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Climate change and Water Resources In Tunisia

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Summary

Tunisia have signed the United Nations Framework Convention on Climate Change (UNFCCC) in Rio de Janeiro in 1992, and then ratified it in July 1993. As non-annex I Party to the UNFCCC and in accordance with article 12, Tunisia have submitted its first national communication in October 2001.

Like most countries affected by aridity and particularly within the Maghreb region, water resources represent in Tunisia the most precious environmental good. The annual average rainfall is estimated to 36 000 Millions cubic (Mm^3) / year. Unfortunately, potential water resources (total flow) represent only 4629,6 Mm^3/year, of which 550 Mm^3 are not renewable. This potential presents a greater regional disparity:

- 2801,5 Mm^3/year in the North (17 % of total area), or 60%
- 766,8 Mm^3/year in the Center (22 % of total area), or 16%
- 1061,3 Mm^3/year in the South (61 % of total area), or 24%

Others aspects of water resources management concern:

- artificial recharge, limited in volume,
- little use of the no conventional water.

Some pollution problems are observed locally (Sfax region layer), but the main concern is probably water salinity.

Mediterranean region is not favored by climate change and particularly the south shores. Climate change projections indicate changes in mean climate conditions (temperature, rainfall). However, climate change is likely to bring changes in climate variability and extreme events as well. Furthermore, we expect decrease in stream flow and groundwater recharge. Tunisian climate is characterized by its greater variability and aridity. Tunisian water resources sensitivity to climate change concern particularly: Surface water resources variability exacerbated by climate change, Higher evaporation rate amplified by climate change and some infection coastal layers by seawater intrusion. Moreover, wetland sensitivity to climate change concerns: Stagnant water subject to more rate evaporation and rise in the water level of some coastal wetland area, such Ichkeul lake.

Considering the previous institutional framework, climate change activity was co-ordinated by the Environment and Land Use Planning Ministry (the Environment State secretary under the Agriculture, environment and hydraulic resources Ministry in the actual organization). The National Committee on Climate Change (NCCC) was created in 1992. It is an inter-ministerial Committee with an advisory capacity. In October 2001, the NCCC have been substituted by the Focal structure on climate change (FSCC). The aim of this initiative is to improve the efficiency activity notably by, best representatively and meeting at regular frequency. The most activities on climate change issue have been implemented in the framework of the two projects; the national project TUN 95/G31 and the regional project RAB 94/G31. Network experts activity and NGO's activity are limited. Regarding the end of the two projects and the unofficial character of the advisory structures, the institutional framework should be strengthened, with particular emphasis on sustainability and ability to make arrangements.

Because, near 80 % of water is used by the agricultural sector, water resources policy and strategy is centralized in the Agriculture, Environment and Hydraulic Resources Ministry. This Ministry has a regional institutional network responsible by the implementation of the national strategy. The

mobilization and management of water resources is organized by geographical region: the North, the Center and the South. The water Code represents the main legal framework related to water policy. The NGO's field activity is limited to isolated regions. In spite of their number, NGO's activities is very limited because the lack of tradition and knowledge. Furthermore, wetlands haven't a specific strategy. This issue is included in the Tunisian strategy on water resources mobilization and management. Legal provisions related to wetland conservation and management are including in the Forestry Code.

We have a greater discrepancy between climate change issue and water resources and wetland issue. Water resources are a common concern in Tunisia. This issue has large economic and social impacts. Furthermore, climate change is a new issue with no sufficient assessment of impacts and a large part of uncertainty.

Several studies bas been conducted to define the outline of the future water resources strategy and propose the basic elements and prospects the water resources stakes. Unfortunately, these studies have taking as assumption the climate stability. The key challenge, therefore, is to incorporate climate change assumption.

Quantitative assessments of sensitivity, adaptive capacity, and Tunisian water resources vulnerability to climate change, with particular emphasis on change in the range of climatic variation and the frequency and severity of extreme climate events, are not available at the national level. In reality, we have too a lack of methodology to assess such information. The regional collaboration is probably the best way to develop this issue. The aim is to make available, pertinent scientific information that can be used to inform responsible and policy maker and alive them, particular by risks.

Balance between operating water resources and demand resources is very close and climate change assumption can upset it. So, the key challenge is to incorporate uncertainty in the range of climate change, in this balance. We can use an approach by climate change scenario and define a balance of each scenario.

When developing adaptive strategy for water resources and wetland in Tunisia we should be consider some key assumptions such:

- Water quality degradation,
- Higher cost of new water resources mobilization,
- Storage and regulation capacities,
- Irrigated agriculture,
- Peasant practices,

Currently supply-side approaches (e.g., increasing flood defenses, building weirs, utilizing water storage area, improving infrastructure for water collection and distribution) can be widely used as basic adaptive measures. These options have the advantage to be integrated in the national water resources strategy and don't have a specific cost related to their adaptive aspect. These measures could have multiple benefits, today and in the future, even in the absence of climate change pressure. In the other hand, some institutional arrangements and practices, available to made, can allow to have immediate benefit and probably with low cost.

In practice, it is difficult to change water management practices. The challenge, therefore, is to develop ways to introduce integrated water management practices into specific institutional settings. Moreover, we should improve and strengthen management institutions and market-like processes.

Tunisia have some adaptive capacity, especially ability to implement integrated water resources management witch enhance adaptive potential to climate change. However, the improvement and strengthen of the national water resources strategy is the best way to adapt and response to climate change.