

Executive summary

The GIWA region Canary Current encompasses Cape Verde, the Canary Islands, Mauritania, Senegal, The Gambia, Mali, Guinea, Guinea-Bissau and the western part of Morocco that drains into the Atlantic Ocean. In order to conduct a suitable assessment, the region was divided into two sub-systems in recognition of significant ecological, climatic and cultural differences. The northern sub-system covers part of northern Mauritania and the western part of Morocco. The southern sub-system includes the southern part of Mauritania, Senegal, The Gambia, Mali, Guinea, Guinea-Bissau, Cape Verde and the Canary Islands. The boundary between the two sub-systems is at Cape-Timiris at approximately 19° N.

The population in the region totals approximately 45.2 million people, out of which an estimated 70% are directly dependant on international waters for their livelihoods. The growth rate fluctuates between 0.8% and 3.03% with an average of 2.3% for the region. This population is engaged mostly in marine fisheries, agricultural production and tourism activities.

Mean annual rainfall ranges from 10 mm to more than 2 000 mm. The total annual renewable water resource in the region is on the average about 342 km³ per year and average freshwater is approximately 15 km³ per year. It is estimated that more than 80% of all water withdrawals are for agricultural use.

Based upon the assessment, the main transboundary GIWA concerns in the region are Freshwater shortage and Unsustainable exploitation of fish and other living resources. In the northern sub-system, a declining groundwater base flow is a major issue linked to the long dry periods that the region as a whole has experienced for more than 30 years. For the last two to three decades, the average aquifer draw down in the Souss River Basin has varied from 0.5 to 1.5 m per year. The southern sub-system has been suffering from water shortage problems for the last three years and will most likely suffer in the next 20 years.

The regime flow of Senegal River in particular has been significantly modified by the construction of the Manantali and Diama dams, which has altered the River's hydrological regime and has consequently caused transboundary problems.

The environmental impacts of stream flow modification and changes in the water table have led to serious socio-economic impacts that often have significant transboundary implications. These socio-economic impacts include the loss of agricultural income and potential, increased costs associated with the construction of dams and inter-basin transfer schemes to supply water, the costs of alternative sources of water, the cost of deepening wells and pumping, increases in water-borne diseases and conflicts about water supplies.

Unsustainable exploitation and particularly the overexploitation of fish stocks is another major issue in the region. Most if not all the coastal countries have already taken steps in terms of regulating fisheries at the national and international level, as demonstrated by discussions with the European Community over the renewal of fishing agreements with the different countries in the region. All these countries are aware that a moratorium on certain fish stocks is needed and that there is a need for conserving and improving fisheries management overall. In addition, specific policy measures intended to control industrial fishing pressures have been instituted.

Causal chain and policy options analyses were conducted for three issues:

- Stream flow modification for the Senegal River Basin;
- Lowering of the water table in the Souss-Massa River Basin;
- Overexploitation of fish in the Canary Current.

The Senegal River Basin actually experiences two types of stream flow modification: the reduction of discharges to the River due to

the drought, leading to an intrusion of seawater; and a reduction of stream flow due to damming. The first type of modification is natural, while the second one is artificial and superimposed on the first one and characteristic of the Senegal River Delta. Therefore, while the focus was on the damming of the River, reduced precipitation has been considered as an immediate cause. Three major root causes were identified:

- Demographic growth, urbanisation and poverty;
- Lack of appropriate governance;
- Inefficient irrigation technology.

Within the existing regional organisations such as the Organisation for the Development of the Senegal River Basin (OMVS, Organisation pour la Mise en Valeur du Fleuve Sénégal) immediate policy options can be implemented for the Senegal River Basin. The consolidation of OMVS assets is one option that can be pursued. Institutional instruments such as the Environment Observatory would be a way to ensure monitoring and management of the River Basin. The Standing Committee of Water constitutes a framework for dialogue regarding the technical aspects of water resources management; the committee can formulate and present recommendations to the Ministers' Council. The role of these two bodies should be reinforced. Capacity building of the institutions in charge of water resources management must accompany all good governance measures, such as implementation of laws and regulations at the local, national and regional level. It is also essential to determine the implications of recommendations on stakeholders, and to make certain stakeholders are informed.

The main issues addressed in the causal chain and policy options analysis of freshwater shortages in the Souss-Massa Basin concerned lowering of the water table. Five major root causes of the lowering of the water table in Souss River Basin were identified:

- Demographic growth and population changes;
- Socio-cultural constraints;
- Governance and enforcement of water regulation;
- Technological changes;
- Economic causes.

The policy option concerning lowering of water table in the Souss-Massa River Basin is proposed to be of a holistic approach. The general framework of this scenario assumes a clear understanding of an integrated system (technical, institutional, political and economical settings) and full stakeholder participation through consultation and education. A new water pricing policy in combination with institutional changes are part of the proposed option.

Overexploitation of fish has been analysed for marine fisheries. Two immediate causes were identified to explain the overexploitation; excessive fishing efforts and unsustainable fishing practices. Both the industrial and artisanal fisheries are sectors responsible for the overexploitation. One of the root causes for industrial overfishing is that all countries of the region, except The Gambia have ongoing fishing agreements with the European Union. The agreements target on already highly treated species. Another root cause is the discard of small juvenile fish by industrial freezer trawlers. Examples of root causes from the artisanal sector are lack of enforcement of regulations and fuel subsidy for artisanal canoes. Policy options identified in the analysis are:

- Artisanal fishing licence system;
- Regulation of access to resources;
- Banning use of the beach seine;
- Joint negotiation of fishing agreements.

The current rate of water usage in the region is unsustainable if no drastic water policy changes are made. Overpumping of the Souss aquifer has resulted in significant water level declines and deserves special attention. Governance measures in the Senegal River Basin will have to be accompanied by capacity building in order to facilitate the implementation of the applicable laws, agreements and regulations at the local, national and regional level. The establishment of Marine Protected Areas form a key step in the preservation of the coastal area and is of crucial importance for the restoration of fish stocks and biodiversity.