

## Development of River Basin Organizations in Nigeria

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**Abstract:** The present poor drinking water services and sanitation problems have triggered the need to look for a better management strategy under the current water reform in Nigeria. In order to suggest a feasible option, the study examines the present water management structure in Nigeria. Findings indicate that there exist no water management structures at a lower (or sub-basin) level; there exists no water management platform that incorporates the non-government water stakeholders in the present river basin-based water management structure in Nigeria and there is no involvement of present basin management authority in sanitation and drinking water service provisions. To alleviate these problems, the study suggests; one, the rationalization of the present 12 river basin management framework into four along the four natural hydrographical areas in Nigeria, two, the creation of sub-basin management structures within the four natural hydrographical areas, three, the inclusion of key non-government water stakeholders in river basin and sub-basin management platforms and four, the devolution of drinking water and sanitation service provisions to the basin management organizations. The study closes with a set of policy recommendations that could encourage the operation of this alternative water management structure in Nigeria.

**Key words:** Integrated river basin management, stakeholder participation, subsidiarity, water management in France, Murray-Darling basin, water management gaps, possible interventions, Nigeria

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### INTRODUCTION

Throughout the world there is a broad consideration of water as a finite and vulnerable resource (Jaspers, 2003). The concept of integrated river basin management has its roots in a collective effort to make water use economically productive, socially equitable and environmentally sustainable for all users within the basin (Mody, 2004). The idea of integrated management of land and water resources or the use of the river basin as the most appropriate management unit is not new (Saha and Barrow, 1981; Mody, 2004; Burton, 2003) but it is only in recent times that it has become an internationally accepted principle (Burton, 2003). The concept of river basin originally referred to as drainage basin, represents a system of interconnected system of water tributaries that flow towards a single outlet. It combines the natural processes of precipitation, evapotranspiration, surface and ground water runoff with man-made features such as dams and reservoirs and hydro-power projects, diversions and irrigation schemes, industrial and residential water and environmental and cultural protection services.

In the early part of last century, the focus was primarily on exploiting and controlling water. By the middle of that century, growing needs and modern technology increased the need for efficient use of water resources. By the sixties, questions concerning the impact of hydro-engineering projects on social well-being and

environmental protection started to emerge. Along this line, the idea of coordinating water resources development with land and environment in the basin took root. For example, the French plans to basin development in the 1920s, the establishment of the Tennessee Valley Authority in the USA in 1933 and the subsequent examples in India, Colombia and Brazil. In an attempt to operationalise the concept at the international level, institutions were set up and treaties were signed as in the case of the Indus Valley, the Senegal, the Lower Mekong, the Rhine and the Colombia basins among others (Mody, 2004).

With increasing pressure on water resources, the limits of river basins were extended to include surface and sub-surface. In addition, concerns about the potential adverse impact of global warming and the need to restore and protect the ecosystem introduced a new element into defining the river basin concept as integrated water resources management as articulated by the Dublin Principles of 1992. The call for integrated management of water resources was further endorsed in Agenda 21 at the United Nations Conference on Environment and Development at Rio de Janeiro latter that year. Also, from the Dublin statement of 1992, the river basin was affirmed to be the most appropriate geographical unit for planning and management of water resources. Aside from this, there are some other agreements, treaties and policy declarations that give legal recognition to the concept of

river basin as a unit for planning and management of water and environmental resources (Mody, 2004). Under the new approach to river basin management, integrated river basin management thus entails dealing with water management in a more integrated way, moving away from the sector-by-sector approach; looking for sustainable use of water, satisfying the needs of both man and environment and moving progressively away from the centralized management models in order to adopt increased stakeholder participation (Burton, 2003; Jaspers, 2003). According to Tacis, many countries have introduced the concept of river basin management because they recognize that this is the best way to effectively and economically protect and restore water quality and quantity.

In its bid to address poor drinking water services and sanitation problems and meet its water-related Millennium Development Goals (MDGs), Nigeria is currently undergoing a broad process of reform of its integrated water resources management at basin level. This shift underscores its commitment to move from water resources development to an effective water resources management (Federal Government of Nigeria, 2003). In order to complement this effort and propose feasible intervention, the study examines the present water management structure in Nigeria with a view to identify where the water management gaps are and to use the lessons deduced from it and from the review of experiences in the French and Australian (Murray-Darling) basins to suggest an alternative water management structure for Nigeria. It is envisaged that an improvement on the present water management arrangement could alleviate the present poor drinking water services and sanitation problems as well as improve the country's ability to meet its present and future water and sanitation needs and challenges in a sustainable manner including other water-related MDGs. The findings of this study will be useful at both policy and practice domains for countries wishing to reform its water resources management along the hydrological boundaries to meet drinking water and sanitation service provisions in a sustainable manner.

## **MATERIALS AND METHODS**

In examining river basin water management gaps in Nigeria, the study based its findings on responses obtained from two semi-structured questionnaire surveys and a review of regulatory documents. Questions in the first survey assessed the perception of respondents on the existence of both formal and/or informal water management structures (structures are referred to in this study to include the organizational set up and the

geographical area) at a lower (or sub-basin) level and the involvement of the non-government water stakeholders in the present river basin-based management set up. The second questionnaire which was a follow up to the first, requested respondents to identify and complete a list of non-government water stakeholders at basin level, provide a rating on a 4 point scale with 1 as low and 4 as high, on the level of importance and influence of each non-government water stakeholder identified with respect to water use in Nigeria and make a case for or against the creation of a formal water management structures at the sub-basin level in Nigeria (sub-basin is hereby defined as a lower level administrative unit for water management at river basin). On the first survey, questions were targeted at water experts in the Federal Ministry of Water Resources and those of the Benin-Owena River Basin Development Authority for the basins in Nigeria. The Federal Ministry was selected because it is the regulatory body in charge of water affecting more than one State and basins management regulations while the Benin-Owena River Basin Development Authority was selected as a representative basin. The basins in Nigeria are established and operated based on the same rule, so structurally; there may be no significant difference. On the first survey, contact was made through the use of phone calls and e-mails. On the second survey, communication with key water informants in the selected representative basin, the Benin Owena River Basin and the State Ministry of Water Resources in the basin area was by personal contact. A shortcoming here is the low number of respondents. Practically speaking, those knowledgeable in the field of river basin management or water resources management are rather few. Nonetheless, the responses were meant to be illustrative. As such, the limitation may most likely influence only the relative magnitude of effects, not necessarily the overall lesson. To minimize this shortcoming, the study methodological approach (as stated above) was coupled with direct observation and researchers experience in the field of water resources management where necessary and especially on the existence of water management structures at a lower (or sub-basin) level.

The observed present water management situation in Nigeria was compared with those of France and Australia (Murray-Darling basin) which operate on the same water management model, the coordination model and these countries experience in water resources management at basin level could be classified as mature and they also incorporate non-government water stakeholders in their water resources management at basin and sub-basin levels. In brief, the case areas selected are comparable to the situation in Nigeria in the following ways: one, Nigeria

and the selected case areas manage water resources based on the coordination model two, the cases selected represent examples of sustainable river basin management using the said model that Nigeria could learn from and three, France could be classified as water rich while Australia (the Murray-Darling basin) could be classified as water scarce which the study believes will have important implication on the operationalisation of the coordination model. The water hydrology of Nigeria indicates being water rich at the extreme south and water scarce at the extreme north. The study believes that arrangements successfully applied elsewhere via basins operating same model could offer useful lessons that Nigeria may adapt to its situation but not necessarily advocating for a horizontal transfer due to differences in socio-economic, political and cultural conditions. For greater details, the Seine-Normandy Basin in France (the Seine-Normandy Basin is one of the six hydrological basins in France and the Murray-Darling Basin in Australia were selected (the Murray-Darling Basin is Australia's largest and most developed river system). In the study, for the case of Nigeria, non-government water stakeholders in terms of their relative importance (or power), influence or both were rated in the second questionnaire by respondents and was analysed using a matrix classification. Those identified as key (in line with the suggestion of were suggested to be included in both basin and sub-basin management platforms in Nigeria.

In crafting suggestions on organizational, functional, levels and techniques of involving non-government water stakeholders and on important regulatory arrangements for basin and sub-basin management, lessons deduced from the present water management gaps as well as from the socio-economic (e.g., poverty level) and cultural conditions of Nigeria were taken into consideration. In addition to these, useful lessons from the desk review of the French water management system and that of Australia (the Murray-Darling Basin) were also used.

**Impact of present water management bodies on river basin management in Nigeria:** Nigeria covers  $0.924 \times 10^6 \text{ km}^2$  (Ita, 1994) with four major drainage basin areas (Federal Ministry of Water Resources, 2003a, b): The Lower Niger, The Lake Chad basin, The river basin of Cross and Imo and the Southwestern drainage basin. Nigeria is rich in water resources. It has a surface and groundwater resources estimated at over  $250 \times 10^9 \text{ m}^3$  (Federal Republic of Nigeria, 2001). The annual rainfall varies from over 4,000 mm in the southeast to below 250 mm in the extreme northeast and is subject to significant temporal variations (Federal Republic of Nigeria, 2004). Mean precipitation is about 1177 mm per annum.

In practice, three bodies are involved in the management of water in Nigeria. The Federal Government through the River Basins Development Authorities (RBDAs) who control and maintain the water reservoirs and also saddles with the sales of raw water to the farmers via irrigation water and to other users. The State Governments are also involved in water management through the Water Corporations or Boards who procure bulk raw water from the river basins authorities and make it available to users as drinking water. In the basins where there are no large dams, the presence of the RBDAs is less felt. This most often encourages Water Corporations or Boards in those Basins to own their water reservoirs. Example of this exists in the Benin-Owena River Basin (BORB). The local governments are also involved in drinking water provisions especially at the rural level. In most cases, the Local Governments rely on deep well development to meet its rural drinking water supplies. Beside these bodies, there are some private individuals in the drinking water supply sector who depend on government sources or on privately owned deep wells. Despite this arrangement, the formal water sector which serves the majority of the Nigerian population is not performing with unserved and poorly served populations. The Water Corporations or Boards are in most cases stifled by lack of autonomy (bureaucratic and financial) leading to poor market and customer orientations on the part of the water supply organizations with their associated poor revenue base and lack of accountability while the river basins development authorities are rather institutions that can bark but cannot bite. Its powers are contradicted and usurped by other conflicting Federal, States and Local Authorities, leaving the river basins development authorities as toothless bulldogs. Another straw that breaks the camel's back is that there is no political will on the part of governments (Federal, State and Local) to treat drinking water as an economic good but rather, it is essentially being treated as a social good in the face of dwindling budgetary allocations to the drinking water sector. At the local level, there is no framework designed to transfer the operation and maintenance of water infrastructure to the rural dwellers. This situation is compounded by the fact that the rural dwellers are most often not taken along during project planning and development. And in most cases, projects are instituted mostly based on political reasons rather than on the need to meet drinking water targets in a sustainable manner.

Under the federal structure in Nigeria, sanitation service provisions are the responsibilities of the communities/individuals and in some cases with Local

Government, State and Federal interventions (mostly politically driven and not by law). Presently, wastes recovery efforts are very low and poorly coordinated and there are clear indications of both surface and groundwater pollution due to contaminants (mostly organic) migrating from both point and diffuse sources to the water bodies. This scenario attracts less concern from the local government authorities saddled with rendering technical assistance on sanitation. The reasons behind this could be partly due to lack of funds and the absence of a legislative tool saddling the local government authorities with sanitation in concrete terms at the operational level and neither is there any documentary evidence indicating the extent of water/land pollution in Nigeria to serve as a driver. Similar to the case of drinking water, sanitation (e.g., waste collection and disposal) where provided by governments are essentially treated as a social good rather than economic, thereby making self sustainability difficult. At present, drinking water and sanitation (where available, for instance, waste collection and disposal) are provided along administrative lines rather than along the hydrological boundaries.

The present arrangement on drinking water and sanitation service provisions is rather inefficient and unreliable and has maligned the wider socio-economic and cultural contexts of the Nigerian sub-region indicating that the about 62% of the population that have access to improved water source and the about 53% that have access to improved sanitation facilities (in 2004 estimates) (World Bank, 2004) could have worsened further in 2010. Therefore, an organizational and functional change is needed to address the current problems. Shifting these functional responsibilities (drinking water and sanitation service provisions) to the basins therefore becomes imperative because the RBDA's decree of 1986 empowers the River Basins Authorities (RBAs) to operate on cost recovery which is applicable at present to raw water supply (although without any specific provision on the application of polluter pays) although attention has to be paid to granting necessary autonomies to the basins for them to be effective.

**Water management in the selected case areas, France and the Murray-Darling basin:** France is rich in water resources which is estimated to be on the average of  $191 \times 10^9 \text{ m}^3 \text{ year}^{-1}$  (WWF for Nature, 2003). Countrywide, mean annual rainfall is estimated at about 800 mm. The country has a total surface area of about  $0.54 \times 10^6 \text{ km}^2$ . The Murray-Darling basin drains an area of about  $1.1 \times 10^6 \text{ km}^2$  (Turrall, 1998), approximately one-seventh of the land area of Australia (MacDonald and Young, 2001).

The average annual rainfall varies from over 900 mm in the eastern rim to about 100-400 mm in the western half (Purdie, 2003; MacDonald and Young, 2001). The basin could be classified as located in arid and semi-arid regions.

Up to the present, three water management models have been identified: the hydrological, the administrative and the coordination model. At present, France, Australia (the Murray-Darling basin) and Nigeria are operating on the coordination model where it could be said that water resources management is based along the hydrological boundaries (or the river basin concept) and all water development and management decisions are diffused among or coordinated by the river basin authority and the governments. The river basin management concept which is an integral part of the coordination model is based on the following principles, a basin-wide perspective two, the promotion of a high level of stakeholder involvement and three, the use of sound management techniques. In the case of France, water management structures exist at two levels, basin and sub-basin (Betlem, 1994, 1998) which is similar to that of the Murray-Darling basin (Murray-Darling Basin Commission, 2001). In both cases, non-government water stakeholders are involved at different levels. In the French system, water stakeholders are involved at information dissemination and participatory level at sub-basin level while at participatory level for the Board of Directors and at consultation level for basin committee also operating at the basin level (Barraque *et al.*, 1998). In the Murray-Darling basin, the Community Advisory Committee (CAC) operating at the basin level is involved at consultation level (ICM Business Unit, 2004; Murray-Darling Basin Commission, 2001; Bouilly, 2004) while the level of involvement of stakeholder bodies varies from one Catchment Management Board to the other. At the sub-basin level where stakeholder group (or Management Board) is statutory, it is involved at participatory (or joint decision making) level while others are mostly consultative in nature (Bellamy *et al.*, 2002; Murray-Darling Basin Commission, 2001). For example, the Catchment Management Boards of Victoria as empowered by the Catchment and Land Protection Act and the Water Act of 1989 that of South Australia as empowered by the Water Resources Act (1997) and that of New South Wales as empowered by the Catchment Management Authorities Act (2003) are statutory. In both case areas, there are regulatory evidences supporting the application of Basin and sub-Basin water management structures and the involvement of the non-government water stakeholders. In the case of France, these are contained in the 1964 and

the 1992 water acts while in the case of Murray-Darling Basin (MDB), these are specified in the 1992 Murray-Darling Basin Agreement (Murray-Darling Basin Commission, 2001) and in the individual Catchment regulatory documents (for example the South Australia Water Resources Act of 1997, the New South Wales Catchment Management Authorities Act, 2003).

Another striking lesson from the case areas is the linking of water provision with environmental protection along the hydrological boundaries rather than along administrative lines. For example, in the case of France, drinking water and sanitation services are indirectly provided by the Basin Authorities that is through private operators and municipalities which is similar to some catchments in the MDB (Murray-Darling Basin Commission, 2001; Meredith *et al.*, 2003; ICM Business Unit, 2004). In addition to this, the regulatory documents, the 1964 and 1992 French water acts also encourage the application of water supply and environmental protection along the hydrological boundaries. The Murray-Darling Basin Act (2008) and the Integrated Catchment Management Policy (Murray-Darling Basin Commission, 2001) and other catchment regulatory documents (for example, Victoria Catchment and Land Protection Act of 1994, New South Wales. (Catchment Management Authorities Act, 2003) also indicate similar approach. Some of the water laws of the selected case areas also guarantee some levels of governmental interference in river basin management (for example, the French water act of 1964 and 1992 and the Murray-Darling Basin Agreement of 1992).

Although, many factors have contributed to improved water management at basin level in the selected case areas (for example, the application of proven management techniques, availability of human and financial resources, political will etc.), in the case of the French basins, the application of water management along the hydrological boundaries and the application of non-government water stakeholders are seen as contributors to the institutional success of the basins (Correia *et al.*, 1998; Kaczmarek, undated). This is also similar to the case of the MDB (Murray-Darling Basin Commission, 2001; Meredith *et al.*, 2003; Bouilly, 2004).

## RESULTS AND DISCUSSION

**Water management gaps in Nigeria:** Nigeria has made considerable investment in water schemes and related activities in addition to being blessed with abundant water resources. The rise in demand for water related

services that is outstripping supply is consequent on high population growth coupled with increasing urbanization, rising living condition as a result of economic growth and poor management. Direct observation shows that the nation's water resources are under serious threat from inadequate resource management and deteriorating water quality and there is no known regulation (not even the 1999 Constitution of the Federal Republic of Nigeria) that has saddled the RBDAs with environmental protection and drinking water service provisions, either directly or indirectly. Beside these, other threats facing Nigeria with respect to water resources are shortages of raw water exacerbated by widespread pollution, increasing drought and desertification, floods and erosions, climate change, reduced reliability of raw and drinking water supplies and increasing costs of irrigated agriculture, competing water uses, degrading water courses, fragmented and uncoordinated water resources development/policies, poor data and lack of involvement and cooperation of co-riparian use of international waters. The absence of financial discipline and accountability for performance, along with undue political interference in decisions about allocations, pricing and cost recovery are reflected in a host of problems-inefficient operations, inadequate maintenance of water infrastructure, economic losses and unreliable service delivery and non-willingness to pay on the part of users due to poor services. The Federal and State Governments that have assumed greater responsibility for the overall management of the nation's water resources are faced with dwindling revenue base, meaning that there is need to make integrated water resources development and management coordinated and self-financing.

Unlike in the selected case areas which also operate on the coordination model like Nigeria, respondent perceptions indicate that there is no water management structures at a sub-basin level; neither are the non-government water stakeholders involved in the present river basin-based water management platform. Also, the active legal documents, the 1986 RBDAs act and the 1993 water resources decree have no specific provision on the application of management structures at a sub-basin level or on the incorporation of non-government stakeholders in basin-based water management. Just as in the selected case areas, similar drivers or triggers exist for effective water resource management in Nigeria, ranging from political willingness to poor drinking water provision, environmental degradation problems and sustainability issues.

**Possible interventions:** In order to remedy the water management gaps identified above and reposition water management in Nigeria to address poor drinking water services and sanitation problems, three possible interventions are proposed putting into consideration the socio-economic (e.g., poverty level, etc.) and cultural context of the Nigerian sub-regions.

Efforts should be geared towards concentrating drinking water and sanitation service provisions as part of the functions of the river basins with a clear legislative backing. For example, the transfer of irrigation schemes under the Participatory Irrigation Management (PIM) arrangement failed among other reasons due to the absence of an enabling legal framework. Although, in the case of Nigeria where the bulk of the population is poor, drinking water and sanitation service provisions must be treated as both social (in order to guarantee access to the poor) and economic (in order to ensure cost recovery and sustainability) goods which should be backed up by the appropriate legal rules. It is important to create sub-basin water management structures that will encourage a bottom-up approach (or induce the principle of subsidiarity) to water resource management at Basin level. All respondents agreed to the need for water management structures at a lower level. Key reasons cited include the possibility of giving a voice to rural dwellers which will enable access among others, to indigenous knowledge application to water resource planning and management and providing a chance for a collective implementation and management of water projects although, clear legislative provisions are needed to make this work in practice. It is expected that the sub-Basin (including basin) water management structures will be funded under the proposed cost recovery structure and the costs of participatory management are in principle to be recovered from those that benefit from their services or the resources they are designed to govern. According to the United Nations Department of Economic and Social Affairs (2003), all costs must be recovered if the provision of water is to be viable. Beside this as in the case of Nigeria, the application of cost recovery and polluter pays could act as incentives to reduce resource pollution and overuse (or abuse). Involving key non-government water stakeholders in water resource management at both basin and sub-Basin level is essential. Modern water resources management strategies support stakeholder participation. According to Jaspers (2003) and World Bank (2003), water resources management without the participation of stakeholders in decision making, resource planning and management is highly ineffective and a bigger problem of enforcement could arise (including pricing and cost recovery). Also, Pittock *et al.* (2003) list stakeholder

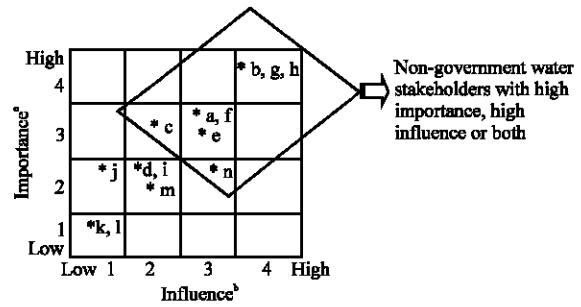


Fig. 1: Matrix classification of non-government water stakeholders\*; a = Industries; b.= Farmers (Crop and animal husbandry); c = Commercial; d = Labour unions; e = Civil society (including representation from villages and towns); f = Professional organization and associations; g = Water services and sanitation providers; h = Academic and research institutes; I = Environment (representations from environmental NGOs and CBOs\*\*); j = Students' body (tertiary institutions); k = Women groups; l = Religious institutions; m = Cultural institutions; n = Political parties; importance refers to those water stakeholders whose water problems, needs and interests can be considered to be critical to the country. If these important stakeholders are not satisfied effectively, then river basin management can not be deemed a success. <sup>b</sup>Influence refers to how powerful a water stakeholder is, with reference to Nigeria under the present local conditions; \*non-government water stakeholders are identified along organized groups. This is done for ease of obtaining representation from them to the stakeholder platforms (Basin and sub-Basin); \*\*CBOs = Community-Based Organisations

participation as one of the critical success factors for integrated river basin management. Figure 1 shows the matrix classification of non-government water stakeholders according to their relative influence and importance in line with respondents' responses and ratings as obtained from the second survey. The Fig. 1 (looking at those indicated in bracket) shows the key non-government water stakeholders that could be involved in water resource management at both Basin and sub-Basin level in Nigeria following the suggestion of Gavin and Pinder.

Incorporating these interventions will require an institutional structural change of the present river basin arrangement in Nigeria. At present, river basin

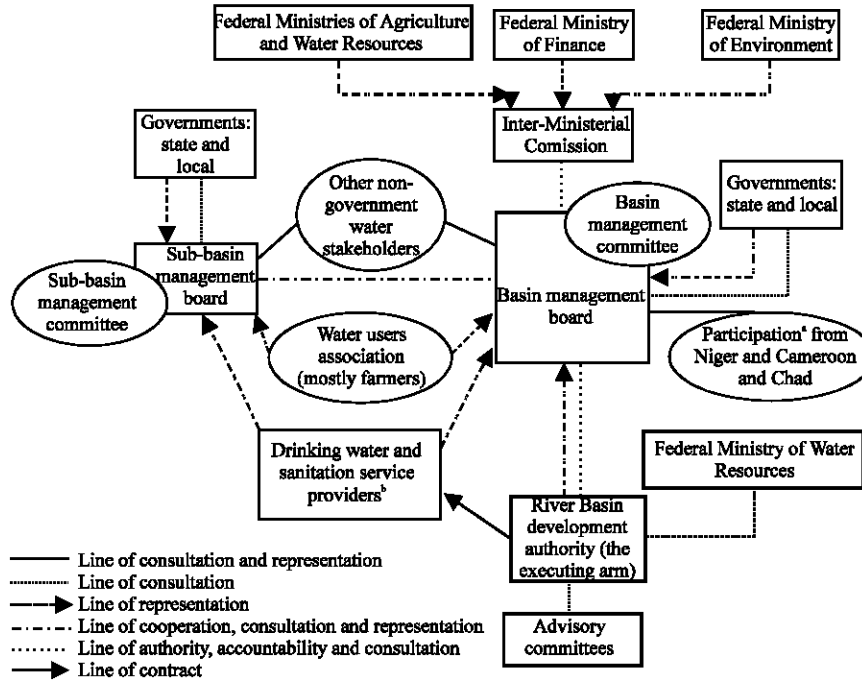


Fig. 2: The present (in bold) and the proposed river basin management structure; <sup>a</sup>Participation is needed for the Lake Chad basin area (that is, representation from Chad, etc.) and for the Lower Niger basin area (that is representation from Niger and Cameroon); <sup>b</sup>Such providers could include the private operators and the local government authorities (especially for the rural areas which may not be profitable to the private operators but with necessary legislative mandate for the local governments to do so)

organisational structure (Fig. 2 in bold) is based on the provisions of the water resources decree of 1993 and the RBDAs act of 1986. As seen from here, the management bodies involved are mostly governmental. A shift from this present structural arrangement, towards incorporating the proposed interventions which is in line with modern water management principles (known as the Dublin principles that is the ecological principle, the institutional principle and the instrument principle) will require formulating a broader organisational structure as shown in Fig. 2. The strength of this structure is that the river basin and its authority (although, indirectly) becomes the platform for managing drinking water and sanitation services in an integrated approach with other basin services at two levels, Basin and sub-Basin with the incorporation of the non-government water stakeholders at four levels of administration (Fig. 2) and based on the cost recovery and the polluter pays principles. Although for this arrangement to be effective, necessary legal backing that will grant in addition, necessary financial and bureaucratic autonomies to the basin management authority is also essential, else the RBDAs may suffer another undue political interference that may make them to become toothless bulldogs. Also as shown in Fig. 2,

the legislative backed Inter-Ministerial Commission will provide the needed regulatory oversight function on behalf of the Federal Government. To be moderate, their role could be limited to auditing, ensuring balanced stakeholder representation, the protection of the poor and other residual legal supervisory functions.

Rather than embedding the proposed structure (Fig. 2) in the present river basins' spatial arrangement, a more worthwhile approach that could help to encourage the participation and cooperation of co-riparian of international waters in Nigeria (Nigeria being at the downstream of river Niger and a co-riparian owner of Lake Chad) would have being to rationalise the present 12 river basins into four along the country's four large natural drainage basin areas: the lower Niger basin (representing about 63% of the total area of the country, the Lake Chad drainage basin (representing about 20% of the total area of the country, the Basin of Cross and Imo (representing about 6% of the total area of the country and the Southwestern drainage basin area (representing about 11% of the total area of the country instead of the proposed eight Basins as indicated in the 2003 draft National Water resources Management Policy (Federal Government of Nigeria, 2003) and in the yet to be

adopted National Water Policy of 2004 and embed it in it. This rationalisation is important especially for basins with international waters because of the benefits to be derived (such as better transboundary water management, conflict reduction, etc.) from the inclusion of representations from countries in the upstream of the Lower Niger basin (that is, Niger and Cameroon) and from countries contributing directly to the Lake Chad (that is Chad, etc.) on the management platforms of the lower Niger Basin and the Lake Chad basin, respectively, in line with the 1960 Helsinki rules on water, Principles 13 and 21 of the Stockholm Conference on the Human Environment, the 2nd Dublin Principle on stakeholder participation and also in line with the UN Conventions on the law of the non-navigational uses of international watercourses and other UN-related conventions and treaties relating to (International) waters which is not the case up till now in Nigeria. For example, the Lake in Chad (shared by Nigeria and others) is contracting partly due to lack of cooperation on the part of the riparian owners. Sub-Basin geographical delineation could be made to follow the natural smaller hydrographical areas to make it meaningful.

### **CONCLUSION**

An attempt to improve drinking water services and sanitation problems and meet its water related MDGs has made Nigeria to embark on a broad process of reforming its adopted integrated water resources management at Basin level. In order to complement this effort and suggest a better alternative structure, the study looks at the present water resources management structure in Nigeria. It investigates water management gaps and suggests possible interventions to remedy the situation.

Its key findings show that: no water resources management structures exist at a lower (or sub-Basin) level that could provoke the principle of subsidiarity, no non-government water stakeholders' representation on the present river basin-based management platform and no involvement of present river basin management organizations in drinking water and sanitation service provisions despite operating on integrated approach. In order to remedy the situation, the study proposes a new institutional structure for water management at basin level in Nigeria and makes the following policy recommendations based on the water management gaps identified, the socio-economic and cultural conditions of the country and also based on useful lessons obtained from the desk review of the French water management system and that of Australia (the Murray-Darling Basin).

### **RECOMMENDATIONS**

The amendment of the 1986 River Basins Development Authorities Act, the 1993 water law and the yet-to-be adopted water policy of 2004 and other water-related regulatory documents to include provisions that will:

- Establish four large hydrographical basin areas along the four natural drainage areas in Nigeria instead of the proposed eight
- Establish sub-basins' water management structures within the proposed four natural hydrographical areas (that is, within the Southwestern drainage area, the Basin of Cross and Imo, the Lake Chad basin and the Lower Niger Basin area)
- Establish, operate and regulate stakeholder based water management platforms at both Basin and sub-Basin level. In this regard, the amendment should recognize in concrete terms the inclusion of key non-government water stakeholders-the industries, agriculture and commercials, etc., on Basin and sub-Basin management platforms at participatory level for Basin non-government organizations and at consultation and participatory levels for sub-Basin non-government water stakeholders, using locally appropriate techniques (e.g., through the use of organized meetings and advisory committees, etc.)
- Saddle the proposed river basins management organizations with water and sanitation service provisions
- Treat drinking water and sanitation services as both social and economic goods and encourage the use of cost recovery and polluter pays principles to drive drinking water and sanitation service provisions' sustainability at the basin level in Nigeria

Besides legal pronouncement, the establishment and operation in practice of statutory stakeholder-based management organizations at both basin and sub-Basin levels is also very essential. The management organizations or platforms should be composed of all categories of water users through representation with 1/3 representing the economic sector, 1/3 representing the social sector and 1/3 representing the ecology, operating at four administrative levels, namely: the Basin management board and the Basin management committee at the basin level and the sub-Basin management board and the sub-basin management committee at the sub-Basin level. The management organisations should be empowered with sufficient gender balance through legally



recognized quota mechanism that guarantees 1/3 of platform size for women. The suggested (new) functions or powers (in addition to those specified in the regulatory documents) of the river basins are expected to be statutory, including the implementation of monetary and non-monetary incentives to encourage participatory integrity on the stakeholder platforms.

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