Integrated Water Resources Management, River Basins Organization and sustainable development of West Africa

Introduction

Water is essential for life (for drinking, for producing food, for washing – in essence for maintaining our health and dignity). It is an essential raw material in many industries that have a major influence on economic performance at the national level, but also at local and household levels. Water also plays a large role in power generation in many countries including African countries, whether through cooling, or directly through hydroelectricity generation. Water transport is also important in many parts of our continent, allowing access to markets as well as generating its own economy.

Surface water and main River BasinsOrganizations in West Africa

Niger River

With a length of 4,200 km, the Niger River is the third longest river in Africa after the Nile and the Congo River. The Niger traverses four countries, two of which (Niger and Nigeria) are named after it. The river basin covers 2.27 million km² and is shared by ten countries, namelyAlgeria, Benin, Burkina Faso, Cameroon, Chad, Côte d'Ivoire, Guinea, Mali, Niger andNigeria. However, the active drainage area is less than half of the basin and excludes Algeria.The source of the Niger is located close to the *Fouta Djallon* Mountains in the South of Guinea at an altitude of approximately 800 m. With more than 2,000 mm per year the area receives a high amount of rainfall. The river flows Northeast through the Upper Niger Basin.Several tributaries provide additional water, until the Niger enters the Inner Delta in Mali.

During the rainy season, the delta forms a large flood plain of 20,000 to 30,000 km², facilitating the cultivation of rice, cottonand wheat as well as cattle herding and fishing.6

The size of the flooded area is subject to strong annual variations, depending on the discharge of the Upper basin.

Volta river

The Volta river which takes its source in Burkina Faso and drains then Togo, Benin, Ghana, the Ivory Coast and Mali before emptying into the Atlantic Ocean. It is 1,600 km long and its catchment area covers 394,100 km2 distributed between Burkina Faso (42%), Ghana (40%), Togo (6%), Mali (5%), Benin (4%) et Cote d'Ivoire (3%).

Senegal River

The Senegal River basin is located in West Africa and is shared by four countries: Senegal, Mauritania, Mali, and Guinea. The Senegal River is the second largest river in West Africa. It is 1800 km long (or1100 miles) and empties into the Atlantic Ocean. The main tributaries, contributing 80% of the flow, are the Bafing, Bakoye, and Faleme Rivers which all originate in the Fouta Djallon Mountains located in Guinea. The Karakoro River and the Gorgol River both originate in Mauritania. The Senegal River Basin Organization (OMVS) is the River Basin Organization managing the water resources, gathering the four countries.

Gambia River

The Gambia Riveris 1120 km long and empties into Atlantic Ocean. It is shared by four countries Senegal (70%), Guinee (16%), Gambia (13%) andGuinee Bissau (1%)

Other medium Rivers

The medium Rivers of West Africa are : Comoé (Burkina Faso, Côte d'Ivoire and Ghana), Mono (Bénin et Togo),Ouémé (Bénin et Nigeria), Mona (Sierra Léone et Libéria), Kabi et Kolenté (Guinée, Sierra Léone), Koliba (Guinée, Guinee Bisau), Komadugu-Yobé (Niger, Nigeria, Tchad), Logone (Tchad,Cameroun), Chari (Tchad, Cameroun, Centre Afrique) and Cayanga/Geba (Guinee, Senegal,Guinee Bissau).

Impact of dams on the people

People in West Africa have always used the rivers for agriculture, fisheries, transport, agriculture, and grazing lands. For many millions of people of this region, the water of the main rivers systems was and still is essential for life. The river water is also used for hydropower and for irrigation of formerly dry land. Many people benefit from these infrastructures. Irrigated areas provide stable food production; electricity supply is guaranteed. However, others suffer when water levels drop and the area of annually inundated floodplain reduces in size as a result. For instance fisheries, navigation and the area of inundation supporting cattle grazing and agriculture in the Inner lands are impacted. The overview of sectors gaining and losing is only telling a part of the story. The same applies for the regions that win and lose.

Focus on groundwater in West Africa

In West Africa, like the surface water, groundwater is characterized by its cross border dimension. Out of the 40 most important aquifers identified in Africa, 10 are entirely located in West Africa and shared by at least two countries of the sub-region. So, in the context of water resources scarcity in the face of climate change, West Africa trans-boundary aquifer resources management in a regional framework is absolutely necessary. The main challenges on West Africa Transboundary Groundwater Management for Development and Climate Change Adaptation are the following : need of strategic partnership at national and regional

levels, need to scale down the gap in knowledge and harnessing of the aquifer systems (scientific, technical, institutional, policy, governance and legal levels), need of groundwater hydrodynamic characterization, database information, mapping and surveillance network, need of protection measures for pollution, need of cross-region synergy actions, requirement of strong institutions at both national and regional level. For handling these challenges outlined above, transboundary aquifer resources has to become more relevant in the focus of climate change adaptation and the following recommendations should be take into account: scale down knowledge and practice gaps of the aquifers systems, improve the knowledge of aquifers in terms of geometry, hydrodynamic characteristics, recharge processes, monitoring of water levels and quality, support climate-aquifer related research on the effect and impacts of climate variability and change on the aquifers and the adaptation measures to be undertaken, inventory and analyze small scale irrigation from groundwater sources, identify pollution sources in urban areas and also the use of water in industrial and mining sectors, support groundwater development and integrate it in all water resources development projects, share experience with SADC, North Africa, India etc. and promote scientific and technical exchanges on irrigation methods.

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