UNEP (2003). Availability of Freshwater in Northern Africa, UNEP/ Africa Environment Outlook. **2003**.

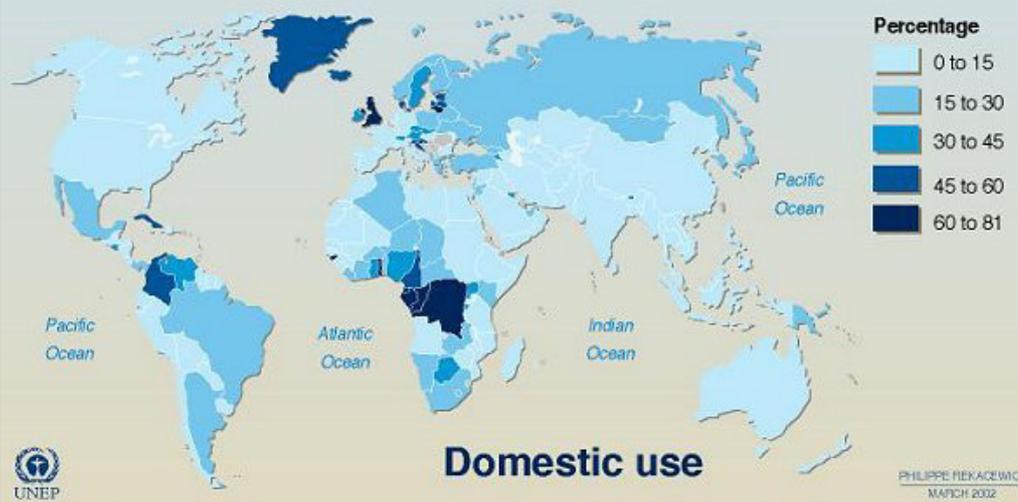
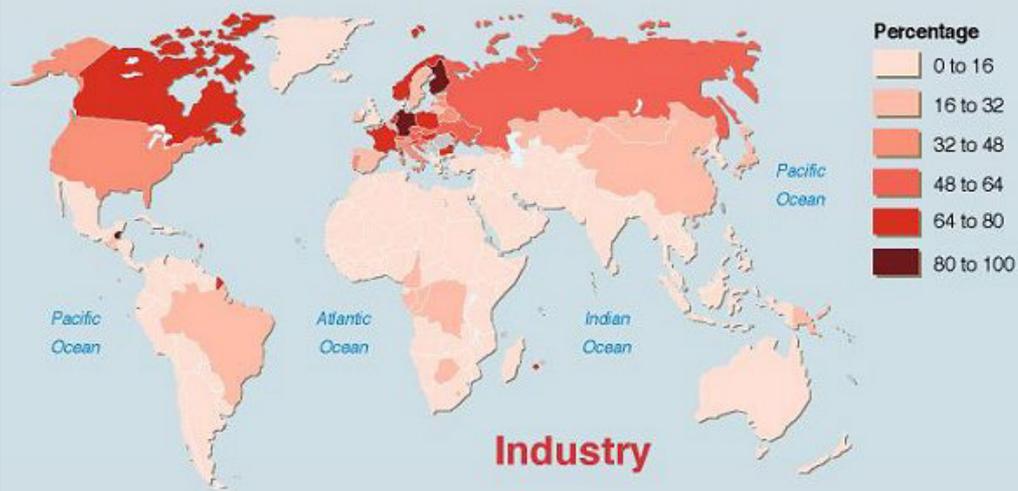
⁴ Between 20 and 45 % of the total employment in agriculture for the region of North Africa for example, according to IPCC

It appears that the agricultural dimension of water security is one where the linkages between the evolution of the resource and the resulting socio-political consequences are very clear. Uncoordinated decision-making and divergent competences and interests of the key actors responsible for issues of water management and conservation often lead to competing claims of different sectors. The relevance of these implications for domestic security issues is reflected by the fact that in many countries the ministry of the interior possesses the largest competence regarding water issues.

The dimensions of water security mentioned here analyse some of the possible structural causes of related conflicts. Nevertheless, these are always triggered by various other factors. It has been confirmed that economic and social variables tend to have a much larger impact on the conflictive evolution of water related disputes than environmental variables⁵ (de Soysa 2000). In the case of freshwater resources, the key role of this element for human development explains the strong links between questions of access to and distribution of water and a large number of policy fields and social relationships. This is what causes the complexity of conflicts over water resources. But this is also the reason issues related to freshwater can trigger constructive change in other sectors, not directly affected by water security. In order to address the numerous factors related to the escalation or the cooperative resolution of water resource conflicts, indicators of water security and, finally, tools for preventing such conflicts, have to be developed accordingly.

⁵ See also, for example, the projects Ecoman and Econile by the Swiss Peace Foundation

Freshwater Withdrawal by Sector in 2000



Source: *World Resources 2000-2001, People and Ecosystems: The Fraying Web of Life*, World Resources Institute (WRI), Washington DC, 2000.

(ii) Implications of these dimensions on inter-group conflict and cooperation

The table developed here (see appendix) indicates schematically how different dimensions of water security can have an impact on the socio-political, economic and ecologic development of a region or a country. The levels of a society affected by these evolutions range from the very local one (household and village/town) to the regional and national one. The international level is concerned either as a consequence of increasing pressure within a state or because of an external link (such as in the case of up- and downstream water users).

Most of these dimensions of water security are linked to the economic and social structures of the respective society. Water insecurity can therefore have direct impacts, like the monopolisation of water access and management, or indirect effects on the employment structure etc. Potential disparities or imbalances that might result from such an evolution at the different levels can help to identify potential rivalries and polarisation between groups. Nevertheless, only a careful analysis of the specific case, i.e., the stakeholder groups concerned with water security, their power relations, interests and needs, the existing or potential coalitions etc. can assess the conflict potential of this evolution. Schematically, we can distinguish the following lines between affected groups:

- a) *Geographical line* (natural and anthropogenic imbalance, so far mostly referred to as an international issue but increasingly important within countries, example: coastal regions versus mountains or desert, coastal zones with high quote of tourism versus agriculture in the hinterlands)
- b) *Intersectoral line* (international level: shown by market of virtual water and import of cereals as in Egypt; national level: mainly agricultural use versus urban or domestic/industrial use)
- c) *Intrasectoral line* (big versus small farmers, agricultural production for export versus for local needs)
- d) *Intergroup line* (according to geographical, political, cultural or other lines)
- e) *Intragroup line* (smallest level of analysis, ex: preferences for allocation for certain uses of water or to certain persons within the same community or household).

The possible disparities or alliances schematized in the table (referring only to the national and local level) may seem artificial as in reality many of these identity-forming characteristics are mixed. A small farmer could well feel discriminated by the water allocation of his landlord and therefore be involved in an opposition of groups within the same sector. But, at the same time, this farmer can become much more irritated about the priorities of political decision-makers to allocate water used for agriculture to a newly constructed hotel complex in his neighbourhood and thus be affected by an intersectoral dispute. To put it even in more complex terms: the political decision-makers as well as the owner of the hotel complex might belong to an ethnic minority that has been exploiting small farmers for a long time... Still, the differentiation between these various affiliations and their immaterial but often decisive patterns of behaviour and perceptions help us to understand the underlying interests and needs of the concerned stakeholders as well as the resources they mobilise to defend them.

What is important here in a perspective of *conflict transformation* is to understand these linkages and to observe their dynamics of cooperation and conflict in order to identify the appropriate moment and means for supporting a process of constructive change. The above mentioned lines are therefore not only dividing lines, but can also be useful for defining common interest and potential allies.

3. Alternative means for assessing water security: an approach to conflict transformation

Quantitative issues

Considering the above-mentioned possible implications of water insecurity on socio-political stability, it appears that most of the existing statistics referring to water resources are somehow too limited to assess these issues. As in many other disciplines, integrating simultaneously quantitative and qualitative factors into an analysis is a challenge. A key problem seems to be that different forms of water scarcity exist and that the implications they have on human development depend on a whole set of institutional, social, economic and ecological factors. Many of the existing water resource indexes focus on its quantity and – except statistics about access to safe drinking water – seldom reflect its quality. Reliable data on regional disparities, be it within a country or for a specific local area, mostly exist only for some key locations. Furthermore, the simple data on the availability of freshwater do not provide much information about its practical exploitation and about the use people make of it. This has been considered at the national level where statistical data on consumption per sector exist, but such distinctions are less developed at a lower level: distribution within the same sector, for example, between state-owned and privatised allocation, disparities between and within different user groups or even concerning different priorities at the household level.

Qualitative issues

The interdependency between evolutions in the natural and the social system as well as the complexity of resulting socio-economic consequences have been widely acknowledged (Biermann, Petschel-Held et al. 1998; Carius, Bächler et al. 1999). Recently developed indicators of environmental and human security are already much more complete in this regard than datasets previously available, which usually neglected ecological and developmental factors. The well-known *Human Development Index* published by the UN is such an example and others, specifically dedicated to human security, have also been developed.⁶ Furthermore, the conflict potential linked to environmental issues has been studied through different frameworks based on the hypothesis of a possible adaptive capacity of the concerned societies (Homer-Dixon 1995; Lonergan 1999; Turton 1999; de Soysa 2000; Lundqvist, Falkenmark et al. 2000; Ohlsson 2000; Mc Donald 2002; Richards 2002).

A recently developed intersection of data that seems to be specifically useful regarding water security is the *Water Poverty Index* (Lawrence, Meigh et al. 2002). It assesses water availability and access adjusted according to socio-economic and environmental factors and permits integration of progress towards sustainable water provision. But still few indexes exist that reflect the above-mentioned implications of water insecurity and the *qualitative evolution* relevant for conflict and cooperation potential. The interdependent evolution of the ecological

⁶ See the *The Index of Human Security Risk* developed by David Carment and colleagues at Carleton University, based on a country's number of resource/territorial disputes, armed forces per 1000 individuals in the population, and military expenditures as a share of GDP, <http://www.carleton.ca/~dcarment/presents/cifp/sld036.htm>, the *Index of Human Insecurity* developed by Steve Lonergan and Kent Gustavson at the University of Victoria with emphasis on environmental security (<http://office.geog.uvic.ca/dept/faculty/lonergan/>). See also the *Niger Human Development Index 1999* which investigates the impact of Niger's difficult environment on levels of human development. For example, the report attempts to identify the link between desertification, food security and environmental degradation and human development indicators such as childhood malnutrition, access to drinking water and life expectancy.

and the social system are partly taken into account in the assessment of environmental change.⁷ But how are these linked to the dynamics of cooperation and conflict? Similarly, as has been developed for early warning systems like FAST, PIOOM or FEWER, a qualitative assessment of the relationships at a micro and a mesolevel would be useful. Such local analyses would include the perception of social cleavages, cultural perceptions of water related issues, interests and needs of leadership members, conflictive subjects etc.

The table below illustrates some of these factors that could be assessed through qualitative research at a local level.

Water security: Qualitative factors of conflict and cooperation potential in an approach to conflict transformation
<p>a) Existing marginalization of groups regarding:</p> <ul style="list-style-type: none"> - Power and access to decision-making processes (incl. influence of discourses and lobbies) - Ethnic/cultural/religious identity - Consequences of economic structure - Language <p>b) History of the conflict: traditional alliances, grievance, conflict resolution mechanisms etc. also including the perception of external parties</p> <p>c) Legitimacy of the ruling leaders at the different levels</p> <p>d) Relationships and underlying interests, fears, needs and power structures</p> <p>e) Structures and quality of communication between and within groups</p> <p>f) Existing formal and informal means of conflict resolution and their acceptance</p> <p>g) Cognitive patterns: perceptions of security issues and of social relationships</p> <p>h) Cultural perception of water and related issues, traditional water use and allocation patterns (preferences according to purposes and persons, gender issues)</p>

Local information networks and fact-finding missions could help to obtain a larger understanding of regional vulnerability. Experience from studies on state failure (Carment 2003) could be combined with the above-mentioned criteria in order to assess institutional frameworks and governance issues but without neglecting aspects linked to the relationships between people. Suggestions in this directions have been made (Carius and Lietzmann 1999) and partly integrated into empirical research (Bächler 2002). But these approaches could be further developed regarding the inclusion of local perceptions, norms and values, because these are, at the end of the day, motivating the actor's behaviour of conflict or cooperation.

Time horizons

Many of the existing datasets on conflicts concentrate on episodic analysis the moment a conflict erupts and do not consider the historical dimensions and a possible future constructive evolution of the situation (Reuveny and Maxwell 2001). The escalation of violence is though always one step of a whole process that began before and that will continue after the immediate stop of fights. Not only event data should therefore be considered but the evolution of processes, including changes in cooperation, interaction, communication and attitudes of

⁷ See for example the "syndrom concept" in WBGU (1996). Welt im Wandel - Herausforderung für die deutsche Wissenschaft. Zusammenfassung für Entscheidungsträger. Bremerhaven, Wissenschaftlicher Beirat der Bundesregierung Globale Umweltveränderungen.

the potential confronting or cooperating groups. Another partly neglected issue in environmental conflict analysis concerns secondary conflicts arising from adaptive measures taken by the respective authority. Measures for increasing water supply, like dam-building, have often caused severe and long lasting conflicts and measures for adjusting demand management can be an even more sensitive topic, as the debates over privatisation and water pricing show. For a conflict preventive policy in the management of water insecurity, potential consequences of the implementation of adaptive measures have therefore to be assessed as far as possible. For these reasons, a framework for the assessment of conflict and cooperation potential of water security should also be based on a larger time horizon.

Taking the experience and knowledge acquired with respect to conflict transformation into account (Lederach 1995; Ropers 1995; Reyhler and Paffenholz 2000), an approach integrating the above-mentioned criteria would help to a concreter understanding of the dynamics of water security. As we have argued above, such a wider perspective is necessary for the identification of windows of opportunities for supporting common interests and possible coalitions for constructive change.

Appendix: Possible implications of the degradation and depletion of water resources
 exemplary representation, non-exhaustive model referring to the domestic level

Level of water (in)security	Dimension	Possible implications linked to this dimension	Concerned interest groups: possible disparities or alliances
National and local	Agricultural and industrial dimensions (incl. tourism)	Economy and social welfare: food security, employment in rural areas, prices of basic goods, privatisation of water allocation, energy (hydropower) Migration to other states or towards urban areas Depletion of groundwater resources and implications (salinisation, erosion, pollution...)	<u>Inter-sectoral</u> (ex: industrial versus agricultural) <u>Intra-sectoral</u> (big landlords versus small farmers) <u>Inter-group</u> (according to geographical imbalances like rivalry between urban and rural users, or to ethnic, religious or other divisions)
	Demographic dimension	Insufficiency of water allocation systems and wastewater management Migration Overexploitation of soils Pollution	Inter-sectoral Intra-sectoral Inter-group
	Climatic dimension	Increase in natural disasters (mainly drought and floods) Desertification, deforestation Impact on biological diversity (incl. decline of fish stocks) and overall impact on agricultural production (see agricultural dimension)	Mainly following geographical lines of affected areas (water basins, regions of arable land, flooded areas or coastal zones...)
Household	Sanitary dimension	Drinking water, healthcare, hygiene, malnutrition	Mainly <u>household level</u> (priorities according to purposes and persons), but also possible imbalances between <u>geographical areas</u> : slums versus city centre, rural versus urban area

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