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An Appraisal of Mainstreaming Ecosystem-Based Watershed Management in Nigeria's Water Resources' Legal, Institutional and Policy Framework

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Abstract: Modernized efforts for harnessing Nigeria's abundant water resources for municipal water supply; irrigation and power generation commenced around 1923 when the first earth dam was constructed. Subsequently many more dams were constructed in the 1970s during the oil boom. And presently more dams are built in a pattern described as a form of top down approach intervention or maladjustment that lacked proper planning; community participation that not only hinder optimal and efficient utilization of resources but threaten sustainability of the projects. Legal, institutional and policy framework / documents that evolved over time to create access, set standards and enforce regulations such as; the (Nigeria)Waterworks Act of 1915, the River Basin Development Authority (RBDA) Decree 25 of 1976 (1979 and 1987), the National Water Resources Master Plan, 1995, the National Water Policy 2004, National Irrigation Policy and Strategy for Nigeria of 2005 and the National Water Resources Master Plan 2013 among other legal/institutional and policy frameworks expounded on and intended to address challenges of water resources development and management in the Country. The aim of this paper is to present an appraisal of these policy and institutional framework in integrating or mainstreaming ecosystem based watershed management. We conduct a review of these frameworks. Our findings reveal that there is a paradigm shift from structural (engineering or hardware) approach to an integrated approach to water resources management that emphasized Ecosystem-Based Watershed Management. The most recent of these frameworks underlined the cross-cutting nature of water resources management and calls for synergy and collaboration, involving users, planners and policy-makers at all levels through participation, and with coordination and technical competence of specialized basin entities or Ministries, Department and Agencies (MDAs) as well as research institutions, donor and development partners. The recommendations are geared towards improving cooperation and complementing efforts and commitments of the MDAs.

Keywords: integrated water resources management, ecosystem-Based-watershed - management, institutional and policy framework.

INTRODUCTION

Water resources development in so many countries of the World faces the challenges of bad planned engineering measures that lacked holistic approach such as ecosystem based watershed management that leads to mal-adaptation and increased social vulnerability [1, 2]. It is increasing accepted that integrated ecosystem based thinking and practice that promotes conservation and sustainable use in an equitable way are require in design, planning, regulation, and management of natural resources systems such as land, water and living biosphere. Therefore, protecting, and restoring ecosystems at the state, river basin and watershed levels is essential in order to foster equitable human development and the welfare of all species through safeguarding of natural resources and bequeathing a sustainable earth to the future generations. Globally, there are reforms for sustainable options that tackle going against nature through constraining regular ecological cycles. Smith and Clausen [3] observe that the present water resources sector has experienced a paradigm shift from the engineer's hydraulic mission to the mission of Integrated Water Resources Management (IWRM) whose coalescence as an idea emerged at global level from the United Nations Water Conference in 1977, with governments later in 2002 making commitment, to its application.

IWRM as has been put forward by Global Water Partnership is being recognized internationally as an effective method on the development and

management of water resources targets three important integrations the first of which entails integrating of the natural system or ecological sustainability. This consider, in an integrated manner, any form and stage of water in natural water cycle. This requires that function of ecosystem in ensuring sustainable quantity and quality of water supply is protected. The second targeted integration has to with economic efficiency that should bring greatest benefits to the greatest number of users possible with available financial and water resources and the last integration deals with social equity that fosters equitable access for all users to an adequate quantity and quality of water necessary to sustain human wellbeing [4-6]. Watershed management forms one of the important components of IWRM. A watershed is a surface area or an extent of land surface where water from rain, river overflow, and melting ice or snow coverage to a single point. It is a topographically delineated area drained by a river system. It is said to constitute a hydrological unit that is described and used as a physico-biological entity and also as socio-economic and political unit for planning/ management of natural resources. Hence, watershed consists of land, water and shed. The letter denotes the vegetative canopies that assist in maintaining equilibrium in watershed ecosystem [7]. Forest and other vegetations are part of watershed components of river basins that are key determinants of water supply, quality and quantity, in every ecosystem [8]. Watersheds as the biological engines of the earth system therefore play a central role in ecological services which form the basis for life and the livelihoods of local communities.

Globally, national success stories on IWRM have tended to emphasize planning and reforms to laws, institutions and policies. As part of reforms to the models of legal and political cooperation in the management of freshwater resources, the European Union in 2000 adopted the Water Framework Directive Act. One of the main goals of this Act was to bring new approaches in EU Water Law, essentially by setting the framework of legislative action. The main thread was the river basin approach, which follows from the international legal dimension and consists of an integrated protection of river basins on a national and transnational scale [9]. In US it is reported that the traditional water management supply without considerations of social or ecosystem impacts are phased out by processionals and authorities in the sector though the implantation has been hindered by the lack of consistent definition that can be made operational with measureable criteria [5, 10, 11].

Nigeria is blessed with water resources comprising eight (8) hydrological areas drained by the two major river systems of Niger and Benue. Modernized efforts for harnessing of Nigeria's abundant water resources for domestic water supply, irrigation and power generation commenced around 1923 when the first earth dam was constructed by NESCO on the Kwall River in Jos Plateau State. Subsequently many more dams were constructed in the 70s during the oil boom and more and more dams are built by successive governments without proper planning as for instance sediment monitoring program in place to ensure sustainable management of these reservoirs [12]. This spontaneous pattern of dams sprawl has been described as a form of top down approach intervention or maladjustment that lacked proper planning and community participation that not only hinder optimal and efficient utilization of resources but threatens the sustainability of the projects [13]. The Country has witnessed an upsurge in dam construction in the past three decades. Nigeria currently has over 200 dams with a combined storage capacity of 34 billion cubic metres [14]. The history of water resources development in Nigeria since colonial time has been characterized with poor governance, irresponsive management practices and low performance [15].

Most of water sector interventions lacked preparation of Environmental Impact Assessment (EIA). Legal, institutional and policy framework / document that evolved over time to create access, set standards and enforce regulations such as: (Nigeria) Waterworks Act of 1915 the River Basin Development Authority (RBDA) Decree 25 of 1976 (repealed by No. 87 of 1979 and also latter by the RBDA Act, Decree 35 of 1987, i.e. Cap 396), the National Water Resources Master Plan, 1995, National Water Policy 2004, National Irrigation Policy and Strategy for Nigeria of 2005 and the National Water Resources Master Plan 2013 among other legal and policy framework expounded on and intended to address challenges of water resources development and management in the country. The aim of this paper is to present an appraisal of Nigeria's Water Resources sector's legal and policy framework in integration or mainstreaming ecosystem-based watershed management. The objective of the research include: (a) examine the Nigeria's Water Resources Sectoral Legal, institutional and policy framework on their provision on integration of ecological sustainability (b) to ascertain challenges and prospects in integration of ecosystem-based watershed management in Nigeria's Water Resources sector's legal and policy framework and (c) to make recommendations on strategies of improving cooperation and complementing efforts and commitments of Ministries, Department an d Agencies (MDAs).

METHODOLOGY

This research examined Nigeria's water resources legal, institutional and policy framework / documents at the federal tier of governance and made a review on integration or mainstreaming of ecosystem

based or integrated watershed management in the framework / documents. Therefore the procedure of data collection or information generation for this work is predominantly secondary or documentary collected mainly from books, journals, government publications and the like. Qualitative method of analyzing corpus of literature with the view of finding relations and establishing a value judgment in the interpretation of findings was employed in this study. As explained the research is confine to the federal tier of government in the Country because there is no consistent or uniformity of legal, institutional and policy framework for water resources governance in the states and local governments in Nigeria.

RESULTS AND DISCUSSIONS

Watershed Management in Nigeria Legal Framework

Though the Colonial Administration in Nigeria has in 1915 passed the Waterworks Act specifically to keep water from being polluted and the law prohibited the pollution of water by impermissible and harmful matters, the Water Resources Act No. 101 of 1993 [16] formed the most important legal framework in the sector. The law vested the right to control or supervise the use and management of all surface and ground water in any watercourse affecting more than one state to the Federal Government. Sections 3 and 4 (d) of the Act made provision for acquisition of right to use or take water from any watercourse and to revoke a prior right to use or take water when its exercise would be detriment to the public ineptest. Sections 4 and 5 of the law also prescribed powers on the Honourable Minister of Water Resources to make regulations that will ensure water security, water-environment sanitation and watershed protection. The Minister was also tasked with responsibility of periodic updates of water resources master plan for the development and management of water resources in the Country.

There is no doubt that WRA-1993 formed the legal basis which provided the foundation for development and management of water sources, resources and practice though to a large extent not in an integrated manner. Subsequent legislations, institutional arrangements and policy formulations such as: National Water Resources Master Plan 1995, River Basin Development Authority Act, 2004, National Water Resources Policy, 2004, the creation of Nigeria Integrated Water Resources Management Commission (NIWRMC) established in 2008, the National Water Resources Master Plan 2013 and National Water Resources Bill built upon the provisions and limitations of WRA-1993. It is however acknowledged that WRA-1993 as a framework law is devoid of detailed regulations, outdated and not complemented by sufficient administrative structures, processes and institutions for administration, largely because of lack of resources, weak database and weak law enforcement mechanism [17]. It is, however, expected that a new National Water Resources Bill whose drafting started in October 2006 and public hearing conducted by the Parliament in August, 2017 when become an Act and effective will serve as a principal legislation in water resources sector replacing the WRA-1993. The Fourth draft of the Bill comprises 14 parts and 90 sections states clearly the powers and functions of FMWR in Part III. Some of the core powers and functions include promoting the protection, use, development, conservation, and management of water resources, to make regulations, policies and strategies for Nigeria; and carrying out of the provisions of the Water Resources Act. Others are powers related to Trans-Boundary Rivers within Nigeria through NIWRMC, by establishing and chair coordination committees for each of the hydrological basins, to coordinate and assist for the situation where development or management of the water resources affects more than one hydrological zone.

Integration of Watershed Management in Nigeria's Water Resources Institutional and Policy Framework

The first institutional structure for water resources management at federal level was the creation of Water Resources Division in the 1960s as one of the divisions of Federal Ministry of Agriculture. In 1975 Federal Ministry of Water Resources (FMWR) was demerged from the Ministry of Agriculture and charged with the responsibility for the development of water resources under it purview are the River Basin Development Authorities (RBDAs) twelve (12) agencies of FMWR that play important role in development of water resources, construction of dam, irrigation and water supply, and its operation and management within the authorities' areas. They were created between 1973 and 1976. The functions of these agencies include: to undertake comprehensive water resources development of both surface and groundwater for multipurpose use such as irrigation, control of flood and erosion, to construct, operate and maintain reservoir dams, dykes, polders, wells, boreholes, irrigation and drainage systems, to supply water from storage schemes to all users for a fee to cover the cost of the services for irrigation, etc [18].

The functions of the FMWR include formulation of policies and preparations of water master plans. With regards to policy formulations, in the year 1995 National Water Resources Master Plan [19] was prepared. NWMP-1995 has been drafted targeting the year 2020. The master plan covered issues such as: evaluation of water resources potential, projection of water demand, water resources development plans; sector development plans and implementation. The outline plans related to watershed management are those on land degradation issues such as gully erosion, hazards and river management. Gully erosion has been

a nationwide problem in Nigeria. However, special attention was paid to the gully erosion problems in Anambra and Imo states in the southern of the Country because they are large-scale and destructive. Also based on the recognition that a well-coordinated river management is effective for economic development of the regions and the country, river management was regarded as responsibility of the central government. Prior to enactment of the Water Act in 1993, there was no single organization tasked to manage the comprehensive usage and conservation of water resources and river system. The water environment management section of the plan observed that there was no national program for the monitoring of the quality of surface water and the then Federal Environmental Protection Agency (FEPA) was mainly concerned with the pollution of water by industry.

Other water environment problem the plan treated included the use of watercourses for solid waste disposal and eutrophication problem in the lagoon waters of Lagos, Ogun, Ondo and (former) Bendel States. The enactment of Nigeria's Water Act 101 of 1993 and the preparation of the National Water Resources Master Plan in1995 paved the way for the Water Resources Management Reform Programme (WRMR) that was commenced in 1997. This programme carried out a Water Sector review in Legal and Regulatory Framework, Institutional Framework and Participatory Approach, Information and Water Resources Data base, Water Resources Economics and Financing, Environment and Resource Sustainability, Water Resources Infrastructure, Assets and Assets Management and International Waters [18].

The Evolution of IWRM and Watershed Management in Nigeria

Nigerian Government with the assistance from Food and Agricultural Organization (FAO) undertook the formulation of National Water Resources Master Plan aimed at efficient management and development of water resources. This project could only yield a preliminary draft report due to lack of funds. In 1991 the Government of Nigeria sought the aid of Japanese Government on this issue. Then, Japan International Cooperation Agency (JICA) formed a team of consultants and sent to Nigeria. The master plan study was conducted over a period of three years from the end of March 1992 until the end of March 1995 by the JICA Team and the Nigerian counterpart. This milestone in the water sector coupled with the prevailing global movement and campaigns for the adoption of IWRM to the water resources problems, and resolutions of International forums such as: Rio de Janeiro's Earth Summit, Dublin Declaration of 1992, the UN Convention to Combat Desertification, 1994, Marrakesh World Water Forum of 1997 and the 2000 UN Millennium Summit served as launching pad for evolution and subsequent domestication of IWRM in Nigeria. The country recorded a lot of success in formulations of plans of actions, policies and programmes all under the guidance of the principles of IWRM which climaxed with the creation of NIWRMC established in 2009 under the FMWR which is tasked with responsibility for comprehensive water resources management culminated into reform of the sector. The Water Resources Management Reform Programme in 1995 recommended reform in the water sector.

In terms of institutional and policy reforms the most important of these is that of the creation of the NIWRMC. The powers and functions of NIWRMC are stipulated in detail in Section 8, Part II of Bill for an Act to establish NIWRMC (the NIWRMC Bill). In summary, NIWRMC has three key roles, which include: permit of water use and regulations for all stakeholders including public and private institutions (implementation of regulatory function), strengthening of the management of water resources at basin and catchment level for achieving the MDGs (implementation of management function) and formulation of the Catchment Management Strategy and Plans (implementation of planning function). The formulation of National Water Policy in 2004 has tremendously been guided by the philosophy of integrated approach and was a big turning point in integrating watershed management in Nigeria. The National Water Policy [20] was built on vision of optimizing the use of Nigeria's water resources at all times, for present generations to live in harmony with nature, without compromising the rights of the future generations [13]. In the light of this vision the new management of water resources represents the challenge of carefully balancing the water uses and watershed protection through a regulatory system of integrated river basin management and regulated allocations of water resources. Some of the principles of water resources policy [13] include: control of all water in the hydrological cycle as a national asset and common resource. The objective of managing the quantity, quality and reliability of the nation's water resources according to the policy was to achieve optimum, long term, environmentally sustainable social and economic benefit for society. It further asserts that water quality and quantity are interdependent and shall be managed in an integrated manner which is consistent with broader environmental management approaches and that the management of water resources shall seek to harmonize human and environmental requirements, so that the human use of water does not individually or cumulatively compromise the long term sustainability of aquatic and associated ecosystems [13].

Under the section of compliance with environmental requirements, the policy made provisions that: in order to respect environmental requirements as laid down in the general principles, all water infrastructures shall be subject to regulations to achieve

policy objectives such as conservation and protection of the environment from degradation, pollution and overexploitation, prevent uncontrolled exploitation of water as a natural resource and ensuring sustainable access to water through good environmental management practices. The policy listed strategies to achieve these such as: establishing regulations compelling project proponents to carry out Environmental Impact Assessment (EIA) and Environmental Audit (EA) on all water resources programmes and projects and impose sanctions in order to control environmental degradation and ensuring implementation of resettlement and compensation programmes and projects during main project execution. Other strategies include carrying out Environmental Impact Assessment (EIA) and Environmental Audit (EA) for mitigation measure.

Under dams and reservoirs the policy states that dams are important structures for storing water, thus regulating flows and containing floods. They are an important economic factor through the provision of water for economic activities and for avoiding the destruction of economic means, life and property through floods. However, establishment of dams and reservoirs in a watercourse automatically introduces the element of risk in possible loss of life and property to the people residing in downstream due to possibility of dam failure. The policy therefore favours the construction of small and medium dams due to the inherent much bigger danger emerging from big dam constructions. Some of the strategies the policy proffers are ensuring proper operation and management of dams and reservoirs in accordance with the operational manual and engineering standards and construction of small and medium dams in accordance with the guidelines provided in the National Water Resources Master Plan. The National Irrigation Policy and Strategy for Nigeria (NIPSN) is consistent with and expands on the Irrigation and Drainage sub-sector policy outlined in the National Water Policy, 2004. The policy seeks to institutionalize IWRM in irrigation sub-sector. The policy essentially harmonizes strategies for managing water for agriculture without compromising the integrity of productive ecosystems. Principles of the NIPSN include: functional inter-sectoral management of water across river basins, predicated on high quality information generation and exchange; environmental responsibility in irrigation and drainage and ensuring coherence of policies, planning and budgets within the mainline Federal Ministries of Water Resources, Agriculture and Environment.

The National Water Resources Master Plan 2013 [18] served as a review and update to the National Water Resources Master Plan, 1995 [21]. This plan targeting the year 2030 was also prepared through technical cooperation of JICA Project Team with Nigerian counterparts. The NWRMP-2013 was formulated analyzing available data and information on the basis of the philosophy of IWRM. The three main components of the plan are: water Sources development plan, water sub-sector development plan and water resources management plan. The NWRMP-2013 deepened the discussion of the topics on environmental management for water resources. The plan made provisions with regards to conservation of surface water resources that it would be implemented in dams and reservoirs as well as in watershed areas. It considers both two activities are related to each other. The former is a part of dam management activities, and as one of the measures for recovering and upgrading existing dams. This is mainly implemented by dam owners (RBDAs). On the other hand, according to the plan, the latter needs cooperation among wider range of stakeholders in a watershed, which deals with environmental management, water quality management, erosion control and so on. Groundwater conservation in quantity and quality is important for sustainable usage of groundwater. It is taking place in many boreholes: i) lowering of groundwater level and drying up of boreholes due to over pumping, ii) deterioration of groundwater quality by sea water intrusion and infiltration of domestic drain and factory pollutant into aquifer. Pumping will be controlled as quantity conservation measure based on aquifer capacity assessment. On the other hand as quality control measure, pumping will be controlled against sea water intrusion, and pollutant discharge will be controlled against pollutant infiltration based on water quality standard. Guideline for measures will be prepared, and technical transfer is necessary for NIWRMC and Nigeria Hydrological Services Agency (an Agency of FMWR), which are in charge of groundwater management and conservation [18].

NWRMP-2013 prepared a management plan, called Water Sources Development Plan. The plan formulated a Responsibility Assignment Matrix: developed with assigning of responsibilities (M=Main Responsibility, S=Sub Responsibilities and D=Participation in discussions) to about 26 specified federal and states MDAs, their projects NGO and individuals. Some of these responsibilities include: (a). surface water resources conservation, (b). management of dam/receiver removal of weeds, (d). dredging of sediment, (e). watershed conservation and etc, It is interesting to observe that coordination of watershed conservation activities is the only responsibility that all the 26 have role to play from M to S and D roles and environmental education & awareness campaign followed second while erosion control, water environment conservation (forest management) came third. The plan also take into cognizance provisions made in other policy documents outside the FMWS such as Nigeria's First National Communication (2003) and Draft National Climate Change Policy (2011) documents of the Federal Ministry of Environment

where protection of watersheds and reservoir sites through establishment of intensive vegetation cover to minimize evaporation were highlighted.

Challenges to Ecosystem Based Watershed Management in Nigeria

The deficiencies of the Waterworks Act of 1915 and the Water Resources Act of 1993 in providing legal framework that would coordinate development and management of water resources in an integrated manner have been explained in section 2.0. National Water Resources Policy of 2004 lamented the poor watershed management among other problems highlighted by the policy attributed the cause to poor and uncoordinated management of the resource in the Country. The NIPSN asserted that a key constraint to resolving these issues is the fact that water and agriculture policy are not 'joined up' and institutional mandates confused. According to NIPSN although the FMWR has the overall responsibility for formulating policies and programmes for irrigation development in Nigeria, the Federal Ministry of Agriculture (FMA) and States Irrigation Departments also carry out their own programmes, notably the *fadama* project and state irrigation scheme development. This has led to a fragmented and often conflicting approach to irrigation development with the various agencies competing rather than cooperating with and complementing each other.

Despite the importance of watershed management to water resources development and management, the creation of Federal Ministry of Environment (FME) in 1999 took away the role on erosion control and flood control of the Federal Ministry of Water Resources and transferred to FME with its department. As a result of this, the countermeasure of erosion and flood control which was proposed in the NWRMP-1995 has been mostly implemented by FME guided by the National Policy on the Environment in 1998. The sectors of flood control and erosion control are mainly implemented by FME and State governments. FMWR used to take these sectors before; however, these sectors were transferred to FME at present. Consequently the sectors within FMWR have not been active only with relevant activities of irrigation projects. Not only these, it is pertinent to also point out that the Strategic Issue number 9 of the NWRMP-2013 that is Institutional Development & Strengthening of Water Resources Management development (surface water and groundwater), water supply and sanitation, irrigation and drainage and other sub-sectors such as hydro-electric power generation, flood control, inland transportation,\fisheries/aquaculture/livestock etc. are undertaken by Federal Ministry of Powers, Federal Ministry of Environment etc. In addition, even in a single sub-sector, roles and responsibilities are further compartmentalized in some institutions.

World Bank [22] and the NWRMP-2013 noted that the current water resources management is a multi-sectoral management and that lack of adequate coordination and cooperation is considered the challenge to be addressed. It further stated that inconsistency of policies and strategies in some ministries and agencies causes fragmentation in the management. It is however, important to establish and strengthen effective development and management of the water resources sector which is to be guided not only at administrative boundaries but at river basin level as the most appropriate unit, on the basis of a general principle in IWRM. Hence, World Bank [22], called for the completion and implementation of the National Water Policy and promulgation of the National Water Resources Bill as basis of new institutional arrangement. Other challenges noted by the Bank are those of funding, capacity building, institutional strengthening and informality in monitoring and inspection.

Prospect in Integrated Watershed Management in Nigeria

The provisions of National Environmental Policy (NEP) and National Forest Policy (NFP) clearly spelt out major policy objective that encourage measures which sustain a balance between development and environment whose major goal is the sustainable development based on proper management of the environment. In particular, the NEP objectives of securing a quality of environment adequate for good health and well-being, conserve and use the environment and natural resources for the benefit of present and future generations, restore, maintain and enhance the ecosystems and ecological processes essential for the functioning of the biosphere to preserve biological diversity and the principle of optimum sustainable yield in the use of living natural resources and ecosystems; and encourage individual and community participation in environmental improvement efforts as well as the NFP priority areas which include forest management, community Participation in and outside forest reserves and game reserves, environmental services of forests, watershed forests and wetland management and, education and awareness creation have already been blended with those of the water resources sector mentioned above through institutional arrangement such as NIWRMC and adequately mainstreamed in the National Water Resources Bill. Effective implementations of these policies will definitely tackle the crisis in the water resources sector of the Country.

Another progress recorded in this sector is the emergence of a World Bank funded projects of flood and erosion control in Nigeria are currently Nigerian Erosion/ Watershed Management Project (NEWMAP) and Web based Flood Early Warning System (FEWS)

funded by the FME. NEWMAP has the overall objective of supporting participating states and local governments to reduce vulnerability to erosion. The relevant Federal Government's MDAs are Federal Ministry of Finance (FMF), FME and FMA. This is to be achieved by applying a comprehensive watershed management approach and by selecting and implementing affective engineering/ecological solutions for selected erosion sites. The project focuses on nine states, namely Anambra, Abia, Imo, Enugu, Ebonyi and Kaduna, Kano Ogun. The project includes two major components of investments in targeted areas and institutional development and establishment of information systems for erosion management and watershed planning. The total financing is said to be 508 million US$. NIWRMC has since its creation been active in integrated watershed management through collaboration and partnership with international donor organizations/ development partners and NGOs such as Water and Nature Initiative (WANI) of the IUCN

CONCLUSION

Water Resources Act No. 101 of 1993 (WRA-1993) has so many limitations but it formed the Legal framework and basis which provided the foundation for development and management of water sources, resources and practice though to a large extent not in an integrated manner. Subsequent legislations, institutional arrangements and policy formulations built upon the provisions and limitations of WRA-1993. The formulation of National Water Policy in 2004 has tremendously been guided by the philosophy of integrated approach and was a big turning point in integrating watershed management in Nigeria. The current water resources management is a multi-sectoral management and that lack of adequate coordination and cooperation is considered the challenge to be addressed. The new management of water resources represents the challenge of carefully balancing the water uses and watershed protection through a regulatory system of river basin based integrated management and regulated allocations of water resources.

The provisions of National Environmental Policy (NEP) and National Forest Policy (NFP) clearly spelt out major policy objectives that have already been blended with those of the water resources sector mentioned above through institutional arrangement such as NIWRMC and adequately mainstreamed in the National Water Resources Bill. Effective implementations of these policies will definitely tackle the crisis in the water resources sector of the Country. Therefore, Nigeria is not lacking in articulated legal, institutional and policy framework to tackle its water resources crisis. The missing link in this sector is the issue of effective adequate coordination and cooperation among specialized basin entities, community participation in developmental processes and the like. Hence the recommendations that this research proffers are:

- The cross-cutting nature of water resources management calls for synergy and collaboration, involving users, planners and policy-makers at all levels through participation, and with coordination and technical competence of specialized basin entities or Ministries, Department and Agencies (MDAs) as well as research institutions, donor and development partners.
- Because of the above, NIWRMC and other projects such as NEWMAP should intensify efforts and commitment in land, soil and water conservation , forest, agro forestry and agronomic (tillage and cropping) management in the watershed, basin and country levels.

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