



## TUNISIA

### COST OF WATER RESOURCE DEGRADATION OF THE MEDJERDA BASIN

#### POLICY NOTE<sup>1</sup> -- DECEMBER 2012

Tunisia has adapted a strategy of water resources mainly directed towards the mobilization of supply and demand management since 1999. The Government has implemented this strategy in a ten-year program (2001-2011), organized around three specific pillars: (i) integrated management and conservation of water resources, (ii) the economic efficiency of the use of water in agriculture, and (iii) institutional restructuring and capacity building in the water sector. Since its revolution in January 2011, the new Government, through its Ministry of Agriculture, focused on issues of employment, development and orientation of its interventions to the less privileged and disadvantaged on the one hand, and the management of natural resources in a participatory manner at the catchment areas of these regions on the other hand. In the latter, a more concrete prioritization can be identified on the basis of costs and benefits of interventions for which the sustainable management of water is a critical component in reducing poverty, especially in rural areas. The cost of the degradation of water resources in the watershed pilot of the Medjerda is part of the regional study of the cost of degradation of water resources at the watershed level and is supported by the project SWIM-SM. The main objective is to evaluate the cost of degradation of water resources at the watershed Medjerda to help decision makers at the national and local levels to identify and prioritize concrete actions to improve the management of this basin through the funding of potential projects that will reap environmental benefits and reduce externalities.

The costs of degradation of the Medjerda and Greater Tunis reach Tunisian Dinars (TD) 214 million in 2010 with a range of TD 151 to 324 million, equivalent on average to 0.34% of current GDP but 0.85% of constant GDP (compared to 2000) of Tunisia in 2010. Regarding the Medjerda, the costs of degradation reach TD 192 million in 2010 with a range of TD 133 to 295 million, equivalent on average to 3.3% of GDP of the basin. The cost attributable to human health is TD 81 million in 2010 representing 42.5% of the cost of degradation of the Medjerda and 63% of the water category (Table 1 and Figure 1).

*Table 1: Cost of degradation of the Medjerda and Greater Tunis, 2010 and in TD million*

Category	Medjerda	%	Lower Bound	Upper Bound	Greater Tunis	Lower Bound	Upper Bound	Total Medjerda and Greater Tunis	%	Lower Bound	Upper Bound
<b>Water</b>	129.5	68%	99.1	164.5	22.3	17.5	28.1	151.8	71%	116.6	192.6
<b>Solid Waste</b>	60.5	32%	33.7	130.9	-	-	-	60.5	28%	33.7	130.9
<b>Biodiversity</b>	0.5	0%	0.4	-	-	-	-	0.5	0%	0.4	-
<b>Natural Disaster and Global Environment</b>	1.1	1%	-	-	-	-	-	1.1	1%	-	-

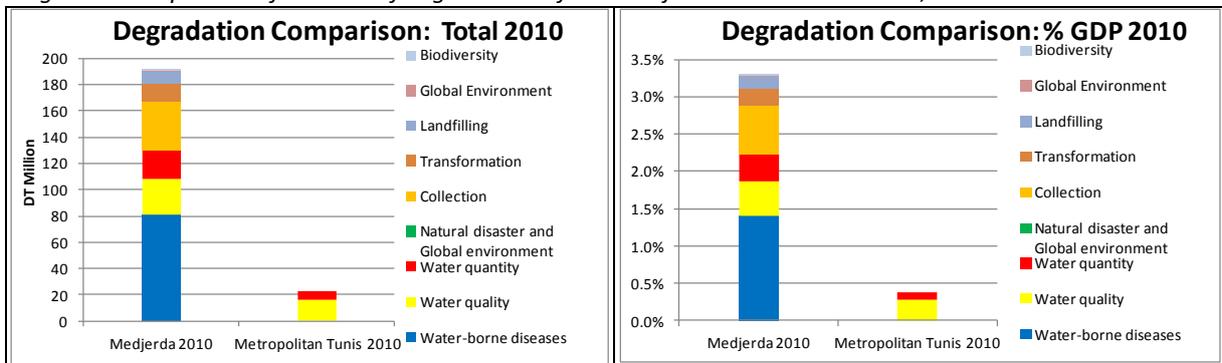
<sup>1</sup> This Note was prepared by Sherif Arif and Fadi Doumani, and is based on the report : *Tunisie, Coût de la Dégradation des Ressources en Eau du Bassin de la Medjerda*, prepared under SWIM-SM.



Total	191.5	100%	133.2	295.4	22.3	17.5	28.1	213.9	100%	150.7	323.5
% GDP Medjerda	3.3%		2.3%	5.1%							
% GDP Tunisia								0.34%		0.24%	0.51%

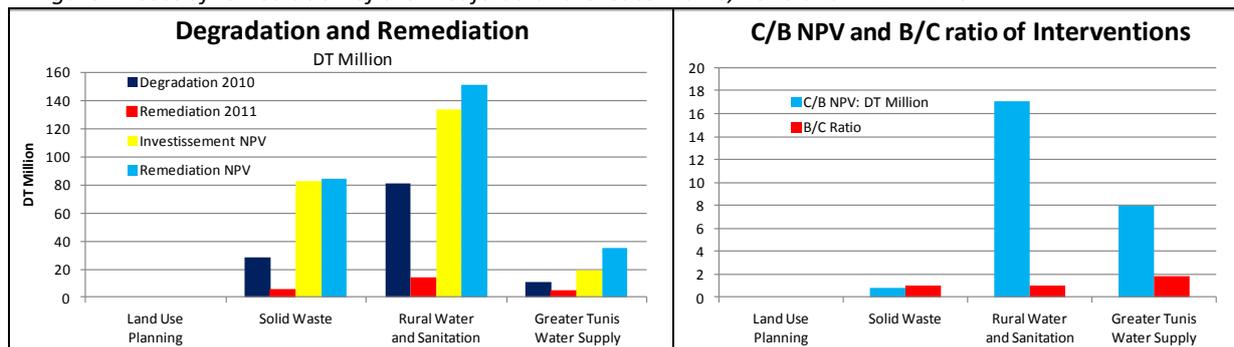
Broken down by category, water degradation is the largest in the Medjerda and Greater Tunis in relative terms with 68% of total in 2010. Waste, which is simply covered in Medjerda, comes in second place with 32% of total followed by the global environment with 1% and biodiversity with 0.01%. There were no major natural disasters in the Medjerda basin in 2010. Broken down by the Water sub-category (TD 130 million in 2010), waterborne diseases account for the majority of costs in the Medjerda basin (81 million TD) followed by water quality (TD 27 million), water quantity (TD 21 million, relatively low amount due to the 2010 favorable season) and finally the global environment (TD 1 million). Broken down by the Waste sub-category (TD 61 million in 2010), the collection represents the majority of costs of the Medjerda basin (TD 38 million) followed by waste transformation (13 million TD), landfilling (TD 10 million) and finally the global environment in terms of green house gases (TD 1 million).

Figure 1: Comparison of the cost of degradation of the Medjerda and Greater Tunis, 2010



Based on these findings, four intervention scenarios were considered but only three were calculated. Only the categories *drinking water salinity*, water and sanitation in rural areas and landfill management were valued. Interventions related to land use and to reduce erosion and siltation of dams were not considered due to lack of studies to establish a causal link between interventions and the reduction of siltation to conduct an economic valuation.

Figure 2: Cost of remediation of the Medjerda and Greater Tunis, 2010 and in DT million



The most efficient scenarios were selected and are shown in Figure 2. On water and sanitation in rural areas, the pairing of scenario sanitation on one hand and scenario drinking water and sanitation on the other hand makes them profitable. Regarding drinking water in Greater Tunis, desalination part of the water resources in order to dilute the salinity of water is profitable. However, this alternative has not been compared to the cost of transporting water from the Barbara Basin and would become unprofitable if the desalination threshold of 30,000 m<sup>3</sup> per day over three months is exceeded. The Barbara basin strategic reserves can not only ensure the safety of the resource, but also perform dilutions of water when the salt content is high in summer and especially during dry seasons. For waste, the recycling center is not profitable and only the landfilling in cells





and electricity generation alternative is profitable. Segregation and recycling alternatives are not because they are too expensive. Thus, to overcome this shortcoming, a multi-criteria analysis could be considered for decision making where the weights are assigned not only to analyze C/B but also for employment creation, poverty reduction, etc. In addition, interventions related to land use and to reduce erosion and siltation of dams were not considered due to lack of studies to establish a causal link between interventions and the reduction of siltation to conduct an economic valuation.

Five intervention areas are proposed for the integrated and sustainable management of water resources of the Medjerda underlying the recommendations of this study:

- a. **Gradually shifting the policy of intensifying the exploitation of natural resources**, including through the mobilization of water resources. This shift can be made on the basis of criteria that explicitly include economic performance and degradation and resource scarcity in the Medjerda basin.
- b. **Focusing primarily on efficient investment for domestic pollution control in rural and peri-urban areas**, which have been neglected in the past. Priority would be that the state invest in the expansion of water and sanitation in rural areas of the basin where poverty is predominant, and waste management includes not only a landfill for each governorate, but also the closing of dumps.
- c. **Planning of upstream interventions that reduce siltation of dams** to derive the determinants of siltation and assess the exact impact of erosion control for the control and mobilization of surface water and adapt techniques erosion control for their effective use by the stakeholders.
- d. **Setting up an information network in partnership with water and the environment institutions for decentralized monitoring, monitoring of the environment and natural resources of the basin** aimed at understanding and assessing of the environment and its impact on health and the degradation of natural capital to contribute to decision-making based on accurate and regular data and information.
- e. **Considering a horizontal action for an overall and integrated management of water in the watershed of the Medjerda**. This group will aim to: develop expertise in the assessment of benefits and damages and water conservation; provide advice regarding ways and means of integrating this aspect in programs and sectoral development strategies; and put in place a system of monitoring and evaluation for investments and activities in the Medjerda basin.