WORLD IN TRANSITION - THE INTERFACE BETWEEN CLIMATE CHANGE, WATER CONFLICTS AND HUMAN SECURITY: ISSUES AND INTRICACIES

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Abstract:

The Mediterranean region is a climate change "hot spot" – an area that scientists say will experience strong climatic changes. Climate change projections show that it can expect decreases in precipitation of up to 30% and increases in temperature exceeding 4 -5 °C. Climate change in the region is, however, not only an environmental issue. It raises concerns regarding human security and the possibility of future conflicts over water in the region, if no appropriate counter measures are taken. This research paper describes some of the socio-political impacts of climate change and gives two good examples of policy responses from waters user associations in Egypt and a Turkish agricultural insurance scheme.

Egypt is a water scarce country. It depends heavily on Nile water for agricultural irrigation. Climate change is expected to exacerbate water scarcity, through a mixture of factors such as changes in precipitation patterns, sea-level rise and increased demand resulting from increased average temperatures.

Turkey is a country where an estimated 30% of the labor force is employed in the agricultural sector with a declining tendency. Climate change is expected to lead to an overall decrease in precipitation and an overall increase in mean temperatures, making water a scarcer resource overall. Farmers are considered the most vulnerable group to climate change in Turkey. Even today, there is evidence of farmers migrating to cities once they cannot secure their livelihood from agriculture anymore. Thus, climate change is an issue impinging on human security in Turkey. After the introduction of the scheme, the number of insurances has considerably increased. One drawback of the current scheme is that so far the insurance does not cover drought, quite a significant gap when considering the likely future impact of climate change.

Key words: Global climate change, Ecological conflicts, security, policies, programmes.

Introduction:

Water is a fragile natural resource, and yet reliable access to water is a key factor for social and economic development in Mediterranean countries. The region is undergoing rapid social and

environmental changes and all indicators point to an increase in environmental and water scarcity problems with negative implications towards current and future sustainability. Recent changes in agricultural land use and irrigation, tourism development, demography and lifestyle, and trade stress water resources with recurrent and increased frequency. These social pressures on water resources highlight the challenge of managing water resources in a sustainable way. Pressures and impacts of water scarcity often result in conflicts and with an apparent lack of policy response towards sustainable management, due to the complex institutional organization (Garrote et al., 2005; Iglesias et al., 2005a; Iglesias and Moneo, 2005; Garrido and Llamas, 2005).

Groundwater resources stand out as an attractive, reliable, and easily accessible source of water to millions of farmers and thousands of cities. Increasing access to groundwater plays a key role in alleviating poverty, stabilising populations and reducing the need for farmers to migrate when drought threatens agricultural livelihoods (Moench et al., 2003). Nevertheless, daunting management problems threaten the conservation of numerous aquifer units throughout the region.

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Climate Change and its impacts on human security and conflict:

The UN defines human security as a situation where the social, political, environmental and economic conditions conducive to a life in freedom and dignity are present. Human security is multi-faceted, including freedom from diseases, hunger, unemployment, crime, social conflict, political repression and environmental hazards. Climate change is intimately linked to some of them (e.g. hunger), and less directly related to others (e.g. crime). A sub-aspect of human security is water security. As a result of Climate Change, the frequency and intensity of extreme heat and drought events are also expected to increase. Both trends would negatively affect certain aspects of human security such as water security or food security.

Moreover, there is also an ongoing debate on how climate change is related to conflict or cooperation. Some observers expect climate change to act as a catalyst for (violent) conflict. Water scarcity may lead to regional and national tensions among groups who control and use the water, especially along transboundary basins. Existing water scarcity in the MENA region leaves it particularly exposed to conflicts over limited water resources; water becoming scarcer as a result of climate change may exacerbate the conflict potential. However, conflict is not an automatic result of scarcer environmental resources; in fact, there are numerous examples of cooperation within and across borders in cases of scarce natural resources.8 Whether or not climate change undermines human security and/or creates conflict or cooperation over water resources, will, however, depend on socio-economic and cultural factors as well as on political factors. Policies adopted on climate change adaptation, water resources management and human security are among such political factors.

Water users associations in Egypt: enhancing environmental sustainability, reducing conflicts:
An interesting policy example comes from the water sector in Egypt. Egypt is a water scarce country. It depends heavily on Nile water for agricultural irrigation. Climate change is expected to exacerbate water scarcity, through a mixture of factors such as changes in precipitation patterns, sea-level rise and increased demand resulting from increased average temperatures.10

At the same time, there is a long record of conflicts over water between farmers at the local level over irrigation water, involving upstream and downstream users. Water conflicts have assumed various forms, ranging from the exchange of harsh words, to fist fights, beatings and injuring the other party, and in some case even resulting in the violent death of actors.

In the 1990s water users associations (WUAs) were formed in Egypt in order to involve farmers more actively in water distribution and the maintenance of the infrastructure needed for this purpose. A WUA is a group of farmers, served by a common source of water, who jointly allocate, distribute, and manage water. Farmers of a WUA jointly perform activities that are more difficult or impossible to implement individually. WUAs are empowered to act on behalf of their members in their relations with water authorities, to solve problems of water supply, as well as to conclude contracts for the construction and maintenance of the irrigation infrastructure. Egypt already has more than 7,000 WUAs in several governorates; WUAs are to be established in other parts of Egypt gradually.

According to several studies, since the introduction of WUAs the efficiency of irrigation systems has significantly improved and, ultimately, water savings have been achieved. The distribution of water between head and tail users is more equal and thus conflicts over water use among farmers have greatly diminished. However, it should be noted that the creation of WUAs was only part of a larger scheme, which also included technical improvements. The observed water-saving effects are thus likely to be due, in part, to technical improvements, not only to changes in the socio-political structure. Overall, it seems that the system in place is fairly robust in terms of avoiding conflicts, and is thus likely to prevent future conflicts which may result from reduced water availability under altered climate conditions. It has also been observed that with WUAs representing millions of end users, it will be easier for government bodies to communicate on measures taken to adapt for climate change impact on water resources, as such communication could be done through the WUAs. The Egyptian policy thus is good example of how a policy takes account of the ecological and social dimensions of environmental change.

Agricultural insurance in Turkey:

Another interesting policy example comes from Turkey. Turkey is a country where an estimated 30% of the labor force is employed in the agricultural sector (figure for 2007), with a declining tendency. Climate change is expected to lead to an overall decrease in precipitation and an overall increase in mean temperatures, making water a scarcer resource overall. Farmers are considered the most vulnerable group to climate change in Turkey. Even today, there is evidence of farmers migrating to cities once they cannot secure their livelihood from agriculture anymore. Thus, climate change is an issue impinging on human security in Turkey.

Insurance against agriculture loss could counter-balance such trends. State supported public-private agricultural insurance schemes were first introduced in Turkey in 2005 when an agriculture insurance pool was created. The Turkish state provides support to farmers to pay the premiums. The scheme insures farmers, for example, against crop losses from hail, storm, fire, tornado, landslide and earthquake. Before the creation of the scheme, Turkey only had a minor share of its agricultural land covered under an agricultural insurance scheme, 24 leaving farmers vulnerable to climatic risks.

After the introduction of the scheme, the number of insurances has considerably increased. One drawback of the current scheme is that so far the insurance does not cover drought, quite a significant gap when considering the likely future impact of climate change. Nonetheless, the Turkish agricultural insurance scheme is an example of a policy which, maybe with some modifications, has the potential to reduce risks to human security resulting from changing environmental conditions. The underlying law No 5363 sets forth in Art. 12 that the insurance pool covers losses caused by drought, hail, flood, storms, whirlwind tornadoes, earthquakes, fire, accidents, pests and animal diseases for crops, greenhouses, agricultural buildings, agricultural machinery and livestock and/or other risks considered as important for agriculture shall be determined by the Council of the Ministers upon the proposals of the Committee. However, it appears that drought has actually not been included in the scheme.

Institutional response:

Pressures and impacts of water scarcity often result in conflicts and with an apparent lack of policy response towards sustainable management, due to the complex institutional organization. No single management action, legislation or policy can respond to all the aspects and achieve all goals for the effective drought management. Multiple collaborative efforts are needed to integrate the multidimensional effects of drought on society. The United Nations Convention to Combat Desertification (UNCCD, 2000) provides the global framework for implementing drought mitigation strategies. The United Nations International Strategy for Disaster Reduction (UNISDR, 2002) establishes a protocol for drought risk analysis.

Current legislation on water and drought management shows different development stages for the Mediterranean countries that lead to important differences in the way droughts can be faced. While some of the countries have a stable and long tradition legislative framework with functional river basin authorities and clearly defined responsibilities, others are still developing institutions and organizations that take care of water management issues (Iglesias and Moneo, 2005; Iglesias et al., 2005a).

A common characteristic of the countries in the region is the weak cooperation among the different institutions related to water management, and the fragmented roles of the State, the administrative regions and the river basin authorities, that result in administrative conflicts that are an impediment for

Groundwater's role in managing water scarcity in the Mediterranean Region:

Mediterranean countries (Source of data: Iglesias and Moneo, 2005; Iglesias et al., 2005a). The key issue of transboundary water management is included in drought management plans. Spain shares a large amount of surface water resources among basins in the country and basins that extent to Portugal. The agreements on water transfer amounts between national basins (such as the Tagus-Segura) or between countries sharing a common basin (such as the Spanish and Portuguese portions of the Tagus basin) include strategic regulations in the case of drought. Other Mediterranean countries, especially in the southern basin, share a significant portion of groundwater, but the regulation during drought needs to be further developed.

International cooperation:

Almost one half of the Earth’s surface is covered by international river basins and freshwater scarcity is on the rise. Water can lead to political hostilities and many regions with political conflicts also share water resources. International Organizations need to address conflict. Most

Mediterranean freshwater and groundwater resources are shared among countries (Wolfe, 1999), being the Nile River a key global example. Within the countries, shared water among administrative units is also common in the Mediterranean. Disputes exist, especially during drought conditions, and potentially will increase due to the increasing water imbalances. Policies of a single government or basin unit cannot resolve issues over shared water bodies, and local interests are likely to diverge. International Institutions play a key role as formal mechanisms to deal with water related conflicts in the region.

Conclusion:

Groundwater is already an important insurance available to communities, agriculture, and industry against drought, and the conjunctive use of surface and groundwater makes societies more drought resistant. However groundwater is not fully integrated into the general water management plans, due to limitations in monitoring systems, understanding of the processes, and uncertainties about the future. Emerging technologies such as artificial recharge, aquifer storage and recovery, recharge of reclaimed wastewater, and desalination are crucial for using groundwater as a mechanism to mitigate water scarcity and drought. Groundwater can only serve this purpose effectively if it is integrated in a flexible way with other options, such as recharge and permit of use. Achieving this integrated role for groundwater requires institutional arrangements to go along with engineering.

The Mediterranean region is undergoing socio-economic processes that will lead to increasing pressure over its already limited resource base. In the Southern countries, these processes are driven by technological, agricultural, demographic and economic factors. They pose serious threats to the sustainability of their water resources and their ability to provide social benefits. Low per capita incomes in the rural areas, coupled with large rural populations using agriculture with low capital. Groundwater's role in managing water scarcity in the Mediterranean Region and low inputs and food markets liberalization, provides the context for intensive groundwater use. The use of virtual water has provided a means to use more water embedded in the imported food products. Yet, the room for further use of virtual water is hindered by the need to earn more hard-core currencies to be able to pay for the inputs. Some of these exports can be agricultural products, taking advantage of the liberalization of the EU market, but this would further exacerbate the pressure on the resource base.

Institutions in the region are evolving to ensure more sustainable water resources management. There is progress going on in many of these countries, favored by increasing regional cooperation, better monitoring and management systems, and above all the awareness of governments. Yet, in our view, a number of factors will go against easing the pressure on water resource base, including groundwater, until per capita incomes grow and rural populations diminish significantly. Drip and desalting irrigation is now affordable to millions of small farmers, markets will provide incentives to produce more fruits and vegetables for export, labor costs are cheap, and the economy will grow. Under these circumstances the non-direct uses of water, such as service reliability or natural processes, will likely be impaired, but damage may not be irreversible.

But other factors, such as the dissemination of science and technologies, the increasing regional cooperation, the awareness of the risks involved and the opening of markets and economic opportunities to the rural population, may help reduce the pressure. It is difficult to say which factors will prevail and when there will signs of more positive trends.

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