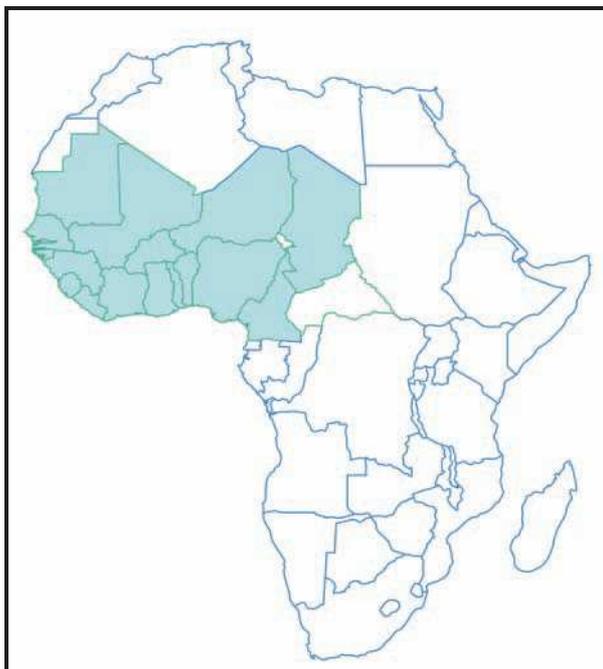


**POLICY BRIEF N°1**

**Dialogue on the Joint Management  
of Groundwater  
Resources in West Africa**

## In West Africa, like surface water, groundwater is characterized by its cross border dimension



### 1. BACKGROUND AND RELEVANCE

In West Africa, like surface water, groundwater is characterized by its cross border dimension

Opening a regional space for groundwater dialogue is one of the most crucial steps for a comprehensive trans-boundary aquifer management, in which institutional arrangements and policies can play a central role. Surface and groundwater in West Africa are characterized by their trans-boundary nature. 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. Amongst the 15 continental West African countries, 12 are directly related to at least one cross bordered aquifer (GWP/WA, 2011a). Some countries are related to many trans-boundary aquifers, such as Niger related to 6. The hydrogeology typologies of the groundwater in the region are very diverse and complex. 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. According to UNESCO (2008), Africa is having two kinds of groundwater: the renewable and non-renewable. The renewable are generally replenished by annual hydrologic cycles, while the non-renewable sources constitute fossil water and are mostly deep aquifers.

Groundwater is also classified according to the criteria of continuity; there are continuous aquifers (generally in tanks made with loose rock or unconsolidated sedimentary formations), semi-continuous aquifers, and discontinuous aquifers (in tanks made with cracked compact rocks or consolidated ones such as granite). In such circumstances, a dialogue on groundwater in Sub-Saharan Africa, particularly in West Africa, is critical to establish a sub-regional cooperation on cross-border aquifer issues as groundwater does not respect political boundaries.

**Due to their buffer function, the groundwater reservoirs play a vital role in the resilience to climate change**

A diagnostic study on trans-boundary aquifers management and policy dialogue in West African regions has been recently carried out with the support of the African Climate Policy Centre (ACPC) and other regional institutions. In this context, the Global Water Partnership for West Africa, in collaboration with ACPC, was the facilitator of this initiative related to the groundwater resources management in West Africa in the context of climate change. Water stress and scarcity are becoming a critical challenge and the world leaders at Davos Economic Forum (2012) considered it as one of the 5 top agendas items. Important impacts on water resources are expected in the context of climate change, with an increase of the number of African countries that will be facing a water stress by 2025. African groundwaters are an important element of the adaptation strategies to these climate changes impacts in Africa. Indeed, they constitute the most important reserves. Thanks to their buffer function (storage of runoffs in high-level rain period, supply to water streams and/or use in deficit periods), the reservoirs made up of aquifers systems play a vital role in the resilience to climate changes.



This concern was underlined during the Tripoli conference (2008) by SSO which noted that “It is mainly through the increase of water demand and direct impacts of climate change, that aquifers will be strongly affected. It appears therefore that these underground water resources, which are less visible, could demonstrate their strategic aspect in the framework of climate changes. These aquifers or water reserves should be protected and managed in a rational and concerted way amongst countries, so that they can better use this strategic stock and its unique features to climate (resource available at any season, support to water streams, etc).

For that purpose, it appears fundamental to strongly share knowledge on the resource which still remains poorly studied”.

The aims of the regional dialogue on the concerted management of groundwater in West Africa are to contribute to the collaborative management of groundwater in West Africa and to ensure that groundwater is effectively taken into account in the national and regional water management policies, especially on trans-boundaries aquifers issues.

The management of cross border aquifers raises specific issues, and it is often confronted with the following major difficulties:

- Insufficiency of communication between countries using the same resource with borders difficult to see ;
- Insufficiency of technical information on the resource ;
- Heterogeneity of codifications and geographical reference from one country to another ;
- Disparities amongst the data base contents, when they exist ;
- Insufficiency of networks to measure the quality of the existing ones ;
- Insufficiency of tools to control and process information ;
- Lack of specialized institutions/bodies like the basin bodies of surface waters
- Lack of dialogue and concerted policy among states on the management of groundwater.

The current initiative on the regional dialogue on concerted management of groundwater in West Africa is a response to strong needs, expressed at the high political level, in terms of water management, sustainable development and population well-being. It takes roots in the Declaration of the African Union Summit held in Sham El Sheikh (June 2008) in which the heads of states and governments of the African Union have recognized the necessity « To integrate the management of surface waters and national and cross border groundwater», and have engaged to ensure a fair and sustainable use of water resources,

promote the notion of integrated management and use of national and shared water resources in Africa ». The project is also a response to the resolution of the 6th AMCOW summit (2007), held in Brazzaville, which advocated “mainstreaming groundwater management with surface waters”. The aims of the regional dialogue on the concerted management of groundwater in West Africa are to contribute to the collaborative management of groundwater in West Africa and to ensure that groundwater is effectively taken into account in the national and regional water management policies, especially as trans-boundaries aquifers issues.

To come up with solid consensual working bases and address the genuine priorities of the concerned actors, a regional diagnosis study on underground waters, including policies and practices taking into account climate issues, with a particular focus on trans-boundary aquifers was deemed necessary in West Africa. The workshop brought together researchers, policymakers, regional institution and development practitioners to share informed opinions and experiences on the local and regional manifestations on groundwater conjoin management in a sustainable way. In line with the above, the validation workshop of the diagnostic study done by a group of consultants in collaboration with key water stakeholders in the Sub-region has been held on the 26-27 October 2011 in Ouagadougou in Burkina Faso; has come out a comprehensive list of actions to be implemented that ensure the consideration of groundwater issues into the policies at national and regional level. The prioritized and harmonized action plans were based on the reports of the five working groups presented and discussed (GWP/WA, 2011b). The five topics were (i) Status of the Scientific and Technical Knowledge of Groundwater; (ii) Identification of Major Environmental and Social and Economic Stakes of Aquifers; (iii) Dialogue and Communication; (v) Management and Institutional, Legal and Policy Framework; and (iv) Development and Reinforcement of Competences and Adaptation/Resilience Capabilities.



## SUMMARY OF FUNCTIONS PROVIDED BY GROUNDWATER

SERVICES PROVIDED BY GROUNDWATER	KEY FEATURES OF SERVICES	MANAGEMENT NEEDS
<b>WATER-SUPPLY PROVISION</b>		
<b>SUSTAINING WATER ENVIRONMENT</b>		
<b>STRATEGIC SECURITY</b>		

*Source: Stephen Foster, GWP senior advisor*



## 2. RELEVANCE OF GROUNDWATER RESOURCES IN WEST AFRICA

***Groundwater is the most important water resource and the most heavily used by West African populations***

The extreme climate phenomenon such as drought and high temperature causing high evaporation will disturb the groundwater status. According to UNESCO (2008), groundwater is gaining greater importance by time in many parts of Africa, particularly in the arid and semi-arid zones of the continent where it is often the only source of available water. Groundwater is the most important water resource and the most heavily used by West African populations (UNECA/ACPC, 2011). This characteristics make groundwater attractive including its ubiquitous and perennial presence, high storage capacity, good water quality, resilience, to inter-annual climate variability and low cost relative to alternative sources (Adelana and MacDonald, 2008; Calow et al., 2010). African groundwaters are an important element of the adaptation strategies to climate changes in Africa. Indeed, they constitute the most important reserves, and groundwaters have an economical advantage since they become an ideal water source for rural Africa. From the regional consultative dialogue under the facilitation of both GWP/WA and ACPC, a number of core challenges for addressing the most urgent and capacity needs in groundwater resources management have been identified in West Africa. The keys challenges are summarized in Box 1

### **Box 1. Challenges on the West Africa Transboundary Groundwater Management for Development and Climate Change Adaptation:**

- Need of regional and stakeholders dialogue and advocacy;
- Need of cross-region synergy actions
- Need of clear management vision and policy mainstreaming at national and regional levels
- Requirement of strong institutions at both national and regional level
- Need of strategic partnership at different 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 to enhance the weak capacity on groundwater management.

## 3. POLICY RECOMMENDATIONS

For handling the challenges outlined above, groundwater particularly the transboundary aquifer resource has to become more relevant in the focus of climate change adaptation. It provides a number of key advantages compared to surface water such as an individual provisional basis and it mostly provides better quality water. It becomes indispensable to analyze groundwater management in the broad sense including its social, economic and environmental implications together with the political aspects. From the regional dialogue (diagnostic study and validation workshop) a roadmap has been set up with identified priority actions for regional dialogue on groundwater to be carried at the national and regional levels. The following policy recommendations define this roadmap:

### **3.1 Policy Recommendation for Knowledge:**

- Scale down knowledge and practice gaps of the aquifers systems; generate and strengthen the status of the Scientific and Technical Knowledge of Groundwater in West Africa through an inventory of the existing literature/data at each country's level; identify the assets and weaknesses and facilitate the dissemination of literature/data;
- Improve the knowledge of aquifers (Geometry, hydrodynamic characteristics, recharge processes, monitoring of water levels and quality), setting up a common database for the countries in order to share data such as digitized data, then harmonize, create central databases, reinforce regional monitoring network and establish synergies with similar initiatives (e.g. CCRE/ECOWAS Observatory, G-WADI/UNESCO Project.);
- Support climate-aquifer related research on the effects and impacts of climate variability and change on aquifers, and the adaptation measures to be undertaken.





### 3.2 Policy Recommendation for the identification of Major Environmental, Social and Economic Stakes of Aquifers:

- Inventory and analysis of small scale irrigation from groundwater sources, identify pollution sources in urban areas and also the use of water in industrial and mining sectors through national and regional efforts;
- Promote reasonable and equitable utilization of transboundary aquifers and aquifer systems in an efficient way including withdrawal of water, storage and supply or disposal, etc...;
- Encouragement should be accorded to regional projects on groundwater preservation, environmental sustainability and ecosystem integrity, which include social and economical aspects of the vulnerable aquifers;
- Support groundwater development, and integrate it in all water resource development projects;

### 3.3 Policy Recommendation for the Dialogue and Communication

Advocate with politicians at the national and regional levels in order to integrate the groundwater component in the IWRM, and to allocate research funds;

- Adapt sensitization messages and groundwater information system to target the public, and the communication messages to various media and providing a minimum technical training should be an active focus to fill the communication gap;
- Sensitizing financial partners to value the development and economic advantages of groundwater projects should be accorded specific attention;
- Take groundwater issues into account in inter-States committees and inter-States agreement should be accorded priority;
- Support for setting up purely African/endogenous funding in which each country should have a budget line for research on groundwater; and also setting up international funding water resource mobilization projects should be dedicated to funding research;

- Accord greater attention for encouraging the dialogue between States at the regional level, and reinforcing the Country Water Partnerships (CWP) and the civil society by including the groundwater component and the cross-border aquifer issue;
- Harmonization of policy in transboundary system related to protection, recharge, use and sustainability.

### 3.4 Policy Recommendation for the Management and Institutional, Legal and Policy Framework

- Facilitate the creation/reinforcement of the dialogue frameworks at the national level, sub-regional level, and at the level of aquifers using the existing coordination mechanism, extending the activities of existing organizations to transboundary aquifers, and going beyond the limits of the hydrographical basins, seeking for partnership and developing inter-organizations cooperation or one between organizations and States;
- Promote proper institutional structures harmonized with adequate means to implement and support the necessary actions toward sustainable aquifer system management;
- Use the opportunity of existing sub-regional consultation frameworks (WRCC/ECOWAS, AMCOW, CILSS, African Network of Basin Organizations) at their best normal attributions, and not necessarily creating new structures.

### 3.5 Policy Recommendation for the Development and Reinforcement of Competences and Adaptation/Resilience Capabilities

- Share experience with SADC and promote scientific and technical exchanges on irrigation methods (India, North Africa, etc);
- Make an inventory and analysis of hydro-geologists and environmentalists' training at the university and professional school level in the West African sub-region;
- Encourage investment in education and training for reinforcing human and material means, improving salaries and particularly revaluing the status of technicians



## 4. CONCLUSIONS

Water is the core element for sustainable development; therefore groundwater should be given adequate attention in the face of climate change since it has reliable sources of safe water for the benefit of current and future generation. Nearly all large aquifer systems extend over two or more countries. Thus, groundwater should be given high priority in order to identify pathways for better policy alignment at national and regional levels with particular reference to transboundary aquifer management to meet the challenges of climate change. The present policy brief has summarized in policy messages key recommendation points with the need to develop groundwater projects, strengthen existing institutions, create dialogue framework at different level, invest in education, training and groundwater research, and fill the knowledge, practice and data gap of the aquifers systems. As stated from the GWP/WA diagnosis study, the groundwater dimension may be extended beyond the boundaries of any single state thus forming 'transboundary or shared' aquifers. It also has to obey joint water sustainable management paths that look at the social, environments, policy and legislation ambits. In this regard, a groundwater policy framework should be mainstreamed into the national governments and regional policies. This should lead to anticipate serious impacts and interactions between groundwater resources and climate change in Africa.

## 5. ACKNOWLEDGEMENT

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the International Association of Hydrogeologists (IAH), as well as the African Ministers Council on Water (AMCOW), the International Fund for Agricultural Development (IFAD), the Ramsar Convention on Wetlands, the UN Convention to Combat Desertification. The substance of the paper is from the diagnosis study and the outcomes statements of the regional dialogue workshop on groundwater in West Africa that has gathered stakeholders and countries under the facilitation of ACPC and GWP -WA.

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