

Report Working Group on Groundwater – French speaking (Session 5)

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1) Case study used to stimulate the group discussions:

The case of the Senegalo-Mauritanian transboundary aquifer was presented by the moderator to provide an example for the group discussions. With an area of approximately 350,000 km², the Senegalo-Mauritanian aquifer basin is the largest basin in the Atlantic margin of North-West Africa. The groundwater it contains is a strategic resource for the four aquifer countries, respectively Gambia, Guinea Bissau, Mauritania and Senegal. In the present context, there is no specific cooperation framework or agreement put in place by the riparian countries allowing the overall knowledge and the joint management of the transboundary aquifer. The two river basin organizations, the Senegal River Basin Development Organization (OMVS) and the Gambia River Basin Development Organization (OMVG), are the regional institutions addressing transboundary concerns over the Senegal and Gambia Rivers, but since the boundaries of the two river basins do not coincide with the boundaries of the Senegalo-Mauritanian aquifer, their capacity to deal with the aquifer issues remain limited. In general, the High Commissioner of these Basin Organizations supports the technical services of Member States (acquisition, installation of piezometric stations and training of technicians). In return, data exchange protocols are signed between the Office of the High Commissioner and the hydrological services of the Member States.

There is a clear interest for regional cooperation to strengthen the knowledge and sustainable management of the transboundary aquifer Senegalo-Mauritanian aquifer. Without being exhaustive, the following potential intervention may be the subject of more in-depth considerations, taking into account the basin as a whole in consultation with the member countries.

- Collection and harmonization of all available hydrological and hydrogeological data and information on the Senegalo-Mauritanian aquifer and river basins in the four countries.
- Harmonization of typology and delineation of water bodies in transboundary sections.
- Determination and evaluation of the aquifer characteristics: three-dimensional structure (aquifer geometry), hydraulic and transport properties (hydrodynamic properties), and chemistry. Indicative flow systems in the primary aquifer systems directions, potential recharge and discharge areas.
- Pressures and impact analysis of the water bodies and assessment of ecological status of selected water bodies including harmonization of methodologies and joint research.
- Analysis of significant national and transboundary water management issues/ drivers, root causes and indicators.

- Evaluation of the surface and subsurface interactions and lateral in/out groundwater flows and analysis of the characteristics of the river basins.
- Development of a conceptual groundwater flow model that will serve as a prerequisite to develop a numerical model of the aquifer.
- Development of a numerical model to simulate groundwater flow, recharge, infiltration and pollution spread as well as different groundwater abstraction scenarios.
- Development of surface and groundwater quantity and water quality monitoring programmes, and their implementation; considering the capacity of national monitoring networks and the ability of transboundary monitoring setting. Proposing a network of additional observation boreholes in the four countries to measure groundwater trends (including isotope and geochemical interpretations) and to monitor the evolution of the aquifer system.
- Proposing a series of aquifer field tests to estimate hydraulic properties of the aquifer in selected locations in the four countries.

2) Best practices presented by the participants:

Several examples of transboundary aquifers with a cooperation agreement in place and specific protocols for the exchange of data and information were mentioned:

- The North Western Sahara Aquifer System (NWSA), shared by Algeria, Tunisia and Libya
- The Nubian Sandstone Aquifer System (NSAS), share by Libya, Egypt, Sudan and Chad. The NSAS Joint Authority (NSAS-JA) was established to . Among its functions, the JA has the responsibility to collect all information, data and results of studies conducted by relevant countries.
- The ResEau project in Chad is co-financed by the Government of Chad and the Swiss Agency for Development and Cooperation (SDC). Two series of hydrogeological maps have been be produced. The first, on a 1:500,000 scale, covers the entire area by assembling eight contiguous maps illustrating the nature, location and relative productivity of the various regional aquifer reservoirs. Several synoptic maps related to the climate, water quality and socio-cultural categories are also presented on the back of the maps and in the technical documentation produced by the project.

3) Issues of concern regarding data and information collection, management and sharing:

- national and international (ref. WMO) data collection networks should collect representative data on pluviometry, hydrometry, groundwater levels, etc.,
- governments are not providing sufficient financial resources to build and maintain data collection networks. Without knowledge of the aquifer system

(water balance, flows, groundwater levels, quality indicators) it is difficult to envisage a proper management of the resource,

- legal arrangements and provisions should be adopted also at the national level to enable institutions to centralize all data and information supporting decision-making processes (a new law will be passed in Chad supporting this approach)