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10. Sustainable Performance and Capacity Assessment Indicators for River Basin Organisations in Nigeria: Case Study of Ogun-Osun River Basin Development Authority

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ABSTRACT

Water is an indispensable constituent that sustains life. Due to increased water demand and competition among the various users, basin organisations were established to manage water resources. Regardless of the significant presence of River Basin Organisations (RBOs) for development purposes in Nigeria, the problems for which the RBOs were established remain unresolved. Purposive sampling technique and interviews were adopted to select participants from the community and interviews were conducted for respondents from Ogun Oshun River Basin Development Authority (OORBDA), the targeted government officials, and members of academia. Although performance assessments have been done in water allocation, water quality, and basin management among others, this study reviewed six categories out of ten (10) qualitative indicators developed by Hooper based on data availability and time limit of the research. The categories are coordinated decision-making, responsive decision-making, organizational design training, and capacity building, information /research, and private and public sector roles as strong indicators for effective management of the RBO. The challenges observed include but are not limited to water scarcity, pollution, and sedimentation, however, little has been done to assess the performance of RBOs in response to flood prevention and power generation. The indicators that contributed to poor performance are the use of multiple agencies, poor basin planning, inadequate national water law/policy, ineffectiveness of rivers basin organization to prevent flood through risk assessment, lack of efficient water management program, poor institutional arrangement, stakeholder participation, and lack of capacity building in flood prevention and power generation. The outcome of the performance indicators from the study shows that the OORBDA has not been able to serve the purpose it was created. To attain one of the goals of sustainable development, especially goal 3, the government needs to review the objectives of OORDBA and improve the organization's structure for efficiency.

Keywords: Water resources, River Basin, Flooding, Ineffective management

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Introduction

Water is an indispensable constituent that sustains life. Due to increased water demand and competition among the various users, basin organisations were established to manage water resources at the basin level. River basin organisations (RBOs) are seen as an important instrument for meeting the objective of managing the water resources in the riparian environment. It is considered a vehicle for implementing integrated river basin management at the basin level (Hooper, 2006). The organisations are to oversee various activities relating to managing water resources. Various researchers have tried classifying and defining them in different ways (Hooper 2006; Mody, 2004). The areas of coverage of RBOs are vast and at times overlap with other agencies such as ministries of works, agriculture, water resources, and environment among others. Some countries set these bodies as independent entities and others make their operations fall under any ministries. However, the types, roles, and responsibilities of these organisations in various countries differ and range from irrigation, water quantity and quality, agriculture, hydropower, and dam construction. The low performance (http://awdrop.org/uploads/3/1/7/8/3178681/national-water-policy.pdf) (Biswas, 2008) has given rise to the need for assessment at different stages of development for the different functions in a multipurpose basin using the generic key performance indicators developed by Hooper (2011). River basins as defined in Article II of the 1966 Helsinki Rules and as a conglomerate set of water courses as defined in the Water Courses Convention Article 2a of 1997 (http://legal.un.org/ilc/texts/instruments/english/conventions/8_3_1997.pdf) are not limited to surface waters but also include the physical land area and underground waters
flowing into a common terminus (http://www.internationalwaterlaw.org/documents/intldocs/Helsinki_Rules_with_comments.pdf). Understanding the river basin is essential to help frame the role and scope of the basin organisations. The Helsinki definition makes it apparent that the coverage of the River Basin organisation has widened. The consequence is that water management comprises a variety of uses, especially in multi-purpose river basins. Based on the geographical area and other factors, basin organisations face different challenges, including water scarcity, pollution, sedimentation, and flooding (Jaspers, 2003). The scope implies that most activities of men having to do with natural water bodies are under basin management. Moreover, the scope of the river basin organisation is also governed by the most pressing needs of the stakeholders. These scopes may change as the needs change over time. It is surprising to recognize that despite the numerous existences of river basin organizations for development purposes in many countries, the problems for which they are established remain unresolved. (Dinar et al, 2007). Furthermore, flooding, resulting from a combination of factors is fast becoming a major challenge facing Nigeria (Djordjevic, 2011). The research study aims to identify the relevant sub-indicators that would be useful to measure the performance of river basin organisations dealing with flood control, in particular, dam-related floods. Also, come up with a recommendation that can be used to formulate policies or plans for effective management of rivers in the water sector.

Disasters occur in many countries of the world (Van Westen, 2000) that could either be a result of human activities or natural. The latter resulted in more loss of lives and properties in developing countries than the developed countries with an estimated financial loss of about US$400 million annually (Gupta et al, 2003). Examples of natural disasters include among other cyclones, earthquakes, and volcanic eruptions. Flooding is the most widespread of disasters that occur naturally (Etuonovbe, 2011; Gupta *et al,* 2003). According to (Olajuyigbe *et al*,

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2012; Barredo, 2007) flooding is seen as the short term of a land surface covered by water that is usually not covered by water. It regularly claims more than 20,000 lives and approximately adversely affects 75 million people per year worldwide (Smith, 1996 cited in Adejuwon and Aina 2014). Universally, floods have posed a great threat to people's lives and property. Flooding is about one-third of damage from natural disasters (Askew, 1999 cited in ibid). It is also ranked as the second major disaster behind tornadoes with the United States recording damages totalling $8.41 billion in 2011 (Adhikari *et al*, 2010). Examples of countries prone to and affected by floods are the United States, India, China, and Nigeria among others (Etuonovbe, 2011; Adhikari *et al,* 2010).

Furthermore, research studies also revealed an estimated number of deaths to be 100,000 people per year. Those affected are about 140 million people annually (Adhikari et al, 2010; Jonkman, 2005). Other impacts of floods are loss of aesthetic and aquatic lives, and cultural as well as socio-economic human well-being (Jonkman, 2005). However, flooding is a common, occurring disaster in Nigeria. It is not a contemporary occurrence in the country, and the damage propensity is occasionally colossal. Many states in Nigeria have also experienced several flood disasters that have claimed lives and properties worth millions of dollars (Adejuwon and Aina, 2014; Etuonovbe, 2011). There are various types of flooding, including urban and coastal among others. However, the focus of the study is dam-related river flooding (Adejuwon and Aina, 2014; Olajuyigbe *et al*, 2012; Barredo, 2007; Jonkman, 2005). Recently, in the year 2024 floods in parts of Kogi State have displaced tens of thousands of people from their homes in affected areas including Ibaji, Lokoja, Kogi and Bassa, according to the Nigerian Red Cross Society (NRCS). This follows spot assessments of the flood situation in the State. While most affected people have relocated to higher ground in neighbouring areas including Idah and Lokoja LGAs, others have moved to other states for safety such as Anambra, Adamawa, Benue, Borno Enugu, Delta, and Nasarawa. Some have, however, opted to remain behind to protect what is left of their crops/potential harvests. This created a financial burden on the state and federal government leading to more creation of Internally Displaced People (IDP) centres/camps all over the states especially in the flooded states.

Hence, there is a need to fill the gap by identifying and applying suitable indicators to evaluate river basin organisations dealing with the prevention of floods in a developing country with high rainfall. The study aims to identify the performance sub-indicators that would be suitable for assessing the performance of river basin organisations dealing with the specific function of flood prevention (Hooper 2006). Also, come up with recommendations that could be useful to improve the performance of river basin organisations dealing with flood prevention. It should be noted that an indicator is a tool for assessing performance in the management of water which is referred to as water governance (Hooper 2006; Makin *et al*, 2004).

Given the objective of the research study, the key performance indicators developed by Hooper 2006 were considered. It is imperative to put to test these indicators to ascertain the most suitable for RBO flood prevention. In this study, 23 indicators were identified but clustered into six categories namely: (1) Coordinated decision-making, which focuses on the existence of high-level, cross-sectoral policy links between natural resources management and other sectors (water users) (2) Responsive decision-making that emphasises evidence of dialogue to be used as an instrument of decision-making on preferred management options – as in open meetings, tribunals, forums (3) Organizational design that seeks evidence of institutional arrangements for basin

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management which specify the roles and responsibilities of different entities and stakeholders, and the existence of water law and policies. Other categories include (4) Training and capacity building which describes the mechanism of building human capacity related to the administrative, economic and political setting within the country of operation (5) Information and research that considers interagency cooperation and accessibility of information by relevant stakeholders is a necessity in flood control. The last category focuses on Private and public sector roles which, suggests a strong community awareness and participation processes to enhance greater ownership of basin-scale plans of action as a strong indicator for effective management of the RBO. Not all the selected indicators are expected to be applicable for the assessment of the RBO in flood prevention in the study area. Understanding the scope and performance of river basin organizations with flood control as one of their roles would enormously help to understand the causes of failure. This study assessed how RBOs in Nigeria function in practice and what can be done to improve the performance of RBOs in Nigeria in the effective prevention of floods. Of great importance is the role this report may have as a reference for policymakers to investigate the causes of failure and see how to establish an improved policy in the future towards improved integrated water resources management at the basin level. The study identified suitable performance sub-indicators that could be applied to evaluating river basin organisations dealing with flood control in Ogun-Osun RBO, Nigeria (Figure 1).

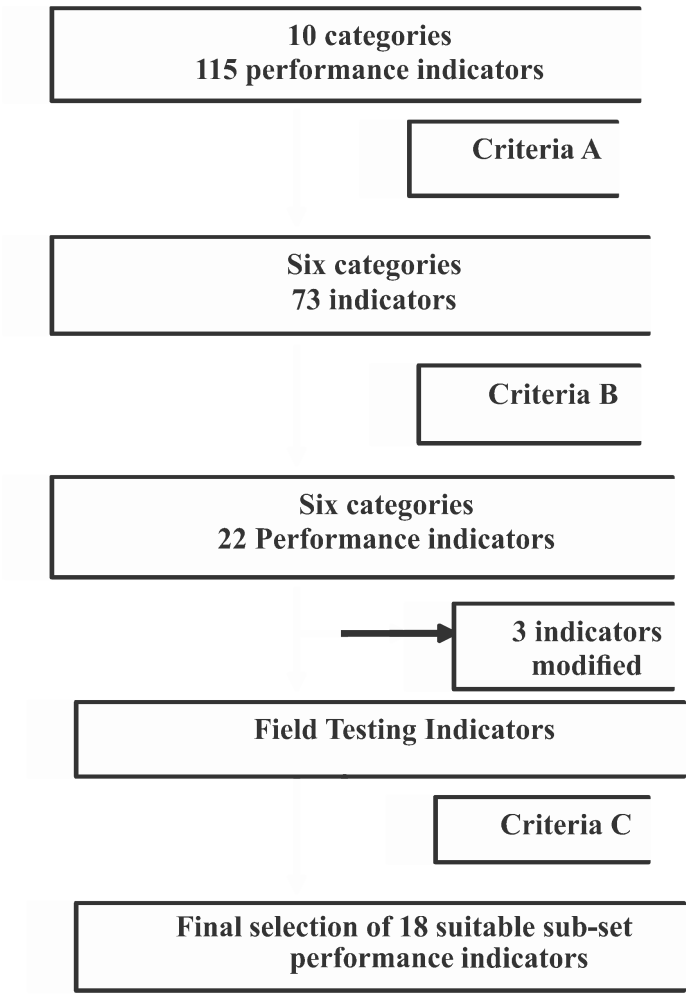

Figure 1: Schematic diagram of the selection procedure

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Historical Perspective of RBOs

Human societies have been formed very close to the existence of natural waters, especially rivers because of the inevitability of water to the existence of man. To ensure that water is available for drinking, washing, and bathing, every society, even before civilization had devised means of putting under control, the use of this essential commodity using their natural intelligence (Dellapenna and Gupta, 2009). The manner of taking control, of the use of water, has been greatly affected by a whole maggot of changes that have characterised human societies which have brought the need to see the issue of water management as the societal norm. The Society therefore considered it proper to have organisation(s) that will be taking a total look at and paying attention to the issue of water control seeing to flood and flood-related matters, drought, and all that concerns water as an essential aspect of life. The birth of river basin organisations (RBOs) was, for this reason, necessitated to ensure that bodies exist to take charge of the responsibilities of providing water for society and allied duties (http://www.rivernet.org/general/docs/making-WFD-work-February05.pdf).

Furthermore, for rivers that are claimable by two or more countries, formal agreements tend to exist on how the water could be used by those who share it. This may come in the form of commissions on rivers as could be seen in Rhine (Jaspers and Gupta 2014) such arrangement, as in the case of Rhine was mostly concerned with matters of navigation and the best way to use water for the general benefits of mankind. Organisations such as the International Joint Commission for US and Canada which later became the International Boundary and Water.

The commission was involved. Argentina, Bolivia, Brazil, Paraguay, and Uruguay benefited from treaties on water management at the international level. Egypt and Sudan were beneficiaries as well. More countries in Africa also formed commissions to see to the issue of water allocation and general management. They include the Niger River Commission and the Zambezi River Course Commission. In 1992, Kazakhstan, the Kyrgyz Republic Tajikistan, Turkmenistan, Uzbekistan & Afghanistan were involved in treaties to form Interstate Coordination Water Commission (Jaspers and Gupta, 2014). One can also trace the growth of RBOs to the days of the Industrial Revolution which made waterways become a transportation route (Hooper, 2005).

Considering the global trends in water management via RBOs, especially in irrigation, dam construction, and flood control, the Federal Government of Nigeria, via decrees 25 and 31 of 1977 respectively established twelve River Basin Development Authorities including Ogun Oshun River Basin Development Authority (OORBDA). Over time, there have been a series of amendments to the original operational responsibilities of the Authority occasioned by the enactment of Decree 35 and 25 of 1987 and 1988 respectively. The OORBDA, as presently constituted operates as a parastatal of the Federal Ministry of Water Resources. OORBDA' v the potential of the area it covered in respect of water resources. This is to boost the individual, agricultural and domestic fortune of the people and for effective flood control. It must be said that the kind of emphasis placed on any of the purposes above over the years has depended on the policy direction of the federal government through the supervising ministry (http://www.oorbda.com.ng/home.php).

Functions of River Basin Organisation (RBO)

River basin organisations (RBOs) are umbrella organisations for basin-wide (Wingqvist and Nilsson, 2015) water resources management. However, the establishment of RBOs, either formally or informally was to enable the society to do what is needful to its people in the areas of provision of drinking waters, protection of coastal

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boundaries, and prevention of flood. In the pursuance of these objectives, RBOs have been billed to carry out specific functions that may vary depending on the needs of the people and their environment concerning river water management. The roles and responsibilities that are expected from these basin organisations are dictated by the rationale behind their establishment and vary from country to country (GWP, 2009). Furthermore, these basin organisations perform several functions, which include planning and policy development; and analysing stakeholder needs related to natural resource management. Other functions are identifying goals and guidelines for sub-catchment, development of cost-sharing programmes, coordination and monitoring of programmes related to the management of natural resources10. Makin and colleagues noted that, in most countries, river basin management organisations' structure and functions continue to evolve, and, in some cases, integrated management of river basins is replacing sector-based management while water laws and regulations are being developed and implemented (Makin *et al*., 2004). Moreover, in most cases, the legal instruments that establish RBOs usually specify, in clear terms, the functions that they should perform. These laws, of course, are not the same in all countries of the world. In Namibia, for example, river basin committees were established under the Water Act 24 of 2004 as coordinating units. The roles of the basin committees were anchored on improving stakeholder participation, efficiency in managing resources and coordinated planning among others. Also, the Piracicaba – Capivari Jundai River Basin State Committee was established via the Sao Paulo State Water Law 7663 of 1991 in Brazil.

The role of the committee includes management plan; approval of budget allocation among the various water resources management programmes and to promote cooperation among the water users (Nashipili 2008). Moreover, in Nigeria, river basin authorities were established according to Salau (1986) via decrees 32 and 33 of 1973 and other decrees in 1976. The basin organisations operate under the same conditions because they have one supervisory ministry. The functions include the widespread development of both ground and surface water resources for multi-use; maintenance and construction of dams, drainage systems, and dykes; development and maintenance of up-to-date detailed water resources master plan and undertaking plans for the
control of erosion and floods among others (Olomola *et al.,* 2014).

From ages past, RBOs evolved to take charge and take care of society's needs around the provision of drinking water, the use of rivers for water transportation, and more importantly, the control and prevention of flood incidents. Therefore, one can affirm that the functions of RBOs have been naturally defined by the existence of rivers as the gift of nature. Thus, peculiarities in the control and management of rivers often dictate the function that RBOs perform. In addition to this and as expected too, treaties and legal provisions that brought about the establishment of the RBOs state the functions that these organisations should perform. The laws are not the same in different countries hence the functions are also changing (Makin *et al,* 2004). Furthermore, the challenges faced by basin organisations differ from country to country. It ranges from pollution, water scarcity and flooding, the focus of this study.

Methodology

Study Area

The choice of the Ogun-Oshun River Basin Development Authority was influenced by the following factors.

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Familiarity and language, relevance to research study, knowledge acquisition in management of water resources at basin level, and contribution to policy development towards effective management of water at basin scale and reduction of the incessant flooding. Additionally, the choice of OORBDA was necessitated by the need for this study to identify, locate, and establish in practical terms, those indicators that are key to the performance and capacity of the operations of the organisation in dealing with flood prevention.

Ogun-Oshun River Basin Development Authority (OORBDA), a river basin organisation in

southwest Nigeria was established for the effective management of water resources at the basin level. The organisation is a parastatal of the Federal Ministry of Water Resources and Rural Development. Based on Hooper (2006) basin organisation characterisation, the Ogun-Oshun River Basin Development Authority, Nigeria falls under the commission type of basin organisation characterisation. The river basin area stretches across the four southwestern states of Lagos, Ogun, Oyo, and Osun and covers approximately a land area of 66,264 km2. The basin was named after the Ogun-Oshun Rivers lies between latitudes 6°30′ - 8°20′ N and longitudes 3°23′ - 5°10′ E (Ewemoje and Ewemoje, 2011). Mainly, the study area experiences two types of seasons, the rain season between April and October while the dry season runs from November to March (Idowu et al, 2012: Ewemoje and Ewemooje, 2011; Oyegoke and Sojobi, 2012; Jaji *et al*, 2007). The Headquarters of OORBDA is in the capital of Ogun State, Abeokuta which has an annual rainfall of 1205mm and is situated within the vegetative zone of moist semi-deciduous forests and wooded savanna (Idowu *et al*, 2012). Furthermore, three main tributaries Ogun, Oshun, and Yewa Rivers, while Ikere Gorge Dam is directly on the Ogun River, Oyan Dam on the other hand is on the Oyan River; they are the two major dams within the basin which are also multipurpose in use. Oyan Dam is the only one in the basin responsible for regulating the water flow in the Ogun River basin. Commissioned in 1983, Oyan Dam has turned out to be a mixed blessing for the people in the riverbank areas. Jaji *et al,* (2007) noted that as a storage dam, the annual flooding of Lagos and Ogun State residents experienced perpetually caused by water released from the dam during overflow which had made the Dam very dysfunctional having failed to serve the purpose it was built.

Moreover, Oyan Dam is located on lat. 7°14'N, long. 3°13'E close to Abeokuta, Ogun state capital city. The surface area river covers about 4,000 hectares with a catchment area of 9000km2. The dam has a height of 30.4m, crest length of 1044m and storage capacity of 270 million cubic metres. The dam was designed for two main reasons: to support the 3000 hectares of irrigation project at Lower Ogun basin (not functional at the time of visit) and raw water supply to Abeokuta and Lagos. Also, installed were three thousand (3000) megawatt turbines that had not been utilised (Ofoezie and Asaolu, 1997) at the time of the visit to the dam site (Figure 2).

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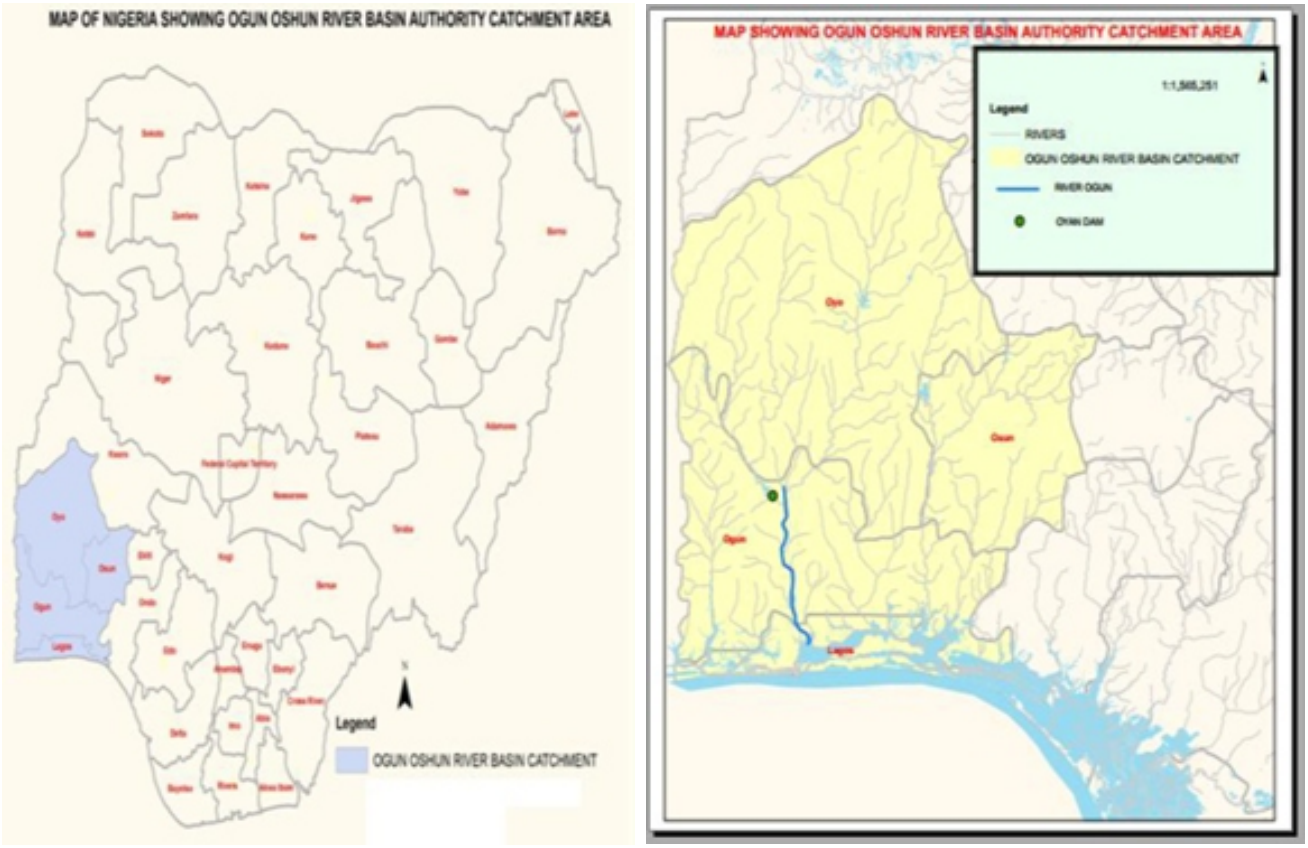

Figure 2: Map of Nigeria showing Ogun Oshun River Basin Authority Area (Four States covered by OORBDA) and OORBDA Basin Map showing the study area.

Sampling Techniques

The qualitative ex-post-fact nature of the study has made it imperative to use purposive sampling. According to O'Leary (2013), purposive sampling includes the choice of the strategic sample with a precise purpose in mind and expands data by exploring the limitations or boundaries of circumstances or Key respondents that will be of assistance in obtaining essential data that are appropriate to the study. A purposive sampling technique was adopted for the focus group discussion to select participants from the community because of the already established and recognised community development associations consisting of representative/s per property in each community in the Nigerian context. On the other hand, interviews were conducted with respondents from the Ogun Oshun River Basin Development Authority and the targeted government officials as well as the academics. The merit of using this method unlike the random technique is that one can be sure that the respondents will have useful information that will benefit the study. It should be noted that more than fifty communities exist along the bank of the river. The choice of twelve communities under the auspices of community development associations grouped into four became expedient because the effects of each occurrence of a flood incident affect some communities more than others. The communities were those mostly affected by flooding occasioned by the release of water from Oyan Dam in year 2010 and 2013. The choice of the communities was based on accessibility and the high tendency to obtain detailed and objective information.

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Data Collection

The methods of acquiring data for the study are Interviews and focus groups besides reviewing text and literature. Interview and focus group methods were adopted because they offer the opportunity to play an active role with more interest in the intricacy of the data instead of the comprehensiveness. Furthermore, interviews with twenty (20) respondents in different capacities and institutions were conducted. These include officials from the Lagos and Ogun states ministries of environment, physical planning, emergency management, Lagos Water Corporation, and National Meteorological Management Agency (NIMET). Others were National Emergency Management (NEMA), Department of Civil Engineering and Water Resources Management at the Federal University of Agriculture, Moshood Abiola Polytechnic, Abeokuta-Ogun State, and the University of Lagos respectively. They were asked questions that can help in understanding the applicability of the twenty (22) sub-indicators, clustered into six categories. Four focus group discussions were organized to accommodate the views of the communities that are affected by the flood caused by water release from the Dam in the River Basin. Each of the focus group discussion participants consisted of twelve (12) members for adequate representation of the different communities and span across different genders, ages, and statuses. The communities involved are Abule Otun, Riverview/Opic Estate communities in Abeokuta, Ogun State; Agiliti-Maidan Community and Ajegunle Owode community in Ikorodu, Lagos State. Nonetheless, it should be emphasized that the selection of the communities was done randomly out of all the communities that were affected by the flood (Table 1)

Table 1: Names of communities used for the focus group discussion

S/N	Name of Community	No of People	Composition
1	Ajegunle Owode Community Development Association	12	Executive members of the association, mixed (comprising of both middle & lower class educated & local people)
2	Agiliti Maidan Community Development Association	12	Executive members of the association, mixed (lower & middle class)
3	Abule Otun Community Development Association	12	The lower class, predominantly the local people and inherited property owners
4	Riverview/Opic Estate Community Development Association	12	Upper-class, predominantly educated and property owners

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Data and Data Analysis

The total number of interviews conducted was twenty-one (21). In pursuance of further information, discussions were held with the following focus groups: which were established to be affected flood communities and each group in the community consisted of 12 people who were the representatives of the Community Development Associations (CDAs). Moreover, the main crux of the analysis was embedded in the critical analysis of how suitable the 22 performance indicators selected from Hooper's (2006) 115 performance indicators were in the assessment of the Ogun-Oshun River Basin Development Authority concerning functions of dealing with flood prevention. The analysis was based on the data collected from the field study conducted in Ogun and Lagos States; the states downstream of Oyan River Dam, a tributary of Ogun River and under the jurisdiction of the Ogun-Oshun River Basin Development Authority (OORBDA). The 22 indicators that were put to test on the field were clustered into six categories namely: (1) Coordinated Decision-making, (2) Responsive Decision-making making 3) Organisational Design, (4) Training and Capacity Building (5) Information and Research, and (6) Private and Public Sectors roles.

Furthermore, the selected indicators were used to assess four key fundamental areas. First, the indicators were used to identify & examine the responsibilities of the Ogun-Oshun River Basin Authority in dealing with flooding due to the release of water from the dam (river dam flooding). Secondly, they were also used to identify and assess task distribution between different levels and agencies of government in flood control. The third reason is in the assessment of the impact of the task distribution on the performance of the Ogun Oshun River Basin Development Authority, and the last recommended mechanisms or strategies to improve the performance of basin organisations to address flood issues that are informed by the performance assessment indicators. However, the findings that helped to identify and examine the responsibilities of the Ogun-Oshun River basin authority in dealing with river dam flood prevention were considered vital to this report.

The statutory responsibilities of Ogun Oshun River Basin

Development Authority as stated in the RBDA Act 1987 No 35 Section 1(4) titled "*functions of each Authority*" involves to:

i. carries out a comprehensive development of both ground and surface water resources for multipurpose use specifically in the provision of irrigation systems, erosion, flood control and basin management.

ii. build, operate and maintain the dams, dykes, boreholes, irrigation and drainage systems, and other facilities needed for the attainment of the Authority's function and entrust all lands under the irrigation plan to the farmers for cultivation.

iii. supply water to all users from the Authority's completed storage schemes at a fee to be decided by the Authority and approved by the Minister; (the Minister in the Federal Ministry of Water Resources is referred to in this case)

iv. build, control and maintain infrastructural facilities linking project sites such as bridges and roads provided such facilities form an important component and are incorporated in the lists of projects approved.

v. Develop and maintain an up-to-date detailed water resources master plan, identify all the water resources requirements around the operation, by collation and collection of adequate socio-economic, water use and

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environmental information of the basin.

However, the role of OORBDA in flood prevention downstream Oyan/Ogun River basin was identified and assessed using the pre-selected indicators examined below.

Concerning basin planning, it was clear enough from the initial response that the lack of coordination was reinforced by the non-existence of basin planning. Most importantly, the non-existence of a joint monitoring mechanism for a basin programme between OORBDA and other government institutions makes it difficult to involve other entities in basin planning for effective flood prevention. However, much emphasis was placed on the importance of basin planning to address institutional coordination, flood risk management, monitoring and information, and institutional arrangements that are enshrined in the thematic planning of a river basin Nevertheless, it could be argued that the lack of appropriate basin planning and coordination between multiple agencies could have been addressed by the national water laws and policies.

Effectiveness of river basin organisation to prevent flood through risk assessment

One of the major features of verifying the suitability of any performance indicator in assessing the effectiveness of a river basin organisation is to look for evidence that the basin management decision processes address critical problems first: e.g. water scarcity, flooding, droughts for very large and rapidly growing populations through risk assessment. The findings indicated that the sequential discharge of water from a dam reservoir before the commencement of the rainy season in the preceding year and sensitisation is the current measure put in place by the basin authority to control flooding in the lower Ogun River basin. The response was buttressed by the other respondents from states environment, physical planning ministries, emergency management agencies and the academia. The gradual release of water was an agreed measure between the basin authority, relevant government agencies/ministries and the downstream communities after the major flood disaster that occurred in the year 2010 and recent events in 2024. Several communities were displaced and rendered homeless, and properties were destroyed. These were the responses received from all the interviewees including the focus group sessions with some of the affected communities. Some of the communities affected as listed by the officials of States Emergency Management Agencies and States Ministries of Environment as well as a community leader including Abule Otun, Ajegunle, Agiliti, Kara, Ikosi, Isheri North, Isheri Olofin, Maidan, Mile 12 and owode onirin. Others were Riverview Estate, Spark light estate, Abule Apo, Akute, Warewa, Denro, Oluwakemi, Ojodu Abiodun and lastly Ishasi Igboko. The State Emergency Management Agency supposedly expended above million naira as compensation in year 2010 flood disaster in the latest flooding disaster, but the compensation to communities could not be ascertained. Furthermore, a sensitisation programme at the community level was also put in place by the basin authority as an effective measure in flood prevention/control but the degree of awareness is low, untimely and ineffective according to the community respondents.

In conclusion, the Ogun Oshun River Basin Authority management decision and decision processes from investigation may not have effectively addressed the flooding problem downstream Oyan/Ogun River as the agency did not seem to have taken effective measures in flood prevention within the study area. As part of the international best approach to flood prevention, the use of floodplains for developmental and other various purposes should be adapted to the existing risk. It was suggested that responsible basin organisations should provide reliable and timely flood warnings which are determined by correct response and preparedness level.

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Efficient Water Management Programme

Water efficiency as defined by Cai *et al*, (2003) is to reduce the quantity of water that is wasted by determining the quantity of water needed for a specific purpose, quantity utilised and distributed. To verify the applicability of the indicator, the question on the programme put in place for efficient water management within the Oyan-Ogun River basin was posed to the basin authority. According to the respondents, the programmes included the supply of water to States Water Corporation, the basin irrigation scheme and water production facility. However, it was surprising to discover that the irrigation scheme may likely still be lying fallow as at the time the study was carried out. Information as to the quantity of water distributed for irrigation could not be ascertained. Downstream Oyan dam, industrial activity was rarely observed as most areas had been used for housing development; rather a major hatchery organisation was observed along the Oyan dam route. Information also revealed that the supply of water for industrial uses was not presently taking place during the period the study was conducted. In contrast to the response from the planning and design department of the basin authority, the respondents from the state environment ministries and the academia were that because Oyan the dam was underutilised; the efficient water management program of the Ogun Oshun River basin authority could not be determined. This was also supported by some comments made at the meeting with some of the community associations. In line with best practices in river basin management where there is the presence of dam reservoirs, efficient water management is seen as a measure to address the problem of flooding downstream.

Institutional Arrangements and Stakeholders Participation

In keeping with Jha *et al*, (2011) assertion, successful flood prevention cannot be achieved without a clear direction and roles of various agencies that might be responsible for flood control. A strong institution as suggested by Giordano and Wolf (2003) remains the key element in effective flood control by the river basin. To discover the evidence of institutional arrangements for basin management which specify the roles and responsibilities of different entities and stakeholders, the following questions were asked: Is the basin authority (OORBDA) autonomous; what is the highest decision-making body of the RBDA and how is the decision-making process carried out? What role does the ministry or agency play in flood prevention issues downstream Oyan/Ogun River basin? Responding to these, one of the respondents noted that the roles of other government bodies involved in flood prevention are embedded in the relevant law that established these ministries & agencies[39]. Moreover, Ogun Oshun River Basin Development Authority (OORBDA) is a parastatal of the Federal Ministry of Water Resources (FMWR) and reports and seeks approvals from the supervising ministry because the highest decision-making body of the authority is the board of directors. The response was also affirmed by other interviewees and the members of the communities. In addition, the roles of various stakeholders are defined in the relevant laws that established the agencies or ministries according to government policy at Federal and State levels as responded by other interviewees. The roles of the various stakeholders are outlined in Table 2.

Water resources management at the basin level that led to the development of the Ogun-Oshun River basin authority is on the legislative list of the Nigerian Constitution 1999. This means that the decision and decision-making process is fully centralised. Appointments of board members,

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advisory councils, and determination of roles and responsibilities including programmes/projects are undertaken either via direct approval from the supervising ministry. According to the basin authority

Table 2: Stakeholder Analysis of Case Study Area

The stakeholder analysis table showed the influence or power each stakeholder has on the decision-making and implementation process of the Ogun Oshun River Basin Development Authority concerning flood-related matters downstream of the dam. The criterion was based on the power to influence the decision as identified during the study

S/N	Stakeholders	Characteristics	Role	Influence on Decision-Making
1.	State Ministry of Environment	Primary	Monitoring of river levels, awareness creation, construction and clearing of drainages, consultations	High
2.	State Ministries of Urban and Physical Planning	Primary	Development control to prevent flooding within the state including waterways. No. 35 vol 35 of 2nd September 2010 page A13 section states that the minimum distance to Ogun River should not be less than 100m. Monitoring awareness creation, and disapproval of developments on waterways serves contravention and demolition notices	High
3.	State water corporation	Primary	Supply of raw water from dam reservoir for production and domestic use. Expected to pay subsidies for the raw water produced from the dams	High
4.	National Emergency Management Agency (NEMA)	Primary	Provide early warning alerts from flood forecasting and predictions issued by Nigeria Meteorological Agency (NIMET)	High
5.	Federal Ministry of Agriculture Abuja	Primary	Promotion of agricultural development and national resources towards food security	Low
6.	State Emergency Management Agency (SEMA)	Secondary	Coordinates and responds to disasters/ provision of relief at state/disaster management at state level	Low
7.	National Red Cross Society	Secondary	Respond to disaster and relief	Low
8.	Ecological Office, Abuja	Secondary	Collaborate with authority on conferences and workshops	Low
9.	UNIDO, Abuja	Secondary	Projects, funding and training	Low
10.	JICA, Abuja	Secondary	Projects, funding and training	Low
11.	UNIDO, Abuja	Secondary	Projects, funding and training	Low
12.	The Communities	Secondary	Collaborate with authorities to prevent flooding and as a pressure group through consultation to prevent flooding in communities	Low

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The investigation further indicated that stakeholders' meetings are at the instance of the basin authority, irregular and exclude the communities when decisions on flood and flood-related issues are to be made. According to the communities, a stakeholder meeting was held only once in the year when a major flood disaster occurred. This explains the rationale behind the ineffectiveness of the basin authority to tackle the problem of flooding in Nigeria because the management of Ogun River, the study area is not at the lowest appropriate level of basin management as explained in (Jaspers, 2003).

The findings of the study indicated that the stakeholders' involvement is perhaps inadequate especially the involvement of communities when decision-making of flood control measures

are to be made. This is because community involvement may provide useful information (such as the topography of the area) that may help undertake the function of flood prevention effectively. "Stakeholders" is a convenient term that encompasses a wide array of individuals and organizations. Some stakeholders are individual water users, and others are organisations or groups of water users (e.g., utilities, industries, irrigation associations among others. Even central government officials or ministries may be stakeholders in a basin where the central government has a substantial interest, facilities or prior involvement" (Dinar et al., 2013).

Capacity building in flood prevention

The most common problem of many organizations can be attributed to a lack of capacity to respond to challenges by individuals in the organization. This called for capacity building within such organization to tackle the problems. The study looked for indications and evidence of training programs to improve the skill levels of river basin managers and stakeholders, specific to their situation. To achieve the objective, a question that would help the readers to understand if Ogun Oshun River Basin development authority has technical and competent staff to undertake the function of flood prevention. If the basin authority organises staff and stakeholder training and workshop programs specific to dam-related flood prevention?

Quoting the basin authority respondents "the authority has competent staff to tackle the problem of flooding within the basin". The investigation, however, indicated the non-availability of professionals in the field of meteorology, weather forecasting and prediction, surface water or groundwater hydrologists, and dam and/or basin management operators among others. It was not clear if the basin authority has a professional in the field of surface water hydrology; however, the total staff capacity was about three hundred and thirty-four staff members as at time of study. The respondents further noted that regular capacity development programs take place as evidenced by the availability of a training school on the premises of the basin authority and training programs for some members of staff took place during the field study. However, the relevancy of the training program to the current situation of flooding could not be determined. International training programs are conducted in collaboration with international donor agencies. Management training and development is indeed at this time in trendy because there is a significant increasing belief in the profits of investment in training and development. However, training should be tailored, designed and delivered to meet the organization staffs' specific needs. This means creating a course based on an identified skill gap or workplace issue (Smith and Piper, 1990).

Research

To have a deep knowledge of the OORBDA's responsibilities on flood control, there is a need to look at the level of research collaboration between the basin authority, research community,

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government agencies and NGOs. The question sheds more light on how Ogun -Oshun River Basin Authority carries out research with flood, dam river flood prevention and the current research program in flood-related issues. Unfortunately, research is only carried out by the academia with no link or connection with the basin authority. All the respondents from the ministries and agencies informed that no research was conducted on flood and flood-related issues. Investigation showed that no relationship exists between the basin authority with the research community. Unfortunately, the government is perhaps not making use of the best brains that are available in the academic environment to provide the solution to the persistent flood problem of the Ogun River Basin. There is no evidence of a research department and yet does not collaborate with other institutions. It is through information and research that the OORBDA can acquire more knowledge and the know-how that is needed for an adequate response to the flood problem. Agreeing with (García-Hernández, 2011), the essential element of flood prevention is the availability of information through research and numerical meteorological data (observed or predicted) to develop a warning system primarily for the basin to provide a flood warning report.

Assessing the task distribution and impact of the task distribution on the expectation of the performance level of basin organisation in flood prevention

Identifying and assessing both task distribution between various government agencies in flood control and the impact of such task distribution. Nine (9) indicators were used to assess the performance of the Ogun Oshun River Basin Development Authority (OORBDA) concerning the objectives and goals of the study. However, the findings indicated that the relevant laws establishing the various agencies of government involved in flood prevention specify the tasks or roles of these agencies according to the specific federal and state situations. On the other hand, a problem arises because certain sectors are under the legislative list while others appear on the concurrent list in the Nigerian constitution. The management of water resources is a legislative list that gives sole authority or power to the Federal government on water-related issues in Nigeria, the environment and physical planning sector is under the concurrent list. This means that both federal and state governments have the power and authority to control physical planning/environment-related matters. However, these have been effectively carried out by both federal and state governments through the creation of relevant agencies to prevent flooding resulting from the Ogun River basin. Such agencies include but are not limited to state water corporations, the state ministry of agriculture, the land use bureau, physical and urban planning, and the environment among others.

Tasks distribution according to the findings of the study was inadequately distributed among the different agencies involved in flood prevention and not clearly defined - (the how and what were left unattended) in the relevant laws for managing water resources to prevent flooding within the Ogun River basin at the level of different tiers of government. Given the above, the lack of coordination, integration, uncooperative attitude and duplication of roles assigned to the various agencies involved in flood prevention are the reasons for the flooding problem experienced presently downstream of the Ogun River basin.

Coordination Arrangement between National & States Government on Basin Management for Flood-Related Issues

The indicator is very essential in investigating the presence of coordination activities (joint programs of action,

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dialogues and memoranda of understanding) between states for river basin management. For adequate assessment of the OORBDA, it is imperative to know the relationship of the basin authority with relevant MDAs. The respondents noted that the relationship is cordial and that the relevant MDAs are in constant communication with the basin authority especially the Lagos State Ministry of Environment. However, the cordial relationship does not mean that the coordination and cross-sectoral arrangement among the various MDAs in flood prevention are not without flaws. Although, the roles of various relevant government agencies were defined in the law's establishment laws, "the how and what" were not clearly or specifically defined. For instance, the RBDA Act does not specify how the basin authority would liaise with other government MDAs in their effort towards achieving the objective in flood prevention; the programs to be undertaken by the basin state government were not equally defined. Furthermore, it was stated that the basin authority through the supervising Ministry shall forward a copy of the annual activity report to the state government around operation. so much ambiguity was seen in the RBDA Act 1987 No 35. The task distribution from the information gathered was not well defined and harmonised. Therefore, a lack of defined and adequate coordination arrangements and task distribution of roles of various relevant government bodies at all levels may be deduced as the reason for the inability of the basin authority to effectively tackle the flooding problem downstream Oyan/Ogun River basin.

Consensus-Based Decision Making

According to Hasson and colleagues, there are quite many approaches that can be employed for
multi-stakeholder decision problem solving, most especially among groups that have disagreeing views among each other “Multi-criteria methods can be used for such decision making since they include weighting functions". One of the key points of the framework is to gain the trust of all participants: local and central government, other politicians, insurers, and other stakeholder groups. Thus, the decision method should employ familiar concepts as possible while maintaining efficiency (Hansson et al., 2008). The use of consensus-based decision-making in basin-wide planning and management to balance all user needs for water resources and to provide protection from water-related hazards is one of the key indicators that can be employed in the assessment of the OORBDA performance on flood control. Consequently, it was vital to understand whether the RBDA engages in a consensus-based decision approaching basin management decision-making; whether the interests of stakeholders are considered and how the stakeholders are involved in decision-making and process. Quoting one of the top officials of the basin authority for the first
question, "he noted not really" but quickly added that the interests of stakeholders are considered on issues related to basin activity, particularly in flood prevention. The representatives of some government MDAs on the advisory committee and state representatives on the board of directors make evident that stakeholders' interests are considered in decisions made. Moreover, the respondents from the state's environment ministry noted that the ministry is not involved in decision making rather the ministry advises the authority on flood-related issues as it concerns the states downstream of the Oyan-Ogun River basin. On the other hand, the academia informed that consensus-based decision-making approach is not being considered as relevant government MDAs are not involved in the process. Often decisions taken at the authority level are dependent on the approval of the supervising ministry. It was evident that there is a lack of consensus decision-making as other agencies were not involved in decision-making. This gives room for ineffectiveness by the basin authority in flood-related issues

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but also in other functions and responsibilities. Extensively, the maximum effect of flooding is on the communities downstream of the Oyan-ogun River basin. Thus, an investigation was carried out on some of the affected communities on the community involvement in decision-making and process. About twelve (12) communities engaged gave similar resounding answers and expressed their dissatisfaction with the neglect by the basin authority in the process of decision-making on matters that affected the communities. For instance, one of the participants from the Agiliti community noted and quoted him:

"Nobody called us for a meeting when the time comes to make a decision; this is not good enough because we are the ones that suffered most during the time of flooding. Getting our opinion would have assisted them greatly in providing a solution to flood management"

These were the words of another participant from the River View Estate community. In addition, another participant contributed from the Ajegunle Owode community thus:

"The fact that we were not involved in the decision-making does not necessarily mean we should not lobby and agitate for our interest to be protected when the basin authority is taking decisions that affect us all. We do many lobbies, and we do see our interest protected in some cases"

The gradual release of water from the dam was cited as an example where the interests of stakeholders were considered. Regardless of the level of involvement in decision-making by stakeholders and communities, it was evident that consensus-based decision-making was not in practice by the Ogun Oshun River Basin Development Authority.

Clearly Defined Roles of Private Sector/Public

During the whole study process, there was no evidence of clear specification of the private sector involvement and links to basin decision systems. All the responses from the various respondents indicated the non-involvement of the private sector in basin management in Nigeria except the academic representative who noted that the private sector involvement is in emergency assistance that is material and/or financial assistance for victims of flood.

Organisation Structure and the Problem Analysis (Oyan dam operations)

This indicator helped to look in the evidence if the organization type reflects prevailing needs for river basin management. Information gathered from all interviewed respondents indicated that the organization structure is a hierarchical type of structure. The Basin Authority reports to the supervising ministry and seeks approval for decisions/projects on their activity (OORBDA). The findings show that hierarchical organisation type does not reflect the prevailing basin authority as bureaucratic bottlenecks are involved which does not allow for effective flood prevention. Besides, the hierarchical structure does not give room for responsive decision-making in flood-related situations.

The Oyan River Dam, which was commissioned in 1983, is in the southwestern part of Nigeria, Abeokuta North local government area of Ogun State. The dam is on Oyan River, a tributary of the Ogun River; moreover, there is Ikere Gorge Dam on the Ogun River at Iseyin in Oyo state. Ikere gorge has no radial gates and flows into Ogun

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River year-round. According to the Ogun Oshun Basin Authority respondent, Oyan dam was constructed at supply to Abeokuta and Lagos and flood prevention but has potential use for generating electricity the instance of Lagos and Ogun States government to resolve the problem of water shortage at that time64. The main purpose is for raw water and irrigation. However, at the time of the visit, the Oyan River was used for fishing activity, and raw water supply to Lagos and Ogun water corporations on request while the hydropower facility had not been functional since inception.

Furthermore, the crest is 11km in length and the maximum height of the crest is 32.5 metres. While the normal (design) water level (N.W.L) of the service spillway capacity is 2271 cubic metres per second, the maximum water level (M.W.L) is 3440 cubic metres per second. The reservoir, on the other hand, is 27km in length and at normal water level, maximum width of 6 km (N.W.L) while the water storage capacity is 270 million cubic metres with a surface area of 40 square km also at N.W.L. However, the maximum power-generating capacity of the dam is 9000 kilowatts. In addition, the dam has four radial gates, a butterfly valve, a regulating valve and raw water pump control (used for pumping raw water to the staff quarters and water treatment plant. The gates are opened either mechanically or electrically and manually by winding the lever for 20 minutes while the opening of the gates could be from 1 - 100% depending on the level of water in the reservoir. Also, the release of water to Lagos Water Corporation is done by the opening of the radial gates which is the maximum water release, and the butterfly valve is used for water releases to Ogun Water Corporation. However, at the time of the visit, the radial gates had been closed; the water level was 59.03 metres while the maximum and minimum levels were 63 m and 55 m respectively. According to the respondents, water releases through the radial gates could only be done when the water level is above 55 m level, but at 55 m, releases could be done through the butterfly valve65.

Suffice it to mention that the release of water by the basin authority to the water corporations from Oyan dam is done on request and at a specified fee. Such requests are made during the dry season. According to the respondents from the state water corporations, water release from the Oyan dam reservoir is made only when the water level at the Ogun River intake point of abstraction is below 1m. That is when water from Ikere gorge dam is no longer flowing adequately or a prolonged dry season66. Water is stored and retained at the maximum level of about +60 metres in Oyan dam reservoir till another rainy season and when the maximum dam capacity is reached. Then the sudden release of water is carried out to avoid total collapse of the dam.

Further investigation indicated that the irrigation scheme of the basin authority had been abandoned although information from one of the interviewees was that the irrigation scheme was functional. Certainly, there is enough water stored in Oyan Dam reservoir to help alleviate problems of water scarcity or inadequate supply to meet the growing water demands of Lagos and Ogun states, as most communities around the Ogun River basin lack access to potable water and the communities with access to potable water made personal provisions. The visit to Lagos Water

Corporation revealed that the corporation is currently expanding the corporation's storage capacity. The presence of an anti-salinity wear was observed but was informed that the purpose of the anti-salinity is to help maintain a flow of water abstraction point. Request for raw water from basin authority is done to maintain the water balance of the suction head of the pump because the minimum attainable height for abstraction is about 1.5m. In addition, the Lagos corporation's current production facility at Ogun River intake is about 48,000 million gallons per day

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(216,000,000 litres per day) without constraints. With constraints, it is between 36-38 million gallons per day which could be estimated at 167,000,000 litres per day at an average velocity of 1.6 cubic metres per second. At Ogun Water Corporation, a question was asked: "Why does the corporation not request water from the Oyan dam reservoir to help reduce the problem of flooding". The respondent blamed the corporation's inability on the failure of water users to pay water rates. Again, a follow-up question was asked to know if there is a monitoring and enforcement programme or team put in place to ensure that water rates are paid; then the respondent withdrew and informed that such questions should be directed to the scheduling officer. A rough estimate of the number of people affected by the flooding downstream of Ogun River both Lagos and Ogun States could be about two million people. Several reasons such as lack of coordination, cooperation and integration or harmonisation of roles, ambiguity in the law, and lack of politics, among others, were deduced to be the reason for the ineffectiveness of the Ogun Oshun River Basin authority to tackle the problem of flooding downstream Oyan/Ogun River basin.

According to the International Commission on Irrigation and Drainage Report (ICID) (http://www.icid.org/dam_pdf.pdf) a large fraction of water stored in dam reservoirs is mainly utilised for irrigation purposes globally. While a smaller fraction of the dam reservoir is supplied for industrial, domestic and hydroelectricity generation purposes. Dams were used years ago to increase crop yield to meet the ever-growing population towards ensure food security. Oyan dam operations negate the original purpose for which the dam was built as well as the good operational

practice.

The report has been able to bring to the fore a clear understanding of the first three specific research questions which aimed towards identifying and examining the responsibility of the OORBDA in dealing with flood prevention. This assessment and identification of the responsibility of the basin authority was done using nine (9) different indicators. The indicators include the use of multiple agencies, basin planning, national water law/policy, the effectiveness of river basin organization to prevent flood through risk assessment, efficient water management program, institutional arrangement, stakeholder participation, and capacity building in flood prevention. Also, the study was able to critically assess the task distribution and impact of the task distribution on the expectation of the performance level of OORBDA in flood prevention. This was done using indicators such as coordination arrangements between national and state governments on basin management for flood-related issues, organization structure, community participation, best management practice, clearly defined roles of private sector/public, dialogue approach in decision making, and linkage between basin organisation & government decision making. This without a doubt provided deep insight into the performance level of the OORBDA. Discussing the statutory

responsibilities of OORBDA in flood prevention and bringing to the fore the problem of Oyan dam (Figure 3) created a platform that allows the reader to comprehend the impact of the indicators that were used in juxtaposing the responses of the respondents at OORBDA. By and large, this report has made the task of identifying the suitable and the unsuitable indicators in assessing the performance of OORBDA that the study.

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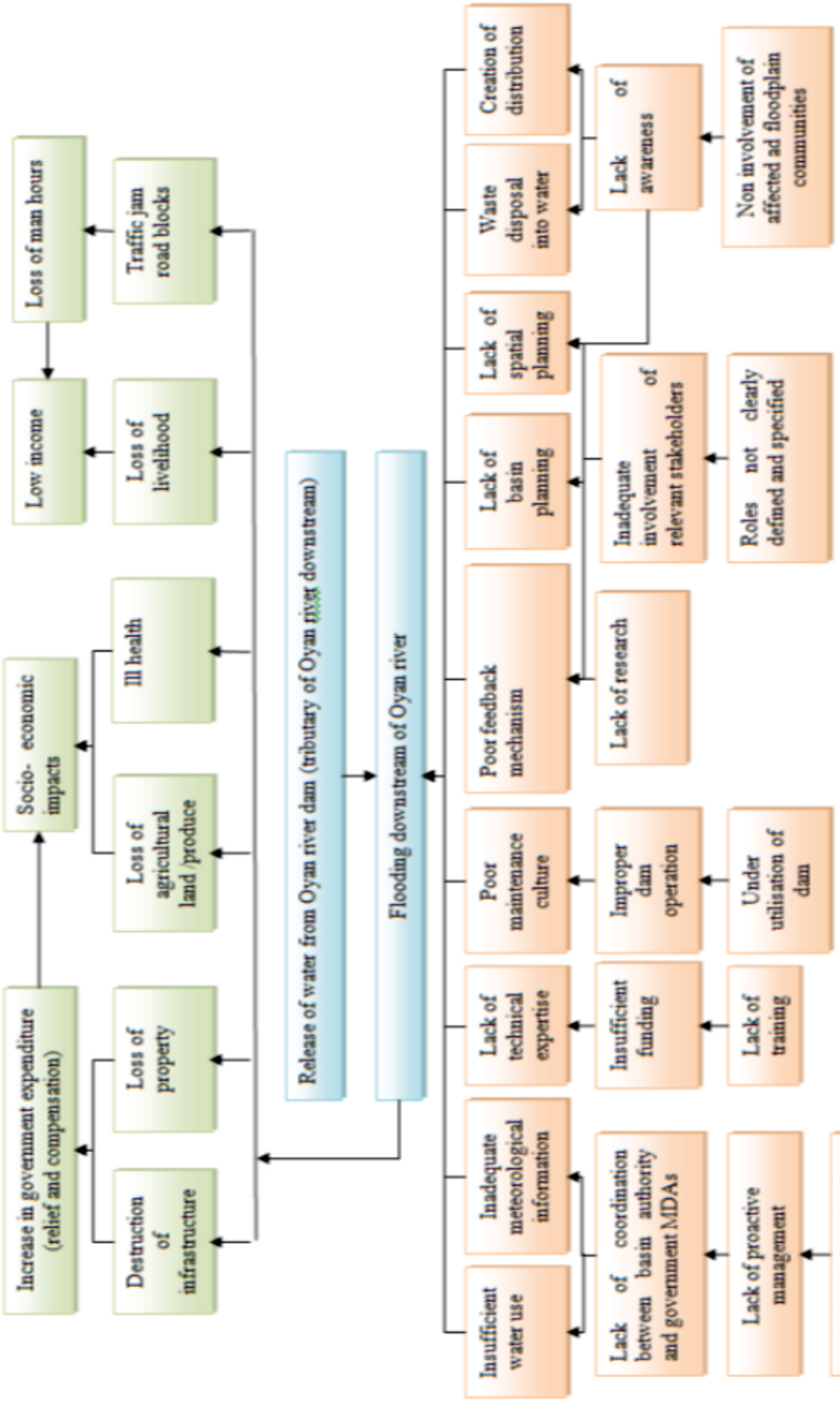

Figure 3: The Causal-Effect of flooding in the study area

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Conclusion and Recommendations

Given the objective of the research study, we have been able to identify the key performance indicators that are suitable for the performance assessment of OORBDA. Twenty-two (22) indicators clustered into six categories namely: coordinated decision-making, which focuses on the existence of high-level, cross-sectoral policy links between natural resources management and other sectors (water users) (2) Responsive decision-making that emphasises evidence of dialogue to be used as an instrument of decision-making on preferred management options – as in open meetings, tribunals, forums (3) Organizational design that seeks evidence of institutional arrangements for basin management which specify roles and responsibilities of different entities and stakeholders, and the existence of water law and policies. Other categories include (4) Training and capacity building which describes the mechanism of building human capacity related to the administrative, economic and political setting within the country of operation (5) Information and research that considers interagency cooperation and accessibility of information by relevant stakeholders a necessity in flood control. The last category is Private and public sector roles which, suggest strong community awareness and participation processes to enhance greater ownership of basin-scale plans of action as a strong indicator for effective management of the RBO. Not all the selected indicators are applicable and suitable for the assessment of the OORBDA in flood prevention. 18 indicators out of the 22 were assessed as suitable for evaluating the performance of river basin organizations dealing with flood control. Three were identified as not suitable while one could not be determined. Furthermore, the distribution of tasks among the different agencies involved in flood prevention was assessed which turned out not to be adequate and clearly defined - (the how and what were left unattended) in the relevant laws for managing water resources to prevent flooding within Ogun River basin at the level of different tiers of government. The study identified the lack of coordination, integration; uncooperative attitude and duplication of roles assigned to the various agencies involved in flood prevention are the reasons for the flooding problem experienced presently within the Ogun River basin downstream of Oyan dam. The overall task distribution between different levels and agencies of government in flood prevention within the Ogun River Basin under the authority of the Ogun -Oshun River Basin Development Authority is however not effectively harnessed to prevent flooding that occurs due to the release of water from the dam especially between the Authority, state water's corporation and the agricultural agencies.

Moreover, the various factors that are responsible for ineffective operational activity to prevent flooding within the Ogun River basin were discussed. The study identified river basin management centralisation in Nigeria as one of the likely reasons for the ineffective operational activity to prevent flooding within the Ogun River basin. Despite the involvement of the state government in basin management, however, state governments are involved in basin management concerning land allocation or development. This is because the federal government is in control of water resources while land resources are controlled by the state

governments and basin management includes both land and water, the reason for haphazard or

ineffective task distribution among the different levels of government. Secondly, the political

reasons as the political ideologies of the federal and basin states of the Ogun-Oshun basin authority differ. Suffice it to mention that three (3) indicators were assessed as not suitable while one (1) indicator could not be assessed as suitable or unsuitable due to lack of information

availability in the study area

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Recommendations and suggestions for further research study

The following recommendations are hereby proposed towards effective river basin management in flood prevention.

a. Proactive river basin management starting with the appointment of relevant technical and professional manpower in specialised fields such as river basin management, dam operations, and ground and surface water hydrologist among others.
b. Collaboration with international institutions and donor agencies for local or tailored training in other relevant fields such as planning, and flood risk assessment among others.
c. Re-structuring of the organisation to accommodate and include relevant departments or units such as flood and erosion control, planning, training, hydrological or meteorological units and others as separate entities and clearly defined roles and authority.
d. Adequate involvement of relevant stakeholders and community participation that would create awareness to living in floodplain areas.
e. Establishment of a monitoring team and determination of accurate data or information of the various water users within the area of operation.
f. Effective coordination arrangements among the relevant agencies involved in flood prevention.

However, effective river basin management at the international level in our opinion may be tackled using a bottom-up approach. A situation where the various challenges, issues, water policy and laws particular to each country may be utilised to determine the relevant and appropriate achievable policy at the global level.

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