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Exploring the Links between Environmental Security and Governance

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1. Introduction

Environmental change has proven to have a significant impact on human security issues. Phenomena like extreme weather events linked to climate change, increasing resource scarcity caused by high demand and diminishing supply, and environmental pollution are key factors threatening humans' development and physical security. The definition of *environmental security* has been the object of vast debate (Biermann, Petschel-Held et al. 1998; Brock 1998; Diehl and Gleditsch 2001; Dalby 2004). For a better understanding of these issues in the context of the present study, we propose some working definitions on environmental security and the human capacity to adapt to this phenomenon.

We define **environmental security** as the balance between the status of an ecosystem and its function for human social, economic and ecologic stability.

According to this definition, environmental pollution or degradation *as such* does not affect environmental security, as long as it does not have a direct or indirect impact on **socio-political stability**. This concept refers to the results of various research projects on environmental security that have identified possible causal links between the degradation of the environment and violent conflicts on the international, regional or local level (Homer-Dixon 1991; Bächler 1994; Homer-Dixon 1999; Bächler 2002). Nevertheless, empirical evidence showed that the physical degradation of nature was not as relevant for the evolution of the situation toward conflict as were economic, social and political factors (de Soysa 2002; Matthew, Brklacich et al. 2003). The focus of research on violent conflicts in regions affected by environmental change was thus much too narrow for a comprehensive understanding of the complex interactions between society and nature sometimes leading to conflict.

In this regard, the environmental security research community identified different **gaps of research** like successful conflict avoidance and mitigation (Carius and Lietzmann 1999; Diehl and Gleditsch 2001; Mc Donald and Gaulin 2002) or the potential benefic effects of conflict as an agent of change (Matthew, Brklacich et al. 2003). Furthermore, physical and social vulnerability appeared to differ significantly from one region to another and even complex models of interaction of these various factors, like the *Syndrome Concept* (WBGU 1996) did not seem to allow a unique concept to seize conflict potential linked to environmental change. Nevertheless, there was a consensus over the potentially destabilizing effect of failed adaptation to these changes.

These findings point to the relevance of **adaptive capacities** to environmental change and to the conflict potential induced by it. As a working definition, we propose to define adaptive capacity not only as the political and technical ability to balance water demand and supply,

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but rather as a broader notion including related social and economic issues. This notion also permits us to integrate a deliberately normative factor of “social cohesion,” referring to the function of adaptive capacity to mitigate the conflict-generating effects of water scarcity.

As the above-mentioned definitions indicate, this paper raises the issue of **governance as a key factor of environmental security**. This focus allows us to seize on the effective impact environmental change has on social cohesion of a given population group, and takes into account the physical evolution of a resource in relation to certain social and political functions and needs. Taking the example of water scarcity, these interdependencies are illustrated for the national and the local level. The strategic value of water resources as well as their physical characteristics render them prone to disagreement over their use. Water resources are therefore an interesting object for the analysis of interdependencies between environmental degradation, political priorities, and social unrest.

2. Adaptive capacity in the context of environmental conflict potential

2.1 Modeling adaptation to water scarcity

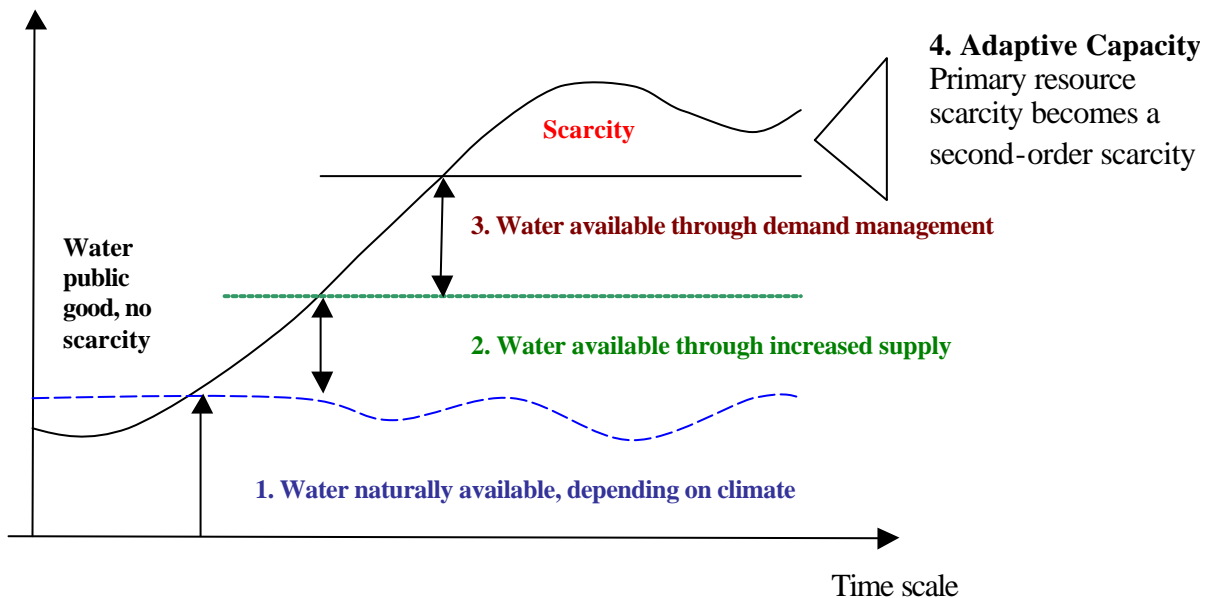
Water resources are a key factor of human development and at the same time are increasingly threatened by the impact of climate change, diminishing supply, and sharply rising demand for agricultural, industrial, and domestic use. Arid and semi-arid countries often already suffer from large geographical and seasonal disparities in rainfall and water availability, which are even more pronounced by the effects of climate change and high water demands.

In Northern Africa as in other water-scarce regions, water policies since the late 1950s consisted in increasing water supply through important dam constructions and, later, the mobilization of groundwater resources. Population growth, the expansion of irrigated land, the aim of self-sufficiency in food production, but increasingly also the development of (golf) tourism in arid regions contribute to further increasing demand. Even huge investments to increase the supply such as the biggest dams of the African continent in Egypt or Morocco did not succeed in providing a water supply adequate to the demand.

But in most countries governments are hesitant to enforce effective demand management because of the political sensitivity of these measures. Water pricing in agriculture, the privatization of domestic water supply or the payment for water pollution, for instance, have led to social conflict in different countries. We argue that this sensitivity of adaptive measures to water scarcity is mainly caused by the political, social and economic functions of water allocation.

The model below illustrates the different phases of these evolutions of water management:

Evolution of water consumption



Model adapted from : (Ohlsson 2000)

In the first phase, water can be considered as a public good without restrictions to its access. Once demand is higher than the ‘naturally available’ supply, governments take supply increasing measures like dam-building or the exploitation of groundwater resources. The third phase requires the implementation of demand management, which refers to water economy in irrigation, domestic and industrial use. It is essentially the fourth phase, where only adaptive capacities beyond supply and demand management can contribute to balance, which been the object of debate in environmental and water security. In this phase “... *water scarcity is transformed from an absolute constraint into a strong driving force for societal and economic structural change*” (Ohlsson 2000).

Ohlsson refers to it as the phase of “adaptive capacity” (Ohlsson 1999), Homer-Dixon as “ingenuity gap” (Homer-Dixon and Barbier 1996) and Abrams as “capacity threshold” (Abrams 2003). Turton points to the relevance of a government’s legitimacy for the non-conflictive implementation of adaptive measures (Turton 1999). Homer-Dixon identifies four restrictions to “ingenuity”: market failure, social friction, (human and financial) capital availability and constraints on science (Homer-Dixon 1995). All refer to a mix of technical, human and financial capacities combined with political will and the social support of the population to implement the measures.

Keeping in mind the above mentioned definition of environmental security as a threat to social and political cohesion, we argue that **adaptive capacity depends on the social and economic functions of water**, and only if these are compensated by other means can adaptation be successful, i.e. socially sustainable. This argument will be developed using examples of case studies in Morocco.

2.2 Adaptation as a matter of governance: Empirical evidence from case studies in Morocco¹

In Morocco, the first phase of mobilization of water supply goes back to the time of the French *protectorat*, when key regions for agricultural production were equipped with irrigation supply, mainly for the French colonists and their local allies. After the independence of the country, this policy was maintained for achieving self-sufficiency in food production and supplying energy to the growing industrial sector. Especially in rural areas, the royal dynasty's power was built upon alliances with local elites who were rewarded for their loyalty through the allocation of arable land and prioritized access to water supply (Leveau 1985; Sedjari 1991; Hammoudi 1997). Already in this phase of supply management, water policy came to be much more than the mere allocation of the resource, but an instrument of establishing and maintaining power relations and legitimacy. Whenever the Monarchy's legitimacy was weakened in phases of economic decline, severe droughts and losses in agricultural production, and increased economic and social disparities (Desrues and Moyano 2001; Abrams 2003; Gandolfi 2003), this function of water and land allocation reinforced strategic alliances.

From 1974 on, several dams were built every year and today a total of 90 dams contributes to the irrigation of 1 150 00 hectares of land (Bzioui 2004). Nevertheless, the country is still highly dependent on food imports and has to face extreme droughts when even drinking water supply is not always satisfied, like in summer 2005 (Bentak 2005). While 2560 m³/person/year of freshwater were available in 1960, Morocco faces 900 m³/person/year today and this number is expected to fall under 500m³/ person/year in 2020. These figures do not take into account the large regional and seasonal variability, nor unequal allocation due to political priorities. Since the 1990s, water policy began to be more oriented towards demand management. The agricultural sector is responsible for 88% of the total water consumption, but up to 50% is lost due to irrigation inefficiencies and aging infrastructure.

How are these figures related to environmental security and governance? In Morocco, the agricultural sector, which was the first to be tackled by a policy of demand management, represents 15% of the total domestic product and employs 47% of the active population (EU 2003). The farmers can be divided into two groups: one are the private entrepreneurs, who secure access to irrigation water through investment in drip-irrigation and private wells and who often produce mostly lucrative but water-intensive goods for export. The other group, representing the large majority, is mostly illiterate farmers cultivating relatively small areas of land often without financial means to secure water supply through private wells, and mostly producing for the local or domestic market. Evidently, restrictions in irrigation water supply does not affect these two groups in the same way, because in the first case the coping capacities are much higher.

The link between environmental security and governance is, in the case of the handling of water scarcity in Morocco, rooted in the first phase of water mobilization. But as the resource is not yet scarce at this moment, the impact of unequal supply does not often affect social cohesion. In Morocco, the first allocation strategies prioritized certain population groups who thus given better conditions of production were able to accumulate a certain financial and social capital to reinforce their relative power position. In the present phase of water management, where only adaptive capacity can help bridging the gap between water supply and demand, these assets tend to widen the gap between their adaptive capacities and those of

¹ The author thanks the SIRMA project *Water Economy in Irrigated Systems of North Africa* for its financial support and the Ecole Nationale d'Agriculture de Meknès for its cooperation. All references below concerning observations in Morocco are, if not mentioned else, based on empirical studies by the author conducted in Autumn 2004 and Spring 2005 in the country.

smaller farmers. These disparities sometimes coincide with other patterns of inequality, like political participation, the level of education, or access to financial support by the state. Adaptation to water scarcity can thus contribute to polarization between population groups by enforcing existing disparities, even more if these follow ethnic, tribal or other symbolically sensitive lines.

On the other hand, research proves that adaptive strategies can also emanate from **collective action**: where farmers mobilize communities to build a common well or to invest in common irrigation systems, they are able to palliate the effects of their relative deprivation (Le Goulven, Sami; et al. 2005). In an ongoing research on these adaptive capacities and the handling of potential conflict linked to water scarcity, we are studying several strategies on the local level. The results so far point to the fact that water scarcity does not necessarily lead to conflict if capacities for mitigation and cooperation can be mobilized. Individuals, households, and communities use their natural, financial, social, and physical capital to cope with vulnerability through strategies to protect their livelihood. Nevertheless, these approaches on the local level are often not sustainable if not embedded into regional or national policies.

A few more results of the studies in Morocco referring to the conflict potential of water scarcity and adaptive capacities might be mentioned:

- ?? Water allocation reflects more general power relations – therefore a change in these policies is often highly sensitive.
- ?? Property rights, practices of land allocation, water management rules, and the social capital of population groups are key linkages between governance and resource management.
- ?? Informal networks, norms, and values are often much more important for water management options and coping strategies than the implementation of formal policies.
- ?? The latter also refers to conflict management strategies: where formal institutions fail or do not exist, informal ties and authorities are often able to establish contacts and negotiate agreements.
- ?? Innovative social dynamics at the *local level* can induce efficient adaptation processes, because they can adequately reform institutions to solve collective action problems.
- ?? Conflict potential over water management issues can be a window of opportunity for transforming the socio-political power relations (as observed in the case of the empowerment of user groups (Mathieu, Benali et al. 2001).
- ?? The private sector is an often neglected actor in environmental security studies. In Morocco, it plays an important role in cases of monopolization of water supply (for tourism or irrigation), but also in providing alternative employment opportunities for farmers suffering from water scarcity. Drinking-water supply is another sector where the role of the private sector – and its influence on conflict or cooperation- becomes of crucial importance.

3. Conclusion

The empirical work on conflict potential related to water scarcity has shown that environmental security studies need research on factors of conflict avoidance, mitigation strategies, and cooperative approaches. Adaptive capacity does exist at the macro as well as at the micro level, but these different coping strategies are seldom related to each other².

² This is especially true for water management, as the formal competences and responsibilities are often extremely spread.

Empirical evidence also reveals the great importance of social and political networks, alliances and norms which determine the different actors' behaviour. These factors influence cooperative or conflictive strategies and shape adaptive capacities. The **socio-political setting** where polarizations take place and where cooperation opportunities may be seized should therefore be integrated in any analysis of environmental conflict.

These observations show that environmental degradation can have an impact on security, but the linkages can only be analyzed in context within the specific socio-political framework. The same logic prevails for the development of coping strategies: only if these links between governance, disparities and conflict potential are addressed to a similar degree as the natural phenomenon as such can conflict-avoiding adaptation policies be developed. In this regard, study on environmental security can benefit from other research in development studies, in water management including participative approaches but also in security studies, particularly in concepts of human security and conflict transformation.

Adaptation can thus be understood as a process whereby the government maintains or gains legitimacy through the socially and ecologically efficient dealing with resource scarcity. The issue at stake is then not only the management of a crisis situation, but may also be considered as a window of opportunity for enhancing social cohesion and distributive justice.

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