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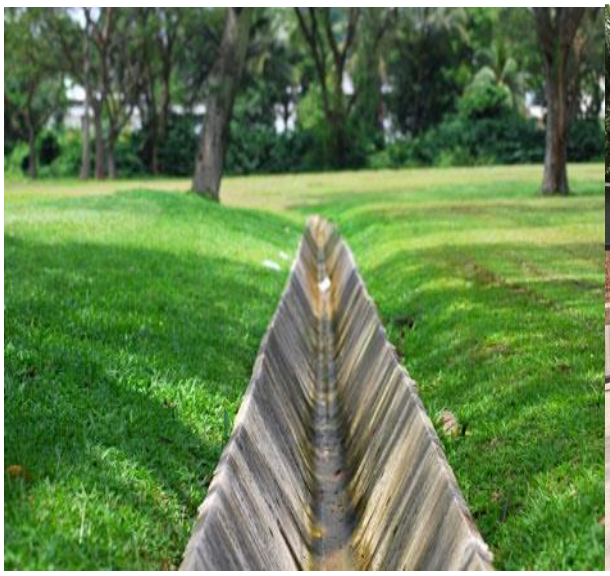
STRATEGIC ENVIRONMENTAL AND SOCIAL ASSESSMENT (SESA) OF THE IBADAN INTEGRATED FLOOD RISK MANAGEMENT AND DRAINAGE MASTER PLAN (IIFRMDMP)



DRAFT FINAL REPORT

March, 2021

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ADB	Africa Development Bank
ADP	Agriculture Development Programme
BID	Business Improvement Districts
BPPDC	Bureau of Physical Planning and Development Control
CBO	Community Based Organization
CEA	Cumulative Effect Assessment
CFRN	Constitution of the Federal Republic of Nigeria
CMO	Catchment Management Office
DIMS	Digital Integrated Monitoring System
DMP	Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP)
DUP	Detailed Urban Plan
EA	Environmental Assessment
EIA	Environmental Impact Assessment
EPA	Environmental Protection Agency
ESA	External Support Agencies
ESIA	Environmental and Social Impact Assessment
FAR	Floor Area Ratio
FEPA	Federal Environmental Protection Agency
FEWS	Flood Early Warning System
FGD	Focus Group Discussions
FGN	Federal Government of Nigeria
FMEnv	Federal Ministry of Environment
FMWR	Federal Ministry of Water Resources
FRM	Flood Risk Management
FRMMA	Flood Risk Mitigation and Management Agency
FRN	Federal Republic of Nigeria
GIS	Geographical Information System
HEP	Hydro Electric Power
IBA	Impact and Benefit Agreement
IITA	International Institute of Tropical Agriculture
IPPC	International Plant Protection Convention
IUFMP	Ibadan Urban Floods Management Project
IIFRMDMP	Integrated Flood Risk Management and Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP)
JICA	Japanese International Cooperation Agency
KII	Key Informer Interview
LCDA	Local Council Development Agencies
LGAs	Local Government Areas
LRP	Livelihood Restoration Plan
LVC	Land Value Capture
M&E	Monitoring & Evaluation
MCM	Million Cubic Meter

MDAs	Ministries Department and Agencies
MENR	Ministry of Environment and Natural Resources
MHEWS	Multi-Hazard Early Warning System
MLGCM	Ministry of Local Governments and Chieftaincy Matters
MLHDC	Ministry of Lands, Housing and Development Control
MOU	Memorandum of Understanding
MWT	Ministry of Works and Transport
NCWR	National Council on Water Resources
NHA	Natural Heritage Areas
NIWRMC	Nigeria Integrated Water Resources Management Commission
NESREA	National Environmental Standards and Regulatory Enforcement Agency
NGOs	Non- Governmental Organizations
NWRI	National Water Resources Institute
O&M	Operation and Maintenance
OORBDA	Ogun-Osun River Basin Development Authority
OYSADEP	Oyo State Agriculture Development Program
PAD	Project Appraisal Document
PIU	Project Implementation Unit
PPP	Public Private Partnership
POPS	Privately Owned Public Spaces
RAP	Resettlement Action Plan
RPF	Resettlement Policy Framework
RS	Remote Sensing
RUWASSA	Rural Water Supply and Sanitation Agency
SAC	Special Areas of Conservation
SDG	Sustainable Development Goals
SEO	Strategic Environmental Objectives
SESA	Strategic Environmental and Social Assessment
SPA	Special Protection Areas
SUD	Sustainable Urban Development
SWM	Storm Water Management
TIF	Tax Increment Financing
TOD	Transit Oriented Development
TOR	Terms of Reference
TSS	Total Suspended Solids
TWG	Technical Working Group
UNEP	United Nations Environmental Programme
UNICEF	United Nations International Children Emergency Fund
UNIDO	United Nations Industrial Development Organisation
WASCOM	Water and Sanitation Committee
WASHCOM	Water and Sanitation Hygiene Committee
WB	World Bank
WESCOM	Water and Environmental Sanitation Committee
WHO	World Health Organization

EXECUTIVE SUMMARY

1: General Introduction

Given the history of flood events in the city of Ibadan, particularly the August 26, 2011 flood event that resulted from the downpour of 187.5 mm in 4 to 5 hours, the Oyo State Government has recognized the need for an integrated and long-term solution to flooding in the City. Hence, the Oyo State Government requested the World Bank's support to finance a flood management project in Ibadan. This request informed the establishment of the Ibadan Urban Flood Management Project (IUFMP), which aims to develop long-term flood resilience in the city by collaboratively identifying and implementing robust and sustainable solutions to mitigate flood risk, and improve flood preparedness, response and recovery. The Bank's support will help Ibadan city reduce environmental and social risks associated with flood, improve waste collection and treatment that exacerbate flood impact, support livelihood rehabilitation/restoration efforts, while developing and improving the institutional capacity of Oyo State Government to manage risks and impacts associated with flooding, as well as the quality of existing infrastructural assets to cope with expected floods. It was therefore recommended that three Masterplans be prepared for the City namely, Ibadan City Masterplan, Solid Waste Management Masterplan and Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP). This report is focussed on Strategic Environmental and Social Assessment of the IIFRMDMP.

The Ibadan Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) therefore sets a process to mitigate flood risks in the city today and over the next 20 years. The overall objective of the project is to "improve the capacity of Oyo State to manage flood risk and to respond effectively and promptly to flooding in the City of Ibadan".

The **Strategic Environmental and Social Assessment (**SESA) provides the opportunity to strengthening public participation process in decision making for improved governance, assessing the strategic dimensions of the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP), anticipate implications over the medium and long term of the proposed interventions, provide inputs into a proposed policy plan or programme (PPP) for flood management – (so that they address environmental, social and economic dimensions effectively) and related government financed interventions. SESA's components/processes for Analytical work and Public participation is indicated in sections 1.4 and 1.5.

2: Project Description

Ibadan City includes four North-South flowing river systems, namely, Ona River (Western), Ogunpa River (Western Central), Ogbere River (Eastern Central) and Omi River (Eastern). Eleyele reservoir is located in the north-western part of the city. These rivers are the main drainage channels that can cause flooding when not properly maintained. Structural and non-structural measures for flood protection are proposed, to be integrated within Ibadan Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP).

The scope of the drainage infrastructures will include Site Clearance, Excavation/ Earthworks, Concrete and Steelwork, Crossing Structures (Culverts/Bridges/Dams), Channels

(Lined/Earth) construction of pavements, River gauges' installation and markings, river channel setback markings with landscaping as appropriate. The cost summary of all proposed works is presented in Table 2.4 and 2.5

3: Policy, Legal and Institutional Framework

A review of the policy, legal and institutional basis relevant to the Ibadan Flood Risk and Drainage Management Masterplan is presented in chapter 3 under the following categories;

- International Environmental Agreements and Treaties ratified by the Federal Republic of Nigeria
- Federal Acts, Rules, Regulations and Standards, and the common law of the Federal Republic of Nigeria (FRN).
- State and Local and relevant Acts, Rules, Regulations and Standards.
- Development Partners Safeguard Policies.

Institutional Framework which includes MDAs, Donor Agencies, Private Sector etc., specific roles/responsibilities, as well as gaps, overlaps and redundancies in the system were assessed with corresponding recommendations proffered (Table 3.6) for the successful implementation of this project.

Stakeholders and Interest groups on Flood Management with Gaps in the existing Flood Management and Planning System was assessed. The results of the survey are provided in Table 3.4 followed by an analysis of options for improvement.

4: Stakeholder Consultation

Project stakeholders can be categorized as primary & secondary stakeholders. Primary stakeholders (include individuals, groups, the vulnerable, etc directly or indirectly affected, positively or negatively affect by project). Secondary stakeholders (include stakeholders who may be able to influence the outcome of the Project because of their knowledge about the affected communities or political influence over them).

Consultation were carried out for various stakeholder groups through different methods such as; focus group discussions, interviews, surveys, print media, meetings, emails, etc (presented in Table 4.1). Special consideration was made available on a need basis for separate consultations with women or vulnerable groups, within the community meetings.

Several consultations, review and working meetings, presentations and four levels of workshops were held with the Drainage and Flood Risk Management Consulting firm (DAR) (to ensure close collaboration and coordination of efforts), affected communities in the study area, key experts from relevant MDAs, relevant stakeholders including two high level segment with the IUFMP steering Committees were organized (between 2017 and 2020) precisely; 15th-16th August, 2017, 31st January & 1st February, 2018. 24th and 25th April 2018 and 22nd January, 2020. Details on consultation & pictures in section 4.6.

5: Environmental and Social Baseline Data

Primary data by sampling and checklists, were collected on the field by Specialists (Environmental and Social Scientists, and Engineers). Community Engagement, Focus Group Discussion, use of Subject-specific Fliers, and questionnaire administration was also conducted and concluded with series of technical workshops. River gauge installation was done to generate primary data on the water level for the various river channels at Kudeti, Ogbere and Omi.
A stakeholder mapping exercise was conducted in June 2017, in conjunction with the PIU, to identify all potentially relevant stakeholders for the SESA study. This identified a number of relevant stakeholder groups with whom consultations were conducted.

The checklist developed for the survey was sent to most of the experts through e-mails and in the course of the four level consultative workshops to facilitate the assessment.
Secondary data was gathered from existing literatures on past flood events in Ibadan and documented report. Including data sourced for at various government agencies on the existing

Environmental and Social Pressures/Problems with *Population, Income, Economic Structure And Livelihoods, Flood Emergency Measures and Flood Emergency Management, Gender Issues and Women Vulnerabilities, Flood Insurance, Stakeholder Engagement, Land Use Activities In Ibadan, Community Vulnerability, Health And Disease Issues, Surface And Ground Water Resources and Quality, Solid Waste Dumping, Quarries and Contaminated Sites, Agriculture and Aquaculture, Climate Change, Soil, Geology and Channel Modification, Hydrology and Related Material Assets, Transportation, Cultural Heritage and Touris.*

These were elucidated in the context of the proposed Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) Development and subsequent implementation of the plan. Taking note of the various constraints – (physical, technical, economic and political) in any flood management decision-making, and that societal values, perceptions of risks and the trade-offs between development and environmental preservation differ among various stakeholders,

The Chapter minimized subjectivity in decision-making through an environmentally and social sensitive framework that considers the driving force in the evolution of each receptor in the context of its current state and trend analysis as optional pathways.

6: Strategic Environmental and Social Objectives, Targets and Indicators

SESA uses a system of objectives, targets and indicators to rationalise information for the purpose of assessment. The overall purpose of environmental and social indicators in the SESA is to provide a way of measuring the environmental and social effects of implementing the DMP and track progress.

The SESA objectives for Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) and ancillary Channels Designation, and their associated sub-objectives, indicators and targets are presented in Table 6.1.

7: Alternatives

A major role of Strategic Environmental and Social Assessment is to assess the reasonable alternative options, considering the objectives, geographical scope of the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) and potential environmental and social effects of the proposed plan. Identification of alternatives is to avoid, reduce or minimize adverse environmental and social impacts on the various environmental and social receptors in Ibadan city. The schematic diagram in Figure 7.1 shows steps followed in the identification of flood management alternatives for the DMP and Table 7.1 presents a set of Alternatives proposed by SESA for flood management of River basin in Ibadan under the DMP.

8: Impact Assessment

This is a fundamental aspect of the SESA, as identification of any adverse environmental and social effects at an early stage allows the formulation of mitigation measures that may be used to prevent, reduce or offset these effects before implementation of the works.
The assessment criteria for SESA of DMP is based on the knowledge of social and environmental receptors; Aligned SESA/DMP objectives, and indicators identified at scoping and throughout the consultation stages etc. The assessment criteria used is presented in Table 8.1.

The key findings from the assessment for each alternative are summarized in Tables 8.5-8.11, while the Preferred Strategy is summarized in table 8.12. The SESA studies provided opportunities for early consideration of mitigation measures by following the sequence **of avoid-reduce-mitigate-compensate-enhance environment and social issues.**

(a) Anticipate and avoid risks and impacts;
(b) Where avoidance is not possible, minimize … reduce risks and impacts to acceptable levels;
(c) Once risks and impacts have been minimized or reduced, mitigate; and
(d) Where significant residual impacts remain, compensate for or offset them, where technically and financially feasible.

It also identifies those significant impacts which are expected to remain after the application of recommended mitigation measures. Thus, the proposed mitigation measures for preferred options are indicated in table 8.13.

9: SESA Implementation Plan

The last stage in SESA/ DMP is proposing the implementation and monitoring plan. The ultimate outcome for implementing the DMP taking cognizance of strategic environmental and social factors is to have a liveable Ibadan city that is flood resilient and economically competitive. The responsibility for managing the Drainage facilities and adjoining public

space, including Operation & Maintenance responsibilities, can be assigned to a range of actors including government agencies, the private sector, not-for-profit organizations, or community organizations. Financing options have been discussed in section 9.3.

The success of the SESA with respect to managing environmental and social impacts related to Ibadan river basins and particularly to the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) development can be measured by the capacity of the Oyo State government to implement proactive regulatory mechanisms and activities to govern watershed catchment and flood plain developmental activities. A mind mapping of the required operational aspect of implementing the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) taking cognisance of the SESA is indicated in figure 9.10

Three broad areas of focus to implement the preferred strategies for creating great drainage facilities and public spaces for people, are:

- *Stakeholders and partnerships:* Creation of public spaces for communities and their well-being in ways that ensure the inclusive engagement of different groups of actors and users
- *Policies, planning, and design:* Equitable and inclusive spatial distribution, quantity, and design quality that enhance access to drainage facilities and public spaces across the city
- *Management, governance, and finance:* Sustainable financial and organizational arrangements for creating and managing public-space assets during their life cycles.

10: Monitoring and Evaluation Plan

The monitoring plan aims to monitor the extent to which SESA objectives and recommendations made in SESA reports are being met and assess the effectiveness of the mitigation measures. The Monitoring & Evaluation unit (M&E) of IUFMP will develop Digital Integrated Monitoring System (DIMS) with the help of other relevant organizations. In particular, the IUFMP, being the Proponent will develop 'Environmental and Social Monitoring Checklist' to decide on what is to be monitored based on Table 10.1 on a need basis as the DMP implementation progresses in the various watershed and by whom. Details on SESA Monitoring Plan for DMP is presented in table 10.1 and guidance checklist is provided in Annex 8.

11: Conclusion and Recommendations

Conclusively, the assessment exercise identified gaps in the mandate of the Oyo MENR. These gaps needs to be filled and; the State Ministry's capacity needs to be strengthened to assure sustainability of the investment of the IUFMP to mitigate flood in Ibadan. Gaps identified include;

- Absence of Flood Mitigation and drainage policies.
- Existing Forest Ordinance on Forest reserves aimed to manage the topography and protect the watershed, have been modified without policy support for green infrastructure to reduce run off and consequential flash floods

- No Mapping of Setbacks and therefore no clear demarcation for no development zones in both the Environment and Physical Planning Laws.
- Inadequate capacity within the Ministry to obtain flood risk data, store data and utilize the data for mitigating flood risk along the catchment.

Recommendations include;

- Encourage Proactive measures: Oyo State Government would need to put more resources invested in prevention and mitigation strategies, which can result in lives being saved, injuries being minimised and damages to infrastructure and the economy being reduced.
- Ensure stakeholder participation and flood risk assessment should be inherently linked processes.
- Implementing the **DMP** taking full cognisance of the SESA objectives will require addressing some barriers to flood risk management and strengthen them as enablers of good flood risk management in the certain aspects including:
    - Competence Capacity building and Strengthening Coordination
    - Preparation of risk maps showing areas liable to flood and other hazards.
    - Funding for Flood Mitigation
    - Infrastructure data management.
    - Continuous coordination of the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) with the Detailed Urban Plans for Ibadan and the Entire Oyo State.

CHAPTER ONE: GENERAL INTRODUCTION

1.1 Background Information

The Oyo State Government in conjunction with the World Bank has recognised that, in significant areas in Ibadan, there are significant levels of flood risk which could increase in the future due to climate change, fluvial and pluvial flood regime changes, anthropogenic pressures, drivers such as population increase, infrastructural development in flood prone areas and land use changes. Examples of such changes includes, natural vegetation to an agricultural area, from an agricultural area to housing or industrial areas, or from natural vegetation to open water in the case of mineral mining or intensification of economic uses-road or power line infrastructure in the floodplain and in the wider catchment that brings about hydro morphological pressures which act as drivers for flood events in floodplains.

Thus, a Strategic Environmental and Social Assessment (SESA) provides a key means to address the concerns discussed above and, ideally, to be embedded within the Programme, Policies and Plans in development process.

On 26th August 2011, a rainfall downpour of 187.5 mm (NWRI1, 2011) occurred for around 6 hours resulting in the overflow of the Eleyele reservoir, causing the death of more than 120 people and inflicting serious damage to infrastructure (many bridges collapsed, roads washed away, and substantial property loss). Following the floods, the former Executive Governor of Oyo State, his Excellency, Senator Ishaq Abiola Ajimobi, set up a task force on Flood Prevention and Management.

The outcome was a report containing short, medium- and long-term recommendations to the state government, which included the proposal to prepare three Masterplans for the city namely Ibadan City Masterplan, Solid Waste Management Masterplan and the Integrated Flood Risk Management and Drainage Master Plan.

Recognizing the need for an integrated and long term solution to flooding in the City of Ibadan, the Oyo State Government set up "The Ibadan Urban Flood Management Project" (IUFMP) to improve the capacity of Oyo State to effectively manage flood risk in the city of Ibadan. This project is funded by the World Bank (WB) and is being executed with WB's assistance through the Project Implementation Unit (PIU).

The Project Implementation Unit (PIU), acting as the Client, commissioned Dar (the Consultant) to prepare an Integrated Flood Risk Management and Integrated Flood Risk Management and Drainage Master Plan for Ibadan City (the Project), covering the 11 local government areas which include the Ibadan Metropolis and the surrounding outlying areas.

The Ibadan Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) therefore sets a process to mitigate the flood risks in the city today and over the next 20 years to 2040.

Noting that the environmental and social impacts of flood events can be complex, diverse, with both negative and positive environmental and social consequences which are influenced by or influence flood protection strategies, the PIU recognised the limitations of

Environmental and Social Impact Assessment (ESIA) to evaluate the environmental and social implications of policies, programmes and plans, hence, the emergence of the Strategic Environmental and Social Assessment (SESA) as a valuable tool to serve the purpose to assess impacts of the investment for the proposed Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP).

The IUFMP therefore commissioned a Consulting firm (Sustainabiliti Ltd) to undertake the Strategic Environmental and Social Assessment (SESA) of the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) in order to examine and incorporate environmental and social solutions to manage this flood risk in a sustainable and cost-effective way of the 20-year plan.

The SESA provides a process to evaluate the linkages between the investments and the environment, social, health, job creation, economic diversification, and poverty reduction. It can also open new mechanisms for intergovernmental and societal dialogues to reach consensus on watershed development priorities, raising attention to environmental and social priorities, strengthening constituencies for policy change and improving social accountability for example, by bringing all classes of stakeholders together and identifying policy, capacity and legislative weaknesses in institutions. All of these attributes make SESA a valuable support process to advance the goals of DMP by improving the development and implementation of DMP as part of Ibadan overall development plan.

Strategic Environmental and Social Assessment (SESA) is a systematic examination of environmental and social risks and impacts, and other issues associated with any large-scale plan, programme or strategy, typically at the national level but also in smaller areas. The examination of environmental and social risks/ impacts will include consideration of the full range of environmental and social risks/ impacts of the project.
The SESA on the Ibadan Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) study was carried out between 2017 and 2019.

1.2 IUFMP's Objectives

The overall objective of the project is to "improve the capacity of Oyo State to manage flood risk and to respond effectively and promptly to flooding in the city of Ibadan".

The progress in achieving the project development objective (PDO) will be monitored by the following PDO level indicators:

a. Direct project beneficiaries (number), of which female (percentage).
b. Effective use of flood control assets management plan.
c. Land area protected from a 25-year return period flood event.
d. Improved institutional coordination on flood risk management in Ibadan

The above indicators will be measured using hydraulic and hydrological models developed under the Ibadan Integrated Flood Risk Management Masterplan.

The IUFMP project consists of **three main** components and **eight** sub-components, namely:

Component 1: Flood Risk Identification, Planning and Preparedness

- Sub-Component-1.1: Design of Flood Risk Management Investment Program
- Sub-Component-1.2: Development of an Oyo State Long-Term Flood Resilience Strategy:
- Sub-Component-1.3: Establishment of an Integrated Flood Early Warning and Response System:
- Sub-Component- 1.4 Contingency Components.

Component 2: Flood Risk Reduction

- Sub-Component 2.1: Priority Infrastructure Improvement
- Sub-Component 2.2: Long-term Integrated Flood Risk Mitigation:

Component 3: Project Administration & Management Support

- Sub-component 3.1: Project Administration
- Sub-component 3.2: Project Implementation Support

The SESA studies is with respect to preparation of Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) for the Ibadan City which is a 20-year plan for flood management structures such as channels, bridges, culverts, etc under Component 1 and sub-component 2.2 of the IUFMP.

1.3 Rationale and Objectives of the SESA on the Ibadan Integrated Flood Risk Management and Drainage Master Plan.

The Ibadan Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) is designed to address identified multiple[1] and interconnected issues which contribute to the growing challenges of flooding in Ibadan as part of effective and sustainable urban flood risk management strategy for Ibadan.

This is a complex process requiring a mutually agreeable understanding of the various factors contributing to the problem and an understanding of the **cumulative environmental and social impacts of the proposed current and future intervention plans.**

The **Strategic Environmental and Social Assessment** (SESA) provides the opportunity to strengthening a robust public participation process in decision making for improved governance, assessing the strategic dimensions of the Integrated Flood Risk Management and Drainage Master Plan, anticipate implications over the medium and long term of the proposed interventions, provide inputs into a proposed policy plan or programme (PPP) for flood management – (so that they address environmental social and economic dimensions effectively) and related government flood risk and management financed interventions.

Specifically, the SESA objectives is to promote:

- Effective management of potential changes that could occur as a result of flood management during Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) implementation;

[1] Floods usually result from a combination of meteorological and hydrological extremes, such as extreme precipitation and flows. However, of increasing importance are floods that have to do with human activities. Heavy/prolonged rainfall, dumping of refuse in stream channels, Channels too shallow/sedimentation, Culverts/bridge throughways not wide enough, Houses too close to stream channels, Growth of vegetation on river channels, Blockage of culverts and bridge throughways, Increased impervious surfaces/urbanization are interconnected reasons contributory to flood events.

- Sound Environmental and Social flood management planning;
- Public participation in flood management planning; and
- Well-informed decision-making in flood management planning process

1.4 SESA Process

The SESA components/processes for analytical work and public participation is indicated in steps1-3 and in Figure 1.1 below -:

1. Identify environmental and social priorities (step 1).
2. assess institutional and capacity gaps with budget, financial appropriation and expenditure priorities, and political economy constraints in managing these priorities (step 2); and
3. recommend gaps filling measures to address these gaps, including an environmental and social risk assessment of proposed changes (Step 3)

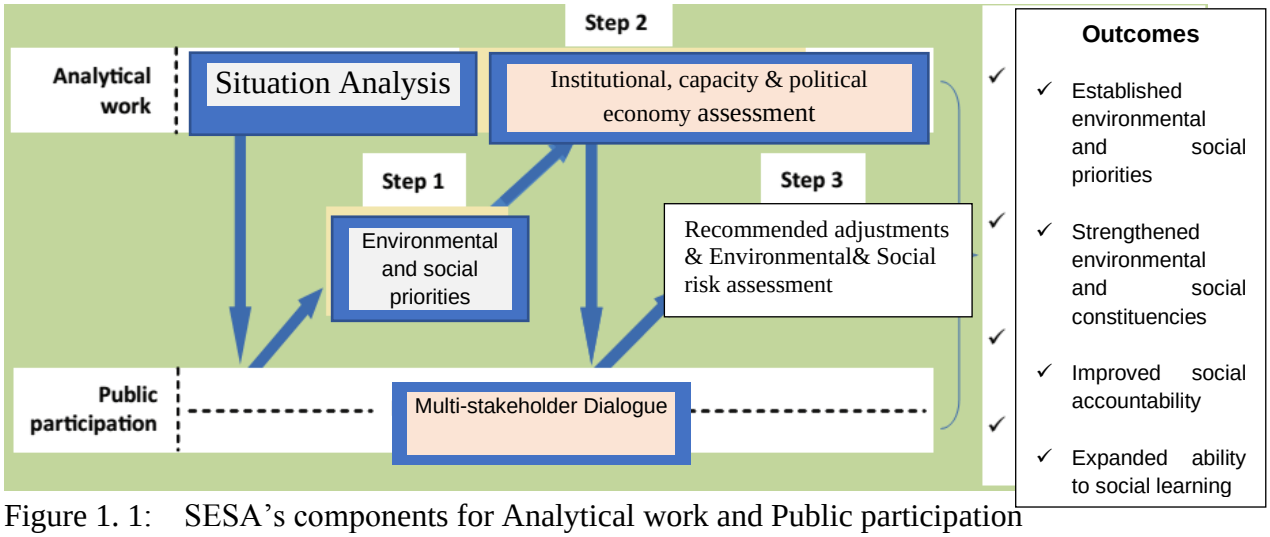


Figure 1. 1: SESA's components for Analytical work and Public participation

This SESA became relevant to Ibadan Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) in its assessment of the **conceptual plan** to improve environmental and socio- economic performance in an on- going implementation and contributed to **preparing a new plan** so that it addresses environmental and socio-economic concerns as the plan take shape.

The SESA focused on integrating environmental, social and economic dimensions of sustainability to the plan and engaged a wide range of stakeholders not limited to expert evaluations conducted over a period of two years as indicated with activities chart shown as figure 1.4. Annex 11 -12 indicate the attendance and summary of views of stakeholder inputs that helped in arriving at recommendations and implementation plans. Thus the SESA was carried out as an integral part of the Ibadan Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) formulation by facilitating a consultative process that allowed for debate and consensus on environmental and social issues.

1.5 Relationship of SESA with other Safeguarding Instruments

SESA has evolved largely as an extension of ESIA principles, process and procedure, figure 1.2 shows the main difference and (figure 1.3) shows its relationships with other environmental and social assessment tools. These follow from SESA application to the

higher level of plan and programme making, which sets a framework for projects subject to ESIA, and/or RAP and potentially many other actions that may have an impact on the environment and livelihood of affected persons within the site specific areas. At plan level, SESA facilitates consideration of the environment and social issues in relation to fundamental issues (why, where and what form of development) rather than addressing only how an individual project in a site specific area should be developed. The potential for environmental and social gain is much higher with SESA than with ESIA. At each of safeguard instruments stages a transparent and continuous engagement of relevant stakeholders is ensured. Table 1.1 compares the SESA and ESIA in assessment details.

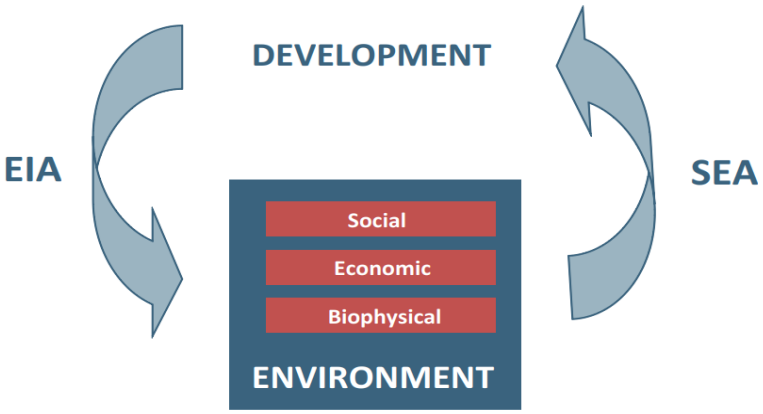


Figure 1. 2: Difference between SESA and ESIA (source: CSIR, 1996)

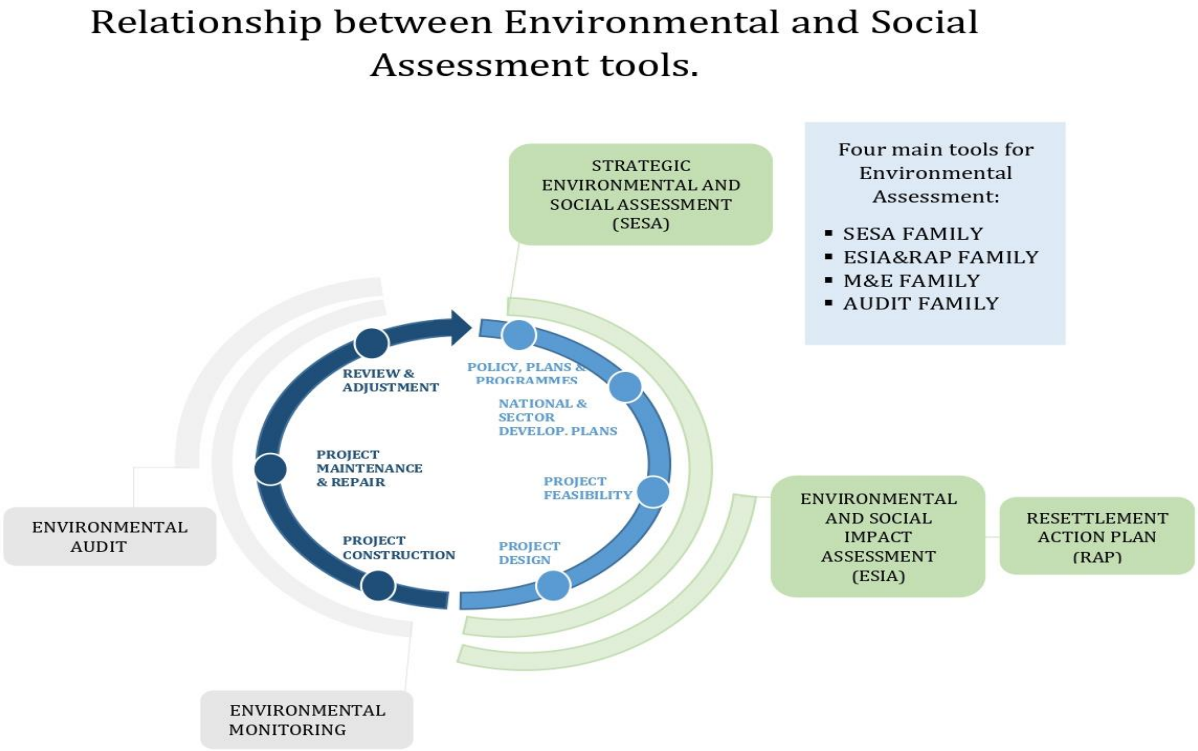


Figure 1. 3: Relationship between Environmental and Social Assessment tool

Table 1. 1: Comparing the SESA and ESIA

	SESA	ESIA

Stage of assessment in the proposals	Takes place at earlier stages of decision-making	Take place at the end of decision-making process
	Pro-active approach to development proposals	Reactive approach to decision-making process (The decision-making process is a result of risk mitigation approach based on the mitigation hierarchy)
Scope of impacts	Identify environmental and social sustainable development issues	Identify specific impacts on the environment and social aspect
	Early warning of cumulative effects	Limited review of cumulative effects
Range of alternatives	Consider broader range of potential alternatives	Consider limited number of feasible alternatives
	SESA	**ESIA**
Characteristics of assessments	Emphasis on meeting environmental and social objectives	Emphasis on mitigating and minimizing impacts
	Broad perspective, lower level of detail to provide vision and overall framework	Focussed perspective with high level of detail
	Multi-stage process overlapping components, policy level is continuing iterative	Well defined process, clear beginning and end
	Focus on sustainability agenda, gets at sources of environmental deterioration	Focuses on standard agenda, treat symptoms of environmental deterioration

Site specific screening will need to be concluded for future subproject for EIA/ESIA/RAP/LRP along the water shed catchment of the six basins (Ogunpa, kudeti, Orogun, Ona, Ogbere and Omi) covered under the Drainage Master Plan to improve their quality, including alternatives to locations, design consideration, construction and its operation in the overall watershed management and flood risk mitigations

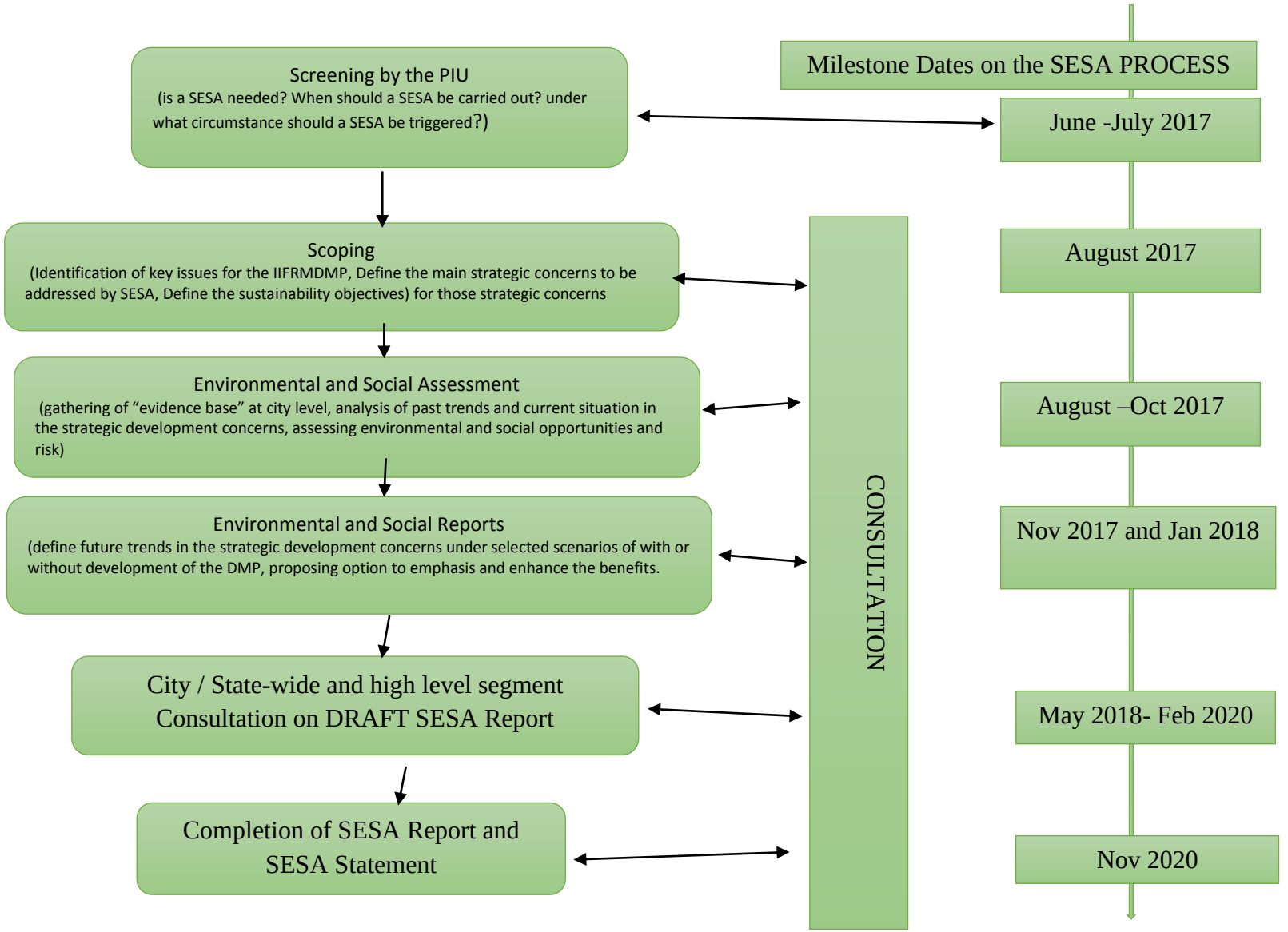


Figure 1. 4: SESA Activity Chart with milestones dates

CHAPTER TWO: INTEGRATED FLOOD RISK MANAGEMENT AND DRAINAGE MASTER PLAN (IIFRMDMP) FOR IBADAN CITY (PROJECT DESCRIPTION)

2.1 Introduction

There is an extensive network of rivers and streams throughout Ibadan city. These conditions result in a large number of drainage structures at road-stream crossings leading to an extensive number of crossing structures with the existing road network.

Ibadan city includes four North-South flowing river systems/basins, namely, Ona River (Western), Ogunpa River (Western Central), Ogbere River (Eastern Central) and Omi River (Eastern) as shown in Figures 2.2 &2.3. Eleyele reservoir is located in the north-western part of the city. These rivers are the main drainage channels that can cause flooding when not properly maintained.

Based on existing land use plans and future proposed land use plans, hydrological analysis and catchment delineation, the 4 major river basins (Ona, Ogunpa, Ogbere and Omi) are delineated into 38 sub basins based on the LiDAR data. See figure 2.5.

Structural and non-structural measures for flood protection are proposed, to be integrated within Ibadan Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP).

The Structural measures investigated in the Masterplan (DARs report N17036-0100D-RPT-ENV 26-Rev0 January 2019) includes interventions such as channelization, dikes, dams and rehabilitation of crossing structures (roads with waterways). Figure 2.1 presents the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) with 69 proposed main systems and their associative sub-systems making a total of 188 systems, the figure also includes the existing system dimensions of Middle Ogunpa (System 2). The figure also presents the proposed dikes and dams for attenuation and multi-purpose respectively.

The proposed channel sizes are presented on a larger map divided into 2 part plans (a northern part and a southern part), refer to Figure 2.2 and Figure 2.3.

In addition, non-structural measures were investigated, which are measures not involving physical construction which use knowledge, practice or agreement to reduce disaster risks and impacts, through policies and laws, public awareness raising, training and education. Others include potential areas for attenuation and landscape, in addition to a set of guidelines in the cited report.

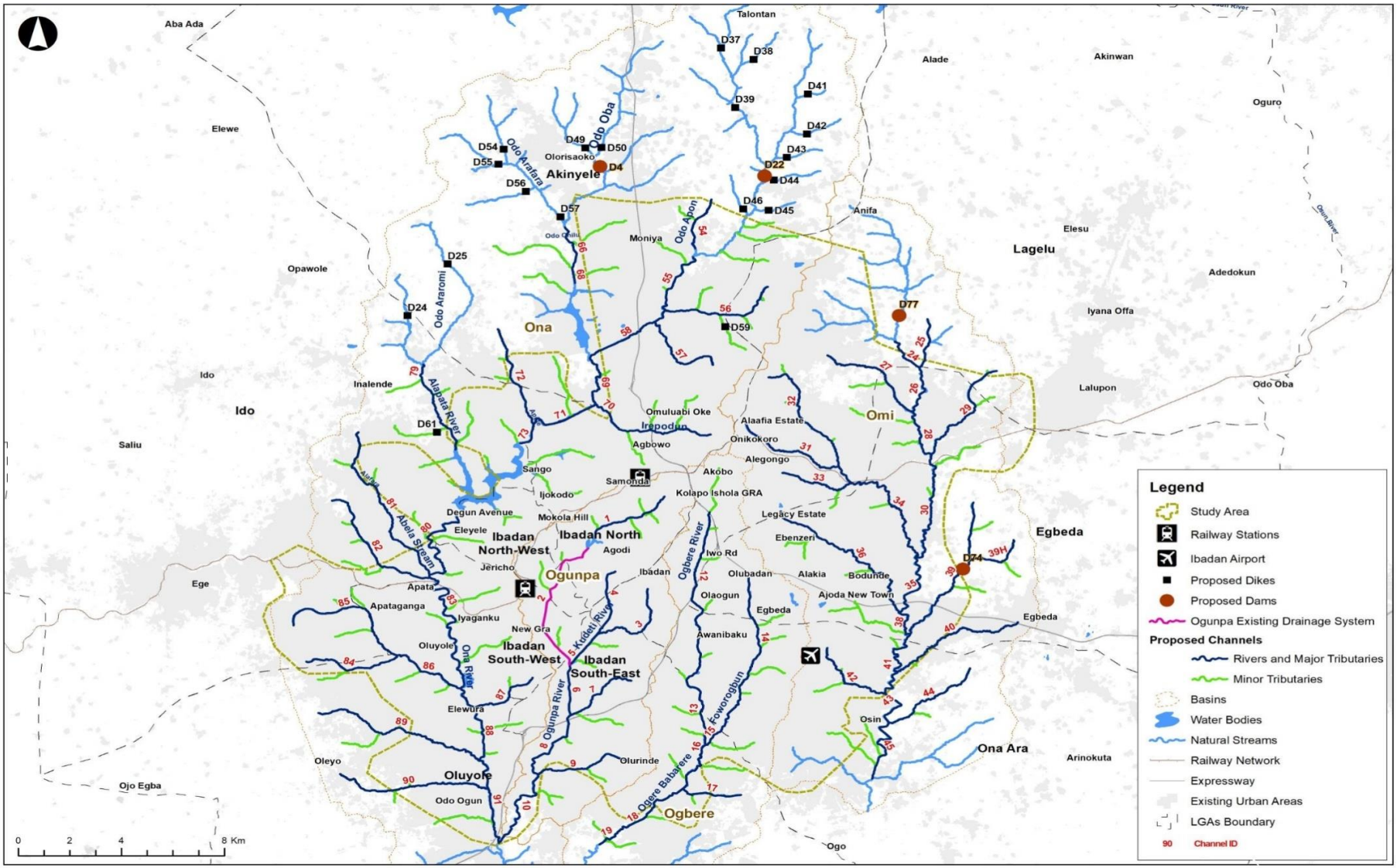


Figure 2.1: Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) (General Figure)

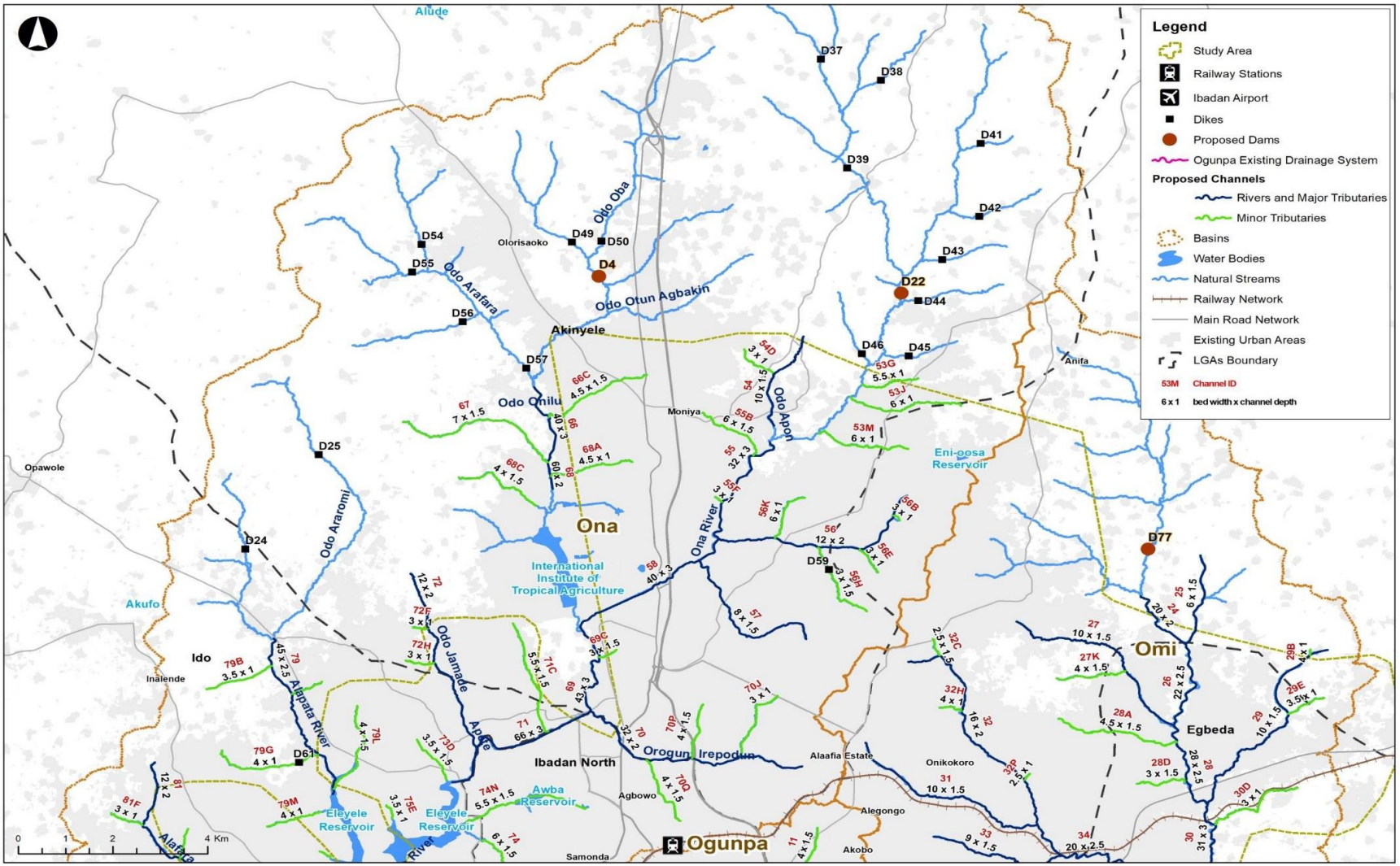


Figure 2.2: Northern part of the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) showing Ona, Omi and Ogunpa Rivers

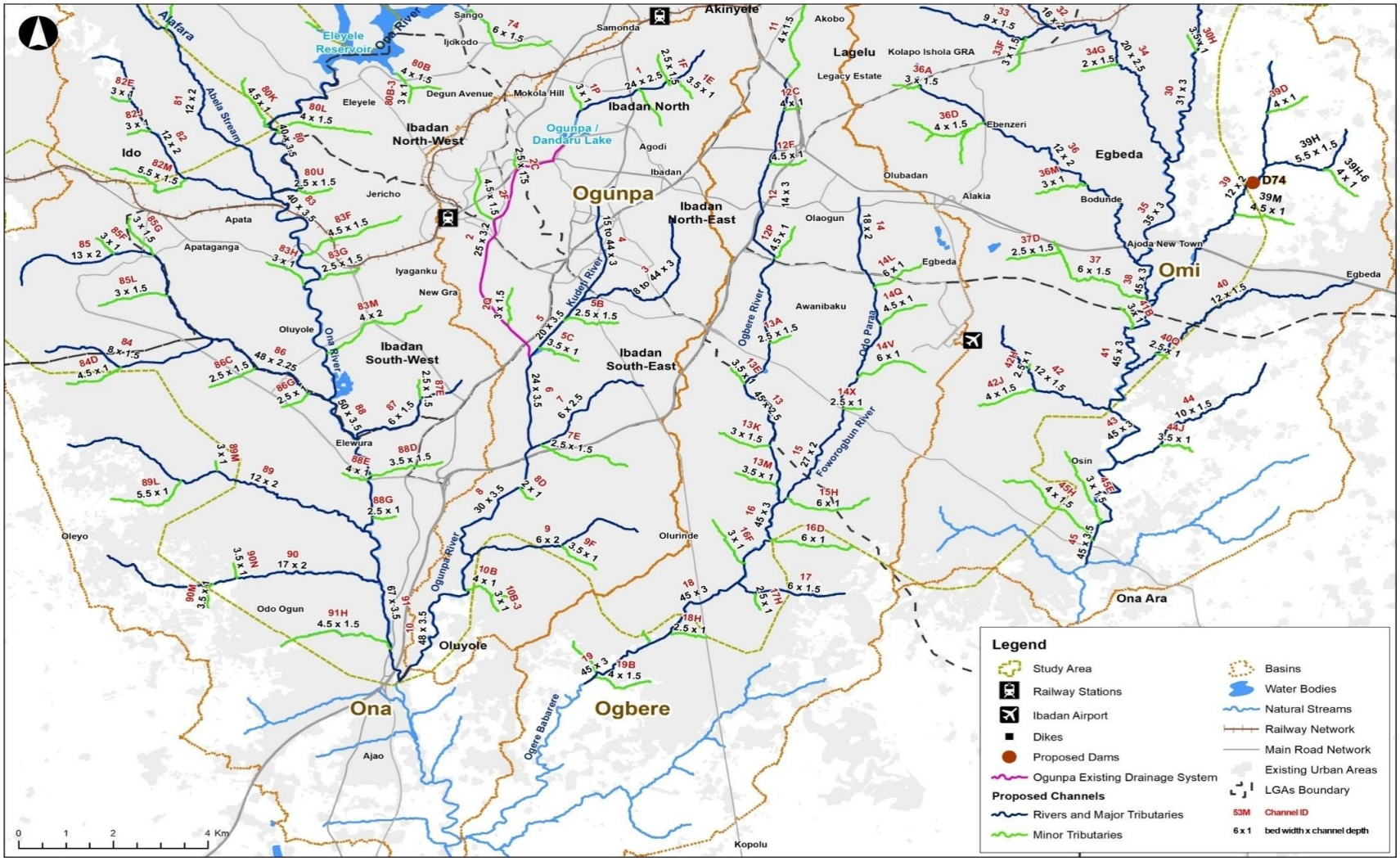


Figure 2.3: Southern part of the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) showing Ogunpa, Ona, and Ogbere Rivers

Proposed Channels

The 188 systems comprising of Rivers and Tributaries that are proposed for channelization lie in different areas in Ibadan. Annex 9 of Dar's Report - N17036-0100D-RPT-ENV 26-Rev0 January 2019 presents the tabularized form for the design for each channel. This data is also copied to the GIS geodatabase. All channelized river and tributaries are presented in part plans in Volume 3 with a scale of 1:10,000. The basis for the design considerations of the above systems proposed channels and crossing structures, dikes and dams are summarised in table 2.2 and table 2.3 presents Identification parameters for Non– Structural Measures design criteria**.**

In the Masterplan, the streams of Ibadan are divided into 6 drainage categories according to a specific threshold. To identify each category separately, the streams of Ibadan are delineated with 6 various thresholds ranging from 0.1km^2 to 50km^2. The various drainage categories are available in the GIS Geodatabase. Table 2.1 presents the 6 drainage categories with a River Name example for each category.

Table 2.1: Drainage categories of the Master Plan

No	Drainage category ID	Drainage Category and Catchment Area Coverage	Examples of Rivers
1	50k	Major River (>50km2)	Ona, Omi
2	25	Major River (25-50km)	Alapata, lower Alaro, Lower Ogunpa, Lower Ogbere
3	5k	Major Tributary (5 to 25km^2)	Upper alaro, Lower kudeti, Lower Olojuoro, Middle and upper Ogunpa, Upper Ogbere, Foworogun, orogun
4	1k	Major Tributary(1 to 5 km^2)	Lower Yemetu, Middle Olojuoro, Lower Labelabe
5	0.5k	Major Stream (0.5to 1 km^2)	Gege, Upper Yemetu, Upper Olojuoro, Upper Labe labe, Lower iye, lower Aremo, Eleta, Oba, Lower Alawo
6	0.1k	Minor Stream (0.1 to 0.5km^2)	Elegun, Olokun, Upper Alawo, Upper Aremo, Upper Iye

Table 2.2: Identification parameters for Structural Measures of Dikes and Dams design criteria set to allow further hydrological analysis

S/N	Dikes	Dams	Culverts	Bridges	Channels
1	Dikes or dams are selected in narrow stream sections to allow a short structure length and reduce its corresponding cost	Dams should have height up to 40m to allow it to store sufficient water for future purposes and to be considered as a feasible economic dam.	Culverts are designed to **convey a flow based on a 25-year return period or according to longer return periods in case of Main Road crossings or Expressway crossings.**	Bridges are designed to convey a flow based on a 100-year return period and with a sufficient freeboard of not less than 0.75m	All channelized river and tributaries are presented in Dar's part plans in Volume 3 with a scale of 1:10,000.
2	The expected impounding reservoir **should have no effect on existing urban areas and road** Networks	A controlled bottom outlet is designed to provide a specific flow for various water demands such as domestic purposes, irrigation and ecological needs.	Culverts are checked to convey a flow based on a 100-year return period such that the storm water does not overtop the crossing road.	The span of the bridge is taken as the top width of the channel	Channels are sized according to the application of Manning's formula for open channels. The design is prepared using a hydraulic model (Flow Master) and checked by another hydraulic model (SAA).
3	Dikes having short heights (4 to 8m) are placed in Tributaries having a	The embankment of the dam is not overtopped during the event of the	Culverts are sized according to the application of	The Bridge's deck is assumed	Channels are designed with trapezoidal shaped sections having side slopes of 2H:1V.

	contributing catchment area of less than 25km2 at the dikes location. Dikes should have a maximum height of 8m to allow a feasible economic dike.	Probable Maximum Flood (PMF).	Manning's formula for open channels. The design is prepared using a hydraulic model (SAA model).	1.25m above the freeboard. i.e. 2m above the water level of the 100-year return period.	
4	Catchment areas obstructed by the dike should have a considerable area that is large enough to have a significant contribution to flood flows; this area should be greater than 2km2.	An emergency spillway is designed to assure that the dike's embankment is not overtopped.	d- Crossing structures and their channels are designed altogether.		The design longitudinal slopes are proposed to match the natural ground slope as much as possible to minimize earthworks.
5	**Higher capacities are favoured over lower capacities for the same dike location.**	In high flows and long return periods such as the 25-, 50- and 100-year storm events, the dam stores stormwater and impounds a reservoir in its upstream. The reservoir should not dry out.			The channel is **proposed to be excavated/dredged by an average of 0.5m to ensure that the size of the channel is fitted,** and the channel may convey the flow within the proposed cross-section.)
6	**Dikes with small filling volume and high attenuation are favoured over other ones in order to reach an economic dike; this is examined by dividing the dike's volume by the magnitude of the flow reduction (attenuation).**	In longer return periods such as the 200-year, 500, 1000 and the PMF, the spillway is overtopped and conveys a free flow without causing any overtopping to the dam's embankment.			The design flow is extracted from the rainfall-runoff model (HEC-HMS
7	A bottom outlet using a culvert is designed to convey both low and high flows without allowing the dike's embankment to be overtopped				The design flow is based on a specified design return period, the design return period depends on the catchment area of the channel ➢ Channels having a catchment area < 50 km2 are designed to accommodate a flow of 50years return period and checked for the 100-year return period. ➢ Channels having a catchment area > 50 km2 are designed in their structural section to accommodate a flow of 25-years return period. On the other hand, the system is designed to accommodate the 100-year return period within both the channel (structural section) and the flood fringe (the non-structural section).
8	In low flows and short return periods such as 5-, 10-year storm events, the culvert conveys the flow freely as an open channel.				Concrete lining protection is proposed for channels such that: ➢ Channels having a catchment area < 25 km2 are proposed to be completely lined (bed and side slopes protection), manning roughness coefficient is taken as 0.017. ➢ Channels having a catchment area > 25 km2 are proposed to be partially lined (side slopes protection only), manning roughness coefficient is taken as

					0.027.
9	In high flows and longer return periods such as the 25-, 50- and 100-year storm events, the culvert becomes submerged causing an impounding reservoir upstream the dike. In this case, the culvert acts as an orifice and conveys a surcharged flow without causing any overtopping to the dike's embankment.				
10	Nevertheless, and in case of any possible overtopping, the surface of the dike's embankment is protected by an economic lining material				

Table 2.3: Identification parameters for Non– Structural Measures design criteria

S/N	Attenuation and Landscape	Environmental and Social Non-Infrastructure- Based Program (Public Education)	Establishment of Policies, Laws and Regulations
1	In the Masterplan, all available areas lying within the 100-year flood extents are determined for both attenuation and landscape purposes	Investing in communities vulnerable to climate change impacts can reduce the damage brought on by extreme weather events and the need for government relief funding.	Climate Change Adaptation and Beautification Restrict Dumping Refuse in Unauthorized Locations
2	Each allocated area is identified with a unique code with the character LA to refer to Landscape and attenuation areas. The identity code includes a prefix	Increasing the awareness of the population that lives close to water courses is essential for a healthy environment.	Enforce Developers use Sustainable Urban Drainage Systems
3	The identity code includes a prefix to relate it to its sub basin Id and a suffix to identify its serial number within its sub basin. e.g. Og4-LA49 presents a land adjacent to the proposed channelization of System 9 (a tributary of Lower Ogunpa) that can be used for either Landscape or Attenuation, the land is in Og4 Subbasin (Lower Ogunpa) with the serial number 49 within its subbasin.	Awareness can be in the form of printouts in newspapers, electronic media, as well as the use of drama sketches and plays on flooding-related hazards and risks associated with encroaching on flood plains.	Restrict Deforestation and Enforce Trees Protection
4	landscape and attenuation area along the proposed channels have been identified in Upper Ogunpa, Kudeti, Orogun and Ogbere	Encouraging and enabling a culture of flood resilience enhances the preparation capacities of citizens and their community as a whole.	Demarcation of Setbacks

2.2 Masterplan Cost Estimate

This section presents the cost estimate for all the proposed drainage elements comprising the channelization works, structures (Culverts/Bridges) and dams. The summary of all proposed works are summarized in Table 2.4.

Table 2.4: Total Proposed works in the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) and Cost Estimates in Million USD and Billion Naira

	Length (km)/ No	Total	
		Cost (Million USD)	Cost (Billion naira)

Channels	418.1	381.1	116.2
Culverts	1336	88.3	26.9
Bridges	61	90.5	27.6
Dams	4	997.9	304.4
Total		**1557.8**	**475.1**

2.2.1 Channels with Associative Crossing Structures

Annex 10 of the DAR report -N17036-0100D-RPT-ENV 26-Rev0 January 2019 on the Drainage Masterplan presents the cost estimate of channels and crossing structures (Bridges/Culverts) lying on these channels. In the Masterplan, there are 188 proposed channels with a total length of 418 km and a total cost of 381Million USD (116 Billion Naira). In addition, there are 53 proposed bridges lying on proposed channels with a total cost of 73.5 Million USD (22.4 Billion Naira). Moreover, there are 491 proposed culverts lying on proposed channels with a total cost of 44.3 Million USD (13.5 Billion Naira).
Table 2.5 summarizes the cost estimate of channels and crossing structures (Bridges/Culverts) lying on these channels.

Table 2.5: Cost of Associated Structures on Proposed Channels (Culverts &Bridges) in USD &Naira

Structures on Proposed Channels	**Length (Km)/ No.**	**Cost (Million USD)**	**Cost (Billion Naira)**
Channels	418.1	381.1	116.2
Culverts	491	44.4	13.5
Bridges	53	73.5	22.4
Total		**499.0**	**152.2**

2.3 Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) Geographical Coverage

There are 12 River Basin Development Authorities under the Ministry, (Figure 2.4) responsible for planning and developing water resources, irrigation work and the collection of hydrological, hydro-geological data. They also provide water in bulk to cities from dams. A Utilities Charges Commission was established in 1992 to monitor and regulate utility tariffs, including those of State Water Agencies. Thus all development activities under the drainage master plan in Ibadan falls under the Ogun- Osun Water Basin authority as strategic partner in the collection of hydrological data and flood alert warning implementation.

The watershed designated to be covered in the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) include Ona, Orogun, Kudeti, Olojuoro, Ogbere, Ogunpa and Omi with six of them indicated in the map (Figure 2.5) below. Figure 2.6 shows the study area including river channels and the communities around them.

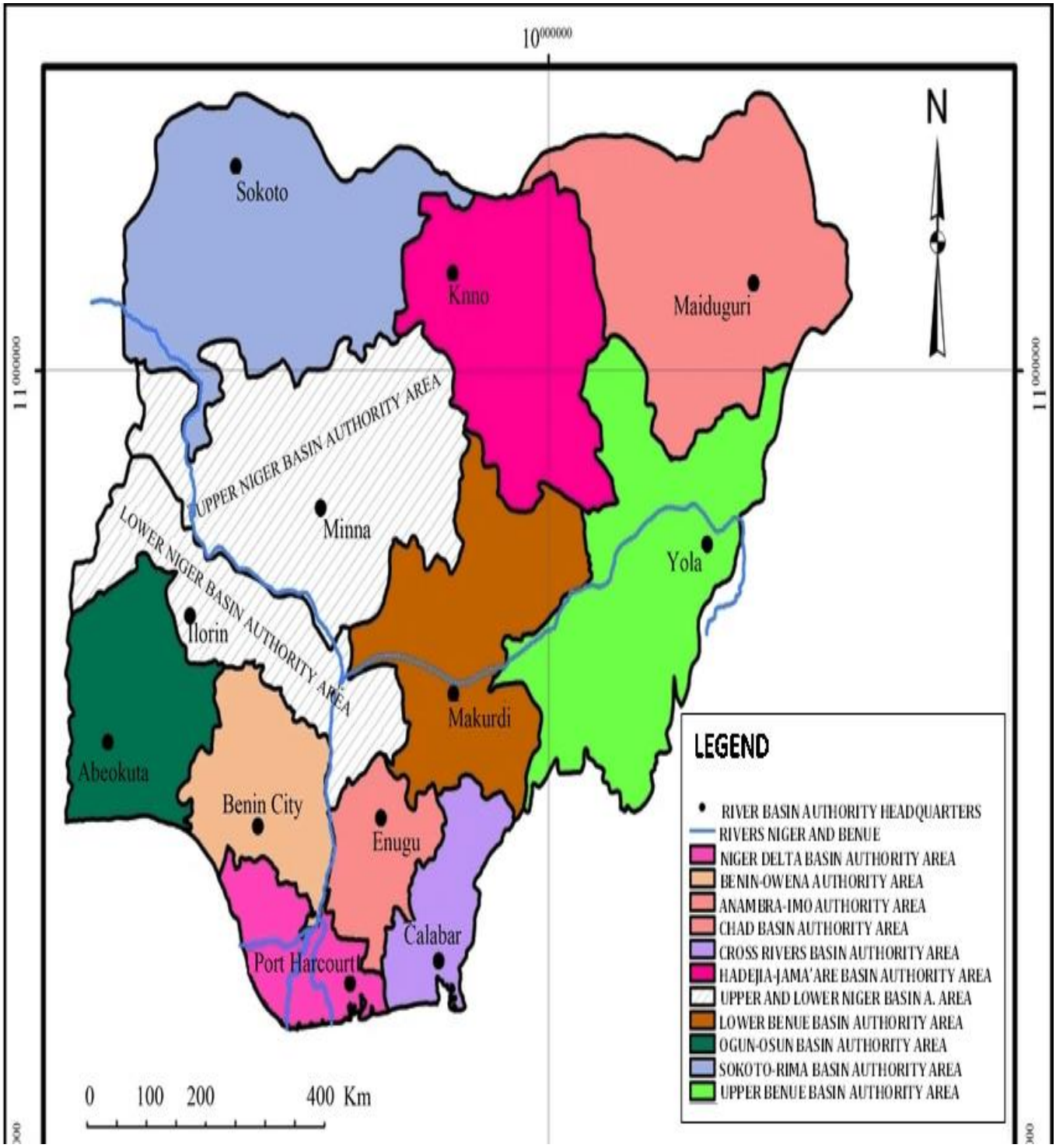


Figure 2.4: Federal Ministry of Water Resources River Basin Development Authorities (RBDA) areas.

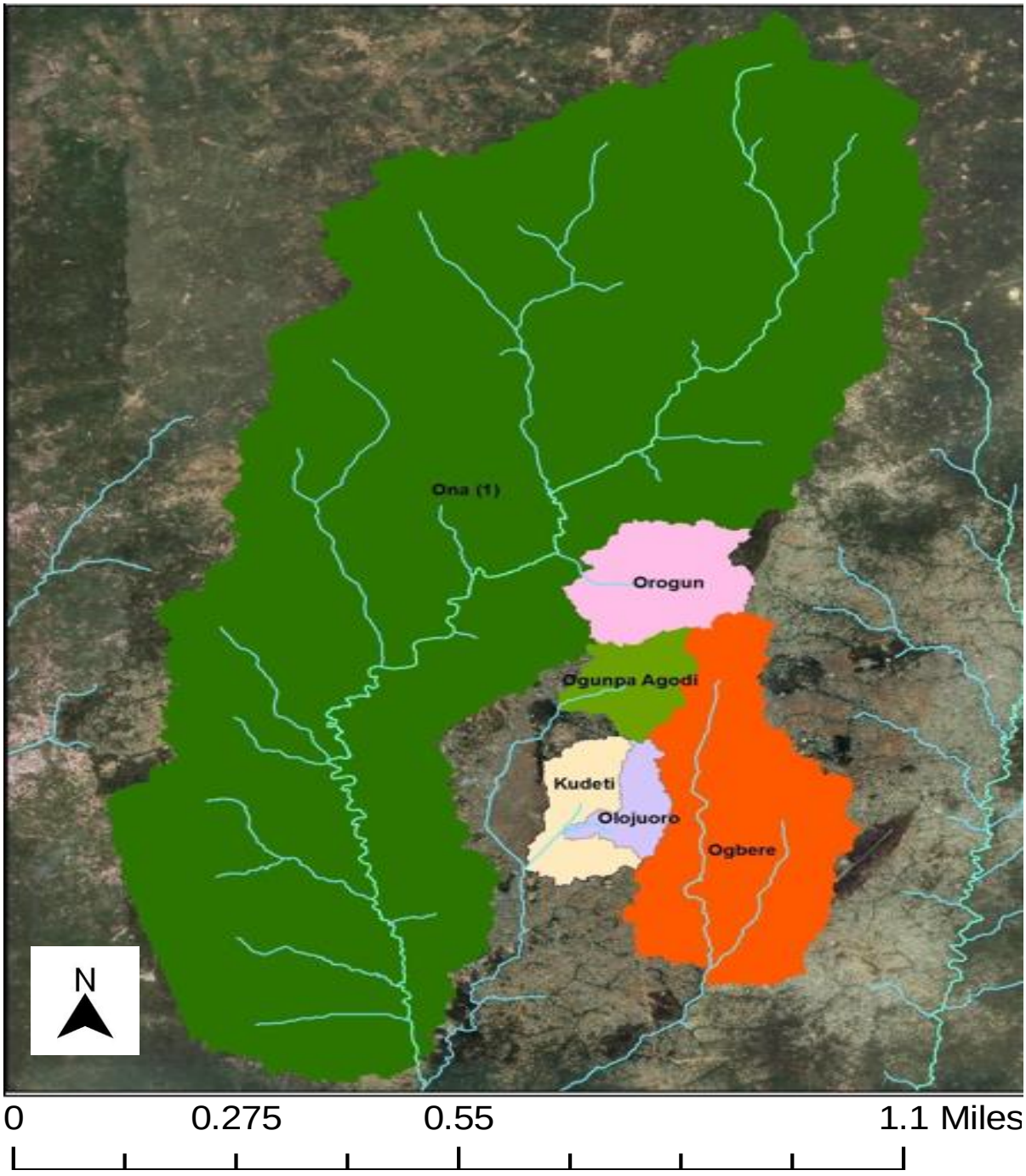


Figure 2.5: The Six River Basin "watershed" coverage in the Drainage Master-Plan

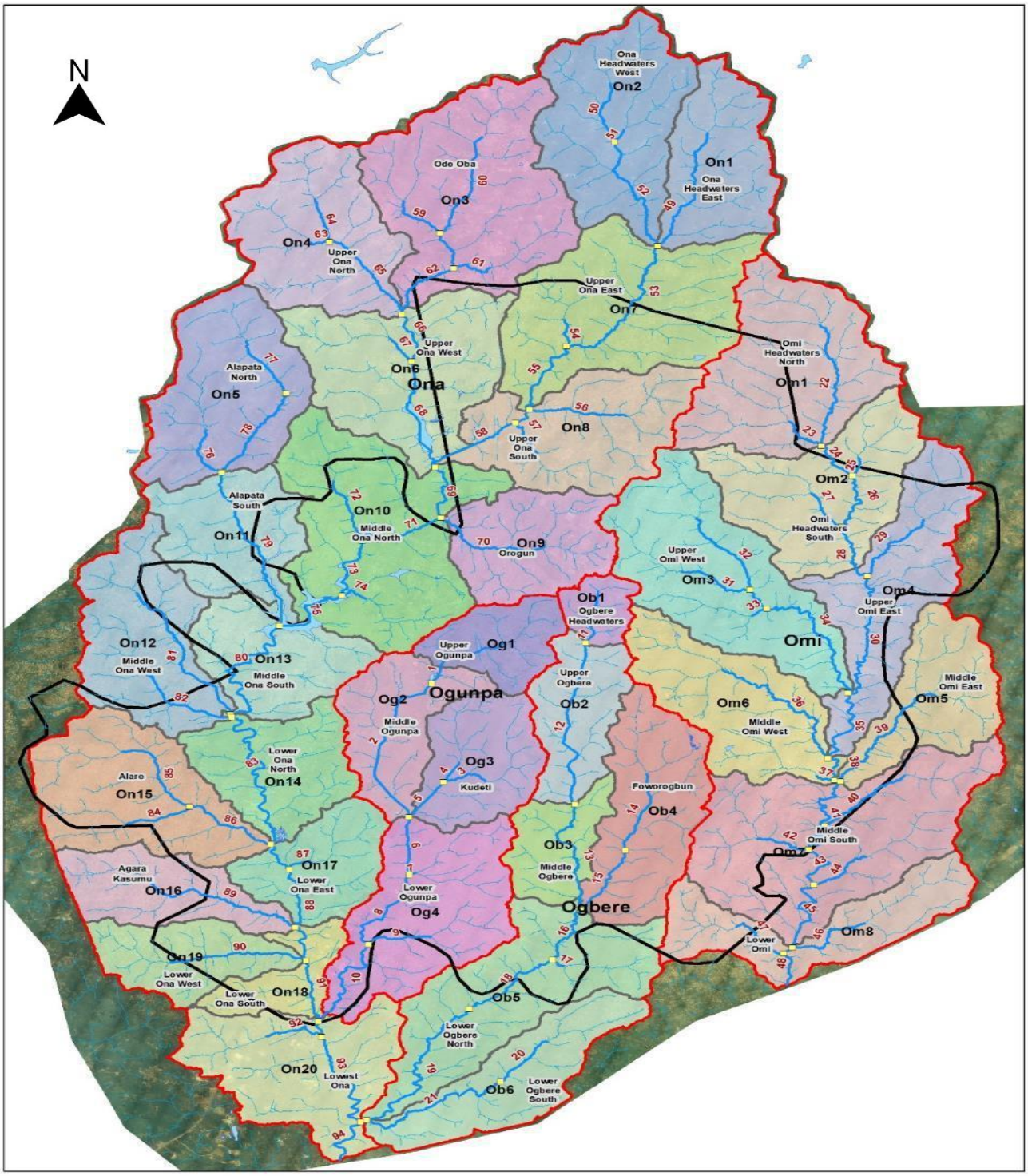


Figure 2.6: Ibadan Map Showing the River Channels, the 38 Sub basins in Ibadan and the 94 Systems

Source: Drainage Masterplan Report

Volume 1/3: Main Report (N17036-0100D-RPT-ENV 26-Rev0 January 2019)

2.4 Drainage Infrastructure Scope of works

The scope of the drainage infrastructure will include site clearance, excavation/ earthworks, Concrete and Steelwork, Crossing Structures (Culverts/Bridges/Dams), Channels (Lined/Earth) construction of pavements, River gauges' installation and markings and river channel setback markings with landscaping as appropriate.

CHAPTER THREE: POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

3.1 Introduction

This section presents a review of the policy, legal and institutional basis relevant to the Ibadan Flood Risk and Drainage Management Project. This is represented under the following:

- International environmental agreements and treaties ratified by the Federal Republic of Nigeria
- Federal policies, acts, regulations and standards, and the common law of the Federal Republic of Nigeria (FRN).
- Oyo State and Local relevant policies, acts, regulations and standards.
- Development Partners environmental and social safeguard Policies.

3.2 Relevant National Instruments

The Constitution of the Federal Republic of Nigeria, 1999 as amended, as the ground norm in the country's legal system, recognizes the importance of improving and protecting the environment and makes provision for it. Relevant sections are:

- Section 20 which makes it a fundamental, but not justifiable, objective of the Nigerian State to protect and improve the environment and safeguard the water, air and land, forest and wildlife of Nigeria.
- Section 12 which provides that international treaties (including environmental treaties) enacted into law by the National Assembly be implemented as an enactment of the National Assembly in Nigeria.
- Sections 33 and 34 which guarantee fundamental human rights to life and human dignity respectively and linked to the need for a healthy and safe environment to give these rights effect.

3.3 Regulatory Bodies and Laws / Legislations Relevant to Flood Risk Management

There are numerous Federal and State Government Ministries, Departments and Agencies (MDAs) involved in water sector as well as some local and Non-Governmental Stakeholders. The nature of their involvement ranges from policy and legal formulation and implementation, through regulatory to services provision.

3.3.1. Legal Instruments Related to Flood Management

Subsidiary laws and regulations relevant to flood management that have been made, as well as International conventions and other instruments entered, pursuant to the constitution's objectives are outlined in table 3.1, while the institutions including regulatory authorities in the water sector relevant to the project area, their current and expanded proposed roles and accountability in the area of flood management are outlined in the table 3.2.

Table 3. 1: Legal Instruments Related to Flood Management

International Legal Instruments			
No	**Instrument (Subject)**	**Relevance**	**Ratified (Yes / No) Comment**
1	1971 Ramsar Convention on Wetlands of International Importance Especially as Waterfowl Habitat	For designated watercourses, States must endeavour to coordinate and support present and future policies and regulations concerning the conservation of wetlands and their flora and fauna.	Yes. The **convention** entered into force in **Nigeria** on 2 February 2001 Though no site designated in Ibadan, yet there are significant Wetlands areas in Ibadan, where water covers the soil, or is present either at or near the surface of the soil all year or for varying periods of time during the year, including

			during the planting season. These are haven for migratory birds and acts as a carbon sink through the CO2 sequestration abilities of the vegetation
2	1972 UNESCO Convention Concerning the Protection of the World Cultural and Natural Heritage	States must ensure the identification, protection, conservation, and presentation and transmission to future generations of the cultural and natural heritage	Yes. Nigeria ratified the convention on Oct. 23, 1974, Taking cognizance of the convention in comprehensive planning programme will facilitate the appropriate legal, scientific, technical, administrative and financial measures necessary for the identification, protection, conservation, presentation and rehabilitation of this heritage are considered in integration to flood management in structural and non-structural works.
3	1992 Convention on Biological Diversity	States must integrate the conservation and sustainable use of biological diversity into relevant plans and policies. States must also ensure the environmental impact assessment of proposed projects and activities that are likely to have significant adverse effects on biological diversity. Where activities under a State's jurisdiction or control are likely to significantly affect adversely the biodiversity of other States, contracting parties must promote notification, exchange of information and consultation measures.	Nigeria signed the Convention on Biological Diversity in 1992 and ratified it in 1994. Floodplain ecosystems are biodiversity hotspots and supply multiple benefits, thus relevant in terms of ecosystem management
4	1992 United Nations Framework Convention on Climate Change	States must develop and elaborate appropriate and integrated plans for coastal zone management, water resources and agriculture, and for the protection and rehabilitation of areas, particularly in Africa, affected by drought and desertification, as well as floods, in order to adapt to the impacts of climate change.	**Nigeria** was among the first group of developing countries that signed UNFCCC and became party to the **Convention** and **ratified** both the **Convention** and its Kyoto Protocol in **1992** and 2006 respectively Measures to mitigate climate change has relevant roles to floods and extreme weather conditions.
5	1994 United Nations Convention to Combat Desertification	Contracting parties should foster the rehabilitation, conservation and sustainable management of land and water resources.	the United Nations Convention to Combat Desertification (UNCCD) 1996 signed and ratified by the Nigerian Government on 31 October 1994 and 8 July 1997,
NATIONAL AND STATE LEGISLATION , POLICIES RELATED TO FLOOD MANAGEMENT			
No	**Instrument (Subject)**	**Relevance**	**Comments and Identified Gaps in the Instruments**
I. NATIONAL PRIMARY LEGISLATION			
	• The River Basins Development Authority Act: CAP R9 LFN, 2004	Water law, River basin law. Basin approach to water resources	Needs updating with respect to: flood risks and its management

	(http://extwprlegs1.fao.org/docs/pdf/nig18378.pdf) • Territorial Waters Act CAP 428 LFN 1990 (http://extwprlegs1.fao.org/docs/pdf/nig1612.pdf) • National Inland Waterways Act, 2004 (https://www.lawyard.ng/wp-content/uploads/2015/11/National-Inland-Waterways-Act.pdf) • Water Resource Decree, No 101 of 1993 (http://www.ielrc.org/content/e9302.pdf)	management Integration of surface and groundwater management Navigation Water resources use/management settings Licensing of hydrological works Prioritization of various water uses	• Factoring basin natural drainage considerations in the alignment and design of canals/watercourses • Role of irrigation/drainage institutions in flood alleviation efforts • Provisions on standards for cross-drainage works • Integration of basin flood risk in drainage planning/design • Siting of sewage treatment plants on flood plain/prevention of flooding of such installations • Dredging regulation • Prohibitions on works affecting navigation
2	• National Policy on Environment • National Environmental Sanitation Policies, 2005 • Environmental Impact Assessment (EIA) ACT. CAP E12, LFN 2004 (http://extwprlegs1.fao.org/docs/pdf/nig18378.pdf • [2]National Environmental Standards and Regulations Enforcement Agency (Establishments) Act of 2007	Environmental Law & Policies Impact assessment of developmental projects and programmes Pollution/discharge control provisions Enforcement of Environmental Assessment process on facilities and developmental projects	• Need to include: • pollution control during floods • Land use practices that exacerbate/mitigate pollution caused by flooding (for example, storage of chemicals, use of pesticides/other compounds, slurry disposal) • Use of agricultural land as "sacrificial" land to be flooded during extreme events • Economic incentives for growing crops capable of withstanding certain depth/duration of flooding, on active flood plain • Licensing/control of logging • Role in reducing likelihood of mudslides or landslides with floods • Role in maintaining stable slopes and reducing flood risk • Role of cultivation of particular flora for slope stability/water retention capacity
3	Land Use Act LFN 2004 (https://www.lawyard.ng/wp-content/uploads/2015/11/LAND-USE-ACT-2004.pdf) Nigerian Urban& Regional Planning Act, CAP N138, LFN 2004 (http://sdngnet.com/Files/Lectures/FUTA-ARC-807-Professional_Practice_and_Procedure/CD%202013-2014/Nigerian%20Urban%20and%20Regional%20Planning%20Act%20of%20199	Land Use and Physical Planning Law: Spatial- and land use planning	Need to Incorporate flood considerations in decision-making Need for: • Control of development on active flood plains • Control of development on passive flood plains (especially areas protected by flood defenses) • Integration with water resources planning • Harmonization of local

[2]The National Environmental Standards and Regulations Enforcement Agency (NESREA) website, http://www.nesrea.gov.ng/ Accessed August 2017. 14 https://oyostate.gov.ng/ministry-of-environment-and-water-resources/#1498825448483-0947fb5e-216b, Accessed August 2017.

	2.pdf)		planning with strategic plans • Siting of key/strategic installations on flood plain • Land use practices that increase/decrease flood peaks • Irrigation and drainage • Factoring basin natural drainage considerations in the alignment
4	National Policy on disaster Management, The National Emergency Management Agency of Nigeria was established via Act 12 as amended by Act 50 of 1999	Disaster management law Climate change policy and strategy, National Action Plan for Disaster Risk Reduction	Need for joint mechanisms for flood forecasting and communication of flood warnings
No	**Instrument (Subject)**	**Relevance**	**Comments and Identified Gaps in the Instruments**
II. NATIONAL SECONDARY LEGISLATION			
5	National Environnemental Protection (Effluent Limitation) Régulations : 1991	Effluent limitation to water body	
6	National Environmental Protection (Pollution Abatement in Industries and Facilities Generating Wastes) Regulations; 1991	Pollution control from facilities	
	National Environmental Protection (Management of Solid and Hazardous Wastes) Regulations, 1991	Hazardous Waste management	Review for its operationalization and effective enforcement
	National Environmental (Wet, River Banks and Lake shores) Regulations, S.1.No 26 of 2009;	Watershed management	
	National Environmental (water, Mountainous, Hilly Catchment Areas) Regulations, 27 of 2009	Catchment care	
	The National Environmental (Sanitation and Wastes Control) Regulation S.I 28 of 2009;	Sanitation and waste control	
	National Environmental (Permitting and Licencing System) Regulations. S.1 No 29 of 2009;	Licensing and permitting	
	National Environmental (Soil Erosion and Flood Control) Regulations. S,1 No 12 of 2011	Soil and erosion control from developmental activities	
	National Environmental (Surface and Groundwater Quality Control) Regulations, S.1 No 22 of 2011.	Surface and ground water quality monitoring	
No	**Instrument (Subject)**	**Relevance**	**Comments and Identified Gaps in the Instruments**
III. STATE LEGISLATION			
	• Oyo State Water Policy (draft 2011) • Oyo State Policy on Environment (2013) • Oyo State Ministry of Environment and Habitat Law, 2012, Draft Oyo State Environmental Protection Agency (Amendment) Law, 2017 • This Law is cited as Forestry (Amendment) Law, 2017 "Principal Law" means Forestry Law, 1938 as revised in 2000.	Water resources use/management settings policy, Environmental Policies Licensing of hydrological works Prioritization of various water uses Pollution/discharge control provisions Impact assessment of developmental projects and programmes Forest resource management	Needs to be integrated to address flood risk from developmental activities and coordination between stakeholder in flood governance

	• Oyo State Ministry of Environment, Physical Planning and Urban Development Law, 2015 • Oyo State Bureau of Physical Planning& Development Control Law 2019 • (Sanitation and Waste Control) Regulation 2013 II Environmental Sanitation and General Cleanliness Section 4 ("litter prohibition) sub section (1)-(3) B20, B27 and B 31 • Oyo State Infrastructural Maintenance and Control Agency Law, 2016 • Oyo State Emergency Management Authority (OYSEMA) establishment Act 12 of 1999	Land Use and Physical Planning Spatial- and land use planning Waste management control and services Determine rates for right of way, building approval levies on communication sites and any infrastructure including building or planning permit fee, ratification fee and annual administration fee. Mobilize Resources Towards Efficient and Effective Disaster Risk Reduction in Oyo State.			
REGULATIONS ON LITTERING, FLOODING, LAND USE, CHANNELIZATION AND SETBACKS						
CATEGORY	**CODE**	**REGULATION & GAP**	**REFERENCE**	**RIGHTS**	**ROLES**	**RESPONSIBILITIES**
FLOODING	4.4	No person shall build kiosk or shop on road median, drainage or road setback. (No information on flood plain, The law covers only kiosk or shop, not houses and focus is on road median or drainage not drainage infrastructure for the river basin)	Ministry of Environment and Habitat Law 2012: Oyo State Environmental (Sanitation and Waste Control) Regulation 2013 II Environmental Sanitation and General Cleanliness Section 4 ("litter prohibition) sub section (4) B20	Access to information on town planning. Access to affordable government shops	Oyo State Physical and Urban Planning Oyo State Ministry of Information and National Orientation	The government shall provide kiosk and shops for willing citizens. The government shall educate and provide information signs on land usage for the citizens on the set backs The government shall do a setback mapping with enforcement of no development on the setback.
Source: SESA Report April, 2020 (Kindly refer to Annex 3 of this previously submitted report for details)						

3.3.1 Federal, State and Local Government Institutions

Table 3.2: Institutional/Personnel Responsibilities and Accountabilities

S/N	Stakeholder	Current roles in relation to flood management	Expanded Proposed Roles and Responsibilities
1	Oyo state Ministry of Environment and Natural resources	• Environmental landscaping, tree planting, • Monitoring the management of all water supply, and hydraulic structures on the river basin including Eleyele	• Environmental and Water Shed / Catchment Compliance Coordinator at the State level for the four North-South flowing river systems/basins, catchment delineation, river/stream setback • Member of the steering committee in the IUFMP

		Dam • Setbacks Regulations and Pollution Control Standards • Oversight and supervisory responsibility to monitor and control Waste management through OYSEMA • Responsible for Environmental, Social, Health and Safety measures for all facilities	• Flood Control Structural and Non - Structural Management and Maintenance, river crossing structures, river channels. • Taking cognisance of Climate change in FRM planning in coordination with NIHSA and OYSEMA • Sustainability of current, proposed/future FRM plans, and ensuring that long term investments, decision making, priority setting, budgeting and updating the DMP under the IUFMP • Flow Regime of river basins, hydrological analysis and Flood Warning Alert • Lead role – in Development of a Catchment Management Plan along the basin with the State Ministries of Agriculture, Industry, RUWWASA, Ogun -Osun River Basin Authority and NESREA • Lead role in monitoring of the River Quality and environmental status/ ecological status and flow regime. • Enforcement of Catchment Management Plan, Flood Plain Management, • However the Environment Ministry works in collaboration with State Ministry of Women affairs and Social Inclusion - on Child rights, Labour management, GBV, OHS, GRM, with the Oyo State Road Traffic Management Authority (OYRTMA)-on traffic management, with Oyo State Emergency Management Agency (OYSEMA)-on emergency preparedness, early warning systems for the dam, security and with Ministry of Information and Mass Mobilisation on – communication • The Ministry of Environment and Natural Resources has oversight functions and responsibility in collaboration with Oyo state Ministry of Women Affairs and Social inclusion, Ministry of Labour and to provide an enabling environment where the rights to survival, protection and development of the people, most especially the most vulnerable groups, as well as their empowerment to participate in the benefits from the socio-economic, development processes are enhanced. .and other MDAs on a need basis.
2	Oyo State Ministry of Lands, Housing and Urban Development.	• Land use Development, land use plans, and Regulations • Space Standards for Physical Development in Oyo State	• Flood Proofing Standards for buildings in flood plain
3	The Bureau of Physical Planning and Development Control (BPPDC)	Monitoring and follow-up of physical development with a view of ensuring compliance and enforcement of approved plans.	• Has an important role in the realization of effective flood management, by identifying and controlling the development on the natural flood plains. • Carry out publicity and enlightenment activities on urban renewal and environmental management programmes and projects. • Control and monitoring of urban environmental degradation and promotion of sustainable development compliance.
4	Ogun-Osun river basin	Systematic compilation of rainfall data from the various sources including the rain gauge stations with special purposes	• Control of flood, erosion and watershed management • Monitoring of rainfall data and installation of early

		to be maintained by the Authority for undertaking comprehensive development of both surface water and groundwater resources for multipurpose use; with emphasis on provision of irrigation infrastructures and the control of floods and erosion and watershed management	flood warning systems
5	Oyo State Agriculture Development Programs/Projects (ADPs),	Aid in watershed management through agricultural practices	• A key partner in watershed planning, development and consequential flood risk management being an agricultural extension outfit with remarkable landmark achievements in the provision of effective agricultural extension services and complementary infrastructural facilities (e.g. dams, wells and rural roads);
6	Oyo State Water Corporation	• Production and distribution of potable water for the use of human and agricultural purposes through construction, installation and operation of necessary water infrastructure • Management of all water supply, and hydraulic structures on the river basin including Eleyele Dam • To control and manage all waterworks vested in the Corporation Including dams and dykes	• Establish, control, manage and develop new water schemes and develop existing ones inorder to meet requirements of general public, agriculture, trade & industry in various parts of Oyo state. • Advise government on watershed management and planning
7	Oyo State Rural Water Supply and Sanitation Agency RUWASSA	Enforcement of sanitation regulations in the water sector	• Propagating awareness of water stewardship at local level and • Basin catchment management plan in its mission for the provision of safe water for the communities through borehole construction.
8	Oyo State Emergency Management Agency (OYSEMA)	• Manage emergencies and disasters preparedness, early warning systems for the dam, and flood control measures, security, communication • Post flood events management • Taking cognisance of Climate change in FRM planning in coordination with NIHSA and Ministry of Environment and Natural resources	• Carry out publicity and enlightenment activities on actions to take during flood emergencies • Training/ support of water ambassadors, residents etc on flood prevention, mitigation and control measures
9	Oyo State Ministry of Public Works infrastructure and Transportation	• Advising government on policy matters in respect to public buildings, including construction rehabilitation and maintenance • Provision of services & equipment to combat disasters in order to safeguard lives and properties of its citizens	• Provide the roadmap for the maintenance of the structural works, especially the hydraulic structures under the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP).
10	Federal Ministry of Water Resource	• Undertaking of the general plan for the development of water resources and its conservation after coordination with other ministries and government units. • Undertake researches, studies and surveys aimed at exploration of water resources & finding out best methods for conservation and & use of available water resources.	• National responsibility for planning and developing water resources, irrigation work and the collection of hydrological, hydro-geological data. They also have oversight responsibility in monitoring, control and provision of water in bulk to cities from dams and to monitor and regulate utility tariffs, including those of State Water Agencies.
11	Federal Ministry of Environment	• Provision of advice in liaison with State Ministry of Environment receiving comments from stakeholders, public	Lead role in Climate change planning for Nigeria and in FRM planning in coordination with NIHSA.

		hearing of the project proposals and social liability investigations • Supervisory role, monitoring and evaluation process/ criteria.	
12	National Environmental Standard and Regulations Enforcement Agency (NESREA)	• Protection and development of the environment, biodiversity conservation and sustainable development of natural resources and environmental technology including coordination, and liaising with, relevant stakeholders within and outside Nigeria on matters of enforcement, regulations, rules, laws, policies and guidelines.	• Lead role – enforcement of standards and regulation on Watershed management beyond the state, • Extended Producers Responsibility and sustainability reporting.
13	Other MDAs	Other MDAs come in as at when relevant areas or resources under their jurisdiction or management are likely to be affected by or implicated by projects.	• Participate in SESA process and decision making that helps prevent/ minimize and mitigate project impacts. • Monitoring and supervisory functions, impose restrictions and gives approval when necessary on aspects of the project.
14	Private Sector Organisations	• Work in collaboration with PIU, contractors, relevant MDAs and stakeholders to ensure success of the project. • Providing insurance schemes for properties on flood plains	• Delivering safe drinking water and sanitation for employees and/or local communities, • Water efficiency in operations and supply chains, and dealing with effluent quality, • Engaging and influencing the governance of water • Identify issues that could derail the project and support project impacts and mitigation measures, Awareness campaigns etc
15	Donor Agencies	Supervise monitoring indicators in safeguard instruments.	• Overall supervision and provision of technical support and guidance. • Recommend additional measures for strengthening the management framework and implementation performance. • Supervising the application and recommendations of sub- project environmental and water resources governance.
16	NGOs/ CSOs/ CDAs	Assisting in their respective ways to ensure effective response actions, conducting scientific researches alongside government groups to evolve and devise sustainable environmental strategies and techniques.	• Ensure community participation by mobilizing, sensitizing community members on environmental and social awareness, watershed management etc. • Support with provision of necessary infrastructures and engage/ encourage carrying out comprehensive and practical awareness campaign for the proposed projects, amongst the various relevant grass roots interest groups. • Ensure sustainability of the project.

3.3.2 World Bank Environmental and Social Safeguard Policies

The SESA preparation has taking into consideration the World Bank Safeguard Policies (https://www.worldbank.org/en/projects-operations/environmental-and-social-policies. The operational policies triggered under the IUFMP project among those listed below are stated in the table below.

Table 3.3: World Bank policies triggered under the IUFMP

Operational Policy	**Yes**	**Reason**
Environmental Assessment(OP.4.01);	**X**	Safeguards policy OP 4.01 is triggered on the IUFMP project and specifically on the drainage master plan with the civil work activities for the immediate restoration of bridges / culverts. Therefore, an Environmental and Social Impact Assessment

		(ESMF/ESIA/ ESMP) is expected to be prepared and cleared by the Bank.
Natural Habitat (OP/BP 4.04)	**X**	This policy is triggered because some project activities may take place **near to** critical natural habitats or environmentally sensitive areas and some mitigation measures may be necessary to minimize any negative environmental and social impacts. The project though is not being implemented in any area with critical natural habitats, nor does it involve the significant conversion or degradation of natural habitats.
Physical Cultural Resources (OP 4.11)	**X**	Some activities in the project shall include civil works that could expose chance finds. These chance find sites may include sacred shrines and burial sites. To mitigate this risk, specific procedures (such as chance find procedures) is expected to be included in the ESIAs/ ESMP as required.
Involuntary Resettlement (OP/BP 4.12)	**X**	This policy is triggered because most of the sub-projects could involve minimal or moderate land acquisition and or restriction of access to usual means of livelihood as most of the sub-projects will largely be rehabilitation of existing infrastructure. However, some of the projects may involve significant land acquisition and displacement of affected people. As part of the safeguards due diligence, the client will prepare a Resettlement Policy Framework RPF which will be reviewed and cleared by the Bank. Also, site specific Resettlement Action Plans (RAPs) or Abbreviated Resettlement Action Plans (ARAPs) will address the needs of persons who will be affected by loss of economic activities, land acquisition and/or relocation. The preparation of these safeguards documents will be inclusive and participatory, promoting community ownership and social accountability. The RPF and/or RAPs will be reviewed and cleared by both the project safeguards team and the Regional Safeguards Advisor. The RPF will have to be sent to the bank for review and clearance before it is disclosed publicly in country and on the Bank's external website prior to project appraisal.
Disclosure Policy (OP/BP 17.50)	**X**	All projects must disclose key information in country and through the Bank's Info shop

3.3.3 The Environmental and Social Framework (ESF)

As of October 1, 2018, the ESF applies to all new World Bank investment project financing. The Environmental and Social Framework (ESF) enables the World Bank and Borrowers to better manage environmental and social risks of projects and to improve development outcomes. It was launched on October 1, 2018.Thus, going forward any subsequent sub project new financing arising from the DMP and SESA in Ibadan shall apply the ESF.

The ESF (https://www.worldbank.org/en/projects-operations/environmental-and-social-framework) consists of:

- the World Bank's Vision for Sustainable Development
- the World Bank's Environmental and Social Policy for Investment Project Financing (IPF), which sets out the requirements that apply to the Bank
- Bank Directive: Environmental and Social Directive for Investment Project Financing.
- Guidance notes for Borrowers and Good Practice notes, templates and other resources: (https://www.worldbank.org/en/projects-operations/environmental-and-social-framework/brief/environmental-and-social-framework-resources#guidancenotes)
- the 10 Environmental and Social Standards (ESS), which set out the requirements that apply to Borrowers as listed below:
  - ESS1 Assessment and Management of Environmental and Social Risks and Impacts
  - ESS2 Labour and Working Conditions
  - ESS3 Resource Efficiency and Pollution Prevention and Management

- ESS4: Community Health and Safety
- ESS5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement
- ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources
- ESS7: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities
- ESS8: Cultural Heritage
- ESS9: Financial Intermediaries
- ESS10: Stakeholder Engagement and Information Disclosure

In line with ESS 1, a thorough analysis of ESHS issues in implementing the DMP/ subsequent E&S instruments has been presented in annex 5.

The existing laws and instruments outlined above are more of laws and policies mainly targeted at single-issues such as water pollution, wildlife protection, forestry, and fisheries etc. These instruments often use a command and control approach, focus on putting limits on resource use to counter overexploitation. These regulatory efforts have been successful in reducing pollutants, preserving conservation spaces and species, spatial planning, however to address flood management will require strengthening of all the laws and innovative policies on issues of flood risk, taking cognisance of climate change, poverty reduction and sustainable development and bringing together the many elements of ecosystem mainstreaming and linking it to core societal goals.

Specific provisions for community involvement thus far on environmental and social issues are normally limited to a requirement to disclose and provide information about the risks a community faces. Community participation in preparedness planning is implied but only rarely legally mandated.

Consequently, the planning and decision-making processes of a number of separate development authorities, several related legal frameworks including the following: Water/river laws; Disaster management laws; Land use planning laws that regulate development; and municipal bylaws that require compliance with building and safety codes; Natural resource management and environmental protection laws; and Specific acts relating to freedom of information influence the hydrological response of the basin, must be coordinated to ensure that the common goal of sustainable development is achieved.

Towards this end, flood management and mitigation policies should take into consideration the natural environment, societal needs and prevailing attitudes. Such policies and legal frameworks should be closely linked to the state development agenda and based on a vision of social, economic and ecological sustainability. Through the establishment of appropriate policies and regulations, the stakeholder participation process can be institutionalized thus ensuring its sustainability and wide utilization.

3.4 Gaps in the existing Flood Management and Planning System

The assessment of current flood management capacities was done (at three levels including flood management planning, prevention & protection, and response & recovery) with the survey as seen in table 3.4.

The checklist developed for the survey was sent to most of the experts through e-mails and in the course of the four level consultative workshops to facilitate the assessment.

Thus, the questionnaire survey included four main sections. The first three sections include policy & planning, prevention & protection, and response & recovery representing the three stages of flood management planning. In order to investigate the constraints and gaps in the existing flood management planning system each of the first three sections were categorized into capacity groups which were identified as pre-requisite for each respective planning stage. Each capacity group was probed through multiple indicators and each indicator was explored through a range of statements (parameters) to assess the existing status of these flood management capacities in Ibadan. Four types of responses were collected from the relevant experts by applying a simple scale where, 4= Exist, 3=Partially Exist, 2=No Response, and 1=Does not Exist. Fourth and last section of the questionnaire includes the suggestions and comments presented by some experts.

Results of the survey with the interpretation from 120 experts across the relevant Ministry, Departments and Agencies in Ibadan who were consulted and interacted with as indicated in annex 15 and 16 are provided in Table 3.4, the scale developed and used in the conduction and interpretation of this survey is depicted in the following terms:

4- Exist= a score 50% or more than 50% for specific parameter has reasonably met the comprehensive set of requirements for specific flood management capacity group.
3- Partially exist= a score between 25% and 50% for specific parameter has partially met the comprehensive set of requirements for specific flood management capacity group.
2- Does not exist= a score less than 25% for specific parameter has not met the comprehensive set of requirements for specific flood management capacity group; and
1- No response= no response or unawareness.

Table 3.4: Survey checklist for assessment of current flood management capacities

Planning level	Capacity Groups	Indicators	Sr No	Parameters		Assessment of the status of the indicators					
					Questions Asked	Exist	Partially exist	Does not exist	No response	Mean Score	SD
Policy and planning	Institutional capacities	Legal framework	1	Adequate legislation(law/acts) exists for the regulation of FRM activities (prevention, response , recovery)	Are there adequate legislation(law/acts) for the regulation of FRM activities (prevention, response , recovery)?	-	45%	6%	49%	2.0	0.65
			2	Adequate guidelines exist for The regulation of FRM practise	Are there adequate guidelines exist for The regulation of FRM practise?	18%	73%	9%	-	3.1	0.73
			3	Adequate enforcement and compliance mechanism exist	Are there adequate enforcement and compliance mechanism?	9%	76%	12%	3%	2.9	0.50
		Financial resources Financing (grants and loans, debt financing, international fund transfers, insurance schemes and revenue options (levies, drainage utility service charge,	4	Sufficient financial resources are available	Are sufficient financial resources available?	6%	52%	30%	12%	2.5	0.25
			5	Sufficient funding is available from the international donors for flood management	Is sufficient funding(grants, or loans) available from the international donors for flood management?	3%	67%	21%	9%	2.6	0.50
			6	Adequate systems exist for the allocation of annual budget at all tiers of administration(disaster relief grant/ fund)	Are there adequate systems for the allocation of annual budget at all tiers of administration?	39%	58%	3%	-	3.4	0.80

		property tax, road fund, etc.)									
		Coordination mechanism-: Territorial integration among jurisdiction, Policy Instruments or, Procedures, institutional information sharing for decision making	7	Climate change is effectively considered in FRM planning	Is climate change effectively considered in FRM planning?	9%	38%	41%	12%	2.4	0.25
			8	FRM planning is effectively integrated into social development and protection planning through consultations, public involvement, training/awareness creation particularly in relation to work life, vulnerability to flood etc	Is FRM planning effectively integrated into social development and protection planning?	3%	48%	49%	-	2.5	0.25
			9	FRM is effectively coordinated with All other critical development planning	Is FRM effectively coordinated with All other critical development planning?	18%	31%	35%	6%	2.4	0.58
		Organisational structure	10	Adequate institutional capacities Exist for the planning and implementations of FRM activities/measure Throughout the city with Appropriate institutional location	Are there adequate institutional capacities for the planning and implementations of FRM activities/measure Throughout the city with Appropriate institutional location?	15%	40%	29%	6%	2.4	0.58
			11	Adequate flood management Policies exist	Are there adequate flood management Policies?	6%	61%	27%	6%	2.7	0.25
			12	Adequate flood management Plans exist	Are there adequate flood management Plans?	24%	58%	15%	3%	3.0	0.73
			13	Adequate flood management Project exist	Are there adequate flood management? Project?	24%	58%	15%	3%	3.0	0.73
		Political capacities	14	Adequate political commitment And support exists for the promulgation of FRM programmes (e. g policy, plans/programmes Project)	Are there adequate political commitment And support for the promulgation of FRM programmes (e .g policy, plans/programmes Project)?	3%	76%	15%	6%	2.8	0.50
		Monitoring capacities	15	Effective system exists for the Monitoring	Are there effective system for the Monitoring?	12%	79%	9%	-	3.0	0.70
			16	Necessary guidelines exist for the monitoring and evaluation of FM Activities.	Do necessary guidelines exist for the monitoring and evaluation of FM Activities?	12%	73%	9%	6%	2.9	0.65
			17	Effective baselines and indicators Exist to monitor progress in FM (ie Monitoring system)	Are there effective baselines and indicators to monitor progress in FM (ie Monitoring system)?	12%	70%	12%	6%	2.9	0.68
	Knowledge, innovation and educational capacities to build flood resilient communities	Community participation and stakeholder involvement capacities	18	Sufficient capacities (e g technical & scientific) and resources (eg funding) are available to integrate community-based participation Approach into FMP	Are sufficient capacities (e g technical & scientific) and resources (eg funding) available to integrate community-based participation Approach into FMP?	15%	41%	29%	15%	2.6	0.60
			19	Stakeholders and affected persons are Consulted and involved effectively In FRM planning	Are stakeholders and affected persons are Consulted and involved effectively In FRM planning?	19%	49%	29%	3%	2.8	0.65
		Human resource development capacities to enhance and improve flood risk reduction /Disaster Reduction skills at all levels	20	Adequate capacities and resources are available to develop human resource to cope with flooding	Are adequate capacities and resources available to develop human resource to cope with flooding	13%	58%	29%	-	2.8	0.68
			21	Sufficient local human resource exists in the field of FRM based on ‘’self Help efforts’’ ‘’mutual-help efforts & ‘’public-help efforts’’ with better condition	Are there sufficient local human resource in the field of FRM based on ‘’self Help efforts’’ ‘’mutual-help efforts & ‘’public-help efforts’’ with better condition?	15%	64%	9%	12%	2.8	0.68
		Awareness creation and training capacities at	22	Effective institutional capacities exists for FRM awareness raising	Are there effective institutional capacities for FRM awareness raising	15%	73%	9%	3%	3.0	0.70

		all levels		and trainings	and trainings?						
			23	Adequate public awareness raising Campaigns exits for FRM, response And mitigation	Are there adequate public awareness raising Campaigns for FRM, response And mitigation?	6%	73%	21%	-	2.9	0.50
			24	Effective mock exercises and training programmes for professionals, volunteers and vulnerable communities are available	Are there effective mock exercises and training programmes for professionals, volunteers and vulnerable communities are available?	6%	70%	18%	6%	2.8	0.50
		Educational capacities to create flood/disaster risk reduction understandin g	25	Adequate definitions exist and flood risk management risk assessment in the city/ state	Are there adequate definitions and flood risk management risk assessment in the city/ state?	12%	88%	-	-	3.1	0.75
			26	FRM measures are effectively integrated into academic curriculum (at primary, secondary or higher education level) in all provinces	Are FRM measures are effectively integrated into academic curriculum (at primary, secondary or higher education level) in all provinces?	12%	21%	45%	12%	2.1	0.50
		Innovative capacities	27	Innovative approaches (e g. combination of technical , scientific and indigenous knowledge) are applied in FRM planning	Are there innovative approaches (e g. combination of technical , scientific and indigenous knowledge) are applied in FRM planning?	12%	64%	21%	3%	2.9	0.68
	Reducing underlying risk factors	Integrated spatial, socio-economic, environmenta l protection (and other development sectors) planning capacities	28	FRM measures are considered Effectively in economic development planning (eg. Industrial plans, public/private Business infrastructure)	Are FRM measures considered Effectively in economic development planning (eg. Industrial plans, public/private Business infrastructure)?	9%	58%	18%	15%	2.6	0.25
			29	FRM measures are considered effectively in environmental Protection planning	Are FRM measures considered effectively in environmental Protection planning?	9%	52%	33%	6%	2.6	0.25
			30	FRM measures are integrated in Water resource management/ Watershed catchment and development planning	Are FRM measures integrated in Water resource management/ Watershed catchment and development planning?	21%	57%	13%	9%	2.9	0.68
			31	FRM measures are integrated in Urban development planning	Are FRM measures integrated in Urban development planning?	9%	64%	18%	9%	2.7	0.25
			32	Drainage system is optimized to flood risk (special measures are considered for storm water discharge e.g. coarse screen	Are drainage system is optimized to flood risk (special measures are considered for storm water discharge e.g. coarse screen?	15%	58%	15%	12%	2.8	0.68
			33	FRM measures are effectively considered in land use/spatial Planning (pre and post-disaster planning)	Are FRM measures effectively considered in land use/spatial Planning (pre and post-disaster planning)?	12%	64%	21%	3%	2.9	0.68
	Scientific and technical capacities	Flood hazard data archiving and disseminatio n capacities	34	Sufficient resources and capacities exist to store and retrieve data regarding flood risk/hazards assessment	Are there sufficient resources and capacities to store and retrieve data regarding flood risk/hazards assessment?	21%	67%	3%	9%	3.0	0.70
			35	Adequate coordinated system exists to exchange information to statistical analysis	Is there an adequate coordinated system to exchange information to statistical analysis?	9%	82%	6%	3%	3.0	0.50
		Scientific capacities (e.g. research and analysis) to predict and monitor future flooding trends	36	Adequate financial , scientific and technical research facilities exist to observe , analyse, map and forecast flood hazards, exposed communities and their vulnerabilities	Are there adequate financial, scientific and technical research facilities exist to observe , analyse, map and forecast flood hazards, exposed communities and their vulnerabilities?	12%	76%	9%	3%	3.0	0.68
			37	Adequate methods and approaches exist for risk assessment	Are there adequate methods and approaches for risk assessment?	12%	76%	12%	-	3.0	0.70
			38	Vulnerable areas are identified and specific measures are	Are vulnerable areas identified and specific	21%	67%	9%	3%	3.1	0.73

				developed on the need and assessment bases	measures developed on the need and assessment bases?						
		Technical capacitates to bridge the gap between science, policy and practise considering regional and trans boundary concerns	39	Adequate technical capacity exists to communicate flood risk information to planners and policy makers	Is there adequate technical capacity to communicate flood risk information to planners and policy makers?	30%	70%	-	-	3.3	0.83
			40	Effective capacities exist to share flood risk information regionally and across the borders	Are there effective capacities to share flood risk information regionally and across the borders?	27%	67%	6%	-	3.2	0.78
		Environmental Assessment Capacities	41	Environmental Assessment is Applied, is effectively for mega projects (i.e highways, dams, irrigation and fisheries	Is environmental Assessment Applied effective for mega projects (i.e highways, dams, irrigation and fisheries?	27%	64%	6%	3%	3.2	0.75
		Post-disaster impact assessment capacities	42	Adequate capacities exist to Record/document data regarding post-disaster impacts and loss assessment (e.g. life loss, economic and environmental losses etc)	Are there adequate capacities to Record/document data regarding post-disaster impacts and loss assessment (e.g. life loss, economic and environmental losses etc)?	24%	70%	3%	3%	3.2	0.75
			43	Effective methodologies and Approaches have been developed or adopted for assessment (e.g. disaster environmental impact assessment)	Are effective methodologies and approaches have been developed or adopted for assessment (e.g. disaster environmental impact assessment)	9%	76%	9%	6%	2.9	0.50
			44	Adequate capacities exist to carry Out post disaster impact assessment (e.g. assessment of impact on livelihood , wetland ecosystem etc)	Are there adequate capacities t to carry Out post disaster impact assessment (e.g. assessment of impact on livelihood , wetland ecosystem etc)?	18%	70%	9%	3%	3.0	0.73
			45	Post-disaster water quality assessment is carried out effectively	Is post-disaster water quality assessment carried out effectively?	6%	73%	18%	3%	2.8	0.50
Prevention and Protection	Structural measures	Reservoirs	46	Sufficient storage capacity(i.e reservoirs) exists to absorb the flood peaks	Are there sufficient storage capacity (i.e reservoirs) to absorb the flood peaks	-	52%	39%	9%	2.4	0.61
			47	Reservoirs are maintained and improved effectively to enhance the storage capacity of the country	Are reservoirs maintained and improved effectively to enhance the storage capacity of the country	12%	82%	6%	-	3.1	0.73
			48	Existing reservoirs are optimized for better flood control/protection	Are the existing reservoirs optimized? for better flood control/protection	12%	64%	21%	3%	2.9	0.68
		Dams	49	Sufficient dams are available for effective flood storage	Are sufficient dams available for effective flood storage?	-	36%	58%	6%	2.3	0.58
			50	Existing dams are optimized and effectively facilitating flood Control	Are existing dams optimized and effectively facilitating flood Control?	9%	55%	30%	6%	2.7	0.25
		Embankments/dikes/spurs	51	Adequate structural measures are constructed (embankments/dikes/spurs) are strategically distributed in the all vulnerable areas of the city/ state	Are adequate structural measures constructed (embankments/dikes/spurs) are strategically distributed in the all vulnerable areas of the city/ state?	2%	20%	69%	9	2.2	0.25
			52	Effective institutional capacities exist for the maintenance and restoration of structures	Are there effective institutional capacities for the maintenance and restoration of structures?	21%	70%	9%	-	3.1	0.75
			53	Effective institutional capacities exist for the construction of new structures where required	Are there effective institutional capacities for the construction of new structures where required?	24%	64%	12%	-	3.1	0.75
		Sandbags	54	Sandbags are used effectively	Are sandbags are used	15%	70%	9%	6%		

				in flood control	effectively in flood control?					2.9	0.70
			55	Post-disaster sandbags are stored effectively for reuse	Are post-disaster sandbags are stored effectively for reuse?	6%	39%	43%	12%	2.4	0.25
			56	Post-disaster sandbags are effectively dumped (e.g. in landfills)	Are post-disaster sandbags effectively dumped (e.g. in landfills)?	6%	52%	21%	21%	2.4	0.25
		Flood flows discharging and diversion structures	57	Effective flood flow regulating and discharging structures (barrages/gates) exists	Are there effective flood flow regulating and discharging structures (barrages/gates)?	24%	30%	40%	6%	2.7	0.65
			58	Flood flow regulating structures are effectively maintained , repaired and improved	Are flood flow regulating structures effectively maintained, repaired and improved?	21%	33%	46%	-	2.8	0.65
			59	Existing infrastructure are adequate and effective (rail ,road bridges and other important infrastructures) in regulating flood flows	Are the existing infrastructure adequate and effective (rail ,road bridges and other important infrastructures) in regulating flood flows?	18%	40%	36%	6%	2.7	0.65
		Canal and channels water flood flows regulating structures	60	Adequate network of canal and channel exist to divert and distribute water throughout the city	Are there adequate network of canal and channel to divert and distribute water throughout the city?	33%	34%	30%	3%	3.0	0.73
			61	Canals and channel effectively facilitate the flood flows regulation in the city/state	Do canals and channel effectively facilitate the flood flows regulation in the city/state?	30%	49%	30%	3%	3.3	0.80
			62	Canal and channel are maintained and restored effectively (e.g cleaning , lining of canals) to regulate the water flows and distribution	Are canal and channel are maintained and restored effectively (e.g cleaning , lining of canals) to regulate the water flows and distribution?	30%	55%	12%	3%	3.1	0.75
		Retention Basins/ Emergency Flood Storage/ Delay action Dams	63	Effective and strategically distributed Retention basin/Emergency flood storage/delay Action Dams exist in the city/ state	Are there effective and strategically distributed Retention basin/Emergency flood storage/delay Action Dams in the city/ state?	6%	55%	33%	6%	2.6	0.25
			64	Designation and expansion of flood retaining structures(e.g dam, reservoirs, and retention basin) is ensured in FRM planning	Is Designation and expansion of flood retaining structures (e.g dam, reservoirs, and retention basin) ensured in FRM planning?	12%	70%	12%	6%	2.9	0.68
	Non-structural Measures	Floodplain Regulations	65	Floodplains are effectively restored and maintained to promote natural flood management	Are floodplains effectively restored and maintained to promote natural flood management?	6%	82%	6%	6%	2.9	0.50
			66	Effective rules and regulation exist to avoid encroachment upon floodplain (e.g residential building, industrial units etc).	Are there effective rules and regulations to avoid encroachment upon floodplain (e.g residential building, industrial units etc)?	3%	79%	15%	3%	2.8	0.50
		Watershed and catchment management	67	FRM is effectively integrated into Wetland Management Plans/ Programmes	Is FRM effectively integrated into Wetland Management Plans/ Programmes?	6%	40%	48%	6%	2.5	0.25
			68	FRM is effectively integrated into Watershed Management Plans/ Programmes.	Is FRM effectively integrated into Watershed Management Plans/ Programmes?	3%	56%	35%	6%	2.6	0.25
			69	FRM is effectively integrated into Catchment Management Plans/ Programmes	Is FRM effectively integrated into Catchment Management Plans/ Programmes?	9%	37%	48%	6%	2.5	0.25
			70	Adequate capacities exist to carry out post-disaster impact assessment (e.g. assessment of impact on livelihood, environment/ ecosystem e.t.c).	Are there adequate capacities exist to carry out post-disaster impact assessment (e.g. assessment of impact on livelihood, environment/ ecosystem e.t.c).	6%	56%	32%	6%	2.6	0.25
		Flood proofing	71	Adequate flood protection public infrastructure exist (e.g road, water,&gas pipelines).	Are there adequate flood protection public infrastructure exist (e.g road, water,&gas pipelines)?	6%	52%	39%	3%	2.6	0.25
			72	Sufficient flood protected public infrastructures exist (e.g industries, houses)	Are there sufficient flood protected public infrastructures (e.g industries, houses)?	6%	76%	18%	-	2.9	0.50

			73	Sufficient capacities and resources exist to grow flood proof agriculture (e.g flood resistant crops)	Are there sufficient capacities and resources exist to grow flood proof agriculture (e.g flood resistant crops)?	3%	70%	27%	-	2.8	0.50
			74	Adequate measures exist for the establishing emergencies refugees centers	Are there adequate measures for the establishing emergencies refugees' centers?	12%	76%	9%	3%	3.0	0.68
Response and Recovery	Disaster planning and disaster	Contingency planning and disaster recovery capacities	75	Adequate capacities and resources are available to develop responsible contingency plans	Are adequate capacities and resources available to develop responsible contingency plans	24%	67%	6%	3%	3.1	0.75
			76	Effective food response plan exist	Does effective food response plan exist?	15%	31%	48%	6%	2.6	0.60
			77	Food response plan are effectively adapted to climate charge	Are food response plan effectively adapted to climate charge?	12%	37%	45%	6%	2.6	0.60
			78	Contingency plans effectively consider environment and social concern	Are there contingency plans effectively consider environment and social concern?	12%	67%	9%	3%	2.7	0.63
			79	Adequate system/measure exist for the monitoring and evaluation of the effectively of the response plans.	Are there adequate system/measure exist for the monitoring and evaluation of the effectively of the response plans?	6%	73%	9%	12%	2.7	0.50
		Disaster declaration and communicati on capacities	80	Adequate capacities and system to declare and activate preparedness, response & rescue mechanism in vulnerable areas	Are there adequate capacities and system to declare and activate preparedness, response & rescue mechanism in vulnerable areas?	24%	70%	6%	-	3.2	0.78
			81	Effective and specific framework exist to support	Does effective and specific framework exist to support?	21%	67%	3%	9%	3.0	0.70
			82	Adequate institutional capacities exist to develop flood response agencies	Are there adequate institutional capacities to develop flood response agencies?	12%	73%	15%	-	3.0	0.70
			83	Sufficient resources are available for effective coordination e.g communication system, transport e.t.c	Are there sufficient resources are available for effective coordination e.g communication system, transport e.t.c?	12%	76%	9%	3%	3.0	0.68
		Flood Hazard/ Risk Assessment maps	84	Sufficient resources and tools exist to develop flood hazard risk / map	Are there sufficient resources and tools to develop flood hazard risk / map	15%	82%	3%	-	3.1	0.75
			85	Effective and updated Hazard/ risk for all flood vulnerable areas	Are there effective and updated Hazard/ risk for all flood vulnerable areas?	12%	67%	18%	3%	2.9	0.68
			86	hazard risk / map are highly effectives, understandable and accessible to vulnerable communities	Are hazard risk / map highly effectives, understandable and accessible to vulnerable communities?	3%	79%	12%	6%	2.8	0.50
			87	hazard risk / map are highly adaptable to climate changes	Are hazard risk / map highly adaptable to climate changes?	6%	70%	30%	6%	3.0	0.50
			88	Effective and distinguished hazard/risk map for different categories of flood e.g riverine, flash floods	Is there effective and distinguished hazard/risk map for different categories of flood e.g riverine, flash floods?	6%	76%	9%	9%	2.8	0.50
			89	Adequate capacities exist to revise and upgrade food risk /hazard maps	Are there adequate capacities to revise and upgrade food risk /hazard maps?	12%	73%	15%	6%	3.0	0.70
		Flood Early Warning System(FEW S)	90	FEWS is strategically and effectively distributed throughout the city /state the country(e.g system for detection, monitoring &forecasting)	Is FEWS strategically and effectively distributed throughout the city /state the country (e.g system for detection, monitoring &forecasting)?	21%	58%	15%	9%	3.0	0.70
			91	FEWS system is highly efficient and effective in saving lives	Is FEWS system highly efficient and effective in saving lives?	18%	58%	15%	12%	2.9	0.70
			92	FEWS is effective adapted to climate change	Is FEWS effectively adapted to climate change?	15%	67%	6%	12%	2.9	0.70
			93	FEWS is effectively and strategically distributed throughout the communities	Is FEWS effectively and strategically distributed throughout the communities?	18%	70%	3%	9%	3.0	0.70

		Multi-Hazard Early warning System (MHEWS)	94	MHEWS is effectively and strategically distributed throughout the community/ city/ state levels	Is MHEWS effectively and strategically distributed throughout the community/ city/ state levels?	9%	64%	12%	15%	2.7	0.25
			95	MHEWS is adequately coordinated with FEWS	Is there adequate coordination of MHEWS with FEWS?	15%	49%	15%	21%	2.6	0.63
	Post –disaster Mitigated Capacities	Resilient communities' development capacities	96	Effective institutional capacities exist to adapt to flood risk	Are there effective institutional capacities exist to adapt to flood risk?	21%	70%	6%	3%	3.1	0.75
			97	Effective flood risk resilient infrastructures development planning e.g zoning and building codes exist	Is there effective flood risk resilient infrastructures development planning e.g zoning and building codes exist?	9%	64%	18%	9%	2.7	0.25
		Provision for financial support and insurance	98	Financial provision/support programmes for the rehabilitation &restoration of public & private residential building and houses	Are there financial provision/support programmes for the rehabilitation & restoration of public & private residential building and houses?	3%	82%	15%	-	2.9	0.50
			99	Financial provision for the rehabilitation of economic activities e.g private business, agriculture e.t.c	Is there financial provision for the rehabilitation of economic activities e.g private business, agriculture e.t.c?	6%	76%	12%	6%	2.8	0.50
			100	Provision for risk insurance for natural hazards	Is there provision for risk insurance for natural hazards?	6%	61%	30%	3%	2.7	0.25

Results of the survey with the interpretation from 120 experts across the relevant Ministry, Departments and Agencies in Ibadan who were consulted and interacted with as indicated in annex 15 and 16 are provided in Table 3.4 above, the scale developed and used in the conduction and interpretation of this survey is depicted in the following terms:

Table 3.5: Scale for survey interpretation

Scale	Name	Mean Score Range	Colour Designation	Interpretation
4	Exist	3 and above		A specific parameter means has reasonably met the comprehensive set of requirements for specific flood management capacity group.
3	Partially Exist	2.5-2.9		A specific parameter has partially met the comprehensive set of requirements for specific flood management capacity group.
2	Does not Exist	2.1-2.4		A specific parameter has not met the comprehensive set of requirements for specific flood management capacity group
1	No Response or Unawareness	2 and below.		No response or unawareness

To a large extent Ibadan has witnessed various flood events that has attracted national and international interventions and support that culminated to some policy, and institutional structures that confirms the existence of flood risk mitigation structures and systems. However, those structures and system need to be harmonised and strengthened to deliver the drainage master plan. The gap areas are further discussed below.

Collectively the survey results throw positive light on the 'policy and planning' framework existing for Flood Management Plan in Ibadan. However, it is acknowledged that there are some weaknesses in the system but in the post-flood 2011 scenario, the system has been undergoing positive changes for example, some new policies and plans. An Environmental

bill, and the recent Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) are positive changes in policy framework.

3.5 Gap Analysis

A gap analysis of the legal instruments and the institutional framework was done through an assessment of the adequacy of State Level public agencies, to manage and address the potential impacts of Drainage infrastructure development. Keeping the focus of the assessment on the effects of sector policy and regulatory development and on environmental and social issues, the following institutional and governance issues stated in the TOR was covered.

- Gap analysis of mandates, capacity, incentives and transparency in permitting, monitoring and enforcing environmental regulations in the sector.
- Coordination between the Dam Department of the Federal Ministry of Water Resources (FMWR) and the environment and natural resource management institutions such as the Federal Ministry of Environment and State Ministry of Environment;
- Accountability of decision makers and authorities with competence for granting environmental permits.
- Organizational and institutional capacity of stakeholders affected by or vulnerable to activities in the sector.
- The specific challenge of ensuring that decision-makers receive comprehensive impact-assessment information on an Irrigation Scheme with ancillary.

Table 3.6 sets out the current status of the overall governance structure for strategic Environmental &Social management in the state and provide recommendations for improving the institutional governance structure (in terms of policy, regulation, capacity, performance, funding/budget, human resources, equipment etc) for the SESA with regards to the DMP. Further details are provided in section 3.5.1- 3.7

Table 3.6: Assessment of Institutional responsibilities, gaps and recommendations

S/N	MDAs	Responsibilities & Accountabilities	Gaps	Overlaps/ Potential Redundancies	Recommendations
1	Oyo state Ministry of Environment and Natural resources	Environmental and Water Shed / Catchment Compliance Coordinator at the State level for the four North-South flowing river systems/basins, catchment delineation, landscaping, tree planting, river/stream setback	No delineation / Nor designation or Map out of Channel Basin or watershed catchment	Similar role with River basins authority, yet the nearest river basin Ogun –Osun river basin has limited capacity to undertake catchment delineation.	• Develop Catchment Laws, Regulations, Standards and guidelines on land use by the floodplain, hilly terrain • Provide guidelines, standards and campaigns for green infrastructure in addition to drainage infrastructure and to reduce risks of Floods • Map out the stream /river setbacks and enforce • Improved competence capacity of staff, performance, funding/budget, human resources, and equipment
		Monitoring the management of all water supply, and hydraulic structures on the river basin including Eleyele Dam, and Flood Control Structural and Non - Structural Management and Maintenance, river crossing structures, river channels,	Monitoring system limited to water supply. No monitoring system in place for hydraulic structures or flood control measures	There is overlap of the Ministry of Environment and natural resources with Oyo State Ministry of Public Works infrastructure and Transportation on hydraulic structures and river basin authority in monitoring mandate and supervisory role	• Monitoring of water quality to find to preserve the water ecosystem from pollution, • Monitoring of resources in the river basins (consumption rates, how much reserves left, how to preserve, recycle), • Sharing findings with relevant government and non-governmental agencies and other users, ensuring that data disseminated are user friendly
		Taking cognisance of Climate change in FRM planning in coordination with NIHSA and OYSEMA Sustainability of current, proposed/future FRM plans, and ensuring that long term investments, decision making, priority setting, budgeting and updating the DMP	Lack of Research on climate change, current trends etc and its impacts on increased Frequency and severity of floods,	N/A	• Integration of climate change challenges in DMP; • Regular liaison with NIHSA on weather conditions, • Monitoring of water levels in rivers and tributaries, generating and issuing flood forecasts in liaison with

		under the IUFMP	Poor monitoring and adaptive capacities		OYSEMA • Public awareness raising of flood hazards and their impacts, capacity-building programmes • Integration of DMP and FRM concerns in critical infrastructure development. • Integration of the DMP with the Ibadan urban city masterplan in conjunction with Ministry of Lands
		• Flow Regime of river basins, hydrological analysis and Flood Warning Alert • Lead role in monitoring of the River Quality and environmental status/ ecological status and flow regime • Lead role – in Development of a Catchment Management Plan along the basin with the State Ministries of Agriculture, Industry, RUWWASA, Ogun -Osun River Basin Authority and NESREA	Insufficient Hydrological Studies and Data on all the Channels Inadequate capacity within the Ministry to obtain, store data and utilize the data for mitigating flood risk along the catchment.	Other MDAs such as State Ministries of Agriculture, Industry, RUWWASA, Ogun - Osun River Basin Authority and NESREA have similar functions	• Improved Flow regime of Channels • Strengthen monitoring mechanisms and Flood Early Warning Systems • Set up a coordinating mechanism to streamline all actors on the channels
		Enforcement of Catchment Management Plan, Flood Plain Management, Setbacks Regulations and Pollution Control Standards	No Mapping of Setbacks and therefore no clear demarcation for no development zones in both the Environment and Physical Planning Laws.	This responsibility is usually practised by Oyo State Ministry of Lands, Housing and Urban Development.	• Enforce the no development zone along the setback of the channels / catchment. • Integration of DMP and FRM concerns in critical infrastructure development.
		Oversight and supervisory responsibility to monitor and control Waste management through OYSWMA	Inadequate waste disposal systems and poor waste management	N/A	• Formulate explicit and clear goals on waste management for the state; • Provide policy instruments in a coherent mix: (a) ‘direct regulation’,

					comprising legislation accompanied by its keen enforcement, (b) economic instruments, providing incentives and disincentives for specific waste practices and (c) 'social' instruments, based on communication and interaction with stakeholders.
		Responsible for Environmental, Social, Health and Safety measures for all facilities. However the Environment Ministry works in collaboration with State Ministry of Women affairs and Social Inclusion - on Child rights, Labour management, GBV, OHS, GRM, with the Oyo State Road Traffic Management Authority (OYRTMA)-on traffic management, with Oyo State Emergency Management Agency (OYSEMA)-on emergency preparedness, early warning systems for the dam, security and with Ministry of Information and Mass Mobilisation on – communication	Need to improve the social aspects of flood management to a coordinated engagement of all stakeholders Recognition of social issues and rights are inadequate.	The laws coverage is with respect to public hearing in the course of Environmental impact assessment. It does not take cognisance of the resettlement policy and aspects of livelihood as required under the donor funding.	• Amend the current environment/ water laws to incorporate social inclusion of rights, resettlement issues and livelihoods.
2	Federal Ministry of Environment	Responsible for Environmental, Social, Health and Safety measures for all facilities.	• Poor enforcement/ monitoring of recommendation of ESIA and other safeguard instruments • Low technical expertise and inadequate manpower for compliance/ monitoring	The three levels of government, Federal, State and Local Government, share responsibility for water resources management. Thus, leading to fragmentation, duplication and lack of intersectoral coordination with each segment pursuing its own independent water agenda. The salient features of water resources management in Nigeria include: weak data base,	• Provides for a coordinating mechanism on water resources management and the environment. • Environmental and social impact assessments, impact monitoring, environmental preservation and pollution control research, raising public awareness of environmental preservation, sharing findings with relevant governments, non-governmental agencies and other users • Training for implementation, compliance and monitoring

				fragmented responsibility and weak institutional framework among others. Because of the fragmented and uncoordinated approach to water management issues, the regulatory and monitoring machinery within the water sector in Nigeria is diverse, diffused and weak. Enforceability in such circumstances becomes lax. Present water laws lack proper provisions and mechanisms for inter-sectoral coordination, tariff setting and conflict resolution. There is therefore an identified need for a new water law in Nigeria and with it, a new regulatory mechanism to ensure sustainable and integrated approach to water resources management.	(including development of necessary checklists to facilitate compliance monitoring) • Understanding and advocating IFM in national, state and local development plans, assisting national, state authorities to develop and implement suitable flood management programmes,
3	Oyo State Ministry of Lands, Housing and Urban Development.	Land use Development, land use plans, and Regulations Space Standards for Physical Development in Oyo State Flood Proofing Standards for buildings in flood plain	• Poor land use practices and regulations • Poor Flood proofing, flood mitigation requirements along the catchment and channels	N/A	• Integration of FRM concerns in social development and protection planning • Proper land use management, building awareness. GIS can be used to create Land use/ Shape file to monitor land use practices • The Ministry of Environment and/ or the Ministry of Lands, Housing and Urban Development literarily have to go on all the channels and flood

					plains to determine who is at risk because of inadequate manpower and capacity to use google and GIS software's on land use • Flood Hazard Map, Dynamic information of location, frequency of flood event • Enforce Flood proofing, flood mitigation requirements along the catchment and channels
4	The Bureau of Physical Planning and Development Control (BPPDC)	Has an important role in the realisation of effective flood management, by identifying and controlling the development on the natural flood plains	Poor floodplains regulations: New policy guidelines and regulations are required to address: - Restrictions for use of floodplains, and river reaches.	Has a few similar responsibilities with Oyo State Ministry of Lands, Housing and Urban Development. Hence, they can work together in achieving common goals	• Physical Planning Regulations need to consider architectural designs suitable for the flood prone areas in the land use permits. • Proper land use management, such as ensuring conformity to existing rules, protection and flood-proofing of buildings,
5	Ogun-Osun river basin	Systematic compilation of rainfall data from the various sources including the rain gauge stations with special purposes to be maintained by the Authority for undertaking comprehensive development of both surface water and groundwater resources for multipurpose use; with emphasis on provision of irrigation infrastructures and the control of floods and erosion and watershed management	• Lack of research and development in river basins • Low awareness on management of watersheds and river basins. • Insufficient Hydrological Studies	OYSEMA and Oyo MENR have similar responsibilities for River basins on hydrological, hence roles should be well defined to avoid overlap. Oyo ADP also have responsibilities in provision of irrigation infrastructures and hence overlapping functions on water resources management	• Development and implementation of basin development plans, • improvement of facilities for preserving water retention, working closely with relevant line agencies, providing a common platform for the basin communities such as government agencies, communities and NGOs, in order to meet and share ideas, information and lessons learned.
6	Oyo State Agriculture Development Programs/Projects (ADPs),	A key partner in watershed planning, development and consequential flood risk management being an	Poor agricultural practices with adverse effects on	NA	• Improve crop yield with minimum usage of fertilizers and pesticides, improvement of crop varieties to withstand flood inundation,

		agricultural extension outfit with remarkable landmark achievements in the provision of effective agricultural extension services and complementary infrastructural facilities (e.g. dams, wells and rural roads);	environment leading to flood (thus causing erosion), deforestation, poor chemical management etc Lack of training and awareness		• provision of training to farmers and other users in farming techniques in flood-prone areas • Planning for seasonal crops, decisions relating to frequency of flooding the fields for replenishment of nutrients, controlling the usage of pesticides and fertilizers, vaccination of livestock, management of rice and seed banks • Planning for fish spawning, enforcement of rules on restricted fishing in certain parts of the basin
7	Oyo State Water Corporation	• Production and distribution of potable water for the use of human and agricultural purposes through construction, installation and operation of necessary water infrastructure • To control and manage all waterworks vested in the Corporation Including dams and dykes	• Operating reservoirs to keep flood risks in view and maintaining environmental flows • Inadequate flood storage capacities: new dikes and reservoirs (preferably serving multi-purposes)	Have similar roles with Oyo State Rural Water Supply and Sanitation Agency RUWASSA	• Monitoring of water quality for water supply • Improved flood storage capacities: new dikes and reservoirs (preferably serving multi-purposes) are required to enhance water storage capacity in the Ibadan.
	Oyo State Rural Water Supply and Sanitation Agency RUWASSA	• Propagating awareness of water stewardship at local level and • Basin catchment management plan in its mission for the provision of safe water for the communities through borehole construction. • Enforcement of sanitation regulations in the water sector	• Low awareness and participation of water stewardship • Poor water and waste management practices	Have similar roles with Oyo state water corporation in provision of water to rural areas	• Construction, maintenance and repair of rural infrastructures • Enforcement of proper land use planning, water and waste management, development planning in rural areas of the river basin • Liaise with Communities along catchment and channels for water stewardship and catchment

					management plans
	Oyo State Emergency Management Agency (OYSEMA)	• Manage emergencies and disasters preparedness, early warning systems for the dam, and flood control measures, security, communication • Post flood events management	• Weak flood early warning system (FEWS) • No clear messages or enlightenment on evacuation areas/plans to the public and implement the community based early warning system • No installation of Simple River Gauge,	• Their mandate is seen as ad-hoc and relevant to post flood events, hence no budgetary allocation to support pre-flood events. Moreover, their mandate covers all emergencies and forms of disaster hence no core competency is post event livelihood support.	• Strengthen and extend FEWS to ensure early dissemination of flood warnings for better protection of human lives. • Develop and implement messages for public information targeting Flood Disaster Preparedness • Coordination with flood insurance companies, understanding the risks of unplanned development, costs and benefits of flood protection • Oversight functions for household insurance programme for properties on the flood plain • Evacuation points and plans in place • Post-disaster impact assessment to develop inventory of environmental receptors vulnerable to flood risk and potential damages • Determine resources allocated for aftermath flood event rehabilitation and its integration into community basin development,
	Oyo State Ministry of Public Works infrastructure and Transportation	Provide the roadmap for the maintenance of the structural works, especially the hydraulic structures under the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP).	Inadequate flood regulation/diversion channels: construction of new flood diversion channels or escape channels	NA	• Improve Conveyance of Flood Water • Planned and Budgeted Infrastructural Maintenance • Improved river navigation systems, construction and maintenance of bridges, roads, railways and waterways, flood protection of such structures and subsequent repairs • Building and maintenance of urban

					infrastructures, flood damage assessment, repair of flood-damaged structures
	Federal Ministry of Water Resource	National responsibility for planning and developing water resources, irrigation work and the collection of hydrological, hydro-geological data. They also have oversight responsibility in monitoring and control of provision of water in bulk to cities from dams and to monitor and regulate utility tariffs, including those of State Water Agencies.	• Insufficient Hydrological Studies • Low technical expertise for effective monitoring	Have overlapping functions with State water MDAs and Federal ministries involved in the different aspects of water resources management, including the Federal Ministry of Agriculture, Federal Ministry of Environment, Federal Ministry of Health who have a form of responsibility for the quality of surface and groundwater in Nigeria. Flood, including dam breaks, tends to be shrugged off as "acts of God" with little done to intervene to prevent their occurring or to mitigate their impact. Upstream dams that could be managed to absorb flood flows have more often been the cause of the floods; nobody has been responsible for river training, the building of flood embankment and dykes and the prohibition of building residential houses in flood plains. Even the advantage of being downstream of virtually all its major transboundary waters, in that flood move down a river at a steady rate, has been	• Monitoring water quality and quantity, construction and maintenance of flood mitigation structures, ensuring the proper utilization of water resources responsibilities • Having a good understanding of drainage conditions, understanding functions of flood moderation requirements of multi-purpose reservoirs

				lost to make flood forecasting.	
	National Environmental Standard and Regulations Enforcement Agency (NESREA)	• Lead role – enforcement of standards and regulation on Watershed management beyond the state, • Extended Producers Responsibility and sustainability reporting.	Inadequate manpower and low technical expertise in compliance enforcement	NA	• Conservation of natural resources, identification of renewable energy, rapid environmental assessment after a flood event, enhancing public awareness • Develop standards/ national state or district development plans in which flood management should be incorporated
	Other MDAs and NGOs	Come in as at when relevant areas or resources under their jurisdiction or management are likely to be affected by or implicated by projects.	Insufficient manpower Inadequate capacity/ technical expertise skills to perform certain tasks	Some MDAs may have overlapping responsibilities as outlined in table	Coordinating with various voluntary organizations, facilitating community-based emergency preparedness, search and rescue, carrying out flood fighting and emergency response, performing rapid damage and loss assessment after a flood event, providing capacity building for the community and volunteers, educating the public on basic flood response and preparedness • Distributing relief supplies to flood victims, facilitating community based emergency preparedness, flood fighting and emergency response, implementing focused activities related to flooding, for example, rapid environmental assessment by a team of volunteers from a local university, retrofitting of individual houses by volunteer groups of engineers
	Private Sector Organisations	• Delivering safe drinking water and sanitation for employees and/or local communities, • Water efficiency in operations and supply chains, and dealing with	• Non-compliance especially companies in Installing appropriate waste	NA	• Enlighten the public on flood proofing and flood mitigation requirements as part of Corporate Social Responsibility • Ensure compliance in operations to

		effluent quality, • Engaging and influencing the governance of water • Providing insurance schemes for properties on flood plains • Facilitating transport of commuters and goods, ensuring • Maintenance of vehicles, vessels and roads in accordance with the law, assisting in relief and emergency response operations as needed • Proper land use management, such as ensuring conformity to existing rules, protection and flood-proofing of buildings, coordination with flood insurance companies, understanding the risks of unplanned development, costs and benefits of flood protection • Providing standardized waste disposal systems, preventing interruption of utility services, providing adequate safeguarding measures, carrying out post-flood recovery operations	disposal schemes, , proper land use management,		mitigate flood risks
	Donor Agencies	• Overall supervision and provision of technical support and guidance. • Recommend additional measures for strengthening the management framework and implementation performance. • Supervising the application and recommendations of sub- project environmental and water resources governance.	-	NA	• Advocating adoption of IFM at the basin or national level, greater public participation in IFM planning, linking macro-scale international capabilities and experience to the individual needs of a particular country or a community • Providing capacity-building at various levels, technical know- how to local government in monitoring and evaluation of flood management plans and technical support to flood and emergency management groups

3.5.1 Mandate, Roles and responsibilities

Various roles and responsibilities are involved in water management at large, and flood management in particular. There is allocation of roles and responsibilities for water policymaking, policy implementation, operational management and regulation. These responsibilities are typically defined and allocated by the Constitution or by national or state law as set out in section 3.3

However, allocation of roles and responsibilities in flood management is widely distributed across several scales ranging from national to subnational and basin levels, as well as across sectors.

The SESA studies illustrate situations where roles and responsibilities on flood management are not officially allocated but rather defined according to informal agreements. These unclear roles and responsibilities can lead to conflict between institutions, that undermines co-ordination across authorities.

3.5.1.1 Areas to improve the current Mandate and Responsibilities

As the observations show, the water sector is associated with high levels of territorial and institutional fragmentation of actors and lack of policy coherence (**policy gaps**), and thus faces overlaps.

For each of the five stages of flood management (Flood anticipation or foresight, flood prevention or mitigation, flood preparation or preparedness, flood response, flood recovery) a diversity of stakeholders, at various scales, are responsible for policy making (e.g. defining flood policy-directions), policy implementation (e.g. financing and budgeting, capacity development, evaluation), operational management (e.g. running of the warning systems, owning and maintaining flood risk assets), and regulation and enforcement (e.g. regulation on construction of houses in floodplains, transposition of spatial planning laws, standards, licensing).

The lack of co-ordination mechanisms across multiple actors can hinder effective policy design and implementation for flood management (e.g. delays, high transaction costs, asymmetry of information, etc.).

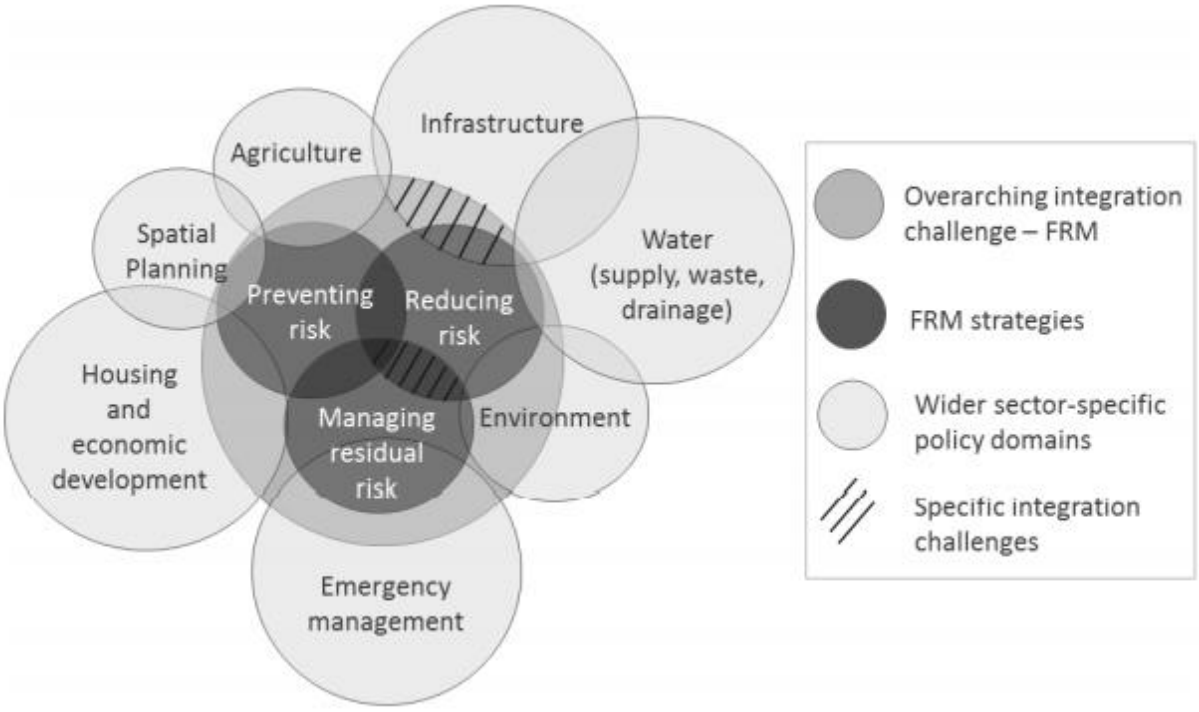
However, having too many institutions involved ends up dissipating responsibility and leadership and affects the decision making processes. There is an inherent potential for conflicts when the allocation of roles and responsibilities across policy areas and between levels of government is unclear.

The missing linkages between water and land can hinder governance, in particular, at the catchment scale. Land, whether private or public, can be very challenging when managing floods given that private property rights can be highly controversial in a context of increasing climate-driven flooding. This raises questions such as: who should pay to protect private property? Who is in charge of compensating the destruction of land that is suffering devaluation?

3.5.1.2 Ways forward on Mandate and Responsibilities

In addition to the division of responsibilities over multiple levels, the distribution of responsibilities over sectors is relevant (e.g. water system management, disaster management, spatial planning)

There is need to encourage policy coherence through effective cross-sectoral co-ordination such as in figure 3.2, especially between policies for water and the environment, health, energy, agriculture, industry, spatial planning and land use.



Figure[3] 3. 1 : Cross-sectoral coordination for Policy coherence

A clear definition and allocation of roles, responsibilities and the interface between them in flood management is thus essential to diagnose inconsistencies and redundancies, to avoid grey areas, and to ensure the effectiveness of the water policy cycle.

It can also serve to mobilize sufficient and stable finance for flood management.

Furthermore, catchment authorities (as proposed in chapter 8) and increasing autonomy of lower levels of governments need to be accompanied by financial support and capacity building to carry out flood functions.

Closing the knowledge and expertise gap may facilitate collaboration amongst authorities.

Co-operation in the form of partnerships is required between levels of government and basin levels, as well as across sectors, to meet flood challenges. Such Cooperation and Coordination is needed between the Dam Department of the Federal Ministry of Water Resources (FMWR) and the environment and natural resource management institutions such as the Federal Ministry of Environment and State Ministry of Environment.

[3] A framework to assess integration in flood risk management: implications for governance, policy, and practice Lydia Cumiskey 1 , Sally J. Priest 1 , Frans Klijn 2,3 and Meri Juntti 4

The SESA studies observed that often, more than one co-ordination mechanisms are needed, and that coordination is mainly achieved through a mix of instruments, both formal (coordinating bodies, contractual arrangements) and informal (bridging concepts such as multi-layered safety, defined operating procedure and information sharing etc.).

The dimensions of the integration of spatial planning, with flood-risk management would need to consider the following aspects:

- Sharing and exchanging information among neighbouring jurisdictions and overlapping jurisdictions because the Spatial Planning spatial hierarchy differs from that of Flood Risk Management
- Check the consistency and conflict among spatial policy levels instruments
- Policies and strategies should be comprehensive and consider the consequences in a broad scope of issues
- Comprehensive input from various actors, such as planning authorities, publics, NGOs, governments, private companies, FRM authorities, and researchers
- Planning policy alternatives are evaluated from the perspective of flood-risk mitigation
- Flood-risk management alternatives are evaluated from the perspective of planning
- and development
- Coordinated management of information
- Operating standardized business process
- Sharing common sets of goals and principles
- Applying efficient telecommunication technologies
- Building communication channels between institutions and their departments and representative

3.5.2 Cross-sectoral Co-ordination of Relevant Authorities in Flood Management

Flood risks are affected by decisions taken in various sectors. Amongst the most inter-dependent sectors are land use, civil protection, the environment, climate change, infrastructure, spatial planning and urban development.

They relate to vertical and horizontal coordination across:

- **Policies**: flood governance has consequences for, and can be affected by, a number of intrinsically related policies such as land use, spatial planning, environment, and agriculture, among others.
- **People:** a number of people from public, private and civil society sectors to water users or landowners have a stake or play a role in flood management.
- **Places**: water boundaries cut across places in terms of cities (i.e. when concerning more municipalities in a metropolitan area), hinterland (i.e. the surrounding environment, rural areas and watersheds, which sustain the major bulk of water demand from cities and where the actual sources of water are often located) and even countries.

Effective planning controls are the first line of defense and are at the heart of effective flood management. A lack of policy coherence can have severe distributional impacts in terms of both the costs and benefits of flood management. Policy incoherence thus can:

- raise economic costs, such as when infrastructure investments could have been avoided with better coordination;
- generate conflicting actions, for instance when urban policies support the development of housing in floodplains while concomitantly flood management policies use these floodplains or flood discharge;
- increase flood risks, including greater risks of human casualties and transaction costs, such as when conflicts arise between stakeholders involved in flood management.

Thus, the lack of coherence in water-related areas can work against flood prevention policies if insufficiently coordinated.

3.5.2.1 Areas to Improve On Flood Management Coordination

Institutions in the water sector in Ibadan face problems **when striking a balance between conflicting financial, economic, social, environmental areas and policy drivers for collective enforcement of flood policy (objective gap).** Such instance is where:

- Municipalities may be willing to develop new housing and real estate but this objective may go against the need to reduce flood risk.
- Time scales for policies diverge and can be difficult to align.
- There is intense competition between sectors, in particular, for financial resources.
- There is limited data and information sharing across ministries and other core water-related players.
- Water and flood policies are, in many cases, driven by decisions made in policy areas over which water experts have little say.

In practice, policy coherence regarding flood management is undermined by several factors: differences in policy goals, vested interests and perverse incentives, insufficient consultation and coordination as well as inconsistencies and rigidities in the institutional structures governing sectoral policies.

Continued poor allocation of roles and responsibilities in the state can favour silos and amplify conflicting objectives. This is often the case when the delimitation of ministerial portfolios is strict and without mechanisms for cross sectoral coordination.

3.5.2.2 Ways forward on Flood Management Coordination

Water is not an isolated sector and thus needs to implement win-win approaches going beyond zero sum logics while combining various interests.

Proposed array of mechanisms (actor based, rules based or resource based as indicated in figure 3.3[4]) to facilitate coherence and mitigate conflicts between flood management policies and other policy sectors include clear allocation of responsibilities:

- **legal/administrative mechanisms** – (legislation, regulation, cross-sectoral plans, inter-institutional agreements between State/ Federal authorities),
- **financial incentives** (e.g. subsidies) and contracts;

[4] A framework to assess integration in flood risk management: implications for governance, policy, and practice Lydia Cumiskey 1 , Sally J. Priest 1 , Frans Klijn 2,3 and Meri Juntti 4

- **learning mechanisms** such as research programmes, schooling and knowledge co-creation projects across different sectors such as the current IUFMP. The current Drainage Master Plan need to have a legal and mechanism to implement it.

Examples of proposed cross-sectoral policy coordination in Ibadan would include the "water test" and "signal areas". In the "water test" governments obtain expert advice of authorized water managers before granting construction permits in any spatial area in the "Signal areas" which are still undeveloped areas with a hard planning destination (residential and industrial areas) located in flood-prone areas. Both these concepts involve permits being declined or granted subject to flood mitigating measures (e.g. flood proof housing, insurance schemes). This form of coordination ensures accountability of decision makers and authorities with competence for granting environmental permits.
Other areas could be to ensure that the "zoning plans" and "local spatial development plans" take into account housing developments, environmental considerations, transport and networks with a feed back to these sectors before final implementation. Thus building transparency in permitting, monitoring and enforcing environmental regulations in the sector.

Setting up of an e- platform through the current IUFMP could facilitate such cross sectoral integration. The model set up of the IUFMP with a high level decision steering committee is the first major success at coordination in the State on flood management issues. The focus of the e- platform could be on Water and Climate Knowledge and Innovation Programme focused on knowledge development and joint fact-finding through the development of a coherent set of knowledge agendas of flood risk management based on three pillars: 1) bringing together all explicit and implicit knowledge from all stakeholders including knowledge institutes, 2) developing knowledge only if it supports decisions and 3) managing knowledge only on demand. Social media and digital tools can be used to stimulate learning from each other.

Furthermore, drills (emergency exercises) can be organized annually to prepare potential disasters with all stakeholders concerned at all levels and sectors.

Such exercises contribute to enable interactions while building knowledge and behaviours on emergency response in actual situations of disasters.

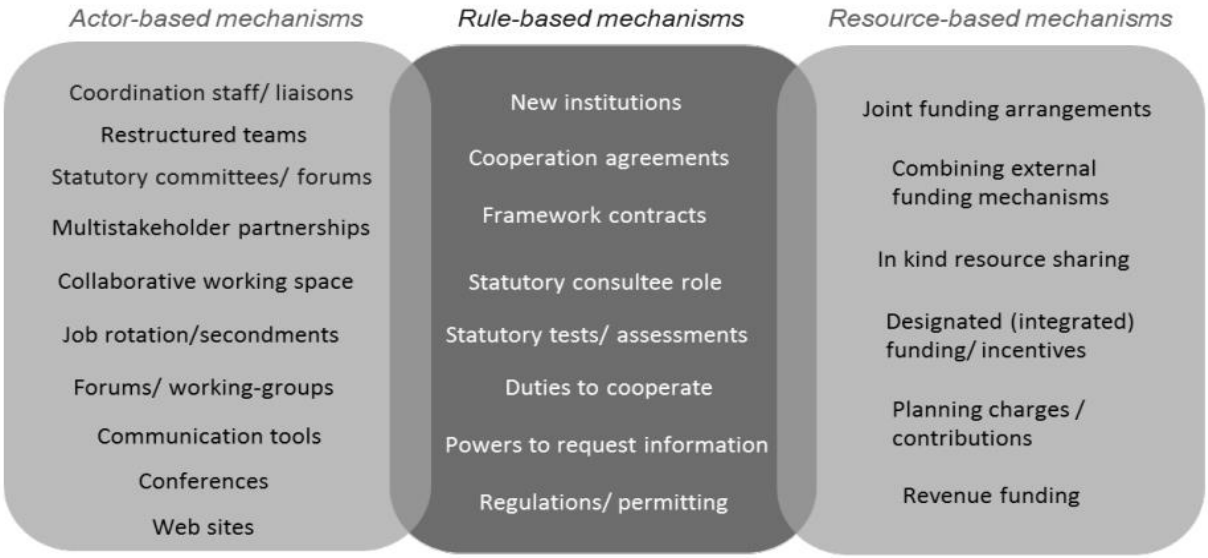


Figure 3. 2: Types of mechanisms to facilitate policy coherence of flood and developmental activities.

3.5.3 Data and information for Flood Management

Improving flood prevention requires hydrological, technical, economic, financial and social data and information to analyse every situation objectively, and to devise performance-oriented, cost-effective and pertinent strategies at different levels.

Standard data and information collected for flood management cover a wide range of topics and include the description of past floods and their consequences, maps of river basins where flood occur, scenarios of flood probability, vulnerable infrastructure and population (e.g. elderly, hospitals), etc. Such data and information are used to develop flood risk management plans, to assess flood risks, to develop flood risk/hazard maps, and to inform participatory decision-making processes.

Developing a robust information system that can guide decisions related to floods is a shared responsibility across levels of government and stakeholders. The production and use of data and information on flood risks involve different actors, beginning with governments as documented in the DMP and this SESA. To a lesser degree, citizens, private companies and water operators produce and also use such data. Science and knowledge institutes play an important role to inform decision makers about past, present and future flooding

3.5.3.1 Areas to Improve for Data and Information for Flood Management

Observed gap in Ibadan institutional framework is Inadequate information generation and sharing among relevant actors, as well as scattering and fragmentation of the generated primary data tend to be important bottlenecks.

Overall, policy makers rarely use the research results; and the science-policy interface remains rather weak in terms of guiding decision making and implementation.

Furthermore, these obstacles are generally exacerbated by a lack of technical capacity to collect, process and analyse flood-related data and information. What is more, is that updating flood information systems and databases is extremely expensive and time-consuming. The lack of capacity can also affect the user, as well as the co-ordination between data producers and users.

For instance, unnecessary data overload and dispersion can make it difficult for decision makers to choose what to use to develop policies, lead to inconsistencies and uncertainties in models and scenarios, generate delays, or create overlaps across data producers.

3.5.3.2 Ways forward on Data and Information for Flood Management

Produce, update, and share timely, consistent, comparable and policy-relevant water and water-related data and information, and use it to guide, assess and improve water policy.

Tracking data and information overload and asymmetries should thus be emphasized to a greater extent in flood management through specific reviews, meetings between data producers and users, or the re-priorisation of objectives for data collection and data requirements, hindering the pathfinder scheme.

In this regard, it is key to continue developing practices and projects that aim at a consolidated information base in order to drive informed policy discussions, as well as guided budgeting debates.

Ultimately, evaluation of the use of the data and information produced is also key to ensure relevance and effectiveness. Focusing efforts towards more adequately generating and sharing information, particularly on the economic and institutional implications of flood management, can provide a robust foundation for evidence-based flood governance approaches.

The production and adequate use of data and information is a typical illustration of a shared responsibility, and of the need of interaction with civil society action and measures and other flood-relevant stakeholders.

Even though many approaches are producer and user-friendly, many others apply new technologies that may exclude vulnerable communities living in rural areas and informal areas. Bridging the digital divide is thus key to engage the broad range of stakeholders for an improved preparedness and response to floods.

In addition, reducing the gap between scientific findings and flood governance practices, is fundamental to take better joint decisions and prioritize actions. For example, Provision of appropriate data and information addresses the specific challenge of ensuring that decision-makers make informed decision on graduated land use to reduced flood ([5]figure 3.4) receive comprehensive impact-assessment information on a water related scheme (irrigation scheme) with ancillary.

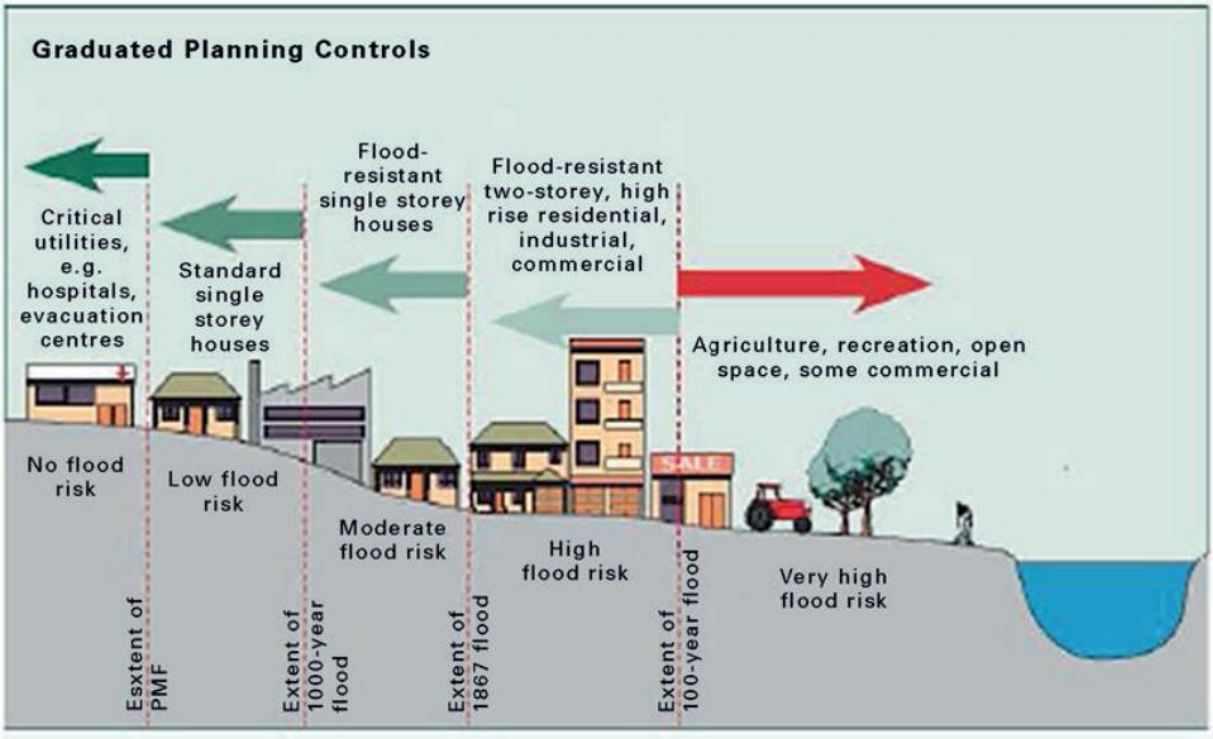


Figure 3. 3: Graduated land-use planning controls to reduce flood risk

[5] Integrated Flood Management Tools Series No.7 Version 2.0 © World Meteorological Organization, 2016

Legal and institutional frameworks on flood governance put an emphasis on information to ensure accountability. The right to information is the primary channel to hold decision makers and stakeholders accountable, and to ensure that flood risk policy making is transparent.

3.5.4 Flood Governance Capacity

Flood governance is contingent on mobilizing the right capacities. The level of capacity of the outlined responsible authorities in Oyo State to the complexity of flood risk management and to the set of competencies required to carry out their duties was observed and assessed in section 3.4.

3.5.4.1 Areas to improve Flood Governance Capacity

Managing multi-level relations, allocating responsibilities and funds, ensuring coordinated, coherent policy approaches, and attracting skilled and competent flood risk professional. In all the ministries, there is need to improve the technical capacity, staff skills set, which is weak as a critical step to bolster flood risk management. There are shortfalls in financial resources; in political will to allocate resources to capacity development; in staff and technical skills; and in training tools and methodology affect capacity development and need to be addressed.

Other gaps as at time of SESA study were in the following areas:

- technical capacity (e.g. modelling, early-warning systems, projections);
- financial capacity (e.g. ability to allocate funds for the construction of flood defences, willingness and capacity to pay for insurance schemes, capacity to raise taxes);
- human capacity (e.g. knowledge, skills, leadership, stakeholder engagement);
- governmental capacity (e.g. departments dedicated to flood management, policies, cooperation with research institutes); and
- infrastructural capacity (e.g. capacity to build green infrastructure, adaptive buildings, retention facilities, dams).

3.5.4.2 Ways Forward in Strengthening Flood Governance Capacity

Technical Capacity: effective prevention and management of floods require strengthening of Ibadan institutions technical capacity in flood modelling and projections such that focus is on prevention rather than post event.

The IUFMP project intervention is addressing this weakness but needs to be institutionalized in the Ministry of Environment in collaboration with key stakeholders.

Financial capacity failures are evident in all the institutions. Going beyond the IUFMP is to align funding processes with various bodies involved in resolving flooding, allowing to identify and prioritise collaborative funding opportunities across sectors, as well as to unlock partnerships.

Consequently, this study proposes need to co-ordinate horizontally across policies and across people as increased knowledge of funding opportunities and capabilities amongst communities has enabled them to implement flood risk measures and improve collaboration with water companies and other stakeholders.

Human capacity: Developing and strengthening capacity throughout the policy cycle can be a daunting and resource intensive task.

The IUFMP is a systematic means to address the various capacity gaps. In terms of human capacity use have been made of guidance documents from the World Bank, hiring a diverse cross-sectoral skill set and peer learning, Workshops and public meetings, guidebooks, and support programmes on flood risks as mechanisms that help educate and train flood governance stakeholders (e.g. flood plan managers, flood risk professionals).

At present, higher education institutions in both in the state and country at large will need to turn out flood management experts and water professionals in sufficient numbers, with the required skills to establish and operate databases, monitoring and early warning systems necessary for the Floods Risk Management and DMP implementation

However, these mechanisms need to be further strengthened with e government platform and open, competitive and merit-based hiring, as well as Policies to strengthen subnational capacities.

Capacity strengthening may include educating engineers to adopt a more holistic perspective on flood management, knowledge exchange through communities of research and practice and knowledge co-creation.

Inclusiveness of stakeholders coming from the public, private and non-profit sector is highly important to pool resources, skills and expertise, and the possibility for a more integrated flood management approach, as well as knowledge-sharing.

This also relates to the science-policy interface. Policymakers and decision makers can quickly take up measures and approaches they are familiar with (e.g., from their specialist field) but they may resist 'evidence based' findings if they do not sit with their values or world views. For example, engineers may be resistant to uptake new ecosystem based measures, while this may change when hiring ecosystem scientists. Thus, having personnel in organisations who understand and are receptive to scientific advances across a range of fields and disciplines is very important, as well as ensuring that capacity building consists of a combination of soft and hard skills.

Infrastructural Capacity: From the 1980 till date there has been various infrastructures to manage flood risk at various scales. Flood risk infrastructure is one of the 'hard' capacities generally available in Ibadan though not well-developed, more attention would need to be paid to the quality and resilience of these infrastructures.

Furthermore in promoting quality Infrastructure Investment, attention needs to be paid to reliable operation and economic efficiency in view of safety and resilience against natural disaster; ii) ensuring job creation, capacity building and transfer of expertise and know-how for local communities; iii) addressing social and environmental impacts; iv) ensuring alignment with economic and development strategies including aspect of climate change and environment at the national and regional levels; and v) enhancing effective resource mobilisation including through public-private partnerships for all the infrastructure investments.

3.5.5 Financing Flood Management

Ensure that governance arrangements help mobilise water finance and allocate financial resources in an efficient, transparent and timely manner

Financial resources matter to sustain effective flood management measures, both in terms of institutions and infrastructures. Flood governance raises a number of costs, be they economic (e.g. building protection infrastructure, producing and collecting data), institutional (e.g. coordination with stakeholders), social (e.g. social conflicts, population displacement), or environmental (e.g. impact on ecosystems, land management, etc.)

3.5.5.1 Areas to improve Financing Flood Management

Existing funding gaps hinder the effective implementation and sustainability of flood management and the ability of responsible authorities to efficiently carry out their tasks.
In terms of policy operationalisation, Ibadan challenges generally stem from a mismatch between administrative responsibilities and resources and unsustainable and/or insufficient revenues.

Other obstacles emanate from insufficient capacity to implement financial schemes like water taxes or charges, or enhance creditworthiness of water-related investments. Another challenge related to financing is the delicate link between recovery and prevention. In Ibadan there is no incentive for pro-active spatial planning aimed at reducing the consequences of flooding.

3.5.5.2 Ways forward to Financing Flood Management

Bridging this gap implies ensuring sound governance frameworks for sustainable financing as well as funding to carry out flood-related responsibilities in a cost-effective way. Even though recovery and prevention activities are primary for flood management, policy and financing continuity in between two or more floods is also key to efficient flood governance.

Sufficient and sustainable sources of finance require adequate regulation, offering incentives to different actors to engage in flood governance. This will require that roles and responsibilities, as well as the necessary funds to put them into practice are clear.
Governance arrangements shall bolster and help to ensure shared financing schemes between the broad range of actors, which can favour a stronger stakeholder engagement and ownership. In this sense, adopting mechanisms or incentives that foster the efficient and transparent allocation of the funds could increase the attractiveness and trust of co-funding and other financial schemes.

Three main sources of finance can be mentioned:
- Contributions from the government: the main source of finance is contributions from the general budget of public authorities, either at national or regional levels in particularly related to flood defence. These contributions can come from taxation of actions that do contribute to the flood problem, for example new constructions in flood risk areas that increase the impermeability of the soil, the occupation of natural flood areas or nonconformity with various regulations. (This option bears the risk that the availability of resources for flood management becomes dependent on political whims.)

Flood management differs from other water functions, like water supply for instance, in that cost recovery is not necessary called for. A few examples of cost recovery for flood management can be mentioned, for example through payments for insurance premiums, payments by beneficiaries directly (e.g. where a charge is issued to landowners or inhabitants their expenses to reduce flood risks)

- Insurance schemes: the second source of finance for flood management is insurance schemes, operating more at the individual or private level. Insurance schemes can be very effective in preventing people from erecting new constructions in risk areas and in providing incentives to stimulate property owners to better manage the flood risk to which they are exposed
- Transfers: the third source of finance is transfers from international funds, such as the World Bank loans or grants etc.

3.5.6 Regulatory frameworks on Flood Management

Regulation concerning flood management is not only about infrastructure, but involves other functions, such as the establishment of efficiency incentives, collection of information and monitoring of performance, and the organisation of citizen's engagement in decisions related to water security. Nor is the institutional framework only defined by laws or the national level, but by many other subnational actors setting the rules (in many cases by informal water institutions such as customary water rights). Unclear or non-existent regulatory frameworks can widen the accountability gap.

The SESA study revealed that existing regulations needs strengthening primarily in the operation of flood protection measures; public information and consultation measures/actions; flood management measures and their prioritisation; technical characteristics of flood management; and stakeholders' roles and missions.

Moreover, a distinction should be made between substantive and procedural regulatory frameworks. (Substantive regulatory frameworks involve legally embedded occupational and safety norms. Procedural regulatory frameworks involve flood risks to be reflected upon in spatial planning procedures.) such that the proposed flood-related regulatory frameworks does not become a barrier or over regulation that generates additional administrative burdens for flood risk management.

In addition, even in cases where these frameworks are in place, they can be ineffective, irrelevant or undermined by a lack of collaboration between levels of government and ministries.

3.5.6.1 Areas to improve Regulatory Framework

Unclear regulatory frameworks are embedded in a bad allocation of regulatory functions and, thus, in the lack of knowledge and awareness of rights and responsibilities. In Ibadan this can be linked to a mismatch between government-induced water and spatial policies and deeply embedded informal institutions with inconsistencies undermining enforcement of existing legislation.

Furthermore, co-ordination with entities with related responsibilities is often pursued on an ad hoc basis rather than through systematic and institutionalised mechanisms. Therefore, more can be done to make flood regulation more coherent with regulations in other fields.

3.5.6.2 Ways forward Regulatory Framework

Flood management requires the establishment of a high quality regulatory framework that supports sound regulatory practices and protects people against floods as efficiently as possible and with the highest possible benefits for all actors involved.

Ensure that sound water management regulatory frameworks are effectively implemented and enforced in pursuit of the public interest.

Regulatory measures for the enforcement of legislation related to flooding, and for more coherence with regulations in other fields, such as land use, law on local governance or local regulations are therefore necessary.

Namely, bridging the divide between land and water is a central element of regulations related to flood management and also a path to unlock greater co-ordination, in particular across places and policies.

Apart from increasing flood management efficiency, a sound institutional framework needs to consider and address the potential clashes that flood regulations can have with land, as property owners become increasingly exposed to risk. Furthermore, flood management regulation related to public participation and clear and transparent regulatory functions offer a window of opportunity for co-ordinating various actors and interests. In sum, regulation, coupled with flood policy and long-term strategies, could provide a more holistic approach if adopted with regards to flood management.

3.6 Specific Gaps of the Main Relevant Legal Instruments

3.6.1 Adequacy of Legal Instruments for Environmental and Social Risk

Generally, with regards to environmental and social management issues, legislation is in continuing process of development in Nigeria. Amongst the existing pieces of legislations highlighted above, there are a number of state, national and international environmental guidelines applicable to the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) programme.

The Oyo State Ministry of Environment and Natural Resources and other relevant MDAs – have enabling laws which support the objectives of this SESA and has the power to enforce all activities to comply with environmental laws and regulations to mitigate any negative impact on the environment. This is presented as follows:

- Ministry of Environment and Habitat Law 2012: Oyo State Environmental (Sanitation and Waste Control) Regulation 2013 II Environmental Sanitation and General Cleanliness Section 4 (“litter prohibition) sub section (4) B20.
- Ministry of Environment and Habitat Law 2012: Oyo State Environmental (Sanitation and Waste Control) Regulation 2013 II Environmental Sanitation and General Cleanliness Section 4 (“litter prohibition) sub section (1)-(3) B20, B27 and B 31

- Oyo State Emergency Management Agency (OYSEMA) established by law to manage emergencies and disasters including flood issues under Act 12 of 1999.

There is no existing State Urban and Watershed Development Plan, and it is recommended that there is preparation of Ibadan Watershed Development plan as a pilot for the Ona river basin that is being proposed to have dykes installed on the upper basin.

The Oyo Ministry of Environment and Natural resources are conversant with the Environmental Assessment (EA) legislation, procedures and framework applicable based on the Federal EIA Act 86 of 1992 currently under review process (it has concluded a public hearing with the National Assembly) and in synergy with the environmental and social safeguards policies/ESF to sustain the implementation of the safeguard instruments on all future projects arising from the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP).

The main challenge would be enforcement of these legislation/guidelines /standards without the enactment of the appropriate laws.

The Ministry of Environment and Habitat Law 2012: Oyo State Environmental (Sanitation and Waste Control) Regulation 2013 II Environmental Sanitation and General Cleanliness Section 4 ("litter prohibition) sub section (4) B20 briefly highlights some regulations on littering, flooding, land use, channelization and setbacks. E.g. No person shall build kiosk or shop on road median, drainage or road setback. (*No such restriction on flood plain,*) *The law covers only kiosk or shop, not houses and focus is on road median or drainage not drainage infrastructure for the river basin*. There is information on setback to a river or stream. *There is no mapping of the setback nor is there reference to a watershed or what is a flood plain, furthermore the law does not restrict the land use activities nor map out a means to engage the communities in development planning and decision making outside the EIA Act thus creating lacuna that needs to be addressed as indicated* in annex 7.

3.6.2 Adequacy of Legal Instruments for implementing the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) towards Managing Flood Risk

Existing legislations which can provide legal backing for the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) are embedded in regulations such as: The Land Use- Development Control; Town and City planning; Environment and Water resources; Emergencies and Disaster management.

There is lacuna in the existing environmental laws and physical planning and regulations as neither of these consider sub watershed planning and the following flood risk reduction requirements or guidance, or programmes in current laws: -

- requirements for initial risk in a flood plain,
- have flood plain mapping,
- the requisite zoning,
- building codes nor standards for drainages structures for either the hilly terrain, flood plain/ flat areas, dual drainage design,
- major drainage mapping the risk communication and the responsible authorities for the communication in the watershed,

- the evacuation plans for each watershed catchment,
- the requirements for the natural storage, attenuation, levees,
- the standard flood proofing or insurance cover for structures in watershed catchment. These lacuna needs to be addressed by a review in the environmental law and physical planning regulations by the State Ministry of Justice in collaboration with the MENR and Planning authorities through budgetary resources, so the Integrated Flood Risk Management and Drainage Master (IIFRMDMP) is not rendered ineffective beyond the Project level. Plan

These will need to be addressed in environmental law and physical Planning regulations review by the Ministry of Justice. Furthermore, there is a culture of cost-cutting (avoidance of the planning permit cost and process) that encourages developers and builders to ignore even the existing regulations regarding structures in flood plain and drainage; this practice is common and widespread. Contributing to the problems, are lack of incentive for compliance and political will for enforcement. Policy and legal arrangements can only be effective and have credibility against a backdrop of good governance. The lack of accountability and transparency undermines the functioning of existing and new arrangements, and can even lead to new avenues for corruption.

These could be addressed through a framework of laws/ policies that "speak the language" needed to engage the broad sectors needed to be involved. The societal change required is transformational, requiring nuanced regulatory approaches that combine limits with incentives in a balance that can be adapted as progress is made.

Furthermore, regulators can use the digital tools and technologies to achieve significant gain to create wholly new ways of delivering products and services in relation to permit processing such as;

- Increasing internal efficiency through automation of regulators manual task and optimizing inspection and enforcement efforts
    - Regulators process large amounts of paperwork and perform other repetitive, labor-intensive tasks. Thus automation of manual tasks can get them done quickly and efficiently, without going over budget?
    - Furthermore, due to their limited resources, regulatory agencies responsible for inspecting buildings, and other facilities typically can inspect only a fraction of the establishments under their charge, which can result in risks to public health and safety and other cost cutting corrupt practices. Predictive analytics and machine learning, however, have proven effective in helping regulators prioritize which establishments to inspect
- Reducing the reporting burden to make better use of data to improve regulatory outcomes
    - Unfortunately, current regulatory data is collected largely without common standards. By implementing data standards and integrating systems across agencies in the land and water nexus (Environment and Lands), regulators can

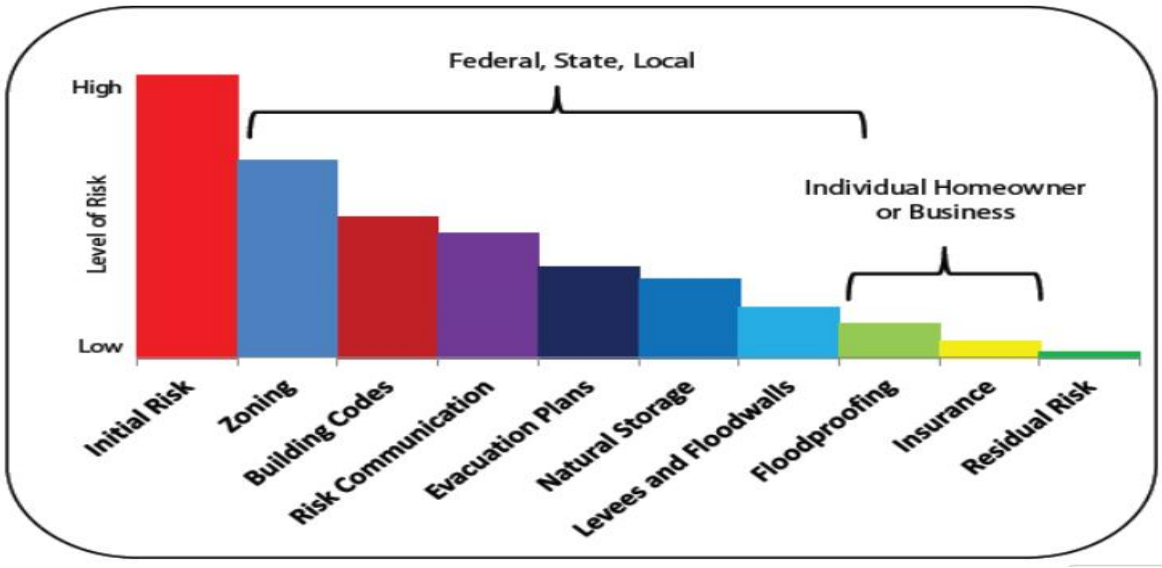
use the data they already have to reduce businesses' reporting burden. Taking advantage of data collected by external aggregators also can help ease reporting burdens.
    - Improving the government to business (G-to-B) experience to reduce compliance costs for businesses without compromising consumer safety?
    - By adopting a customer experience (CX) mindset, governments can make business compliance easier, boosting voluntary compliance rates.

There is need for updating the existing Laws, Acts, Mandates, Regulations, and Guidelines to support policy implementation of the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) with respect to institutional gaps (identified in annex 7) the following key areas:

- Regulate the occupation of high-risk hydrological areas
    - To control river flooding.
    - Ensure availability of river water for daily and industrial use.
    - Classifying rivers.
    - Dividing them into sections.
    - Delegating responsibility for the administration of their various subdivisions.
- Regulate environmental impact assessments for all developmental activities that can bring about (flooding, erosion; water pollution)
- Regulate the managerial tools to be used by the Planning/ drainage office
    - Coordination and cooperation between the various organizations, institutions, sectors and users;
    - Availability and accessibility of the basic data and information for informed decision-making;
    - Building an enabling environment for all stakeholders to participate and make collective decisions

Without binding legal enforcement, the DMP will be ineffective. Legal framework that will support effective implementation of the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) must be considered as part of flood mitigation measures in a watershed catchment basis balancing the water and land nexus e.g. river planning, river improvement, dam/ dyke construction, disaster recovery, sand control measures and coastal preservation, land-use plans, watershed /catchment management plans, building codes, engineering design, monitoring and control of construction and zonation.

The mandate of the Ministry of Environment and Natural Resources needs to be upgraded to respond effectively to issues of flood, manage the risks and strengthened to assure sustainability of the investment of the IUFMP to mitigate flood in Ibadan. See annex 7 for details on institutional gaps. Some flood risk and requisite management options have been identified in the figure below.



[6]Figure 3. 4: Flood risk and requisite management options at institutional and Private levels

The need for a statutory watershed management authority to manage flood risk and implement the drainage master plan endowed with financial independence is ideal. To achieve this goal, the Authority can only levy charges on the water users, public or private with the aim of helping to finance projects necessary to improve the resources or undertake environmental protection.

Their objective will be to promote and monitor activities related to the river basin and its setback in Ibadan specifically and the State at large for compliance enforcement of the drainage master plan for structural and non-structural activities in the watershed /catchment basin, which are of public interest all within the flood plain and setbacks of the river basin. This is, therefore, the application of the "polluter pays and "user pays principle of water resources management and thus a financial incentive to eliminate pollution and wastage, and to economize on water and this statutory backing is to give power to exercise police power and power of eminent domain.

Flood problems are becoming an increasing concern to the urban sector. As the concrete built environment, bitumen roads and pavements do not allow natural run-off to occur, water will run to the lowest points of the city and accumulate. Industrial and domestic wastes also pose a threat as they can contaminate the floodwaters and create a health hazard.
A semi-autonomous authority can bring flood mitigation practices into its location choices, and design and construction work, ahead of any decision by a higher authority. It can co-operate with community groups, non-governmental organisations and transport authorities on a one-to-one basis. At the same time, it can promote a shared concern for flood risk reduction through citywide discussion groups and committees. It can offer a service to others in the fields of:
• Infrastructure data management.

[6] Flood risk and requisite management options at institutional and Private levels https://www.nap.edu/read/18309/chapter/8#110

• Mapping: geological, surface and settlement.
• Geographical Information Systems (GIS).
• Preparation of risk maps showing areas liable to flood and other hazards.
• Provision of public information, that have been provided in the course of developing the DMP.

3.7 Specific Gap Analysis of the Main Relevant Institutions on flood Risk in relation to the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP)

The Oyo State Ministry of Environment and Natural Resources (OYME&NR), Department of Environmental Engineering and Beautification (DEEB), have responsibility for channels/ drainages dredging/clearing and maintenance; Environmental Beautification and maintaining greening and landscaping of major routes in Ibadan metropolis; Water Resources management activities such as watershed management, water course protection and conservation, hydrological and meteorological studies, borehole drilling control activities and Urban water supply policy control and monitoring.

The Ministry supervises the operations of Water Corporation of Oyo State and Rural Water Supply and Sanitation Agency of Oyo State. There are forty (40) Dams in Oyo State with potentialities to build more.

In the area of Erosion and Flood Control, the Ministry has been very much active by carrying out activities such as inspection and control of drainage facilities, enforcing observance of building codes, setbacks and dredging of rivers in Ibadan Metropolis more in cooperation with the Ibadan urban flood management project (IUFMP).

The identified responsibilities outlined above are on an ad-hoc basis and those related to flood mitigation has been supported under the IUFMP project. To implement therefore the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) in the context of watershed catchment management plan would require the Strengthening of the Ministry and the address of the following issues.

❖ **Weak Staffing level**

- Few members of staff from both the environmental engineering and beautification and water resources management departments consisting of about 28 percent of required workforce are recognised as technical committee members of the Ministry of Environment and Natural Resources and have access to the equipment and resources needed to manage the information and tools contained in the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP).
- Institutional level expected through the appointment of designated staff on Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) development has become weakened as a result of the retirement of the designated staff at the completion stage of the DMP, hence institutional knowledge was lost.
- Capacity development of staff in dam management, and drainage master plan implementation in the six basins.
- The department with the mandate for flood risk reduction and watershed management is ill structured to deliver the implementation of the DMP at its current status (see

details of manning level in annex 1), thus, will require upgrading and strengthening into fully equipped department or an agency under the ministry as it is being proposed in a bill.

❖ **Poor Funding and Resources**

- Changes in physical conditions and availability of resources.
- Lack of funding or allocation of budget dedicated to flood risk mitigation or to support and implement the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP).
- Often those charged with implementing flood risk management must relatively quickly allocate their scarce budgets, with no certainty about future budgets, in order to efficiently deliver perceived reductions in flood risk. Statutory Cost-Benefit assessments rarely favour prioritisation of non-structural FM over structural measures to reduce risk of severe floods over mitigating more frequent smaller ones. Thus becoming factors in mismatches in cycles of funding and planning across organization with functions related to flood risk.
- Solid waste is a major cause of drains being blocked, responsibility for management of waste has been shifting between full governmental institution control and Public-Private Partnership control laws. Even with that the Ministry of Environment and Natural Resources is expected to still play a key role in the regulation and oversight functions of solid waste disposal issues within the State along with other duties. By law three governmental agencies are charged with the responsibilities of managing solid waste in Ibadan. They are: (j) The Local Government Councils (ii) The Oyo state Solid Wastes Management Authority; and (iii)The Ministry of Environment and Natural Resources

❖ **Coordination**

- ❖ Coordination meetings on the IUFMP project at the State is limited to the IUFMP steering committee that has relevant MDA(s) in the state as members at policy decisions. This coordination mechanism is working well and needs to be strengthened to continue for the implementation of SESA and the DMP after completion of IUFMP.
- ❖ The Oyo State Ministry of Environment and Natural Resources Collaborates with both the Federal Ministry of Environment and Federal Ministry of Water Resources.
- ❖ At the Federal level it a case of consultation as at when needed as there is no mechanism or structure for coordination meetings. There is no law requiring coordination of development activities of the environment and water resources in the watershed.
- ❖ From the Perspective of the Federal Ministry of Water resources, there is weak synergy between the Ministry and the State/ Local government as a result of institutional challenges such as resource constraints, non-payment of bulk water supply by state to the Ministry (low budget allocation to the water sector over the years has militated against the realization of set targets. In addition, budgets releases have been inadequate and untimely. Furthermore, budget implementation period is effectively less than one year thereby affecting project execution which utilizes dry season for construction.)

- ❖ The Federal Ministry of Environment collaborates on environmental impact assessment preparation and public hearing before approval with the state.
- ❖ Other forms of collaboration for the State and Federal is the annual National Council of States Meeting on Environment and on water resources respectively where policy decisions on environment and that on water resources are taken by the States.
- ❖ Properly Coordinated Water Resource Management Requires Intergovernmental and Interagency Cooperation, and Does Not Necessarily Require "Consolidation" of Responsibilities.

❖ Another key MDA in the development and maintenance of the drainage system in Ibadan is the Oyo State Ministry of Public Works, Infrastructure and Transportation (OYMPWIT), Department of Highways (DH). The Highways Department is involved in the following activities as the need arises:

(i) Design of roads, culverts and bridges;
(ii) Construction of roads, culverts and bridges;
(iii) Supervision of construction works;
(iv) Appointment of consultants for Design and Supervision of Road Projects; and
(v) Consultancy Services to Ministries and other Agencies on Civil Engineering related matters among others.

The main mandate of the ministry is

- Advising Government on policy matters in respect of road transportation with a view to providing an effective network of roads that will enhance economic growth throughout the State.
- Advising Government on policy matters in respect of public buildings including construction, rehabilitation and maintenance.
- Advising Government on policy matters in respect of procurement and maintenance of mechanical and electrical appliances and gadgets throughout the State.
- Provision of firefighting services and equipment to combat outbreak of fire and **other disasters in order to safeguard lives and property of its citizens.**

Beyond the above responsibilities, the ministry of public works, infrastructure and transportation have overlapping duties with the Oyo State for Road and Maintenance Agency. Also, there is no clear classification of roads which sometimes leads to the local governments interfering with the Federal and State roads creating confusions in the urban road management and development, thus the **need** for allocation of responsibilities.

Other Agencies with a role include the Ministry of Lands, Housing and Urban Development (MLHDC) and the Ministry of Local Government and Chieftaincy Matters (MLGCM), through the local governments.

The MLHDC has identified the flood plains but has not prepared plans for their use such that they can retain this essential function while also giving them a functional use that would discourage such development that would negate this function. Alternative uses could be as parks and playing fields, or areas for urban agriculture. MLHDC have identified 1,813 buildings on flood plain that need to be demolished, and the power to do so lies in Powers provided in clause 48, 49, 50 and 59 of State Physical Planning and Urban Development

Law[7]. However, such a decision requires strong political support along with the ability (funds) to relocate the people living in these areas.

To prevent illegal development, development control is essential. Lack of manpower, corruption and lack of political will, all make this task harder. Education and a wider understanding of the plan and its purpose would help. Simple steps such as clearly demarcating areas as reserved open space might help. Furthermore, the Local Government should be involved in helping identify early any transgressions.

Prior to the establishment of **OYSEMA by Oyo State Emergency Management Agency law 2009**,the former State Emergency Relief Agency (SERA) that operated within a limited scope was in charge of disaster management.

This was the situation until year 2004 when the Agency was moved to Cabinet and Security Department, Office of the Governor as a Unit. By year 2006, the Agency was domiciled at the Governor's office and in year 2009, a formally established OYSEMA came into existence. Its mandate is to Mobilize Resources Towards Efficient and Effective Disaster Risk Reduction in Oyo State.

The identified gaps in terms of mandate to deliver Flood Risk Management Roles and Responsibilities, the available information resources from the current IUFMP projects to support delivery of the responsibilities are highlighted in the Annex 7.

[7]Source: BPPDC response to Consultant's Questionnaire November 2017

CHAPTER FOUR: STAKEHOLDER CONSULTATION

4.1 Program Stakeholder identification and Analysis

Program stakeholders are 'people who have a role in the Program, could be affected by the Program, or who are interested in the Program'. Project stakeholders can further be categorized as primary and secondary stakeholders. Primary stakeholders are individuals, groups or local communities that may be affected by the Project, positively or negatively, and directly or indirectly especially those who are directly affected, including those who are disadvantaged or vulnerable. Secondary stakeholders are broader stakeholders who may be able to influence the outcome of the Project because of their knowledge about the affected communities or political influence over them.

Thus, in the course of the SESA studies, the stakeholders and actors involved in flood risk management as indicated in figure[8] 4.1– at varying degrees, are defined as individuals, groups or other entities who:

(i) Have a role in the DMP implementation (also known as 'implementing agencies');
(ii) are impacted or likely to be impacted directly or indirectly, positively or adversely, by the DMP (also known as 'affected parties'); and

May have an interest in the DMP ('interested parties'). They include individuals or groups whose interests may be affected by the DMP and who have the potential to influence the DMP outcomes in any way

The details of their interest is elaborated in annex 9. Inputs received in the course of interaction and various methods of engagement including completed questionnaire administration were duly incorporated.

A stakeholder mapping exercise was conducted in June 2017, in conjunction with the PIU, to identify all potentially relevant stakeholders for the SESA study.

4.2 Stakeholder Categorization

For the purposes of effective and tailored engagement, the stakeholders on flood management in Ibadan can be divided into three core categories:

1. Implementing Agencies
2. Affected Parties
3. Interested Parties

[8] Integrated Flood Management Tools Series No.7 Version 2.0 © World Meteorological Organization, 2016

Figure 4. 1: Identified Stakeholders and Interest groups relevant to flood Management

4.2.1 Implementing Agencies

This category of stakeholders encompasses the leading agencies responsible for overseeing the successful implementation of the flood risk management in general and the drainage master plan in particular. They include the:

- Oyo State Ministry of Finance Budget and National Planning (OyoMoF);
- Oyo State Ministry of Environment and Natural Resources (Dam /Reservoir Operators, Environmental regulator, sewerage services, drainage services)
- Oyo state ministry of Works (drainage services)
- (Basin authorities)
- Oyo state Ministry of Lands

- The EA Department of the Federal Ministry of Environment; (Environmental Regulators)
- The level of engagement with implementing agency will be contingent upon their respective roles and authorities in the management of environmental and social risks.

4.2.2 Affected Parties

Specifically,

- The residential, industrial and commercial facilities along the flood plain
- The core investors in farming, irrigations, shareholders along the flood plain
- Local communities and business
- Contractors/ equipment suppliers on DMP

There could also be impacts on indirect workers who will be engaged under the DMP activities. A subset of this category are the vulnerable groups. A significant factor in achieving inclusiveness of the engagement process is safeguarding the participation of vulnerable individuals in public consultations and other engagement forums established by the program. Vulnerable Groups are persons who may be disproportionately impacted or further disadvantaged by the project as compared with any other groups due to their vulnerable [9]status, and that may require special engagement efforts to ensure their equal representation in the consultation and participation in the program.

4.2.3 Interested Parties

Interested Parties include stakeholders who may not experience direct impacts from the Project but who consider or perceive their interests as being affected by the project and/or who could influence the project and the process of its implementation in some way. Specifically, this category included the following individuals and groups:

- The local population who can benefit indirectly from interventions;
- Residents and business entities, and individual entrepreneurs in the community area of influence;
- Professional groups in the building industry, and environment sector.
- Local contractors and consultants who can support in the delivery of the Project;
- Local, regional and national level civil societies and non-governmental organizations (NGOs) with an interest in consumer's advocacy, Social Protection and livelihood support;
- Other government ministries and regulatory agencies at regional and national levels including environmental, technical, social development and labour authorities;
- IUFMP Project employees and contractors;
- Mass media and associated interest groups, including local, regional and national printed and broadcasting media, digital/web-based entities, and their associations;
- Local Political groups;
- Academia

[9] Vulnerable status may stem from an individual's or group's ethnic or social origin, color, gender, language, religion, political or other opinion, property, age, culture, literacy, sickness, physical or mental disability, poverty or economic disadvantage, and dependence on other individuals or unique natural resources.

- Local NGOs and initiative/advocacy groups, particularly those focusing on consumer's interest environment and social development issues, represent the considerable capacity that the project(s) may tap for disseminating information and raising awareness of the planned activities among the potentially affected communities in the project area.

4.3 Engagement Methods and Tools

For the engagement process to be effective and meaningful, a range of techniques was applied specifically tailored to the identified stakeholder groups. Methods used for consulting with Government officials take the form of formal approaches often different from a format of liaising with local communities (e.g., focus group discussions, displays and visuals with a lesser emphasis on technical aspects). Table 4.1 provides the consultation methods for various stakeholder groups.

Nonetheless the format of every engagement activity met general requirements on accessibility and ensured the participation of vulnerable individuals and women groups in project consultations with tailored techniques.

Information that was communicated in advance of public consultations primarily includes an announcement thereof in the public media – local, as well as the distribution of invitations and full details of the forthcoming meeting well in advance, including the agenda. It was crucial that this information was widely available, readily accessible, clearly outlined, and reaches all areas and segments of the stakeholders. Furthermore, the messages were targeted according to the stakeholder and issues.

Table 4.1: Stakeholder group consultation methods

STAKEHOLDER GROUP	CONSULTATION METHODS
Government officials	• Phone / email / text messaging • One-on-one interviews • Formal meetings
Local communities	• Print media, text messaging and radio announcements • Subject specific fliers on flood management • Public meetings • Focus group meetings • Surveys • Information Centre
Vulnerable Groups	• Print media, text messaging and radio announcements • Public meetings • Focus group meetings • Surveys • Information Centre
Employees and managers	• Phone / email / text messaging • Print media and radio announcements • Workshops • Focus group meetings • Surveys
NGOs, CSOs Political Groups, Academia, Partnering organizations and other interest groups	• Phone / fax / email / text messaging • One-on-one interviews • Focus group meetings • Information Centre • Press Statement

In all the communities and meetings with key statutory stakeholders interacted with in the course of the SESA study A constant mode of engagement was through use of Subject-specific Fliers, Focus Group Discussions, interactive meetings with an introductory letter. Table 4.2 is a summary issues raised at the community levels and figures 4.2 is some photo speak.

Thereafter series of technical workshops were held throughout the lifetime of the project on different issues. Details on the outcomes of this workshops can be found in a report on the project website www.Ibadanflood.org.

4.4 Other Consultations, Review and Approval

- Several consultations, review and working meetings, presentations and four levels of workshops were held with the Drainage and Flood Risk Management Consulting firm (DAR) to ensure close collaboration and coordination of efforts, affected communities in the study area, key experts from the Oyo State and Federal Ministries Departments and Agencies (MDAs), relevant stakeholders including two high level segment with the IUFMP steering Committees in (between 2017 and 2020) precisely; 15th-16th August, 2017, 31st January & 1st February, 2018. 24th and 25th April 2018 and 22nd January, 2020.

- The four levels of workshops included two scoping workshops, city level and Government's Agencies workshops. Stakeholder inputs and concerns formed the basis of this report. Other details of the workshop agenda, attendance and consultation concerns and list are presented in annex 13-17. Table 4.2 is summary of concerns from the stakeholder workshops.

4.5 Identifying Themes to Discuss with Stakeholders

An important part of the Stakeholder Engagement process was to identify themes to discuss with Stakeholders and to ensure that these themes include issues that were important to them.

Stakeholders were also given the opportunity to highlight any other issues of importance which have not been identified under the SESA studies.

In addition, all participants in any of the community consultations were given 3 cards-pink, yellow and blue for them to list out issues concerned within their communities and their expectations from the government on flooding risk management in order of importance: Pink for no 1 priority, yellow for 2nd priority, blue for 3rd priority. The cards were collected at the end of each meeting or interactions and the issues of concerned listed were compiled.
The following list shows the themes identified to discuss with Stakeholders.

1. What are the land use planning and regeneration etc. practices in the community?
2. What are the flooding scenarios or types occurring in the community?
3. What are your understandings of the cause(s)?

4. What are your picture of stakeholders working together in (say) 5/10 years' time in relation to (say): flood risks and defences?
5. What would you like the Ministry of Environment or Lands to do to move towards this?
6. What would you like other stakeholders besides the Environment or Lands Ministry to do to move towards this?
7. Workforce health, safety, labour skills & training.
8. Knowledge/ Compliance to Government legislation & Policy on building on flood plain, drainages.
9. Vulnerability & livelihood
10. Environment & sustainability

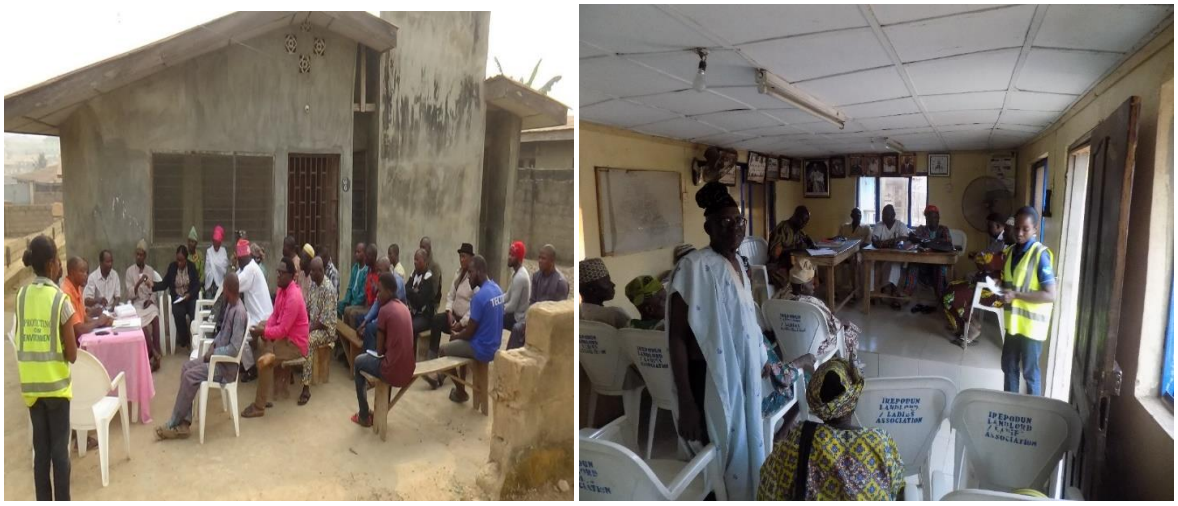
4.6 Photo Speak on Community consultations and Interactions

Pictures below presents evidence on community consultations/ interactions.

Odogbo-Ifelodun Community meeting

Community meeting at Akinwumi

Community meeting at Odo-Ona Kekere and Ogbere (Kumapayi Area)



Community meetings at Jerusalem arulogun, kajorepopo- irepodun community

Figure 4. 2: Pictures from Consultations

Table 4.2: Consultation Summaries from Communities on Situational Analysis & Risk Assessment of Flooding at Community levels

SN	Communities	Issues of concern
	Odogbo-Ifelodun	• The River was out of curtailment and beyond the control of the community • Amuludun Radio Station channelled its drainage right into the Community contributing to the increased volume and velocity of the River • Whenever it rains, there was always a heavy run off from the upland communities across the Express Road • The bridge across the River was badly damaged such that after rains, the community have to support the sides of the bridge with sandbags to make it accessible. • Once it rains, the community members living across the bridge are cut off from going home because of flooding and damaged bridge • The erosion from uphill has also damaged the drainage on the road that leads into the community. • Community efforts at managing the bridge include contribution of money to temporarily repair the bridge which only last between 6-12 months.
	Kajorepo-Irepodun	• The bridge was damaged and very low with water level rising to cover the bridge during rainfall and prevent passage across the bridge • Some inhabitants of the community have built structures along the river course • Two rivers (one from Barracks and the other from Arulogun) form a confluence close to the bridge. The river from barracks has a high flow rate which overflows the bridge during rainfall. • Waste collection by waste contractors was also an issue in this community as some waste collectors collect money for three months and would not show up more than twice, thus encouraging dumping of refuse into the water body. • Difficulty in stopping sand mining from the river by new members of the community.
	Akinwumi	• The bridge was small, low and badly damaged • The river was usually flooded anytime it rained • People on the other side of the river are cut off from their homes. • Two rivers (from AlarereGbagi and Ogbere from Balloon) met at a confluence in the community which strengthens the velocity of the river whenever it rains. • There was heavy sedimentation in the river as evidenced by the high siltation level • Indiscriminate dumping of refuse into the river.
	Odo-Ona Kekere	• There was a high sedimentation rate • Flooding first occurred in 2011 and once a year, but this year 2017, it has occurred like three times • The water floods the nearby market and community and destroys goods and houses • Waste dumping into the river from the community and passers-by.

		• Some influential people in the community also send their servants to dump waste into the river with their vehicles.
	Ogundipe (Kumapayi)	• The river has a high flow rate and usually covers the bridge such that whenever it rains, the community was cut off completely and lots of the people are prevented from going home for two days. • The bridge was now too small for the expanding river and lives have been lost as a result of this • The community had dredged the river as a community effort. • Sand mining in the river was also a major issue in the community and police have been employed to help watch and catch anyone involved in mining sand in the river. • Sometimes when it rains in other communities upstream, the river overflows into the community and floods everywhere. • Flooding still occurred on 22nd July 2017 in the community.
	Ogbere (Kumapayi)	• Omi River forms a confluence with the Ogbere River in this community with a high velocity causing a backflow of Ogbere River which floods the community. • The river was always flooded anytime there was a heavy rain and overflows the bridge. • The bridge was too small (height, width and depth).
	Jenriyin	The bridge was too small and damaged.
	Odo-Ona (Ori-Gada)	• Opening of the Eleyele dam contributes to the overflowing of the river. • The only flood event recorded was the 2011 flood and since the dredging of the river, no flood issue has been recorded • Blocked drainage with waste from flowing streams. • Indiscriminate dumping of waste into the river by people living around the river and passers-by. • Houses have been built close to the river which are obstructing the river flow
	Nihort	• Bridge was too small and narrow • Flooding takes about an hour to drain off the road and in the meantime, movement was prevented along the bridge. • The flood has claimed two lives and it could be linked to the opening of the Eleyele Dam anytime water was released.
	Alaro-Sumal (Oorelope)	• The bridge was badly damaged • Sumal Industry built its fence along the river course and uses this to divert the river flow into the community • Waste disposal was a major problem in this community as only few houses have waste container in front of their houses.
	Ariyo	• The river was flooded any time it rains • The market was located on the flood plain and was built in 2003 by the Local Government. • Market waste goes directly into the river and also water from the Abattoir was discharged directly into the river • There was no waste collection point for the market nor any private waste collector in the vicinity. • The culvert of the bridge was partitioned and was mostly blocked by waste from upstream of the river and the market. Hence, when it rains, the whole market and nearby houses are flooded. • There was a Petrol Station built close to the river which obstructs the river flow. • Community efforts at controlling waste dumping in the river include making announcement in Radio Stations (Petals FM and Inspiration FM) last year and keeping late night watch in order to catch culprits.
	Onipepeye Area	• Flooding occurs almost every time there was a heavy rain • There was usually a backflow of the river because of the obstruction of the bridge downstream along the Iwo Road Express Way of the Onipepeye area. • This causes the smaller bridge to be flooded always • Shop owners and traders on the flood plain of the river were non-challant.
	OgbereTioya	• Low bridge • Indiscriminate waste disposal into the river • Houses constructed on floodplains

		• No waste contractors working in the community
	Bode Wasimi	• The river was diverted from it's main course by some people who built their houses on the flood plain. This had greatly contributed to the flooding issues. • Indiscriminate waste dump into the river since government ban people from putting their refuse on the Iwo Express Road median. • Most people practice backyard waste burning
	Iwo Road (Nurtw)	• Flooding occurs every rainy season throughout the year • Waste problem was too much for the community to handle. • There were no issues until the road was extended as a dual carriageway. • Houses have been built on flood plains which was obstructing water flow. • People dump waste from across the express, passenger boarding vehicles at the NURTW Park also dump their waste and sometimes defecate in the community. • The culvert under the express road created for the river to flow through was very small and half blocked. • Most times, the culvert was blocked by waste until community people evacuate the waste before water could flow through. • There was a large drainage system from the Iwo Road Roundabout under-bridge that also empty its content into the river. • Flooding water takes about 2-3 hours to subside. • Most times when it rain at Akobo and Agbeni, the river in the community overflows even when there was no rain in the community. • There was a high level of siltation / sedimentation in the river. • The people on the floodplain plead for compensation as they don't want their houses demolished.
	Apete-Awotan	• There was a high level of siltation / sedimentation in the river. • The people on the floodplain plead for compensation as they don't want their houses demolished. • The bridge is too small. • The dredging done yearly has not solve problem ofriver overflowing to houses
	Ajibode	• The river has a high sedimentation rate • The passage made for water under NWASER fence was blocked, thus, flooding the road with run-off. • It takes like 3 hours for the flood to drain off the road.
	Bodija	• By the end of the raining season, the river was overgrown with weeds • There are two uneven culverts which does not allow easy passage of water during rainfall. • Waste was being washed from upstream beyond Restoration bridge • Sand Sediments was coming from upstream washed off from the sides of the river channel and from erosion • People are cut off when it rain • After the construction of the restoration bridge, the volume of water flowing through the area increased • Waste collection system was ineffective due to inconsistency in Service provision despite the high rates charged. They don't have efficient capacity, capability and equipment • Fence of houses collapse all the time
	Kudeti-Apateere	• There is nowhere to dump refuse, hence, people dump it in the river. • The river flow as high as a story building when it floods. • Contractors are not available to pack waste in the community.
	Kudeti-Kobomoje	• The river was the main dump site and toilet for the community. • The community was reluctant to pay contractors to dispose their waste • There has not been any flood case in the community since the bridge was constructed • The people are afraid of houses being demolished and that most people had be dead before compensation was made.
	Kudeti-Agbongbon	• Flooding has occurred twice and since the bridge was constructed, it has stopped. • Most houses on the flood plain have been marked for demolition and some are already being pulled down by the river flow.
	Arulogun	• The bridge on the Ojoo-Arulogun road was badly damaged. This causes water from Ojoo barracks to flood the road cutting off people in this community anytime it rains.

		• The river that flows through this community usually overflow anytime it rain because of the wideness. • Erosion washes storm water and sand from neighbouring communities (Banda, Oyediji, Wasoko, Aba-Eko) into the community. • Erosion has also washed off drainages in the community and demolish fence of houses and damaged most roads.

Table 4.3: Summary of the Views, Concerns, & Recommendations, from all SESA Consultations

S/N	Stakeholders Concerns from consultation engagements	Remarks/ Recommendations
1.	What proportion of one's land can be constructed under land use policy?	Land owners are not allowed to build more than 40% of the land area other town planning law. The remaining area account for boundary from pillar to fence, setback and drainage. The government has been sensitizing the public on proper land use. People were implored to obey setback and patronized government approved town planning authority for genuine approval.
2.	Whose responsibility is the construction of drainages for houses, the government or house owners?	The community is the most affected when there is flood disaster. We should therefore not leave flood prevention and risk mitigation only into the hands of the government. We should all be responsible for the waste we generate. Each house owner should construct drainage for their houses and the different drainages should be well connected to the major water channel.
3.	Can those who engaged in indiscriminate refuse disposal be arrested and punished by the community members without involving the government law enforcement officers?	Community members should hand over offenders of environmental laws to the law enforcement officers in the State to be prosecuted under law.
4.	Are members of the communities allowed to burn or bury their waste instead of patronizing the government approved waste contractors?	The law does not support burning nor burying of waste. Burning of waste results in air pollution or can result in accidental fire outbreak. On the other hand, buried waste can leach into and contaminate ground water. Each house should get a refuse bin and patronize government approved waste contactors for collection and proper disposal.
5.	How can houses constructed downhill be protected from flood?	Setback should be observed. There should be enough river setback for flood overflow.
6.	Who is responsible for tree planting in the process of employing green infrastructure in preventing flood?	Tree planting is the responsibility of everyone.
7.	How can the government tackle non-compliance to environmental and town-planning laws?	Government should ensure enforcement of environmental and town planning laws and avoid political interference
8.	How does the Insurance Company fix the premium for house owners with small buildings/properties?	The property will be valued, and this will determine the amount of premium paid. It is 0.25% normally.
9.	If there is emergency in developed countries, there is provision of relief materials (by Insurance Company) for affected people during relocation. Is it also possible here?	When you want to sign up an insurance policy, discuss in details before signing up the documents.
10.	What are the requirements/documents needed to sign up an insurance policy for landed properties?	Some of the documents/papers that will be required include approval from town planning, C of O, Survey plan and any other necessary documents.
11.	How long does it take before compensation is being paid?	When a loss is reported, assessment will be done and the company will act. Also, it depends on the insured if he/she can give the estimate of the damages on time
12.	Will the insurance company compensate an individual whose property is not insured but got affected by helping someone whose property is insured?	As long as the source of the disaster is from the insured, it is covered.
13.	Does Insurance Covers Agricultural produce by farmers?	Yes, there is an Insurance policy that covers agricultural produce.
14.	The role of insurance should be appreciated and extended to disaster	The insurance will also cover market fires and disaster.

	management including market fire and not limited to flooding.	
15.	What happens to the premium if there is no disaster?	The Company uses the premium of many to pay few.
16.	Who will be responsible for the payment of premium?	Both the house/property owners and government.
17.	Can a tenant do insurance too?	A tenant can only insure himself and family members. He cannot insure the property since he is not the owner
18.	What of the hidden terms the Insurance Company normally use	Ask questions before signing policy documents because policies don't change. If you are aggrieved, write to National Insurance Commission.
19.	Will houses on the flood plain be demolished for the dredging or canal	Some structures on the flood plain will be affected in the course of channelization works. Appropriate mitigation to the people that will be affected will be taken and a specific study called RAP- resettlement Action Plan is to handled that aspect
20.	Will compensation be paid to those whose houses are affected	Yes, under the Land use Act we all know that those who have all their documentation and complied with the established setback ROW- Right of Way will received the requisite compensation for their land acquisition or land take. However for those within the statutory setback and also without papers, where the proposed World Bank assisted IUFMP project impacts on their structure and land, there will still be a form of resettlement that will be undertaken in the course of the RAP.
21.	When will the construction work start, and how long? Will the inventory of the PAPs be taken before the civil works rehabilitation commencement?	The construction work will be in phases. Also the community committee will be informed about the date of commencement few weeks ahead of time. Yes, inventory will start before commencement of construction work. In other to have a register for those whom the project construction will disturb
22.	Will the project carry everybody, including those not directly affected in terms of employment benefits and all?	The overall project is geared towards improving or restoring livelihoods. This project will carry all stakeholders involved along
23.	Is it possible for the government to include the narrow NIHORT Bridge in the IUFMP projects?	The bridge /Culvert is part of the projects already.
24.	Does Insurance covers natural disasters?	There is a policy called Fire and Special Peril policy that covers natural disasters.
25.	Indiscriminate dumping of waste in water channels should be discouraged at Akinwumi community as well as other communities by constituting Environmental Watch that will arrest and report offenders to appropriate authority.	The government is currently planning on constituting Environmental Neighbourhood Watch who will be involved in enforcing environmental laws. Offenders will be arrested and handed to appropriate authority for prosecution by mobile or magistrate court.
26.	Is there any compensation for houses along flood plains that were marked for demolition but without approval?	IUFMP has planned to compensate owners of houses marked for demolition.
27.	How soon will people affected get their compensation?	Affected individuals would be compensated prior commencement of civil works
28.	Can the participants/ MDAs have a copy of the excerpts of the environmental laws which will help in the enforcement processes?	The regulations are popularized and made available at different levels of MDAs.
29.	What is the Government doing on the problem of waste collection and management in Ibadan.	The Government is partnering with West Africa Energy on waste management and turning waste to Wealth. Comments on the issue of waste collection should be forwarded to the following contacts: 09099581501 (customer service manager); 09023136608 (OYWMA); and 08086435555 (Hon. Commissioner for Environment and Water Resources).
30.	A participant asked if there is need for the community members to write 'Save our soul' letters to the government before works can be done on their culverts/drainages.	There is no need of writing letters again since the communities have been identified.
31.	Will the project on drainage/bridge construction end by the end of 8years duration left for IUFMP to finance it?	No, it will not end. There is still Master plan project for another 20years
32.	A participant asked how the Landlord association in his area can enforce proper drainage for each house within the area	Enforcement is not within the purview of IUFMP. Town planning office and Ministry of Environment should be notified

33.	Which type of drainage/channelization will be done for the identified communities?	The kind of drainage/channelization for each community will depend on factors like topography/terrain of the area etc
34.	Who will be responsible for maintenance of the drainages/culverts	There are relevant government agencies for maintenance under Ministry of works. Community members can also do maintenance works like debris clearing, grass cutting as part of their community development.
35.	Ministry of Women Affair should also be involved in the implementation of OKIC&FF	OKIC&FF was the initiative of Ministry of Environment and water Resources but local government and other relevant authorities and MDAs like Ministry of Women affair will be involved.
36.	What is the basis for the selection of the priority sites?	IUFMP is working in collaboration with relevant MDAs who identified and recommended the most flood affected areas for intervention/rehabilitation before approval by World Bank
37.	What are the plans currently in place for the maintenance of the IUFMP project at the 4 priority sites?	Maintenance of infrastructures is not within the purview of IUFMP. It is the responsibility of MDAs to maintain the infrastructure because the Ibadan Master Plans are long-term projects. Performance contract had been signed by MDAs and submitted before the approval of the project by World Bank.
38.	What is the level of development of the project at the 4 priority sites? There is high expectation from the community members that the project should have been completed since it is World Bank-assisted.	The timeline for the civil work at the four priority sites was 12 months which should have been completed by July, 2017. But some other things came along the line and the contractor requested for 3 extra months for the work to be completed
39.	How much is the state and IUFMP engaging and educating stakeholders like NURTW and market women in order to discourage open dumping of refuse?	IUFMP in collaboration with the State Government has conducted different stakeholders' engagement/forum. Jingles are currently running on radio on proper refuse disposal and there will also be a weekly OKIC&FF drama series on television.
40.	Pollution and contamination of water bodies by leachate from dumpsites, organic and inorganic chemicals should also be considered in the environmental and social safeguard issues.	The Strategic and Environmental and Social Assessment covers health issues and the activities that can result in the pollution and contamination of water bodies including open defecation were included in the report.
41.	Are there any regulations guiding against sand mining?	Sand mining is regulated under water management. There is also sand mining regulation.

RESOLUTION/ COMMENTS FROM THE CONSULTATIONS WITH COMMUNITY HEADS, TRADERS AND COMMUNITY COMMITTEE

1. The town planning Authority should not give approval to landlords of buildings close to rivers without setback and tree planting
2. The relevant agencies should look into the issue of companies/individuals that are fond of fencing setbacks with their landed properties.
3. The government should employ more waste contractors so as to cover the whole city of Ibadan and monitor them for compliance. Any contractors that is defaulting in his duty should be disengaged.
4. Eleyele dam should be reconstructed and be used for generation of electricity.
5. The government should sensitize the general public on green infrastructures through the electronic media
6. There should be strong political will to environmental and town planning law enforcement mechanism by government agencies.
7. Overhauling the existing Institutional frameworks along their respective statutory mandates
8. Political interference should be avoided while enforcing the laws.
9. Government should employ Environmental Health Officers for law enforcement and Emergency management agency within the community.
10. There should be an effective community policing through vigilante groups.
11. Town planning authority should enforce inclusion of basements in house construction plans
12. The government should establish waste management centres within the various wards in the affected communities.
13. Redesigning and making accessible the existing disaster funds to disaster risk managers
14. Good Governance that promotes redistribution of wealth, social justice and behavioral transformation
15. Insurance scheme and policy with regulatory oversight for flood prone areas in Ibadan metropolis needs to be developed with enlightenment for the communities involved.

16. Government should enlighten communities about flood resilience options and support those who have been affected with relocation to a better place.

17. The government should plan ahead and provide adequate financial resources for the project in order to prevent project abandonment

18. River gauges should be erected at all rivers liable to flooding

19. Deployment of ICT for real time response and recovery planning.

20. Ibadan Urban Master Plan should be holistically pursued, implemented and sustained with periodic review.

21. Build Back Better principle should be incorporated in implementing structural design improvements to achieve efficiency and effectiveness in post-disaster rebuilding process.

22. United Nations project should have implementation research. There should also be an inter-sectoral committee on the issue of environment and IUFMP project.

23. Appropriate and affordable technology should be employed in the channelization.

24. Indigenous knowledge and concept of Ibadan city should be employed in solving the flood problems in Ibadan. The project should focus more on the behavioural aspect of mitigating flood risk in Ibadan such as behavioural change communication for the awareness and sensitization of the people on proper waste disposal for the sustainability of the project.

CHAPTER FIVE: ENVIRONMENTAL AND SOCIAL BASELINE DATA

5.1 Introduction

This section discusses the environmental and social baseline and receptors specifically those that might be influenced by the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) or flood management measures required under the SESA. The baseline serves to determine the critical decision factor in trend analysis and assessment criteria for verifiable indicators as presented in this chapter.

It considers the driving force in the evolution of each receptor in the context of its current state and trend analysis as optional pathways ([10]figure 5.1) that will help reach the intended objective of the proposed Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) (DMP) for the water catchment.

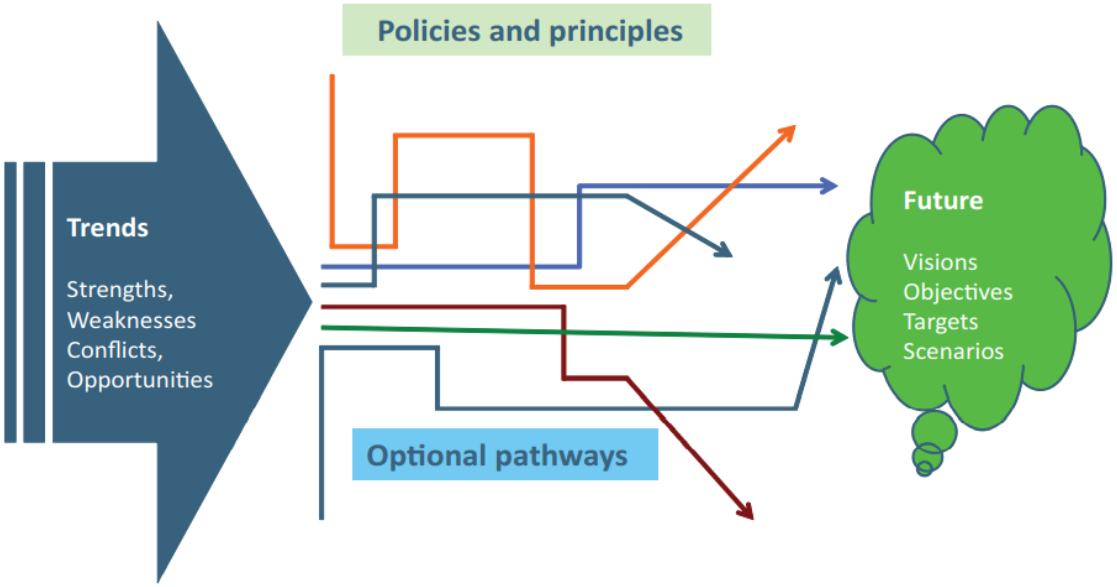


Figure 5. 1: Strategic options and optional pathways

5.1.1 Primary and Secondary sources of data

Primary data by sampling and checklists, were collected on the field by Specialists (Environmentalist and Social Scientists, Engineers and Community officers). Community Engagement, targeted Focus Group Discussion, Meetings with introductory letter, use of Subject-specific Fliers, and questionnaire administration was also conducted and concluded with series of technical workshops. Special consideration was made available on a need basis for separate consultations with women or vulnerable groups, within the community meetings.

The assessment of current flood management capacities was done (at three levels including flood management planning, prevention & protection, and response & recovery) with the survey as seen in table 3.4.

The checklist developed for the survey was sent to most of the experts through e-mails and in the course of the four level consultative workshops to facilitate the assessment.

[10] Strategic Environmental Assessment Better Practice Guide Methodological guidance for strategic thinking in SEA: Maria do Rosário Partidário, Professor at Instituto Superior Técnico - Technical University of Lisbon

The River gauge installation was also done to generate primary data on the water level during the initial four months' period of the SESA Study for the various river channels at Kudeti, Ogbere, Omi, Ogunpa and Ona (Orogun river flows into Ona). It was installed primarily by the SESA consultant to obtain data and as means to engage the local community in understanding their flood risk.
Secondary data was gathered from existing literature on past flood events in Ibadan and documented reports. Data was sourced for at various government agencies.

5.1.2 Focus Group Discussion

A key aspect of the SESA process was consultation and engagement. The SESA process provides a mechanism to ensure that stakeholder engagement and public consultation requirements are achieved by providing interested parties/organisation and the public an opportunity to inform the process and comment on decisions taken.
Focus group discussions commenced in July 2017 through to 2018 across affected communities in Ibadan along the drainage basins of Ogunpa, Kudeti, Orogun, Ona, Ogbere and Omi River channels that were identified for flood issues between 2011 and 2017.
The SESA study consultation was undertaken in key communities within the study area, with notice also given to the appropriate Environmental Authorities, Community leaders and associations, Local Government; and relevant MDAs.
It was important to ensure that environmental and social issues, constraints and opportunities are identified and assessed at an early stage of the project, alongside technical or economic aspects.

5.2 General Description and Location

Ibadan is located in South-Western Nigeria and is the capital of Oyo State. Ibadan is centred about latitude 7º 25' North and longitude 3º 5' East and is located approximately 145 km North of Lagos. It is situated close to the boundary between forest and grassland, which makes it a melting point for people and products of both the forests and grassland areas. Ibadan is regarded as the largest indigenous city in tropical Africa. It was the capital of the old Western Region when Nigeria had only three regions. Ibadan has eleven Local Governments Councils consisting of the executive arm, the executive chairman, the vice chairman, the secretary and the supervisory councillors. These are 1. Egbeda 2. Ibadan North 3. Akinyele 4. Ibadan North East 5. Ibadan North West 6. Ibadan South East 7. Ibadan South West 8. Ido 9. Lagelu 10. Oluyole and 11. Ona-Ara.

The developed land in Ibadan increased from only 100 ha in 1830 to 12 km^2 in 1931, 30 km^2 in 1963, 112 km^2 in 1973, 136 km^2 in 1981 and 214 km^2 in 1988. In 1964 the city had spread beyond the drainage basins of Ogunpa and Kudeti and to the catchment area of Ogbere stream in the East. Today the city spread has extended to Odo-Ona Kekere village in the South to Iroko/Motunde villages in the North, Asejire in the East and Bakatari in the West.
Ibadan lies on a gentle slope hilly terrain. (*Ogundele and Ubaekwe, 2019*)

5.2.1 Population

Review of The IUFMP documents (*World Bank IUFMP PAD 687, 2014*) notes that from around 60,000 in the early 1800s, Ibadan's population rose to 200,000 in 1890 and to a million by 1930, it projects the population to reach 5.6 million by 2033.
Ibadan is the third largest metropolitan area in Nigeria after Lagos and Kano with a population of over three million and a land area of 3026.89 square kilometers.

Ibadan city is one of the largest metropolitan urban centers in West Africa, housing almost half of Oyo State's population (45 percent).
This trend implies that population in the catchment area is projected to rise in the next few years, specifically Nigeria is projected to become third most populous country by 2050 with **Lagos**, **Kano, Abuja and Ibadan** featured as the big cities in the 101 most populous in the world.

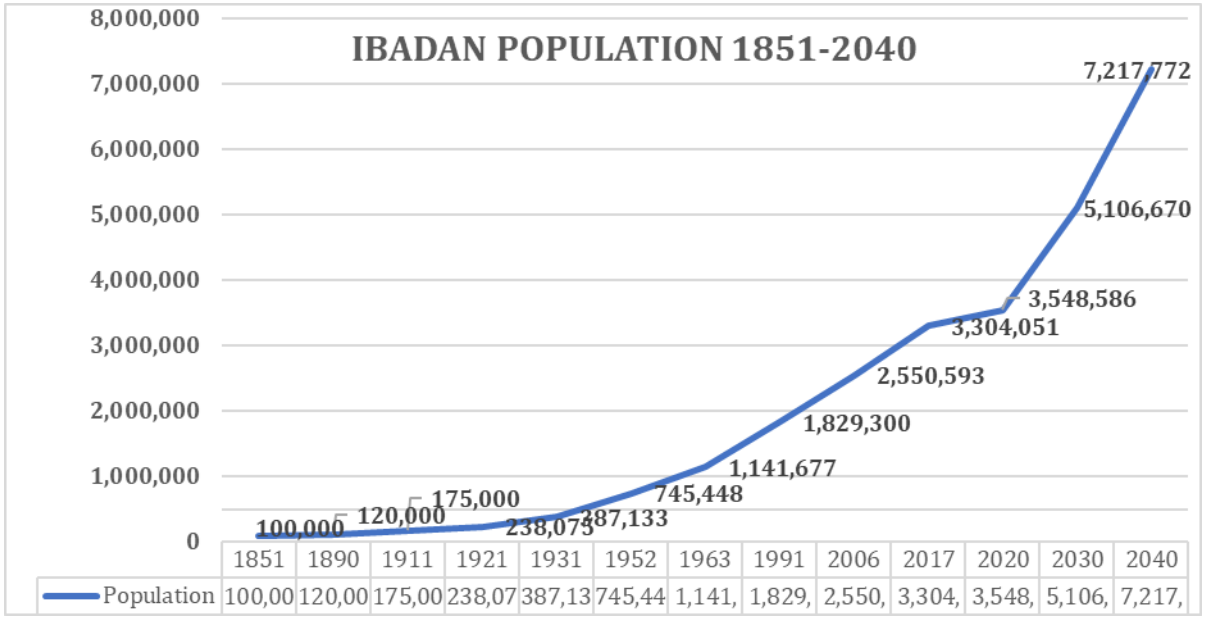


Figure 5. 2: Ibadan population from 1851-2040

***Source**: *1831 and 1890 figures were estimated by Missionaries*
*Census figures 1952, 1963, 1991 and 2006
*Federal Office of Statistics. (*National Bureau of statistics website*)
*2020,2030 and 2040 growth rates from World Population Review

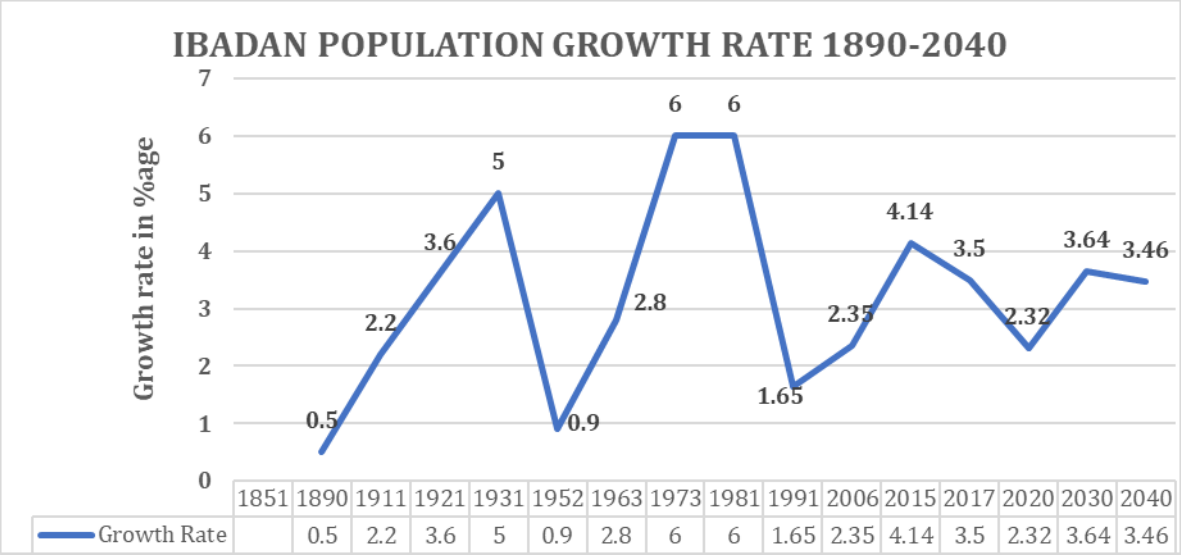


Figure 5. 3: Ibadan population growth rate 1890-2040
(Source:) Growth rates 1952, 1963, 1991 and 2006
*Federal Office of Statistics.
*Pop Projection: National Population Commission of Nigeria (web), National Bureau of Statistics (web)).
*2020,2030 and 2040 growth rates from World Population Review

5.2.2 Population density

In terms of population density, Ibadan is a city of contrast, in that there is a sharp divide between the urban core and the peri-urban fringes of the city. Based on the 2006 National Population census data, the inner urban core of the city has a population density of about 2889 (per square kilometre) making it one of the most densely populated centres in Nigeria and the second most populated city in the western part of the country after Lagos. Conversely, the peri-urban fringes of the city have a population density of only 456 (per square kilometre). This combination of high urban density and very low rural density means that greater Ibadan has a comparatively low population density of about 800 people (per square kilometre), which needs to be considered in future housing development and storm-water runoff and drainage capacity.

Table 5. 1**:** Local Council Area Populations density 1991, 2006 and 2017 Projections (based on National Bureau of Statistics Data)

S/N	LOCAL GOVERNMENT AREAS	POPULATION (1991)	POPULATION (2006)	PROJECTED POPULATION			
				2017	2020	2030	2040
1	Ibadan North	302,271	308,119	397,695	427,128	614,668	868773
2	Ibadan North-East	275,627	331,444	427,801	459,462	661,199	934540
3	Ibadan North-West	147,918	154,029	198,808	213,521	307,272	434299
4	Ibadan South-East	225,800	266,457	343,921	369,374	531,556	751302
5	Ibadan South-West	277,047	283,098	365,400	392,443	564,754	798224
6	Akinyele	140,118	211,811	273,388	293,621	422,542	597222

7	Egbeda	129,461	283,643	366,104	393,199	565,842	799762
8	Ido	53,582	104,087	134,347	144,290	207,644	293484
9	Lagelu	68,901	148,133	191,198	205,348	295,511	417676
10	Ona Ara	123,048	265,571	342,778	368,147	529,790	748806
11	Oluyole	91,527	203,461	262,611	282,047	405,886	573680
	TOTAL	**1,835,300**	**2,559,853**	**3,304,051**	**3,548,586**	**5,106,670**	**7,217,772**

Source: Excerpt[11] from National Population Commission of Nigeria (web), National Bureau of Statistics (web)

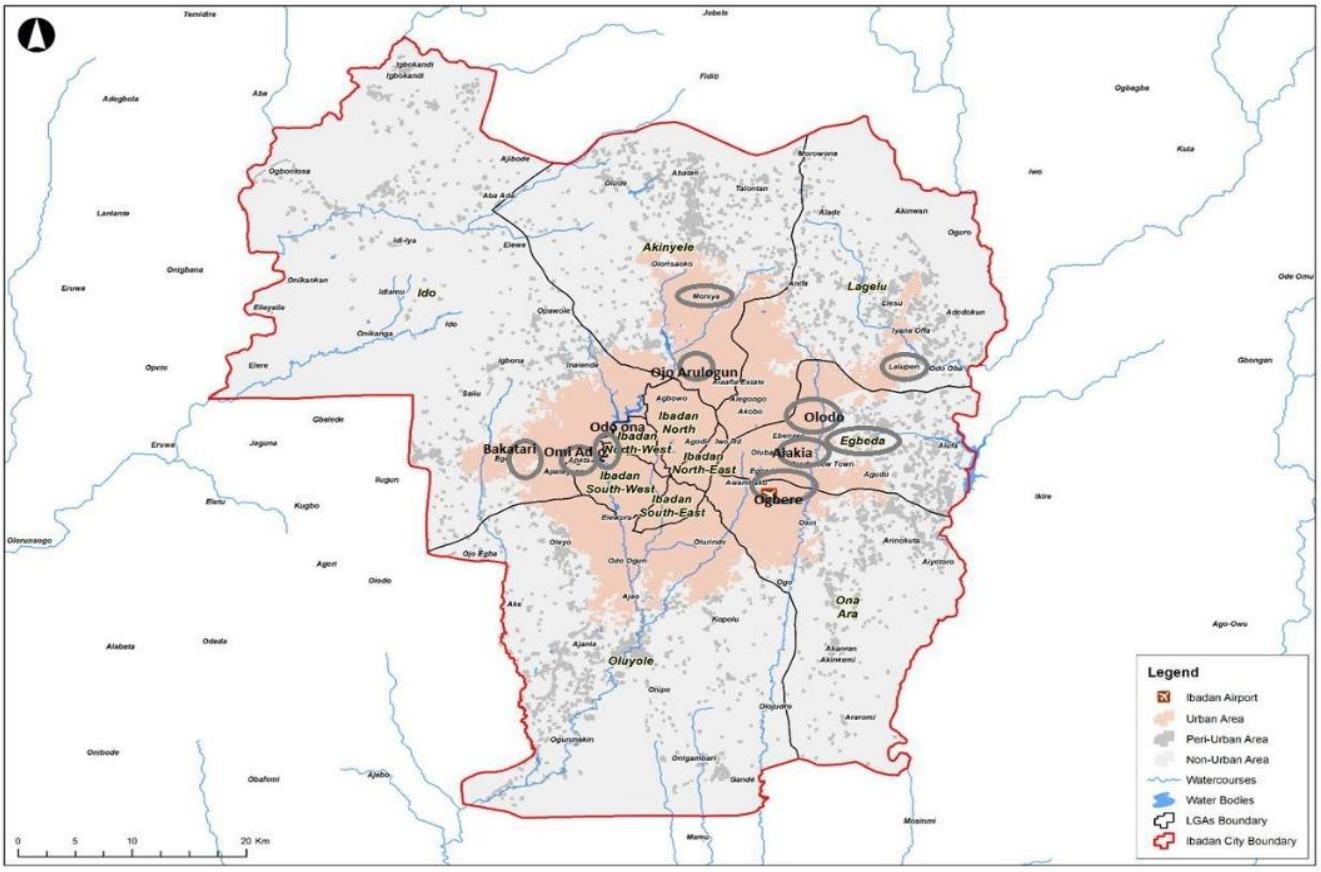


Figure 5. 4: Map of Ibadan showing some rural & urban areas

Source: Modified from DAR report: N16011-0100D-RPT-ENV-15 REV 1, May 2018

5.2.2.1 Existing Social Pressures/Problems with Population in the context of Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) Development

From the population growth in Ibadan city and projections, the main challenges envisaged in relation to the DMP is as stated below:

- The population growth rate of Ibadan is consistently increasing. The estimated **population** of **Ibadan** in 2019 was 3,464,000, a 2.39% **increase** from 2018. The **population** of **Ibadan** in 2018 was 3,383,000, a 2.33% **increase** from 2017. The

[11] *Assessed online from City Population: https://www.citypopulation.de/php/nigeria-admin.php?adm1id=NGA031*

population of **Ibadan** in 2017 was 3,306,000, a 2.32% **increase** from 2016.(*UN-World Population Prospects*)

- Providing accommodation for these population increases will require further development of housing, infrastructure and amenity facilities, thus raising fears that if the environmental, socioeconomic and conservation challenges facing the river catchments are not addressed; the sustainability of the watersheds will be severely threatened thus exacerbating the relationships between housing density and runoff at site and at watershed level. (See figure 9.9)
- Projected population density will increase urbanization. Urbanization has significant economic and environmental and social effects on cities and surrounding areas. As city populations grow, they increase the demand for goods and services of all kinds, pushing up prices of these goods and services, as well as the price of land. As land prices rise, the local working class may be priced out of the real estate market and pushed into less desirable neighborhoods – a process known as gentrification.
    - For example, such urbanization can create Land cover modifications and ecosystem depletion that replace and reduce the amount of land covered by vegetation or open soil. Such urban conditions exacerbate drainage problems; runoff is increased by impermeable urban surfaces and, due to inadequate development control mechanisms, settlements are constructed with little consideration for storm water drainage. The poor are disproportionately affected; they often reside in informal settlements located on marginal land – low-lying land, riverbanks, floodplains and steep hillsides – which are characterized by general disorder, overcrowding, low sanitation standards, with the use of unconventional building materials, substandard construction techniques, and lacking road and services infrastructure.
- Possible increase in unmanaged waste generation and its consequent poor disposal thereby contributing to the aggravation of flood hazards downstream.
- Previous rural areas such as Moniya, Ojoo Arulogun, Omi Adio, Bakatari, Egbeda (figure 5.4) are developing to fast growing urban settlements and commercial areas.
- There is no concerted effort to the proper planning of the city and development control is at best haphazard. Findings indicate the apathy of the public towards formal planning institution in the city. Some of the factors ascribed to this is the administrative machinery for physical planning implementation does not make for inter- agency coordination and poverty of the general populace, a case example is where Development Control authorities succeeded in demolishing make shift shops that had defaced the city, more than half of demolished numbers spring up newly within six months having the approval of the local government councils because for the local government councils, it was another source of revenue generation. The local government councils believed that it is within their statutory power to manage the cities therefore they have the power to approve the erection of make-shift shops for residents on drainage. Refuse sites and dumps are determined by the agencies in charge of environmental sanitation without liaising with the planning agencies for the purpose of safety and environmental beauty of the cities.
- Another problem confronting the planning agencies is the non-compliance with building regulations, space standard and approved design. The monitoring and enforcement units

of the planning agencies are handicapped by logistic problems, dearth of personnel's and poor funding. This has practically made it difficult to constantly monitor new development. Even when a development is considered to contravene planning regulation and subsequently marked for demolition, executing the demolition order can sometime take up to a year or more. In general, inadequate funding, lack of equipment and machinery, lack of adequate public enlightenment, corruption on the part of planning officers, political interference etc. are some of the problems confronting effective development control in Ibadan city.

- Increasing urbanization on uplands/hills is causing flood problems for people in the lowland/valley due to unmanaged reduced forest slopes, potential increased soil erosion and siltation rates. Uplands flood is often flash flood while lowland floods in contrast inundates broad adjacent floodplains and may take many days, weeks, or months to complete the flood cycle.

5.2.2.2 Development in the Absence of the DMP

- Inadequate and Improper drainage system which has been a major issue in Ibadan remains as status quo, because the city is growing outside original walls, and areas not covered by any Master plans. Here physical developments are mostly controlled by the indigenous landowners without any consideration for planning standards. The implications are diverse for residence in such parts of the city.
- Impact of IUFMP 5 years' implementation are positive small steps that needs to be sustained to change status quo when in comparison with population growth rate and dynamics of settlement in Ibadan city. The coverage area of IUFMP is limited in scope to the Ibadan metropolitan area
- Improper refuse disposal issues predominant in Ibadan on the drainage system is exacerbated thus resulting in more drainages blocking and riverbanks overflow
- Because of its ever-increasing population and inadequate drainage system, the city will have sporadic flood events except with sustained ongoing interventions as witnessed under the IUFMP impacted communities 4+13 priority sites, thus justifying A broader outlook of implementing the DMP in Ibadan city.

5.2.2.3 Relevance in Context of the DMP

- Floods events have been the most frequent natural disasters, affecting people in Ibadan and causing significant number of deaths over the past three decades. They are the convergence of hazards and vulnerable conditions.
- The flood Disasters reveal underlying social, economic, political and environmental problems, and unfortunately contribute to worsening them
- Floods lead to tremendous losses of property, infrastructure, business and increased risk of diseases and social disruptions.
- Thus, concerted efforts in implementation of the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) with respect to the growth areas of Ibadan city will

reduce incidences of flood and consequent loss and deaths at individual and community levels.

5.2.3 Income and Economic Structure

5.2.3.1 Labour force and Employment

More than half of the river basin community's population is dependent on their subsistence farming and livestock as their supporting income source. Chicken, goat and pigs are several types of livestock at the study area. The labour force consists of those who are able to work, i.e. those who are aged 15+, out of full-time education and not performing duties that prevent them from working. Based on the national statistics record in 2006, there were 2,372,968 persons in the labour force in Ibadan.

Generally**,** in the communities visited, about 562 (34.1%) were traders, 150 (9.1%) are civil servants, 237 (14.4) are self- employed and others 699 (42%) are either artisans or retired. Among the retirees, a large number practice subsistence farming around their homes, mostly poultry, banana plantation, cassava farming and fishery and are potential project affected persons, either positively or negatively by the project.

Figure 5.5 shows the percentages of those employed in different occupations in the State.

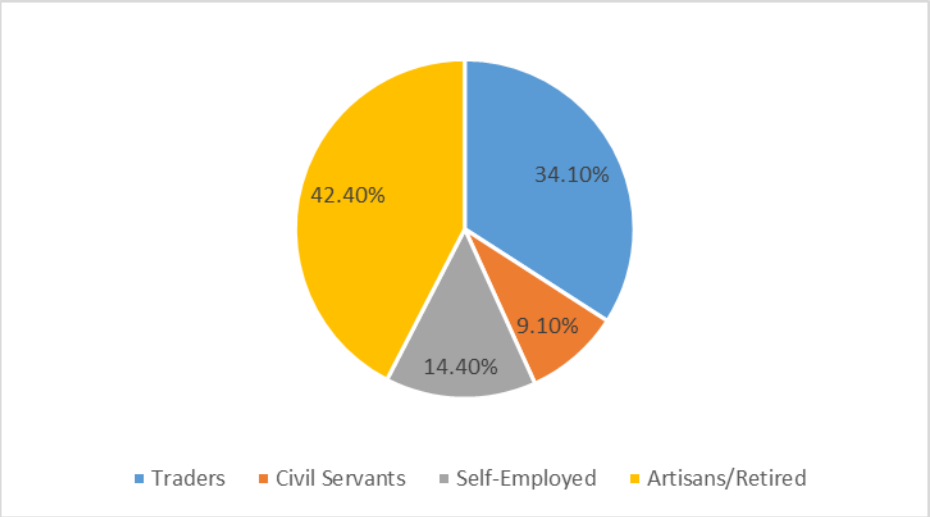


Figure 5. 5: Percentage of employed people in each socio-economic group of the State.

5.2.3.2 Standard of Living

Responses from the survey of those in the flood plain areas in the communities' study area, the level of income varies considerably in the project area as indicated below. Four income-level categories have been identified in the area.

(i) Category I: Those with income per capita <N19, 000/month-(13%)
(ii) Category II: Those with income per capita from N19, 000-N59, 000/month-(49%).
(iii) Category III: Those with income per capita from N59, 000-N199, 000/month- (35%).
(iv) Category IV: Those with income per capita >N199, 000/month- (3%).

5.2.3.3 Existing Social Pressures/Problems with income, economic structure and livelihoods in the context of Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) Development

- During Focus Group Discussions (FGDs) and Key Informer Interview (KII) it was noted that, flood recurrently damages physical infrastructures like houses, schools, road, culverts, shops, gabion embankments etc. Flood also damages the productive agriculture land, and livestock's.
- Reports gathered from community consultations is that damage of houses or structures is dependent on the component materials for wall and roofing. Houses with mud walls are predisposed to soak up of water and tend to damage easily than houses with cemented pillar, and brick walls, with attendant cost of repairs for all types of structures.
- Flood events cause social disruptions and adaptive consequences such as instances where families in the populations have to sleep on higher plains elsewhere in the night in the peak of rainy season and return home during the day (for fear of previous flood events and structurally weakened houses) and in some cases, houses may have been destroyed and inhabitants may be unable to return home.
- Agriculture and livestock rearing is the mainstay of the river basin's economy. From the SESA study in the communities, about 42% directly depend on agriculture for their livelihood. For majority of the people, there is hardly any surplus land since the size of the landholding is very small. Very few well-off farmers have switched from domestic to commercial farming as a large area of agriculture land is being swept away or made unproductive by the flood through river erosion, sedimentation and inundation. It was seen that mostly the communities along the River basins are suffering from river erosion, flooding, inundation and sedimentation. Three crops cassava, maize, and vegetable are reported to be damaged by the flood.
- Wetland farming producing vegetables and other crops and Livestock in smallholder farming systems is a way to generate additional income for daily living, to obtain cash for purchasing agricultural input like fertilizers, pesticides and seeds in addition to artisan or trading form of activities along the communities within the watershed catchment.
- From the perspective of water resources beneficiaries in both urban and rural areas along the river basins there is need for water for cultivation.
- The urban population supplement income from non-agricultural sources and have a higher frequency of vegetable production, cassava and fruit trees in their home-garden while the rural population on the plain cultivate more crops and aquaculture 15(4.6%), and in the upland have more forestry 5 (1.4%). But both need water to maintain water level in the wells, which provide water for domestic uses, especially in areas where tap water from treated water plants are not available. The difference between the urban and rural areas is that the urban areas have more people engaged in commerce and services 198(15.1%) industries and handicraft 83(6.3%), and transport.

5.2.3.4 Evolution in the Absence of the DMP

- The impact of flood events will increase on housing, agriculture, social standards and road or infrastructure access within the watershed catchment and social disruption.

- Social disruption in food supply chain, traffic, electrical and even telecom services are paramount once there is massive amounts of erosion that undermine bridges and buildings causing their collapse.
- Continued Incidences of water damage to homes, furniture, automobiles and Crop loss
- All groups in the society suffer from the devastating disaster effects of floods but women and children and vulnerable are often most suffered. Often women are less likely to have access to weather-related early warning systems or be informed about oncoming rains and floods, yet social networks among women are strong. This means that information can be disseminated in informal ways such as through social gatherings and during conversations with friends and relatives. In this way, essential information about disaster preparedness reaches entire families who may not otherwise have benefited from such knowledge.

5.2.3.5 Relevance in Context of the DMP

In the case of the DMP comprising proposed dykes, retentions, channelization, it is expected to add values to the lives of the local people in reduction to loss of source of income and living standards.

Social impacts will both be positive and negative depending on the economic changes produced. These include the following;

- In general terms, poor persons are predisposed to living near rivers or flood plains subject to flash flooding (rural and urban context), thus there will be great reduction in the number of poor who are vulnerable to outbreaks of diseases arising from flood events and subsequent contamination of drinking water supply that leads to infectious diseases.
- Furthermore, it will limit number of poor who lives in flood plains that needs to be evacuated or displaced.
- The project will significantly alter the economic structure of the local economy and generate change in relative prices, such as land value. If there's an increase in land value, it would be more difficult for the poor to own or rent a space/ house because the rents would increase. – other social issues in long term such loss of shelter, slum development, security threats, social vices (prostitution, GBV etc)
- Farmers downstream of proposed DMP structures may experience sediment deposited during flooding thus predisposing the farm land and crops to deterioration or positively increase productivity as result of the silt because of the cropping nature, especially when the beneficial uses of floods to sustain natural systems is taken into account that also have economic, social, cultural and ecosystem values and functions.
- If training of local people is done timely in the life of the project with skills on watershed management, construction and maintenance of flood control structure and other jobs that the DMP project needs, it comes as means of improving their source of incomes. Women often are also well placed to contribute to disaster recovery as they often have several sources of income away from the farm. Expanding these business opportunities is vital when natural disasters reduce income from agricultural activities;
- The DMP implementation will explore opportunities for technical assistance to integrate gender into policies, programs, activities, monitoring and evaluation and reporting of

development in general and in particular in all components of the flood management; e.g to improve the economy of farming families, there is a need for women to be trained on small agribusiness, packaging and marketing and support them to get access to credit;

- Advocacy on gender and flood issues, gender awareness training related to flood management and agriculture has to be conducted at all level of policy makers including communities in the project areas.
- There is expected temporary or permanent land take or lost income or disrupted livelihood during DMP implementation.
- Implementation of the DMP will create opportunities for various skill set for employment in the planning, construction operational phases at local communities and external labour.
- Furthermore notwithstanding expected compensation for lost income and disrupted livelihood, the DMP implementation is designed to provide support to livelihoods and endeavor to maintain access to water bodies and access roads, etc taking cognizance of various water users- the livestock herders who use the valley floors of hilly terrain as pastures and grazing lands, the loss of land and associated vegetation, medicinal plant harvesters, and potential separation of communities where there are proposed inundation development.
- It is proposed the DMP implementation will take cognizance of SESA to facilitate a form of Impacts & Benefits Agreement (IBA). Depending on the specific context, these agreements go by a range of names, including: Community-Based Agreements, Community Development Agreements, Benefit Sharing Agreements, Partnering Agreements, Indigenous Land Use Agreements, Empowerment Agreements, Community Contracts, Shared Responsibility Agreements, and Good Neighbour Charters. However, Impacts & Benefits Agreements seems to be the most appropriate term as it is the most apt description of what it is. This can be achieved through effective engagement of community stakeholder participation and coordination.
- Part of the Flood Risk Management (FRM) armoury in the implementation of the DMP is the use of laws, regulations, penalties and inducements to persuade (or coerce) private agents to alter their behaviour. In such cases, the costs of FRM fall on private parties, though subsidies can be used to mitigate the financial burden. The use of IBA can serve as inducement or incentives to persuade and encourage shared responsibility.
- The use of public subsidies could even be a more feasible and cost effective way of achieving FRM objectives, compared to measures involving full public sector implementation. Examples include: Subsidies to farmers and landowners for catchment and watershed protection, e.g. afforestation, Reward for environmental stewardship by farmers and landowners making changes to land use and farming methods, e.g. retention of hedges, tree cover, fallow areas). Compensation for set-aside, retention of waterside meadows, wetland restoration, etc.
- Mandatory flood risk insurance can also be used not just as a method of mobilising funds but also a way of influencing public behaviour towards FRM. Where the full risk of flooding is factored into the insurance premium paid by developers and householders,

less development is likely to occur in flood risk areas, than in situations where such risk is not fully monetised.

- Taxes and property surcharges can also be used to penalise inappropriate development in flood-risk areas, or other practices (e.g. building features) not in keeping with FRM
- Implementation of the DMP taking cognizance of these options as stated in the SESA will facilitate the local community to have effective governance mechanisms to deal with the long-term effects of the project in areas such as land use regulation, negotiations over business transactions, and other such issues.
- IBAs should address all issues relevant to a community's determination of whether they would give their broad-based approval or informed consent (FPIC) to a project, including: all financial payments; employment and contracting requirements, including statements about the project's commitment to local content; environmental, social and cultural impact management plans and mitigation activities; capacity building plans; governance arrangements and grievance mechanisms; and any agreements related to specific things of concern to the local community. The process of negotiating the IBA is as important as the outcome, as it helps build effective relationships and establishes trust.

5.2.4 Gender Issues and Women Vulnerabilities

The differences in the roles and responsibilities of men and women occasionally in cultural setting leads to inequalities in their access to, and control over, resources (who inherits land or can get credit from the bank) and decision-making powers (who has a voice and sits on community councils and committees). The combined effect of these differences and inequalities means that women and girls, and men and boys face different types and levels of exposure and vulnerability to natural hazard risks and disaster impacts.

For example, in the study area across Ibadan city, gender-based behaviours and stereotypes attributed to societal concepts of masculinity that compels men to feel they had to take very high risks in order to protect family, community lives and property has often had negative effects on men and boys. There was however noticeable interconnectivity and inter-connectedness across gender lines in the communities.

Poverty exacerbates the vulnerability of both men and women during hazard events, but there can be gender differences among poor people that further compound the risks. For instance, poor women may have heightened vulnerability to hazard events that occur during the daytime, as many live-in unsafe areas and houses and tend to spend more time indoors and near the house than their male relations.

In the study areas the men usually form the majority of poor migrant labourers, their wives and children, as well as older people remaining in the family home, often become more exposed to the impacts of flood issues or other forms of local disasters. Boys between the ages of 12 and 18 are in significant numbers across the study areas with some becoming delinquent from relative poverty induced drug abuse.

Furthermore, in instances of displacements women and girls suffer additional forms of physical abuse beyond problems of protection and safety.

Such often include facing difficulties in gaining access to relief or recovery assistance following any form of disaster, as well as being exposed to demands for sexual favours, suffer from a wide range of violent acts, many hidden and unreported like rape, torture, intimidation, discrimination, and psychological abuse. In addition to violence from the "outside," domestic violence also tends to increase as men are under greater stress than usual and women are easy targets. [12]Gender-based violence is much more than just sexual or domestic violence, it is any action or omission that takes away from women's dignity and abilities.

In the course of this SESA studies, there were some variables that indicated no significant or slight differences, larger magnitude and significant differences appeared to revolve around men's perceptions of being more prepared and being more active or willing to be involved in or led by community-level activities.

Women generally reported being less confident, but perhaps had more realistic views about being prepared while also reporting more household- and family-level cares, concerns, and preparedness behaviors in selected areas. Such a pattern may be underpinned, at least to some extent, by gender-specific roles linked to the household and to community access, leading to a state of affairs that lead to less ability to connect with active social networks within the community, coupled with being less informed and able to be involved in larger decision-making processes.

5.2.4.1 Evolution in the Absence of the DMP

Gender issues and Vulnerabilities may become exacerbated in the study areas for people who belonged to one or more of the following groups:

- Women and children (these are the priorities, as they form most of the displaced population)
- Female-headed households
- Socially isolated groups (minorities)
- People who are isolated from services and lack transport options
- The ill, frail, elderly or those who have disabilities and no financial reserves or means of generating income

[12] 11 General Assembly, Declaration on the Elimination of Violence against Women, UN Doc A/RES/48/104 (1993), art. 1 (DEVAW). 12 Convention on the Elimination of All Forms of Discrimination against Women, opened for signature 18 December 1979, 1249 UNTS I-20378 (entered into force 3 September 1981), art. 5 (CEDAW Convention). 13 Committee on the Elimination of Discrimination against Women, General Recommendation No 19, UN Doc. A/47/38 (1992) para 1, 4, 6 (CEDAW, General Recommendation no 19). "The definition of discrimination includes gender-based violence, that is, violence that is directed against a woman because she is a woman or that affects women disproportionately."

5.2.4.2 Relevance in Context of the DMP

- Therefore, in the implementation of the DMP there is ample opportunity to develop strategies to empower women, educate men, and promote the genders working together synergistically to prepare effectively while also perhaps, at the same time, overcoming gender stereotypes
- For this purpose, planners will need to consider Gender/GBV should be appropriately mainstreaming in the implementation of the DMP particularly with hazard information and emergency warnings.
- Importantly, based on current findings coupled with other research on different gender profiles, both women and men should be seen as valuable resources that might combine complementary strengths to maximize preparedness, response, and recovery.

- That is, promoting more gender-related dialogue that aims to leverage the respective strengths of women and men and requires women to be increasingly empowered to take leading roles in building flood disaster resilience in their community.

- In the course of interaction and consultation during the SESA studies, females reported greater organization of essential supplies and emergency amenities, saving important documents, and dealing with the financial matters of the household. This should be taken not only as an advantage, but also perhaps as a proxy for a more embedded sense of prioritizing the security of the household, which makes them more motivated for arranging household and family concerns

- Boys between the ages of 12 and 18 are in significant numbers across the study areas with some becoming delinquent. They should be targeted for rehabilitation and up-skilling efforts to have lasting results, as they are the primary age group being drawn into the crime/conflict. Behavior change communication calls for engaging boys or girls of this age group in healthy activities and gradually cultivating gender sensitivity in them.

5.3 Land use Activities in Ibadan

Ibadan has a land area of 3,850 square kilometres of which about 15% is in urban areas while the remaining 85% falls into peri-urban area. Ibadan houses almost half of Oyo state's population (45 percent). (*WorldBank PAD 687, 2014)* Some of the former rural areas such as Lalupon, Alakia, Olodo, Ogbere, Odo-Ona, Bode-Igbo and Moniya which lie at the urban periphery of the city are now parts of the Ibadan metropolis.

It is important to analyse land-use activities and the factors underlying them. In this context, questions about the impact of population growth with limited and often degraded resources are most relevant for threatened catchment areas like Ona, Eleyele, Ogbere, Omi. Land use system affects different processes in the watershed, such as surface runoff, erosion, recharge groundwater quality and evapotranspiration.

Land use system depends mostly on the status of the settlements, whether rural or urban. In the rural areas where most of the household economies are based on primary activities such

as livestock rearing and agriculture related activities with very few revolving around trade, the land use system is mainly agriculture. There are few alternative economic activities and those that exist are closely linked to the environment. The low diversity of economic activities diminishes the capacity to mobilize financial resources to diversify livelihood. This increases dependence on the land and natural resources for economic production, making the inhabitants (especially low-income households) highly vulnerable to multiple adverse environmental impacts.
On the other hand, exponential population growth leads to the expansion of urban centres which in turn leads into intensification of land use with consequences such as deforestation, conversion and destruction of natural pristine forest. Rapid urban development and population growth in urban areas have negative implications for the availability of agricultural land and for the urban environment. Less land will be available for agricultural activities in the city and the hydrology of the catchment area will be further affected by the loss of vegetation cover and subsequent concretization of land surfaces for settlements and urban infrastructure.

The land use classification within the project area mapped for the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) is as follows- residential, commercial, recreational, fish farming, conservation, health institutions, cropping agriculture, institutional buildings and service.

The most significant land use change in the city as a whole is the conversion of crop lands, secondary forest, natural forest to other land use types, especially built-up. This land use trend directly leads to land degradation and soil erosion. A case study around eleyele dam depicts the trend in figure 5.6

The land use pattern of the Ibadan metropolitan area shows a clear demarcation. Residential and industrial land use are located in the urban core of the metropolis; conversely agricultural use and forest are located in rural Ibadan (Figure 5.7) is the projected land use for Ibadan by 2030 as indicated in the Ibadan city Master Plan).

The multiplicity of land use activities in the project catchment (often close to the river banks) include; residential areas, arable crop farming, cassava processing, auto mechanic, concrete block moulding industries, open markets and solid waste dump sites scattered around the catchment.
Farming practices are simple and mostly subsistence. The major plants cultivated include cassava, maize, cocoyam and vegetables such as lettuce, okra, amaranthus and water-leaf. Fishing/aquaculture is also common around the peri-urban area of the project catchment mainly for catfish.

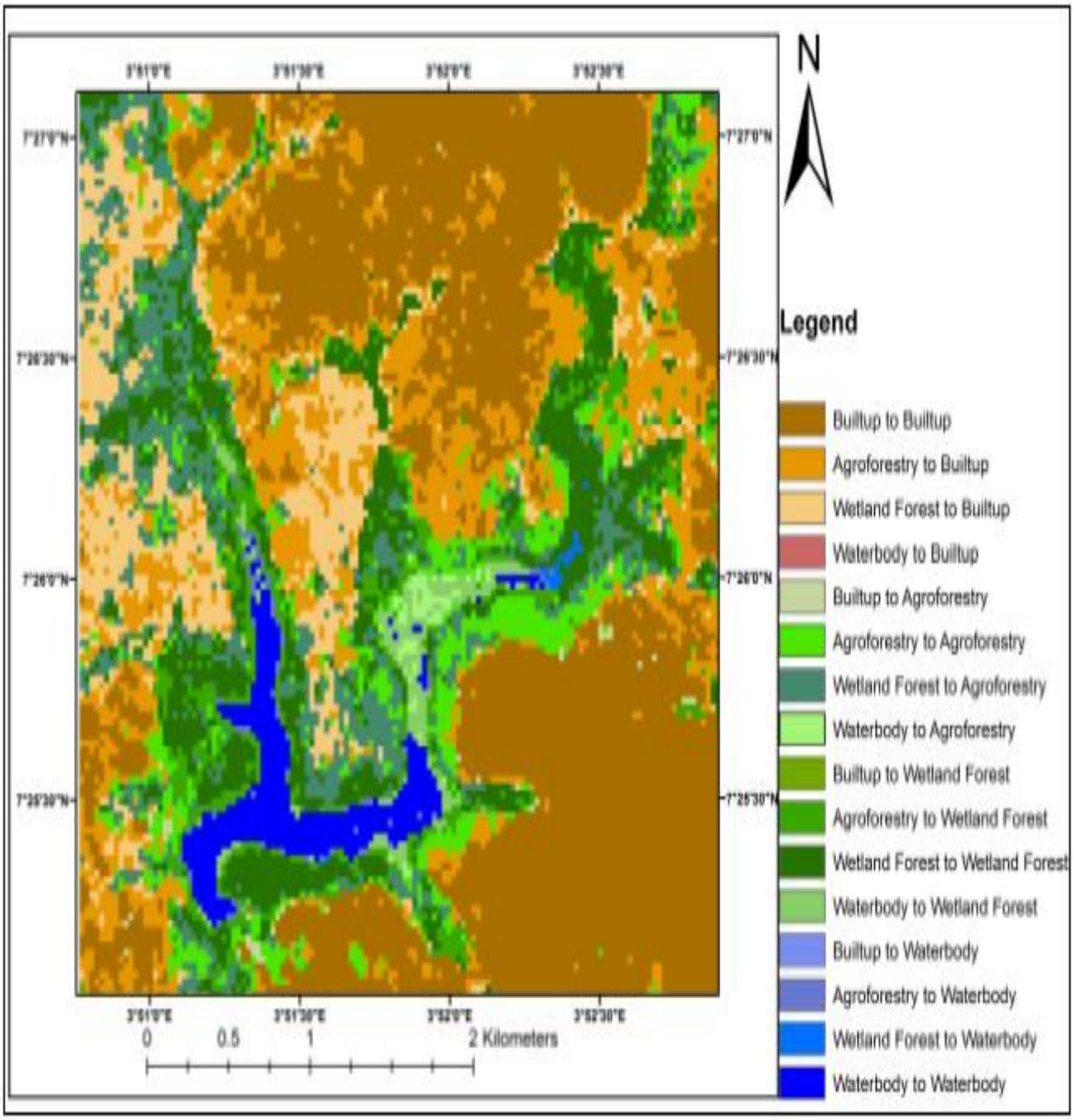


Figure 5. 6: Land uses changes around Eleyele Lake 1984- 2014.

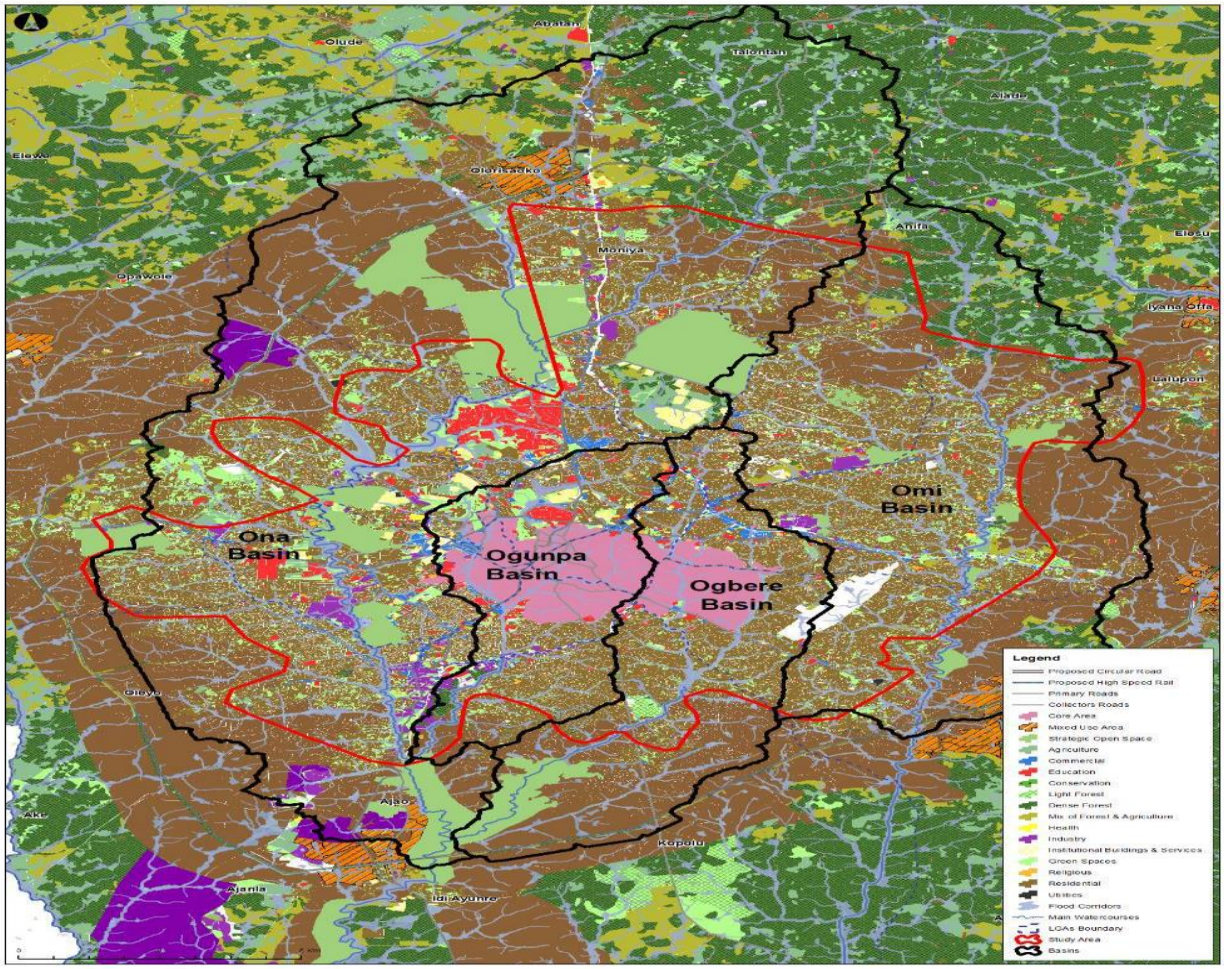


Figure 5. 7: Projected Land Use by 2030
Source: Ibadan city master plan

5.3.1 Existing Social Pressures/Problems with Land use in the context of Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) Development

- The Detailed Urban Plan (DUP) identified and recommended for delineation and marking an area of 120,000 hectares of land in Ibadan city which are flood prone.
- Land use changes and changes in hydrological fluxes of watersheds in Ibadan have been found to be cause of increasing flood hazards and risks in many parts of the city most especially in developing communities within flood plain and reaches.
- Consequence of poorly managed urbanization is the settlement on unstable and risky locations such as along Ogunpa, Kudeti, Ogbere and Orogun, Arulogun floodplains, hill sides of Moniya and hillside of Oke-Are, Oke-Aremo, Sapati and Mokola hills in the centre of the city. This phenomenon is partly responsible for the Ogunpa and recent Ona flood disasters and soil erosion.
- Landuse change is linked with development, driving the market for construction materials; hence, areas undergoing rapid rates of development and land clearing can also have a high demand for sand, thus increasing pressures on local rivers.
- Modifications in land use downstream, contribute to flood hazards upstream.

- The urban poor live in crowded slums within the core residential areas of Ibadan. (such as Ayeye, Agbeni, Bere etc), with limited basic infrastructure services, and without land and personal security. Within the city core residential areas, there is lack of comprehensive water and sewage systems, inadequate garbage collection and disposal which tends to end up in the rivers, blocking drainages and increase vulnerability to natural disasters and jeopardize public health.

5.3.2 Evolution in the Absence of the DMP

- Discrete un-programmed infrastructures such as roads and bridges which hinder natural drainage and increase the risk of flooding downstream continues.
- Land use decision occurs at the local level and is based on local standards. Encroachments are
  routinely permitted, even in areas prone to flood damage and even if those developments exacerbate the vulnerability of flooding to adjacent properties.
- Encroachments into river flooding plains often result in landowners seeking to protect those properties using structural measures and channelization practices.
- Clearing the floodplain for agriculture permits a progressively higher percentage of large flood discharge to be carried by the flood plain. Some parts of the flood plain are eroded and other parts are built up by deposition of coarse sediments, while the channel capacity of the river is gradually reduced.
- The sense of insecurity arising out of the high risks due to recurrence of floods in flood prone but fertile plains dissuades farmers from making long-term investments in farming. It also dissuades other investors, including government agencies, from making investment in infrastructural projects. From this point of view "flood is an inhibiting factor in the process of agricultural growth of areas subject to frequent flooding".
- Consequently, without flood protection, flood prone areas receive low levels of investment in both the farming and non-farming sectors. These result in low levels of economic development thereby perpetuating the vulnerability of the people.

5.3.3 Relevance in Context of the DMP

- Floods events have been the most frequent natural disasters, affecting people in Ibadan and causing significant number of deaths over the past three decades. Floods lead to tremendous losses of property, infrastructure, business and increased risk of diseases.
- Thus, concerted efforts in implementation of the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) with respect to the growth areas of Ibadan city will reduce flood incidences and consequent loss and deaths at individual and community levels.Implementing the DMP within the context of watershed/ mountainous hilly catchment care as specified in the NESREA [13]National Environmental (Wet, River Banks and Lake shores) Regulations, S.1.No 26 of 2009; National Environmental (water,

[13]https://www.nesrea.gov.ng/wp-content/uploads/2020/02/Wetlands_River_Banks_and_Lake_Shores_Protection_%20Regulations%202009.pdf
https://www.nesrea.gov.ng/wp-content/uploads/2020/02/Wetlands_River_Banks_and_Lake_Shores_Protection_%20Regulations%202009.pdf

Mountainous, Hilly Catchment Areas) Regulations, 27 of 2009 will strengthen sustainable approach for enhancement of the socio-economic aspect of the city such as transforming the physical landscape, revitalize the watershed by rewarding and support low wage workers whose livelihood is based on watershed, create "neighborhoods of choice" collect and disseminate timely and reliable information on watershed economies and neighborhood markets within the city.

- In Ibadan there is a strong need for better utilization of the agro-economic potential of flood plains to provide scope for reducing people's vulnerability and providing enhanced opportunities for food and livelihood securities to the flood affected people. This, in turn, would reduce poverty and improve quality of life,
- Implementing the DMP would manage the development that falls within setbacks of streams and rivers as a non-structural flood control mechanism that support the economy of the city and its ecosystem

5.4 Community vulnerability, Health and disease issues (vectors, schistosomiasis, and water-borne diseases)

Cases of increased risk of transmission[14] of cholera when floods occur during the rainy season has been documented in Nigeria. Ibadan has been susceptible to water borne diseases and occasional seasonal cholera outbreaks since 1996 in relation to contaminated potable water consequential to the common practice of open defaecation along all the river channels and dumping of all forms of waste in the rivers. Thus, flood risk in Ibadan increases the spread of contamination and exposure of the population to this water borne disease. After the devastating August 2011 flood that occurred in the city of Ibadan, there was subsequent outbreak of cholera that claimed 18 lives and left several hospitalized.([15]*Oluwafemi & Oluwole, 2012*)

Although it is difficult to prove conclusively because of the complexities of disease transmission routes, there is considerable empirical evidence to indicate that flooding and poor drainage have a significant impact on the prevalence of illness, and that large-scale flooding may disrupt water supply and sanitation systems and result in disease epidemics. Table 5.2 is an indication of the sanitation facilities surveyed in the urban (Ajibode, Apete-Awotan, Kajorepo- Oorelope, Odo- Ona by St Pauls, Oluyole) and rural (Odogbo community- Moniya, Jerusalem community, Jenriyin Community, Odo Ona Elewe, Ogundipe Community (Kumapayi Area) areas sections of the communities along the water basins of Ibadan.

Table 5. 2**:** Sanitation facilities available in urban and rural areas

	Sanitation facilities in percentage	**Urban areas (%)**	**Rural areas (%)**
1	Own toilet	293 (22.3%)	9.6 (2.9%)
2	Shared toilet	130 (9.9%)	9.6 (2.9%)
3	Pit toilet	610 (46.4%)	189 (56.7%)
4	VIP toilet	115 (8.8%)	17 (5.2%)

[14]First Annual Report of the Nigeria Centre for Disease Control (August 2016 – July 2017)

9 Microbiological Examination of Sachet Water Due to a Cholera Outbreak in Ibadan, Nigeria. Flora Oluwafemi, Michael Oluwole 2012, Open Journal of Medical Microbiology.

5	Bucket	4 (0.3%)	0 (0%)
6	None (open defaecation)	162 (12.3%)	108 (32.2%)
	Number of households used in survey	1314	334

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Thus, in poorly drained areas with inadequate sanitation, urban runoff mixes with excreta – spreading pathogens around communities and increasing risks to health from various waterborne diseases. Infiltration of polluted water into low-pressure water supply systems can contaminate drinking water and is frequently a source of gastrointestinal disorders. Wet soils in poorly drained areas, which become faecal contaminated due to poor sanitation, also provide ideal conditions for the eggs of parasitic worms, such as roundworm and hookworm, which can cause debilitating intestinal infections.

Open drainage channels are potential sources of infection and disease, especially to children who play in them, and polluted water from drains is often used for agriculture, where water resources are scarce. Flooded septic tanks and leach pits, and blocked drains (see figure 5.8) provide breeding sites for mosquitoes. Infection with lymphatic filariasis through the bite of an infected mosquito, can lead to a condition called elephantiasis, where swelling due to oedema leads to loss of function in the affected area and thickening of skin. (Gordon *et al*; 2018[16])

Open defecation is a common practice in many communities in Ibadan and they pose social/ health (e.g threat to privacy/dignity, diseases transmission etc) and environmental risks (e.g air, water, land pollution etc) as well as reduce the aesthetic quality of the environment.

Figure 5. 8: People defecating in the river channel at Kudeti

Other social aspect of flooding in relation to health include reduced mental health, increased stress, anxiety, alienation, apathy, depression, personal security status, exposure to risks. Flooding poses a risk to human health and safety. Noting that flooding can cause physical injury, illness and loss of life. Deep, fast flowing or rapidly rising floodwaters can be particularly dangerous, with increased risk if the floodwater is carrying debris. Some of

[16] Catherine A. Gordon, Malcom K. Jones, Donald P. McManus (2018), Tropical Medicine and Infectious Disease (assessed online: https://res.mdpi.com/d_attachment/tropicalmed-03-0058/article_deploy/tropicalmed-03-00058.pdf)

these impacts may be immediate, the most significant being drowning or physical injury due to being swept away by floods. Floodwater contaminated by sewage or other pollutants (e.g. chemicals stored in garages or commercial properties) is particularly likely to cause such illnesses, either directly as a result of contact with the polluted floodwater or indirectly as a result of sediments left behind. It is an environmental safety requirement to restore public water supplies affected by flooding.

Floodwater may also hide other hazards for wading pedestrians, such as manhole openings where the covers have been lifted by flood flows. The impact on people and communities as a result of the stress and trauma of being flooded, or even of being under the threat of flooding, can be immense. Long-term impacts can arise due to chronic illnesses and the stress associated with being flooded and the lengthy recovery process. The ability of people to respond and recover from a flood can vary. Vulnerable people, such as those who are old, disabled or have a long-term illness, are less able to cope with floods than others. Some people may have difficulty in replacing household items damaged in a flood and may lack the financial means to recover and maintain acceptable living conditions after a flood.

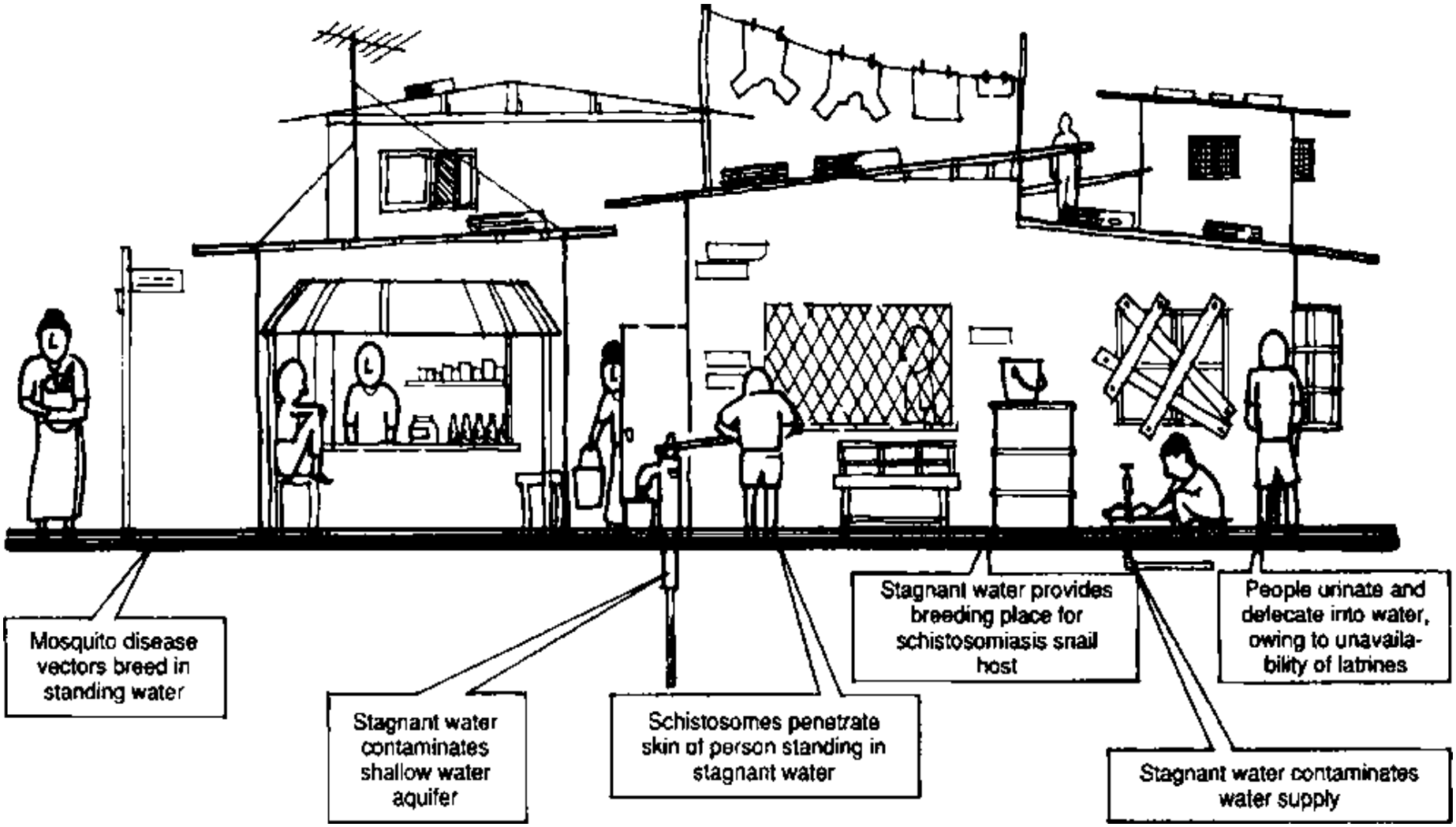

Figure 5. 9: Health implications of stagnant water/ poor drainage

SOURCE: Cairncross, S and EAR Ouano (1991), *Surface Water Drainage for Low-income Communities*, WHO/UNEP, World Health Organization, Geneva, Switzerland.

5.4.1 Existing Social Pressures/Problems with health and disease issues in the context of Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) Development

- Health impacts of flooding are compounded in poor communities.
- The poor have fewer resources available for rebuilding and they generally receive little external support to recover from flooding. Their livelihoods are more vulnerable to the risks associated with flooding and are more susceptible to disruption. The location of poor neighbourhoods and the inferior construction materials used to build homes for the poor contribute to their greater vulnerability. A lack of transportation may also prevent poor households from moving themselves and their possessions out of harm's way
- Ibadan has a significant number of informal settlements. Conventional approaches to infrastructure provision tend to be inappropriate for informal settlements, as they do not take into account the irregularities and unplanned nature of squatter settlements, which are characterized by narrow access routes, occupation of areas of risk, and the lack of a precise definition of public and private spaces. The more obvious physical characteristics of informal settlements are inherently different from those associated with formal settlements and may have significant implications for the design and implementation of the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) systems.
- The poor are not a homogenous group in Ibadan, and preparedness for environment-related hazards such as flooding, and the degree of vulnerability, will differ amongst community members. Groups that are at particular risk include children, the elderly and physically disabled people who experience difficulties in dealing with disasters and who may be particularly vulnerable to adverse health effects from floods. Otherwise known as "social amplification" of disasters, this variation among those affected depends upon factors related to their socioeconomic and cultural status, which will also affect their adopted response strategies.

5.4.2 Evolution in the Absence of the Programme: Human Beings

- The disruption, damage to properties, loss of possessions, as well as financial worries and other stresses from living in damp houses mean that flood events can place a considerable strain on individual, households or community. These are significant recognized social factors to be considered in planning.
- Flood vulnerability consist of three components: degree of exposure, susceptibility and resilience or response capacity of a population in a particular area.
- Ibadan has witnessed more than 16 major flood events (Table 5.3) of which the most damaging of recent are the 2011 and 2017 events thus, a significant percentage of all houses in Ibadan metropolis are vulnerable to flood risk with varying degrees of susceptibility.
- In the absence of the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) activities being implemented, the risk of flooding to the benefiting lands and health related issues to individuals and communities would increase significantly.

5.4.3 Relevance in Context of the DMP: Human Health

- The implementation of the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) works is expected to reduce the risk of flooding and its associated impacts on human health and safety, infrastructure and amenities, and the associated financial losses and costs.
- Its Non-structural strategies for mitigation of flood impacts with focus upon preventative action and reliance on predominantly behavioural changes would need to be employed in low-income communities in Ibadan, where flooding is inevitable and resources for infrastructure are scarce.
- Experience indicates that large-scale eviction and forced relocation can exacerbate social problems, which can be more problematic for urban authorities than the original drainage problem. As demand for land in cities is high, it is not possible to assign land purely for flood management purposes – it therefore needs to have an alternative use to ensure that informal settlements do not appear.
- Innovative approaches to land control may be employed which have positive benefits during flood conditions. For example, areas designated for flood control can also be used as football pitches or recreation arena to discourage further illegal invasions and squatter settlements.
- Furthermore, the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) is to develop damage loss procedures and results, this information will institute the data and methodology to predict flood and determine the protection works desirable for new and future development areas in the course of increase urbanisation along the catchments.

5.5 Surface Water Resources in Ibadan

The city of Ibadan is naturally drained by highly interconnected network of rivers and streams these include Ona, Ogunpa, Ogbere and Omi Rivers. The rivers are affected with seasonal variations such that the volume of water is reduced during the dry season and increased when the rain sets in.

Whenever there is heavy rainfall, most of the city get flooded and water overflows into houses and across roads at many parts of the city. Recorded flood events have been on the Ogunpa, Ona, Ogbere and Omi basin as stated below.

In the last 50years 16 major flood events (table 4.3) were recorded. Notable of these events, was the Ogunpa disaster of 1963 and that of year 1980 which was recorded to have resulted in a death toll of 500 people. The Most recent major flood event took place after a heavy rain downpour occurred August 26, 2011, this time it was not really Ogunpa that overflowed its banks, because sections of it has recently been channelized. However, Ona and Ogbere Rivers, which claimed many lives and destroyed many properties, rendering thousands homeless, resulting in the overflow of Eleyele reservoir and causing the death of more than 120 people and serious damage to infrastructure; were not channelized. The three major flood events that occurred in Ibadan in 1963, 1980 and 2011, had maximum daily rainfall depths of 258mm, 274mm, and 187.5mm, respectively.

Available historical records of floods in Ibadan are shown in the table 5.3 along with the amounts of rainfall causing them in Ibadan between 1951 and 2011.

Table 5. 3**:** Rainfall induced floods in the city of Ibadan (1951- 2011)

Dates	**Rainfall (mm)**	**Estimated damages to properties in (Dollars)**	**Estimated damages to properties in (Naira)**	**Estimated loss of lives**
9-10 July 1951	161	-	Unknown	Unknown
16-17 June 1955	173	-	Unknown	Unknown
16th -17th August 1960	178	Hundreds of dollars	Tens of thousands of naira	At least 2 persons
27th -28th August 1963	258	Hundreds of dollars	Tens of thousands of naira	At least 2 persons
14th May 1969	137	Hundreds of dollars	Tens of thousands of naira	3
20th Apr 1978	126	Over 5,405 dollars	Over 2,000,000	At least 2 persons
31st Aug 1980	274	Over 810,811 dollars	More than 300 million	More than 500 with over 50,000 displaced
26th Aug 2011	187.5	Over 81million	Over 30billion	Over 100

Source: Dar Report

** Using 1 USD= ₦370*

Surface waters have been the major sources of urban water supplies in Ibadan. Oyo State particularly has 12 major water supply schemes with a generation capacity of 233,920 m^3 only 55,080 m3 is supplied out of the 12 schemes 4 are within the Ibadan environ. Table 5.4 is an indicator of water sources in both urban and rural areas based on the questionnaire survey and consultations during the SESA studies in 2017-2018.

A study carried out by Itama and Sridhar (2001) identified also 16 springs in 5 Local Government Areas of Ibadan (Ibadan North, Ibadan North-East, Ibadan North-West, Ibadan South-East, and Ibadan South-West). They further documented their environmental conditions, yield and quality characteristics. Of these springs, 13 (81.3%) served primarily as sources of drinking water for communities in the vicinity and 3 (18.7%), for other non-drinking purposes. (Itama and Sridhar, 2001)

Table 5. 4**:** Indicators of water source in urban and rural areas visited

	Environmental Indicator for Water source	**Urban areas[17]**	**Rural areas[18]**
1	Piped water	109(8.3%)	2(0.7%)
2	Public tap	51(3.9%)	8(2.5%)
3	Well in residence	719(54.7%)	55(16.6%)
4	Borehole	313(23.8%)	19(5.6%)
5	Tanker / trucks	7(0.5%)	1(0.2%)
6	Bottled/Sachet water	47(3.6%)	34(10.2%)
7	Spring/ river / stream/pond/ lake	9(0.7%)	166(49.6%)
8	Rainwater	59(4.5%)	49(14.6%)
	Total Number of Household used in survey	**1314(100%)**	**334(100%)**
9	Time taken for fetching water from	1004(76.4%)	112(33.5%)

[17] **Rural: APN**- Aperin, Arunlogun-Ojoo road, , **IIR** IITA, Idi-Ose, **KUD**- Kudeti/Abeni Ape, **ODGR**- Odogbo-Fatokun, Moniya, **MOR**- Molete, **BER**- Beere, **APR**- Samog, Apete, **BAR**- Babanla Oremeji; Rev., **OOA**- Odo Ona area by St Paul Anglican Church area.

[18] **Urban: AKI**- Akinwumi Area, Iwo Road; **NR** - NISER,Ojoo ; **OR1**- Orogun, U.I second gate, **JR1**- Jerusalem, **ADE** – Aderinto, **OZR** - Orelope Zartech Road, Layout, **KR**-- Kajola (Wole Anjorin),

	source(<15mins)		
	Time taken for fetching water from source(>15mins)	310(23.6%)	222(66.5%)
	Total Number of Household used in survey	**1314(100%)**	**334(100%)**

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Oyo State in recent time has embarked on a programme of rehabilitation of the major waterworks serving Ibadan metropolis. Existing dams and other water schemes for flood irrigation in Ibadan are listed in Table 5.5 while three new dams are being proposed for Ibadan and environ to augment the water supply (in Odedele, Fatokun & Olokuta and Abeta).

Interaction with the Water Corporation indicated that feasibility studies have been carried out and the design works prepared on water supply schemes which are at various stages of execution and functionality at:

- Latigan, Apadi, Ogundipe, Olofin-Oro, Akinmolete and Agbeja in Oluyole Local Government Area; and
- Akanran, Gbedun, Araromi, Olounda, and Matiko in Ona-Ara Local Government Area.

Table 5. 5**:** List of Other Dams in Ibadan and its Environs

S/N	**Name/Location of Dam**	**Type of Dam/ River Basin**	**Local Government Area**	**Total Capacity Mcm**	**Water Spr. Area Q= (1/3AH) Ha**	**Remarks: Year Of construction /Owner/ Condition**
1	Asejire-Ibadan	Earth Fill/ Osun Basin	Egbeda	32.218	526.316	1972 / WCOS/ Good
2	Eleyele-Ibadan	Earth Fill/ Ona	Ido	6.8975	161.943	1942 / WCOS /Good
3	Ogunpa Lake	Concrete/ Ogunpa	IB North-East			
4	Pade(Olorunda)	Earth Fill/ Ona	Akinyele	0.74	26.12	1992/ OYSADEP /Good
5	Sanusi (idi ayunre)	Earth Fill/Ogbere	Oluyole	0.624	23.4	2006/ OYSADEP /Good
6	Akufo	Earth Fill/ Ona	Ido	0.11	5	2007/ OYSADEP
7	Eni-oosa	Earth Fill/Ona	Akinyele			OORBDA/Good
8	Awba Dam	Earth fill/ Ona Basin		227million litres	0.06 km^2, a maximum depth of 5.5 m,	April, 1964, University of Ibadan
9	Ijaye/Alabata (Moniya)	Earth Fill/ Ona Basin	Akinyele	2.025	67.5	2010/ OYSADEP/Good
9	Onidundun	Earth Fill/ Ona	Akinyele	0.097	6.6	2013/ Federal Fadama/Oy/ Proposed
10	Batake	Earth Fill/Ona	Ido	0.204	8.33	Federal Fadama/Oy /Proposed

Source: IUFMP ESMF, 2014

5.5.1 Surface Water Quality

A rapid evaluation of Water Quality of samples collected along the River Channels in Ibadan using World Health Organization (WHO) & FMEnv Guidelines for Drinking Water and Water Quality Index was done (details in annex 3)

The Water Quality of samples collected along the river channels in Ibadan were compared with World Health Organization (WHO) & FMEnv guidelines for drinking water. The water quality in all the sampling[19] points were within the WHO guidelines for drinking water except.

- pH at APN, AKI.
- Mn at NR.
- Fe at OR1, JR1, IIR, KR, NR, APR, OZR, OOA, MOR, BER,and AKI.
- Fecal coliform count was higher than the WHO guidelines in all the water samples collected at the different sampling points.

There was presence of Vibrio spp. and *Escherichia coli* in all the water samples,which causes cholera and diarrhoea. The samples were subjected to different antibiotics to evaluate the resistance of the microbes. The results showed that Vibrio spp. in the water samples collected at the following points were resistance to antibiotic (thus, it needs a stronger antibiotic to be removed.)

- JR1, ODGR, and APN samples were resistant to 18 antibiotics which belong to the following groups: Cephems, Quinolones, Penicillins, Aminoglycosides, Carbapenems, Fluoroquinolones, Phenicols and Tetracycline.
- AKI, and OZR samples were resistant to 7 antibiotics.

This is of great public health importance and urgent intervention is required as it goes to corroborate the often outbreaks of cholera and other water borne diseases among residents of the riverine areas and some Ibadan residents after flooding events. Next steps for SESA based on these results would require the Oyo State Ministry of Environment and Natural Resource taking the lead as part of its statutory function to engage in:

1. Public education and enlightenment on proper waste management including human faecal materials and the possible water related diseases (to be done by Oyo state Ministry of Environment & Natural resources)
2. Treatment of the available water resources before consumption. (Oyo state Ministry of water resources)
3. Enforcing households, properties and commercial centres to have toilets in accordance to environmental sanitation policy of the country at the minimum. (to be enforced by Oyo state by Ministry of Environment & Natural resources)
4. Monitoring of the available water resources in Ibadan at least twice in a year during the raining and dry seasons for at least five years (Oyo state Ministry of water resources)
5. Aid in building public toilets. (to be done Oyo state by Ministry of Environment & Natural resources.

[19] **APN**- Aperin, **AKI**- Akinwumi Area, Iwo Road; **NR** - NISER,Ojoo ; **OR1**- Orogun, U.I second gate, **JR1**- Jerusalem, Arunlogun-Ojoo road, **IIR** IITA, Idi-Ose, **KR**-- Kajola (Wole Anjorin), **APR**- Samog, Apete, **OZR** - Orelope Zartech Road, **OOA**- Odo Ona area by St Paul Anglican Church area, **MOR**- Molete, **BER**- Beere, **KUD**- Kudeti/Abeni Ape, **ODGR**- Odogbo-Fatokun, Moniya, **BAR**- Babanla Oremeji; Rev. **ADE** -Aderinto Layout.

Table 5. 6**:** River Quality Results September 2017

S/N	River Channel	Sampling location	Sample Codes	Total Bacterial count ($\times 10^2$cfu/ml)	Coliform Count (MPN index/100ml)	BOD mg/L	Phosphate mg/L	Nitrate mg/L	DO mg/L	COD mg/L	WQI	Water Quality Rating	Litter Presence	Remark on Environmental Status
1	Agodi Channel	Agodi Davies Hotel/Adeyi Avenue)	DHR	6.6	220	20	0.24	2.4	6.7	29	26	Good	Yes	Sub GES
2	Orogun Channel	Jerusalem, Arunlogun-Ojoo road	JR1	2.6	140	28	0.14	0.91	6.5	68	28.3	Good	Yes	Sub GES
		Orogun, U.I second gate	OR1	2.4×10^3	280	25	0.48	2.75	6.8	44	28	Good	Yes	Sub GES
		Kajola (Wole Anjorin)	KR	1.92×10^3	16	16	0.17	0.47	5.2	23	36.3	Good	Yes	Sub GES
4	Kudeti	Aperin	APN	2.08×10^3	27	28	1.53	2.33	6.1	764	48.3	Good	Yes	Sub GES
		Beere	BER	2.16×10^3	140	25	1.12	2.38	3	416	56.2	Poor	Yes	Sub GES
		Kudeti/Abeni Ape	KUD	1.26×10^3	34	26	0.54	0.67	5.7	324	47.1	Good	Yes	Sub GES
		Molete	MOR	2.6×10^3	34	28	1.26	1.28	6	392	43.2	Good	Yes	Sub GES
5	Ona	Odogbo-Fatokun, Moniya	ODGR	2.2	280	29	0.26	2.72	5.9	232	29.4	Good	Yes	Sub GES
		IITA, Idi-Ose	IIR	8.3	16	4	0.19	1.29	6.2	23	24	Excellent	No	Sub GES
		NISER,Ojoo	NR	6.2	920	24	0.24	0.31	4.5	25	39.3	Good	Yes	Sub GES
		Odo Ona area by St Paul Anglican Church area	OOA	2.1	2.1	25	0.2	0.28	6.4	436	37.2	Good	Yes	Sub GES
		Orelope Zartech Road	OZR	2.8	350	20	0.17	1.77	5.2	27	43.1	Good	Yes	Sub GES
		Samog, Apete	APR	1.01×10^3	280	27	0.15	4.54	6.7	396	32.4	Good	Yes	Sub GES
6	Ogbere	Akinwumi Area, Iwo Road	AKI	2.96×10^3	540	24	0.4	0.55	3.2	324	58.6	Poor	Yes	Sub GES
		Rev. Aderinto Layout	ADE	1.48×10^3	21	30	0.23	1.4	5.7	432	45.9	Good	Yes	Sub GES
		Babanla Oremeji	BAR	2.6	920	18	0.23	2.39	5.8	416	40.2	Good	Yes	Sub GES

These samples were carried out for the SESA study. Samples were also carried out for the ESIA/ ESMP separately. Areas sampled include; **APN-** Aperin, **AKI**- Akinwumi Area, Iwo Road; **NR** - NISER,Ojoo ; **OR1**- Orogun, U.I second gate, **JR1**- Jerusalem, Arunlogun-Ojoo road, **IIR** IITA, Idi-Ose, **KR**-- Kajola (Wole Anjorin), **APR**- Samog, Apete, **OZR** - Orelope Zartech Road, **OOA**- Odo Ona area by St Paul Anglican Church area, **MOR**- Molete, **BER**- Beere, **KUD**- Kudeti/Abeni Ape, **ODGR**- Odogbo-Fatokun, Moniya, **BAR**- Babanla Oremeji; Rev. **ADE** -Aderinto Layout.

5.6 Groundwater

In Ibadan, groundwater quality is mainly of concern in relation to its suitability for use as a source of drinking water, in food processing and related industrial operations, and in the bottled water industry. From the field survey approximately 75% of the private drinking water supply in Ibadan is provided by groundwater. Groundwater is an important source of drinking water but also makes an important contribution to river flows levels

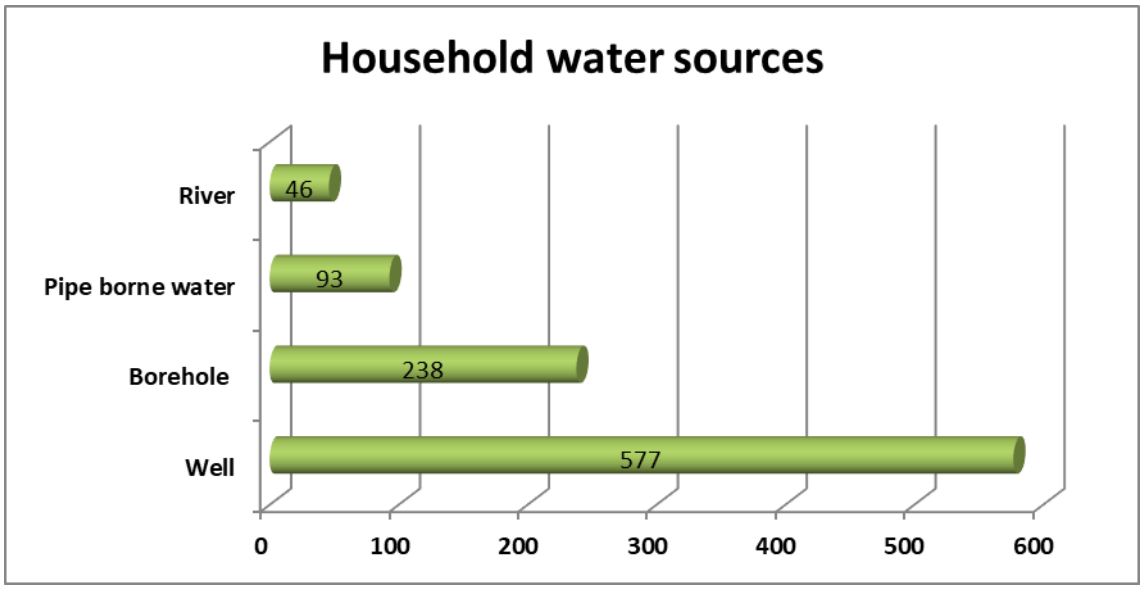


Figure 5. 10**:** Summary of Surveyed Household water sources in the city.

A large number of groundwater supplies exist state-wide. It is estimated that there are at least 10,087,476wells in the Oyo state, although many of these may no longer be in use because of a number of factors that includes among others seasonal availability, rock properties, permeability or pollution. There is currently no law or regulation for groundwater abstractions. In the floodplains, many wells have been constructed to extract groundwater and irrigate during the dry season. No reliable data about these abstractions is available. However, there are indications of small-scale irrigation projects being planned along the catchment area of the basins at various stages of planning and execution Table 5.7 is the summary of depths of wells drilled in Ibadan sourced from RUWASSA.

Table 5. 7**:** Summary of data available from basement complex borehole drilled in Ibadan

Location Rock Type	**Borehole No.**	**Depth to Rock (M)**	**Depth to water (M)**	**Depth of Hole**	**Saprolite Thickness**	**Average Yield L/S**
Ibadan, Orogun granite gneiss	1	7.62	4.6	36.6	29	0.95
Ibadan, Old Ife, Road granite gneiss	2	7.62	10.67	33.53	25.9	0.63
Ibadan, Old Lagos Rd. Quartz schist	3	19.81	13.72	39.62	19.81	0.88
Ibadan, Challenge Quartz schist	4	12.19	7.62	39.62	27.3	0.69
Ibadan, Iwo Rd.	5	6.1	3.66	36.58	30.48	1.26
Granite gneiss	6	15.	9. 15	28.96	21.38	1.14
Ibadan, Ojoo gneiss	7	12.19	7.62	48.77	16.77	0.63
Ibadan, (Old Lagos Road) granite gneiss	8	19.81	12.19	48.77	28.96	0.95
Ibadan, U.I. Auger gneiss	9	15.24	4.57	45.72	80.48	1.26
Ibadan, Bodija granite gneiss	10	10.67	12.19	40.92	30.35	1.14
Ibadan,Oke Ado Qartz schist	11	19.81	6.10	40.92	21.11	0.63
Ibadan, Bashorun granite gneiss	12	22.86	6.10	40.92	21.11	0.63
Ibadan, Bashorun granite gneiss	13	19.81	No water	99.06	76.20	Dry hole
Ibadan, Bashorun granite gneiss	14	22.86	6.09	36.58	13.72	1.14
Ibadan,Old Ife Rd. Gneiss	15	12.19	7.62	36.58	24.39	1.01
Ibadan,Iyaganku Quartz schist	16	15.24	10.67	36.58	21.34	0.88
Ibadan, Idi-Ishin Qartz schist	17	12.19	33.53	60.96	33.53	1.14
Ibadan,Oyo Rd Qartz schist	18	9.1	4.57	33.53	24.43	1.14
Ibadan,Jericho Qartz schist	19	15.24	13.72	36.58	21.34	0.95
Ibadan,Ring Rd. Qartz schist	20	35.53	12.19	42.64	27.40	0.88
Ibadan,Oluyoro granite gneiss	21	15.24	13.5	42.64	27.40	0.95
Ibadan,Ojoo Qartz schist	22	27.43	3.05	42.64	25.21	0.69
Ibadan,Bodija granite gneiss	23	-	-	-	-	-
Ibadan,Ife Rd. Gneiss	24	33.53	13.72	80.5	15.24	0.82
Ibadan,The Polytechnic granite gneiss	25	8.8	3.05	74.1	71.7	0.22
Ibadan,Lagelu Ile-Ogbon	26	6.71	-	56.08	67.39	-
Ibadan,Ijaiye granite gneiss	27	37	13.5	62.18	19.08	1.89
Ibadan, Abanla	28	7.01	Dry	62.18	55.17	Dry hole
Ibadan, Babalolenta granite gneiss	29	4.27	-	62.18	57.91	Very Low
Ibadan,Boshorun granite gneiss	30	34.75	-	58.08	27.43	0.17
Ibadan,Bashorun granite gneiss/Qartz vein	31	34.7	-	61	26.3	0.04
Ibadan,Apata granite gneiss	32	12.5	14.2	67.1	54.6	0.16
Ibadan,Irewole Qartz schist	33	7.6	2.4	67.1	54.6	1.5
Ibadan,Ifelodun granite	34	2.7	-	60.96	58.26	-
Ibadan,Abanla Qartz schist	35	9.4	-	54.86	45.46	0.26
Ibadan,Sobo granite	36	16.76	7	91.4	74.64	-
Ibadan,Agoile Older granite	37	13.4	5	42.7	29.3	6
Ibadan,Omi Adio gneiss pegmatite	38	12.2	-	42.7	30.5	0.66
Ibadan,Kojola gneiss pegmatite	39	6.1	-	54.9	48.8	-
Ibadan,Akinyele granite with dolerite	40	13.7	-	61.0	47.3	0.36
Ibadan, Oluyole Qartz schist	41	7.9	-	48.8	40.9	1.32
Ibadan,Sasa gneiss with Qartz granite vein	42	13.7	6	61	47.5	0.66
Ibadan, Akanran Older granite	43	34.1	-	61	26.9	0.88
Ibadan, Bodija granite gneiss	44	4.9	(unrecorded)	115.8	110.9	0.88

Source: RUWASSAN 2018

5.7 Water Users and Stakeholders

Six water resource users differentiated along the river channels include the following:

- Rain fed farmers and domestic water users in the high catchment and plains.
- Irrigators on the plains at the base of the escarpment
- Pastoralists and fishermen and women in—Garri making industry-.
- Abstraction by industries, hotels and livestock farms
- water supply to Ibadan population and environ
- Proposed Hydro Electric Power (HEP) stations

Major water usage along the river channels visited were fish farming and this was mostly observed at Jerusalem Arulogun, Odogbo, Odo ona Elewe, and Ajakanga communities where most residents are retired civil servants.

5.8 Existing Environmental and Social Pressures/Problems: Water

The main environmental and social pressures on surface and groundwater quality being, Eutrophication's, from industrial wastewater discharges or solid waste dumping, flow regime or physical modification, water quality is summarised by the headings set out below.

5.8.1 Eutrophication and Turbidity

The enrichment of water called eutrophication and seasonal turbidity is recognised as a major threat to the quality and flow of the river channel in Ibadan. The sources of these nutrients enrichment are sewage, agricultural effluents, fertilisers and industrial wastes, composted household organic wastes that are dumped into the channels. Similarly, from commercial activity such as mining, logging or dredging, clear cutting causing soil to wash away into rivers there are issues of increase turbidity.

Impact of eutrophication and turbidity in the river channels include **excessive vegetation growth that can reduce the conveyance capacity of drainage channel,** reduction in the aesthetic quality of rivers, lakes and streams, having a harmful impact on recreation and tourism, increase the cost of water treatment for drinking and food processing; harm fish and other aquatic life by reducing food supplies, degrading spawning beds, and affecting gill function etc.

Implementing the Drainage master plan and its component Sustainable Drainage Systems is expected to regulate surface water runoff close to where it falls and simulate natural drainage as closely as possible. They also provide opportunities to reduce the causes and impacts of flooding, remove pollutants from urban runoff at source, and combine water management with recreation and wildlife. They also help to enhance water quality while protecting natural flow regimes in watercourses.

5.8.2 Industrial Wastewater Discharges and Wastewater from Un-sewered Properties

An important characteristic of most stream channels within Ibadan is the almost absence of base flow within the channels. Therefore, during the dry season and or when it is not raining, most of the channels only act as conduits for the removal of domestic and industrial effluents. This gives vegetation the foothold to grow within the river channels, especially during the 5-month dry season. Within the city, many houses and businesses are

connected to on-site systems that collect, treat and dispose of wastewater, such as (conventional septic tanks or proprietary systems) which invariably because of improper design, installation or operation results in water pollution. Throughout Ibadan, more than 50% of the total properties along the river channels are currently without public sewage provision.

Inadequately treated effluents and spills or leakage from sewerage networks and industrial effluent can lead to unacceptable levels of pollutants in receiving waters. These pollutants can damage water quality and downstream. The potential impacts of combined sewer overflow spillage and run-off from road networks are also potential water problems in Ibadan. There are many cases of river channel being seriously polluted by this type of discharge as shown in figure 5.11.

Even with ample evidences of compliance in facility improvements to address such discharge in response to the State Ministry of Environment and Natural Resources and the NESREA regulations, the weak regulatory enforcement has engendered poor compliance in general with facilities except those who comply because of their international audit requirement, thus lots of room for improving the track records of compliance. Therefore, the implementation of the DMP will strengthen the mechanism in place to monitor adequately and will keep records of all relevant environmental variables, while it improves all aspects of water use and conservation within the city if the political will and financial resources for the implementation are sustained.

Figure 5. 11: Discharge point for industrial effluent from facilities into the river channel

5.8.3 Solid Waste Dumping, Quarries and Contaminated Sites

There are two institutions charged with the responsibility of overseeing the environment of Ibadan. The OYSWMA is the statutory body under the Oyo State Ministry of Environment and Natural Resources that was established by the state government to undertake waste

collection, processing and disposal in the city. As at the time of this study, there were over 500 registered private refuse companies that licensed by the state government to evacuate waste, particularly in the low density areas of the city. There were also over 244 street sweepers to sweep all the fourteen dual carriageways within the city on daily basis. However, all the efforts by the different actors saddled with the responsibility of managing waste in the state have not been translated into much expected success. The residents of Ibadan generate solid waste annually in the city with less than 20 % of this being evacuated. The rest find their way into streams and river channels, open spaces, road medians and side drains, and other unauthorized places. There are several evidences of waste dumping in the river channel (figure 5.12).

Engaging an affordable mix of appropriate technical options to Reduce, Reuse, Recycle & Reject. Ibadan city utilises four open waste dumpsite locations being Lapite, Awotan, and Ajakanga on the Ona Catchment basin, and Aba- Eku on the Ogbere Catchment Basin. A significant number of the Quarries, and industrial locations are on the Ogbere, Omi and Ona catchment, respectively. The major industrial layout of Oluyole and its antecedent wastewater are on the Ona Channel while the developing layout one in the Egbeda area is on the Omi channel. The newly proposed industrial layout at Moniya Akinyele Local government area is within the Ona catchment as well.

Thus, contamination arising from the industrial and un-sewered wastewater, infiltrating through permeable soil layers to the groundwater is an environmental pressure to be evaluated and monitored. Another issue is the lowering of the water table at some quarry sites, which often affect nearby wet areas and change water chemistry due to the transfer of groundwater to surface waters. Effective and sustainable solution would include Information, Education and Communication strategies, Integrated Solid Waste Management approach, and community participation.

Thus, Implementation of the drainage master plan must synergise with already concluded city master plan and solid waste master plan in order to improve solid waste management in Ibadan in the short to long term.

Figure 5. 12: Urban effluent and waste dumps on a feeding Stream and Wetland buffer zone.

5.8.4 Agriculture and Aquaculture

The Federal Ministry of Agriculture has a commercial aquaculture site at Dandaru, Agodi. Channel. Several commercial aquaculture sites are upstream and downstream of the Ona channel for example at Odogbo community inland aquaculture sites and at Idi- Ayunre. Others are at Arulogun upstream of the Orogun channel.

Different agricultural processes will affect river inputs, such as slash and burn agriculture increasing sediment loads or ploughing patterns that promote rapid runoff and soil erosion.

Two main water quality problems relating to agriculture have been identified; these are enrichment of water by nutrients (phosphorus and nitrogen) and organic pollution from animal slurry/manure and silage effluent. In Ibadan, agriculture is a very important activity, mostly practiced is livestock (figure 5.13), fish farming, poultry and crop farming

Aquaculture activities potentially affect water quality, physical habitat, biodiversity and indigenous species populations. Catfish farming has several potential impacts such as increased nutrient loading, organic pollution around cages, use of chemicals and medicines to control disease etc, which can cause morphological impacts mainly associated with harvesting activities. However, the fish farmers find it easier using existing drainage canal for discharges.

The aquaculture business has been impacted from flood events over the years in Ibadan, thus the implementation of the drainage master plan with only structural channelization may affect downstream water users who are into aquaculture if not applied holistically as sustainable drainage system that can positive support the business.

Figure 5. 13: Pollution from waste disposal and piggery farm Ode Aje, Alalubosa

5.8.5 Forestry

Most areas of Ibadan were covered by the rain forest and derived savannah. Growth and development have, however, led to significant loss of vegetation. Though there is forest cover along some of the river channel particularly the Ona, Ogbere and Omi channels. The wetlands are threatened by urban expansion into the wetlands and rural areas.

Forest areas in Nigeria started declining during 1990s at an estimated annual rate of +2.6% or 398,000 hectares per year (FAO, 2005). This was caused by agricultural expansion, desert encroachment, over-harvesting, bush burning, illegal harvesting and de-reservations. Forest cover in Ibadan has significantly reduced from 96.82% of the total land area in 1984 to 49.95% in 2014 (*Computation based on Data from NARSDA, 2016)*
The thick, low-lying forests are prone to flooding as observed in areas like Ajibode, National Institute for Horticultural Research (NIHORT) and Oke Ayo along the course of River Ona. Forests can have both positive and negative impacts on the environment. Positive impacts (include recreational activities, tourism, aesthetic value, improvement in air quality etc) Negative impacts arise with unsustainable forest utilization such (forest fires, deforestation without afforestation, excess logging etc).

The types and distribution of vegetation within a river catchment will affect the amount of sediment generated in the catchment, and the pattern and rate of water and sediment runoff. Deforestation can increase sediment input, whereas afforestation can decrease inputs.

Negative impacts are largely related to poor management or to planting on unsuitable soils. With an objective to expand forest cover in the next 30 years along the sensitive catchment as a non-structural measure for flood control and for habitat-protected species, old practices legacy in afforestation will need to be addresses for sustenance.

5.8.6 Physical Modifications and Other Built Development

Physical modifications can impact waterways by directly affecting habitats, or by indirectly changing natural processes through altering plant and animal communities, by reducing their variety or numbers. Land drainage, overgrazing, de-forestation and stock access can have an indirect effect, changing how much and how fast water drains off the land, resulting in an increased risk of property flooding.
There have been a number of large-scale schemes around the Ibadan metropolis involving physical modifications on the river channels. Stretches of these drained river systems need to be maintained from time to time removing silt build up to keep them in *'proper repair and effective condition'*, thus providing an outfall for land drainage, reducing flood risk and in certain areas ensuring the system is navigable.

Data obtained from the Oyo State Ministry of Environment and Natural Resources revealed that, between May and July 2012, a total of 29 streams/stream segments (including Ona River, Orogun, Agbowo, Alaro and Upper Ogunpa rivers) were dredged in Ibadan metropolis. Other stream channels, including Omolayo Stream, Balara Stream and Odo Oba Elere/Idi Ope streams have been ear-marked for dredging. By 2018, there was need for

unblocking road drainages and dredging of streams at about 64 different locations within the City.

The Oyo State government's 2005 gazetted setbacks ranges from 15m-30m and 45m for 16 streams and rivers in the metropolitan area of Ibadan. Details in Annex 12

A major observation made by residents living close to the dredged channels indicated that the channels were not deeply dredged enough because of the rate of its siltation and vegetative growth. The data reveals that depths of dredging were between 0.5m and 1.25m, which invariably they claim does not significantly improve the conveyance capacity of the streams, especially during flood flows, thus localised drainage by landowners can also lead to flood problems. **Moreover, with annual dredging, the statutory setback already given is impaired.** Flood plain setback regulations are designed to establish distances from water resources where building and other soil disturbing activities are prohibited unless under permitted conditions. The setback regulation is recommended as part of a community's storm water management program for flood control, erosion control, and water quality protection and, providing habitat for aquatic and terrestrial organisms, WHEREAS, the statutory setback already given becomes impaired to provide these functions unless protected from the effects of fluctuations in storm water flow; urban pollutants; various depths and width of yearly dredging, disposal of fill or dredged materials; and other impacts of land use change.

In addition, widespread development on the hilly terrains without consideration for its impact on the floodplains, particularly the potential effects on water quality and flooding behaviour as a result of the physical modifications to flood plains are of concern. In times of flood, rivers flow not only through their normal channel but also along the flood plains. Any constriction of the natural flow path can 'back-up' the river and lead to increased flood levels upstream. The construction of buildings or houses in or across a floodplain can not only put the development itself at risk of flooding, but can also increase the flood risk for land and properties upstream. The same is true of any form of construction or encroachment in the normal river channel. Undersized culverts or narrow openings between bridge piers carry the additional risk of causing a blockage of floating debris during high flows.

Data from the National Emergency Management Authority (NEMA) pointed out that erection of structures in floodplains, without due compliance to river or stream setbacks and obstruction of natural paths of rainwater are the lead factors of flooding in Ibadan. [20]Over 26, 000 structures constituted risk factors that aided the 2011 flooding disaster in Ibadan[21]. After the 2011 floods, over a thousand houses marked as causing obstruction to the free flow of flood waters along some river floodplains in Agbowo, Orogun, Oke Ayo, Apata and Orita-Challenge, among others, were earmarked for demolition by the Ministry of Lands and Physical Planning. Due to pressure from landlords and landlord associations, and pending litigations filed by owners of some structures, the government ended up demolishing only 56

[20] Cited also in the Ibadan Diagnostic report 2016
[21] Oyo State Honourable Commissioner of Lands

houses. These 56 structures referred to were demolished before the commencement of the IUFMP project and followed the Oyo state protocols and compensation procedures. Other structures that became impacted in the course of sub –projects of IUFMP have followed the duly compensation procedures of the World Bank through a diligent implementation of RAP. Effective planning controls and policy coherence are the first line of defense and are at the heart of effective flood management.

Covering natural or agricultural land, such as forests, woodland, pastures, crop fields or wetlands with buildings, tarmac (such as for parking areas or roads), or other impermeable materials without the inclusion of designed attenuation facilities, where appropriate, can significantly reduce the ability of the land to absorb rainfall, and will lead to increased land runoff.

As a result, large developments including those away from major rivers, can increase river flows and the risk of flooding to land and property downstream. The impact of an individual development can be minor, a series of smaller developments built up over a period of time can have a significant effect on flood risk in areas downstream. Development that prevents floodwaters from accessing natural storage areas, such as can occur by constructing embankments around sections of a floodplain, reduces the attenuation of the river system. This in turn will increase flood flows and risk downstream.

5.8.7 Climate Change

Since 2011, NIMET estimated the predicted temperature and rainfall for the future in Nigeria using the climate trends over the years and reported the following- An increase in temperature of 0.04 degree Celsius is depicted till 2046-2065 with an increase to 0.08 degree Celsius after 2050. Again the hottest regions will be the north eastern region with a temperature rise of 4.5 degrees by 2081-2100.
In the southern regions, the average increase of rainfall will be observed at 15cm annually during the period of 2046-2065 while an average decrease of 7.5cm annually will be observed in the north (NASPAN-CCN 2011).

Climate change will impact on water availability as it alters rainfall patterns and soil humidity, and causes water-related disasters such as floods and droughts, which impact food production. A typical rainfall raster image is contained in Figure 5.14 and Figure 5.15 shows Rainfall Isohyet generated in the river basins of Ibadan (reference is Oyo State water stewardship project facilitated under the UNIDO Technical and financial assistance in 2017-2019)

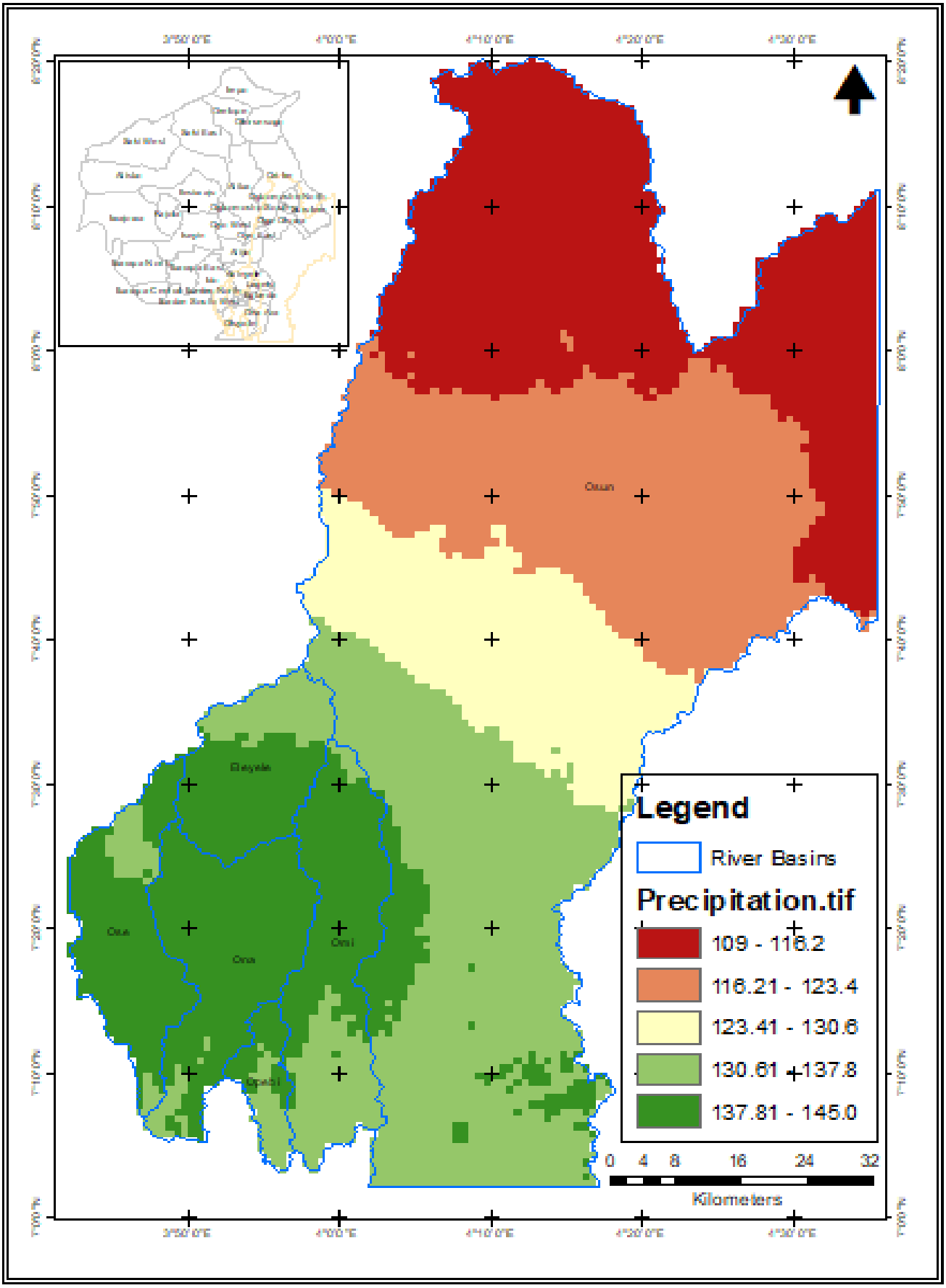


Figure 5. 14: Classified Rainfall Distribution in Osun and Ona Catchment Area (Cm)

These impacts are likely to have significant implications for the degree of flood hazard, in Ibadan with potential for heavier rainstorms to cause more flash flooding, resulting in an increase in diffuse pollution loads from soil run-off and increasing demands on flood controls.

Considering that, Climate Change Increases Hazard Risk, Loss of natural defences increases vulnerability, Environmental degradation weakens resilience, thus, with no influences from other sources (such as development), there will be an increase in flood damage.

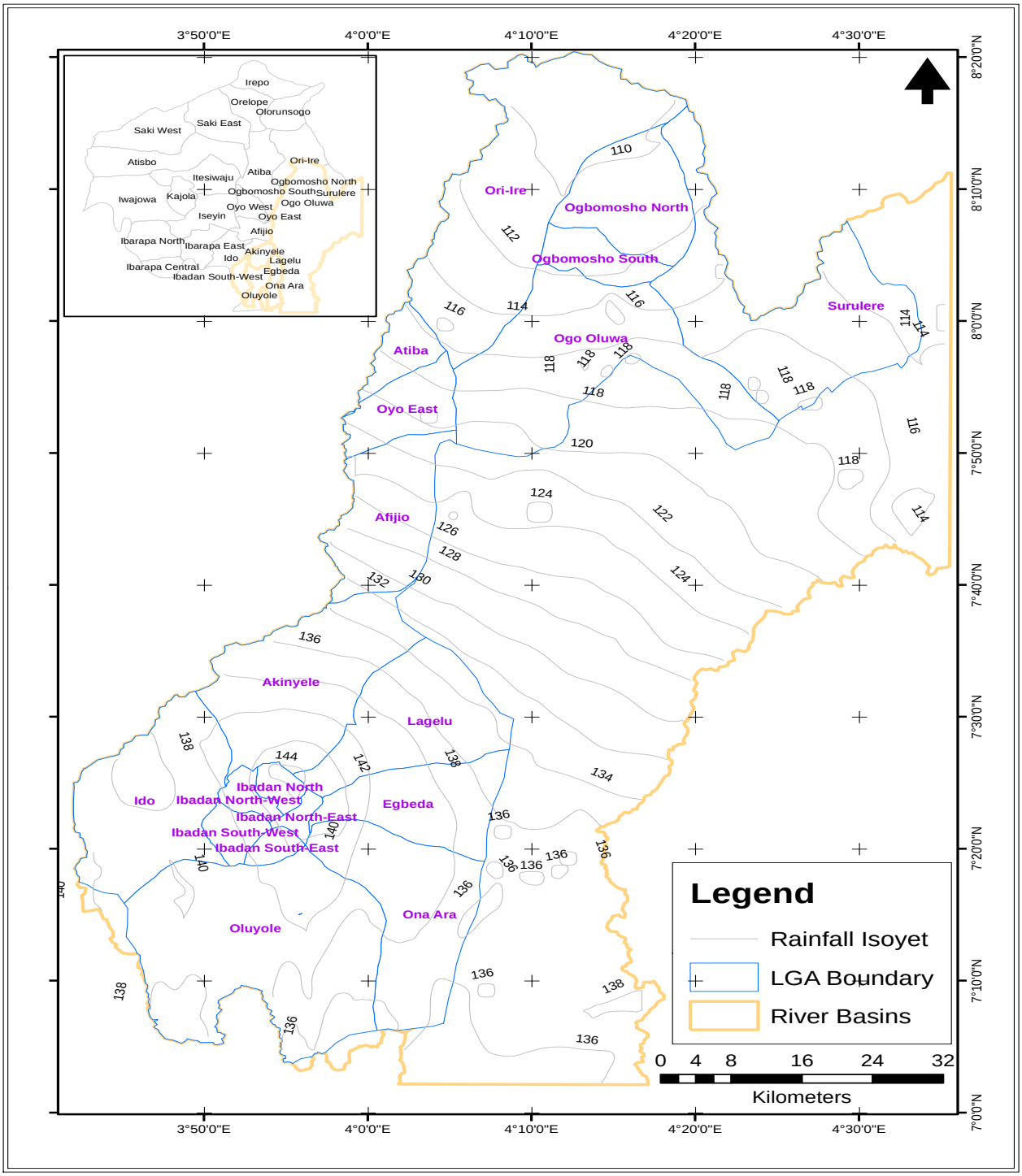


Figure 5. 15: Rainfall Isohyet for the Osun and Ona River Catchments (Cm)

5.8.8 Evolution in the Absence of the Programme: Water

In the absence of the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) activities being implemented, the risk of flooding would increase significantly. This section of the report addresses the potential impacts of this increased risk.

- Ibadan's increasing population will increase demand for clean drinking water and for wastewater treatment. The flooding of water distribution infrastructure, if it were to occur, could result in loss of water supply over large areas, which can magnify the impact of flooding well beyond the immediate community.
- The flooding of wastewater treatment utilities could pose a significant pollution risk to water quality with consequent negative impacts on human health, habitats, flora and fauna due to bacteria and other pollutants carried by floodwater.
- Flood damage to water supply and wastewater treatment infrastructure can also have significant detrimental impacts on local and regional economies.
- Flood events result in wash-off and leaching of pollutants, especially from more highly fertilised soils, causing increased phosphorus concentrations in rivers during flood events. This is particularly problematic if such floods occur during the growing season as eutrophication can result.
- Flood events remain a potential loss to agriculture and aquaculture thus affecting food productivity in the state and other water users triggering social disturbance.

5.8.9 Relevance in Context of the DMP: Water

The Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) form part of a series of works programmes that aim to ensure effective management of flood risk (**see Technical Note: Potential Balancing Reservoirs on Upper Ona**). These works will assist in reducing the risk of flooding and its associated impacts on water quality, and water supply and wastewater infrastructure.

- The DMP will facilitate the delicate balance between the water demand and existing water scheme, drainage infrastructure and new fast development upstream of the Ona and Omi catchment for which there are new proposed dams and dikes coming plan.
- The menace of flood waters in Ibadan can therefore be turned to be an asset if the impounded water in dams or dikes or inundation flood could be gradually used as detention basins for sectoral mini surface water supply systems/ schemes. The flood will thus become a re-usable asset and its menace be curtailed significantly.
- [22]The current shortfall or deficit in Ibadan water supply is over 60%. If handled sectoral, or at district levels at wherever the basins have a capability of pooling up for attenuation, the impoundment can be utilized for modular surface schemes, because boreholes cannot solve the problem of Ibadan water supply since the fractures bearing water in the basement rocks have very limited yields as can be seen in the Table 5.7. Achievement of this has positive social and economic good for the city ultimately.

[22] Cited also in the Ibadan Diagnostic report 2016

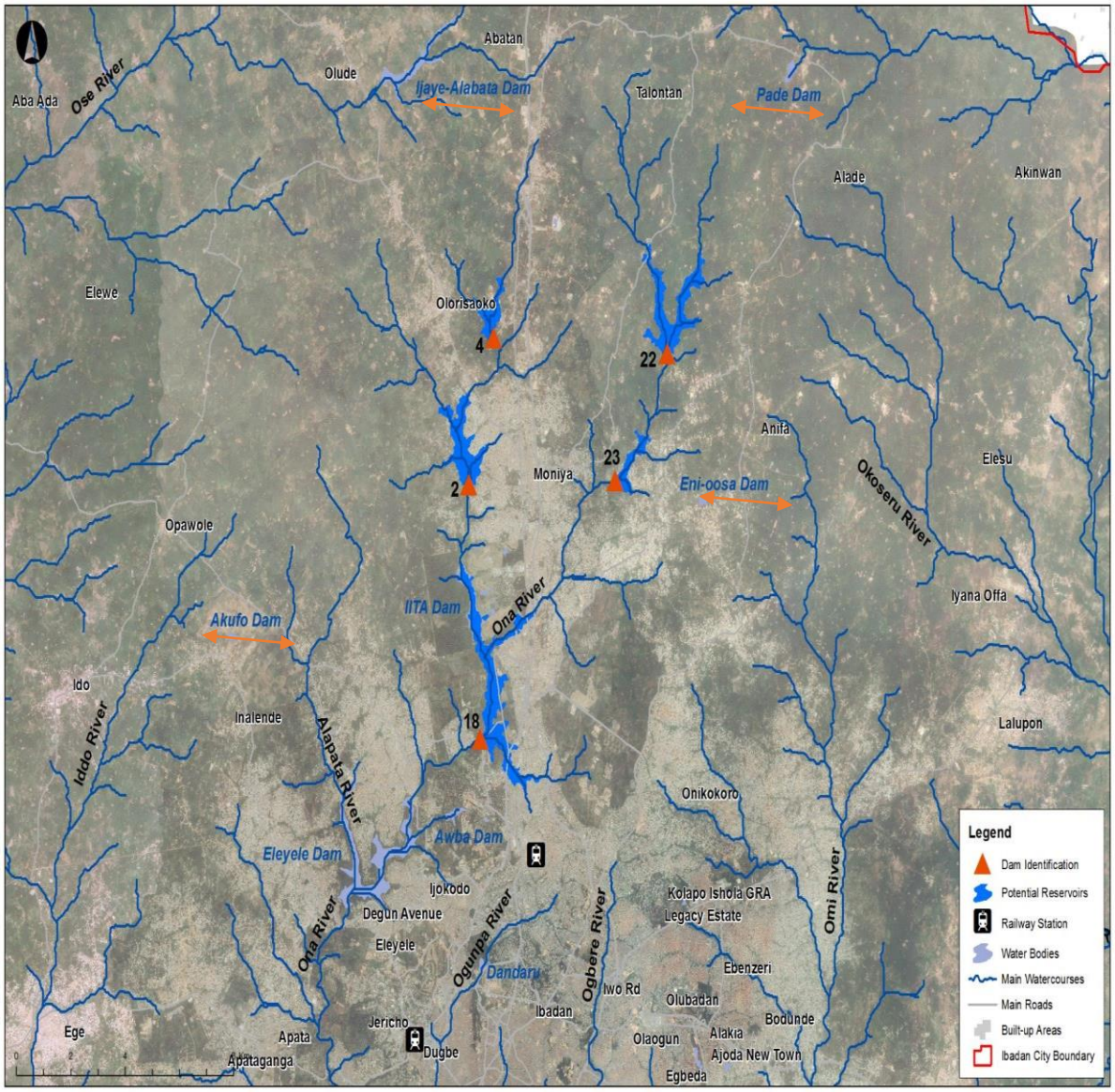


Figure 5. 16: Proposed Flood Balancing Reservoirs for the Upper Ona Catchment by DAR

- The DMP database on hydrology and morphology is one of the three factors that needs to combine with biology and water quality conditions to determine and monitor ecological status or potential of the river channel in Ibadan
- The high-resolution database already generated on the DMP can help to improve the non - existing records of illegal open dump sites and quarry mines along the river catchment and subsequently minimise the disruptions on the channel flow.
- Future changes in climate and the associated impacts on river flows and tide levels are likely to change the frequency, extent, distribution and pattern of flooding. More intense rainstorms, together with possible increases in storminess could significantly increase both the frequency and intensity of flooding.
- For example, floods which currently have a 1 in 100 chance (1% probability) of occurring in any one year could occur much more frequently. In addition to the planned Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) and attendant schemes, which aims to reduce flood risk, the plan will identify high-risk channels and give

permissive powers of maintenance to the state. This will ensure that new and previously unidentified potentially high-risk channels or defences that pose a significant flood risk or are of strategic importance are maintained to reduce the flood risk that may occur.

5.9 Scenic Landscape Areas and Routes

In terms of landscape and visual amenity, the Oyo State Ministry of Environment and Natural resources is expected to conserve and protect scenic value as Areas of High Amenity, Areas of Outstanding Natural Beauty, Scenic Routes and Protected Views, etc. The status of the Ministry performance on this aspect is currently at vision level.

Each Local Government Area is also expected to be responsible for the designation of such features within their individual jurisdictions, with the respective Development Plan providing objectives to protect them. Specific landscape features are often not listed within these plans; as such it is difficult to provide a list of these within this baseline.

The sensitivity of a particular landscape is derived from the evaluation of indicators such as visual amenity, cultural heritage, uniqueness, popularity, distinctiveness, and the quality of the elements of the area, Ibadan has unique hilly terrain and attenuation sites that can be considered for designations such as Special Protection Areas (SPAs), Special Areas of Conservation (SACs), Natural Heritage Areas (NHAs) and National Parks, and from information such as tourist maps, guidebooks and brochures.

This mandate is yet to be actualised in the State. Ibadan city has scenic hilly terrains such as Oke Are, Oke Mapo, Arulogun, among others dotting the landscape. Thus, the MENR will need as a matter of priority to utilise the DMP in conjunction with the Urban City Master Plan under the IUFMP to **develop indicators for mapping of such landscapes and route which will enhance the sustainability of the Urban City Master and Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) and can foster the development of the tourism industry in the state for economic growth.**

5.9.1 Existing Environmental and Social Pressures/Problems: Landscape and Visual

- Existing pressures on landscapes and visual resources are primarily related to visual impacts resulting from the Siting of developments. Many of these developments, which individually do not have significant adverse impact, have the potential to cumulatively and adversely significantly impact upon sensitive landscapes.
- However, the sensitivity of a landscape to development varies according to its character and to the importance which is attached to any combination of landscape values.
- Thus, in the context of the DMP, the long-term answer to urban surface water drainage is not the perpetual upgrading of sewerage infrastructure, for instance by creating ever larger pipes and subsurface storage, as this is impractical and prohibitively expensive.
- Instead, a sustainable approach to surface water management that takes account of all aspects of the urban drainage systems including those from hilly terrains that produces long term and sustainable actions must be deployed.

- This requires examination of the sources, pathways and receptors of flood waters to ensure that during any event the flows created can be managed in a way that will cause minimum harm to people, buildings, cultural heritage, the environment and businesses.
- A key component of this approach is to mimic natural drainage systems by managing rainfall and surface water above ground, maximising the use of permeable surfaces and planted landscapes.
- The landscape visual impacts associated with Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) Channelization and maintenance works in most cases will be negligible. These temporary impacts are limited to the immediate vicinity of the works and are carried out where the channels are already part of the existing landscape. The works that could potentially give rise to localised landscape or visual impacts include tree removal (where the tree is impinging on channel capacity), the spreading of material that has been removed in maintenance operations along the bank or on top of existing spoil heaps where present, and repair works to embankments, in the form of topping up with clay to design height.

5.9.2 Evolution in the Absence of the Programme: Landscape and Visual

The existing landscape, currently under pressure, is expected to change even more significantly over the next 20 years due to urban expansion, housing and building generally, tourism and recreation and infrastructure provision. However, the need for landscape protection is likely to become more significant as landscapes become more vulnerable to increasing development. In the absence of the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) and Channelization works being implemented, the predicted changes in the existing landscape are expected to continue regardless.

5.9.3 Relevance in Context of the DMP: Landscape and Visual

- Mapping of landscapes routes and river channel setback is key to the implementation of the non-structural aspects of the DMP.

- Protection of the landscapes routes and setback will require among others a coordinated monitoring and socio-economic utilization of the mapped-out routes for flood risk mitigation measures.

- Utilization of the DMP in the context of landscape protection will ensure surface water is conveyed to watercourses using the natural topography. Increasing surface water in the sewers would be avoided as this can lead to flooding elsewhere. This approach helps reduce surface water flooding. Lack of coordination between authorities (e.g lack of clearly defined roles, overlapping responsibilities, etc) can impede effective implementation. However, with coordination between authorities using multidisciplinary teams (including landscape architects), there will be clear allocation of responsibilities on flood management in regulatory frameworks which would strengthen the DMP. It will also help to realize multiple benefits including, integrating with and enhancing the urban landscape to provide better places for peoples, with respect to social, economic or recreational activities, improving the

quality and physical habitat of watercourses, increasing biodiversity and making the urban environment more adaptable to future change.

- Sustainable surface water management will involve increased use of SUDs and creation of surface water flow routes that divert 'safe' floods to areas where impacts will be minimized.

- Utilizing the DMP to design the full drainage system, from source to receiving water, from the outset allows the optimum balance between source, site and regional controls to be achieved and further co-ordinate with other authorities and projects to help to maximise benefits (e.g. using foot paths and cycle paths as routes for infiltration and conveying water, contributing to 'green and blue networks')

- The positive impact expected with the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) is the facilitation of non-structural flood control options with landscaping and setback mapping with trees.

- The governance of surface water requires coordination between authorities to achieve these multiple benefits. This can be addressed through integrated legislative framework and policy coherence, teamwork, consultations/meetings, cooperation, setting common goals to be achieved etc. In addition to flood risk management planning, this should include the interaction of:

- development planning and development management (local government authority)
- sewer network management (MENR)
- road management (roads authorities including local authorities)
- enforcement of Building Regulations (Physical Planning and local authority)
- river basin management plans (MENR)
- Local Biodiversity Actions Plans (MENR & local authority

The Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) with the right of way of the channels have proposed landscaping as indicated in Figure 5.17. Other landscape works lying outside the channel/trained stream right of way presented as a concept design for such Scenic landscaping as discussed above is shown in Figure 5.18

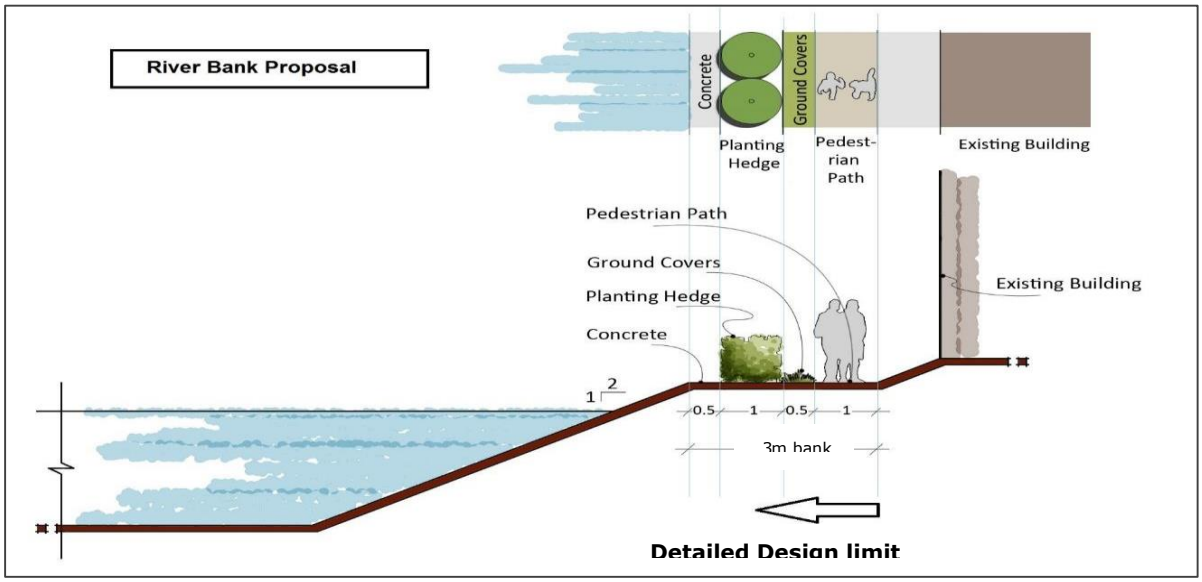


Figure 5. 17: DMP Proposed landscaping design

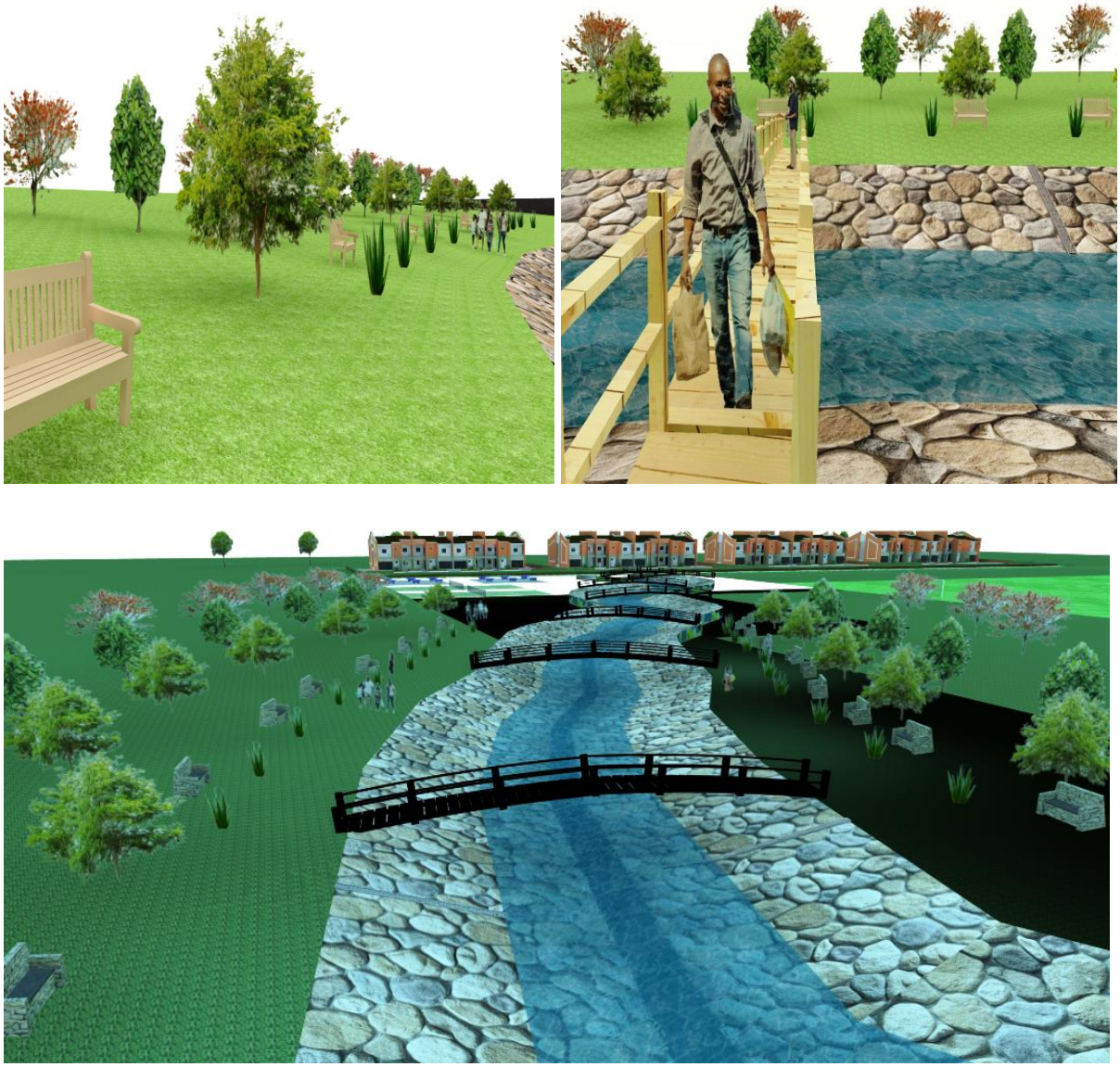


Figure 5. 18: SESA Proposed landscaping Concept design

5.10 Soil, Geology and Channel Modification

5.10.1 Soils

Soils vary considerably in their characteristics, depending on the kinds of rocks from which they were formed, the conditions under which they were formed and the length of time which has subsequently elapsed. Soils differ in depth, physical structure, water content, organic matter content and in their chemistry. These differences affect the fertility of the soil and use for agricultural or commercial purposes, its ability to retain and release substances, its influence on surface waters and groundwater chemistry and the kinds of flora and fauna it supports and contains.

Based on various results of many parameters sampled across completed, ongoing and proposed interventions under the IUFMP in the course of engineering or environmental consultancy or contracting work, data and indicators on soil quality is being established across Ibadan soils and landscapes spatially. These data are best put to use by the IUFMP and the Ministry of Environment as reference for Monitoring of works.

The quality of a soil is determined by a combination of physical, chemical, and biological properties such as texture, water-holding capacity, porosity, organic matter content, and depth. Since these attributes differ among soils, soils differ in their quality. Some soils, because of their texture or depth, for example, are inherently more productive because they can store and make available larger amounts of water and nutrients to plants. Similarly, some soils, because of their organic matter content, are able to immobilize or degrade larger amounts of potential pollutants.

These physical, chemical and biological properties are the basis for scientists, policymakers, and producers to adopt sound soil management that minimizes erosion, compaction, salinization, solidification, acidification, and pollution with toxic chemicals among others---to include a broader concept of soil quality that encompasses all of the functions soils perform in natural ecosystems such as, soil productivity, regulation of water flow in watersheds, global emissions of greenhouse gases, attenuation of natural and artificial wastes, and regulation of air and water quality. These functions are impaired by soil degradation as indicated in figure 5.19

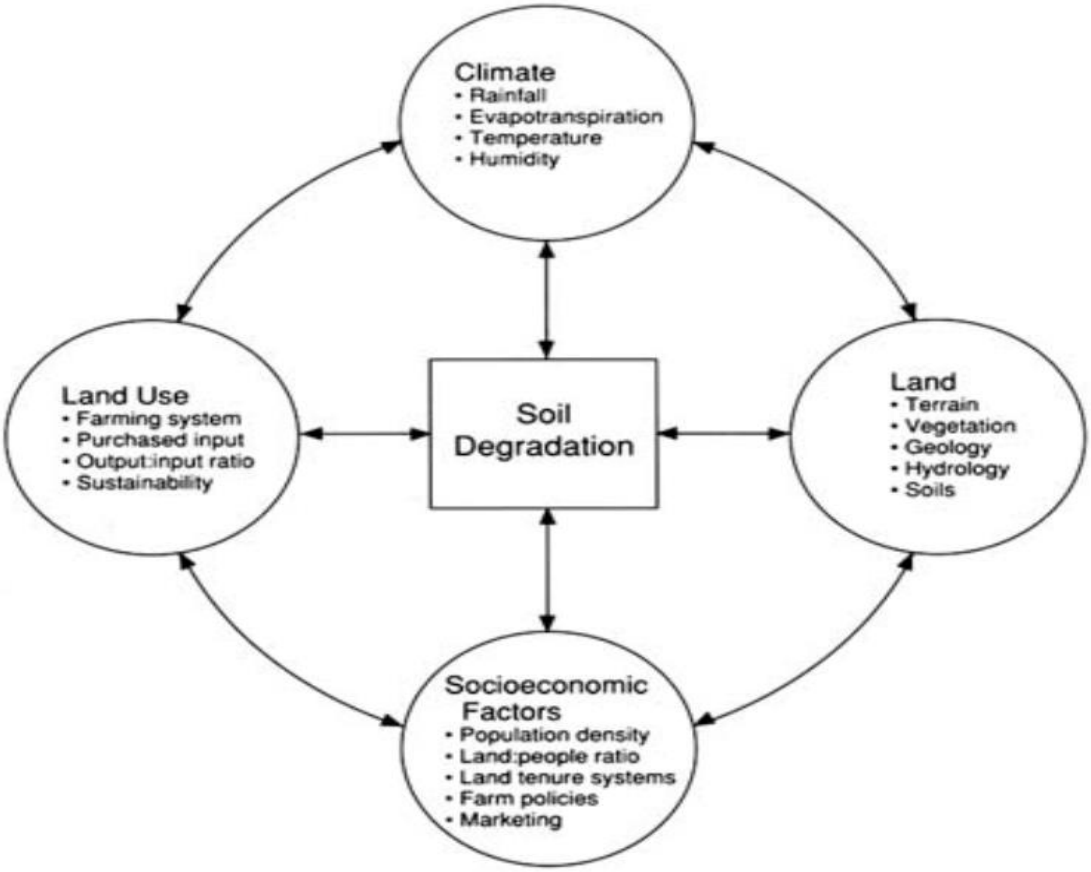


Figure 5. 19: Interactions of factors that cause soil degradation
Source: R. Lal and B. A. Stewart. 1990a. Need for action: Research and development priorities. Advances in Soil Science 11:331–336. Reprinted with permission from © Springer-Verlag New York.

Effectiveness of responsible agencies particularly the MENR who has the mandate for environmental monitoring and that of Ministry of Agriculture that has responsibility for improving-agricultural productivity/ activity needs to be strengthened to utilize the established data and to build on it for sustainable development of the Ibadan ecosystem in soil productivity, regulation of water flow in the watershed and pollution control. The MENR have the opportunity under the IUFMP project to become equipped technically and with infrastructures to carry out environmental monitoring for defined outcomes.

Table 5. 8**:** Soils Types in Ibadan

River Channel	Soil Types
Agodi	Mostly sandy lowland and with low water retention. Soil in this region has good drainage properties.
Kudeti	The soil along this are grayish Mountain top ridge zones, the soil in this region has low risk of runoff. Good for Agriculture.
Orogun	25% of the soil in this channel is sandy with low water retention. There are mountain top ridges with high run off and high gully erosion rate. Sand mining activity for construction purpose is predominant along this channel
Ogbere	Mostly grey podsols with low land with low water retention. Soil in this channel have good drainage properties.
Ona	Basically, gleys soil is found on this channel (80%) with high water retention. These are

	naturally fertile and allows for productive agriculture.

5.10.2 Slope Stability & Landslide Potential

Landslides incidents and earth tremors[23] have occurred in Ibadan dating back to 1939, 1984 though not common occurrences and Ibadan is not considered to be a high-risk location. Most landslides that have occurred in the past have been confined to uplands areas.

Several factors involving human activities contribute to land sliding. Such factors include clear cut timber harvesting operations, building on weak foundations, chaotic planning, infrastructural inadequacies particularly on hilly terrain, blasts, vibrations from machineries and blocking of drainage by artificial fills. Heavy rainfall, porosity of the soil and moisture content as well as slope angles facilitates the occurrence of landslide.
There is however the need to establish a landslide database, which is key to allowing for sustainable development of the landscape and will play an important role in the planning process. The Oyo state or Ibadan city landslide database is not currently complete, though information on specific areas is available such as the incident that occurred in Okeigbo.

5.10.3 Geology and Drainage System

Geology of Ibadan and environs, including the catchment of the river channels, falls within the Pre-Cambrian rocks of South Western Nigeria which is part of the Nigerian Basement Complex. The major rock types are schist-quartzites, granite-gneiss, banded gneiss, augen-gneiss, and migmatites (Jones and Hockey, 1964; Olayinka et al., 1999), while minor rock types such as pegmatite, aplites, quartz veins, and dolerite dykes intruded the main rocks in places (Figure 5.20). Gneiss are migmatized in places and characterized by predominantly medium-sized grains while schist-quartzites occur as elongated ridges striking NW-SE (Olayinka et al., 1999).

The drainage system is controlled by the bedrock geology, with characteristic dendritic pattern of the streams and rivulets being structurally controlled. Flash overland flow and drainage discharge is common during the wet season from May through October aided by the hilly nature of the surrounding terrain.

[23] Towards an integrated seismic hazard monitoring in Nigeria using geophysical and geodetic techniques Kadiri Umar Afegbua*, Yakubu Tahir Abubakar, Akpan Ofonime Umo, Duncan Dauda and Usifoh E. Saturday

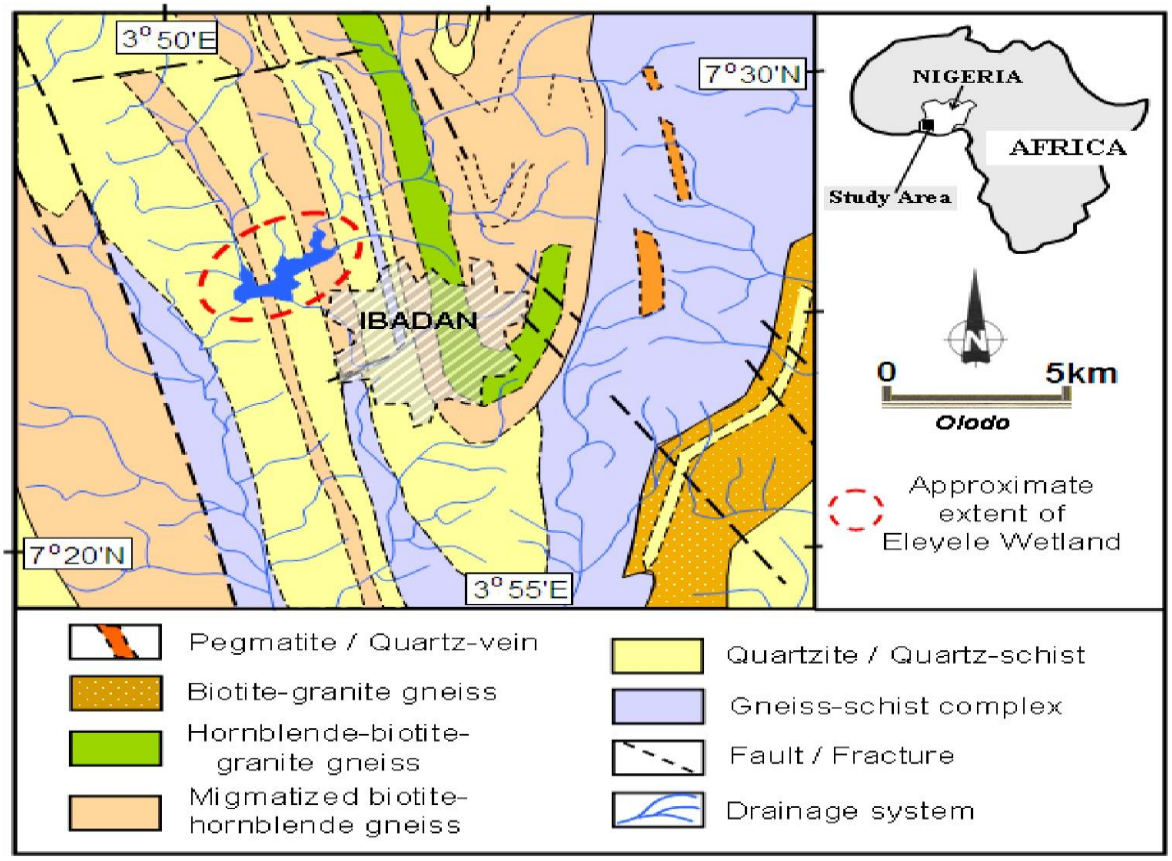


Figure 5. 20: Geological Map of Ibadan showing the rock types within the Eleyele Dam catchment.

5.10.4 Sediment Extraction and Geomorphic Responses

The rivers in Ibadan have a dynamic equilibrium between river flow, river slope, sediment supply and sediment size, and changing any of these factors promote either deposition or erosion such that the channel establishes a new equilibrium with the flow and sediment conditions, if sediment is available, the channel may regain its former geometry, but excess or insufficient supply will alter the morphology.

All the rivers experience seasonal changes within rivers, where sediments are deposited and stored during low flow conditions and then remobilised during periods of high flow thus with this dynamic equilibrium, the channels continually adjust to the changing flow and sediment conditions.

This has encouraged illegal sand mining activities all on the river channels with multi-faceted potential changes that include:

- A reduction in the sediment load of the river: Extracting material will reduce the total volume of sediment available for transport, thus causing bed erosion.
- A reduction in the sediment available for transport: Sand mining generally targets medium to coarse sand and gravels, reducing the availability of this grain-size and reducing median grain-sizes. This change promotes bed erosion.

- A local increase in the slope of the river through the removal of material: Sand mining deepens channels and the resulting depression can locally increase rivers slope and localised bed erosion due.

5.10.5 Existing Environmental and social Pressures/Problems: Soil and Geological and Geomorphic Responses

- Changes in soils result from both natural processes and human activities that contribute to their dynamic and evolving nature. Such changes are matters of concern if they result in the physical, biological or chemical degradation of soils. This can lead to the impairment of essential soil processes, the reduction in productive capacity, the depletion of soil quality and biodiversity and the direct loss of soil.
- The general consensus in Ibadan is that soil quality is good. However, there is increasing pressure on soil, particularly from land-use changes, intensification of agriculture, erosion and overgrazing, disposal of organic wastes to soils, afforestation, industry and urbanization. These activities can lead to soil degradation including loss of organic matter, decline in soil fertility, acidification, loss of soil stability, increasing soil erosion, soil compaction, contamination, loss of biodiversity and loss of soil to buildings and infrastructure. Many of these activities, which affect soil functions, also have the potential to cause deleterious effects on air and water environments.
- Weather patterns in general are expected to change significantly in the coming years due to the influence of climate change. Predictions for the future are for heavier rainy season with an increase in the frequency of high intensity rainfall events. It is possible that such changes could seriously compromise slope stability resulting in landslides, this would have major implications for water quality in affected waterbodies.
- Eutrophication and not just sediment loading of rivers can occur when large amounts of soil are washed into the waterbodies following heavy rainfall.
- Extraction activities/ sand mining is a lucrative business in Ibadan. If not managed correctly can cause socio economic problems with the myriads of stakeholders involved.
- Drainage infrastructures have a direct impact on river systems because they have the potential to alter both the flow regime and sediment budget of a river.
- Large dams can modulate high flows and increase low flows, thus changing the sediment transport characteristics of a river system. Dams trap sediment, with larger sediment sizes preferentially captured by impoundments. This reduces the overall volume of sediment available for transport, starves the downstream river from specific sediment sizes and alters the range of sediment sizes available for transport.
- Downstream channel incision, riverbank collapse and change to the nature of the riverbed are common changes below dams. These processes are very similar to those associated with aggregate mining.
- Channel modification including flood control measures, the straightening of rivers to allow for the development of flood plains, dredging to enable navigation and the diversion of river water for use in irrigation have the same effects as aggregate mining. Straightening and narrowing rivers results in greater flow speeds, exacerbating incision.

Levees designed for flood protection may cut rivers off from their flood plains, while also straightening and shortening rivers.

5.10.6 Evolution in the Absence of the DMP: Soil& Geology

- In the absence of Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) and Channelization activities being implemented, the risk of flooding to the benefiting lands would increase significantly.
- The flooding of agricultural land could result in damage to the valuable soil resource within the relevant lands, with knock-on effects including loss of production and the associated financial losses and costs causing social disruption.
- Aggregate mining not only affects the physical state and ecology of rivers but also the societies within the river catchment. The social impacts of aggregate mining are linked with depleted fisheries, loss of land, destroyed infrastructure and reductions in groundwater quality, all of which have social impacts. The survey in the course of the SESA studies in community cited infrastructure damage and groundwater depletion.

5.10.7 Relevance in Context of the DMP: Soil &Geology

- The Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) and ancillary works form part of group of work programmes that aim to ensure effective management of flood risk. These works reduce the risk of flooding to the benefiting lands, thereby protecting the soil and geology resources within these lands through channel maintenance.
- Channel maintenance operations involves removing the build-up of foreign or natural material that impedes the free flow of water. The material removed in the maintenance operations is normally spread along the bank or on top of existing spoil heaps where present. Restrictions in channels due to bank slippage or damage are regarded to the original profile. Channel breaches due to bank erosion are resolved by re-profiling the bank in-situ or in some cases by importing protection material such as rock armour or log poles.
- Landslide susceptibility mapping and successful prediction of landslide occurrences and the preparation of a map showing landslide-prone areas call for collection of the relevant spatial data which the DMP database on hazard maps can serve a guide.
- In addition, the DMP data on remote sensing (RS) and geographic information system (GIS) will be means of efficient, rapid and cost effective technique to produce valuable data on geology, geomorphology, lineaments and slope as well as a systematic integration of these data for exploration and delineation of groundwater potentials zones in the state that has proven a challenge because of the basement complex rock properties.

Implementation of the DMP taking cognisance of the non-structural measures will facilitate the sustainable mitigation and management of sand mining negative aspects.

5.11 Hydrology and Related Material Assets

River gauges should be installed at all the channels in strategic location for stage-discharge calibration and more efficient monitoring during flood with involvement of the community to support early flood alert warning.

5.11.1 Stage – Discharge Relationships

The river gauge records are the most effective ground means to determine the extent of flooding along the river channel. This model must have a relational interface with the stage heights of the river at chosen control points. Currently, there were not enough river gauge on the river basin except for Ona (by sasa) and Agodi (by Davies hotel) and on Ogbere, recently installed by SESA consultants under the supervision of the Ogun River Basin Authority with the commencement of readings by September 2017. Some records extracted from these readings along Ogbere channel was at Ogbere Tioya. It must be noted that most of the readings within the channel were below 2.0m, even in the peak of rainy season. It is expected that the preferred modelling option for the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) should indicate seasonal variations that will show higher volumes and river stages during the wet seasons. This will be the first level of flood warning, as residents will be prepared for the seasons of high flows.

Implicit in Stage-discharge relations are the flow volumes which the channel must handle, and hence recommendations made for widening and improving channel conveyance capacities. This is a major flood control measure we expect the model to handle on this basin. It will be good if the model can translate into river stage and subsequently discharge along the channel, which will be used to design for either structural or non-structural solutions

5.11.2 Material Assets

This section presents a summary description of the baseline environment in relation to non-water-related material assets, such as road and rail infrastructure. The purpose of including non-water-related material assets is to characterize those facilities whose operations may be affected either by measures in the DMP or who need measures implemented to alleviate impacts occurring in the absence of the DMP.

Figure 5. 21: Sample of Installed river gauge by SESA Consultant at communities within the river channels –at kudeti, Ogbere tioya, Akinwunmi, Ogundipe kumapayi.

5.11.3 Non Water Related Material Assets

5.11.3.1 Roads & Rail Infrastructure

Figure 5.22 indicates the existing and planned road and rail infrastructures in Oyo State that needs to be taken into consideration in course of Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) Studies and designs.

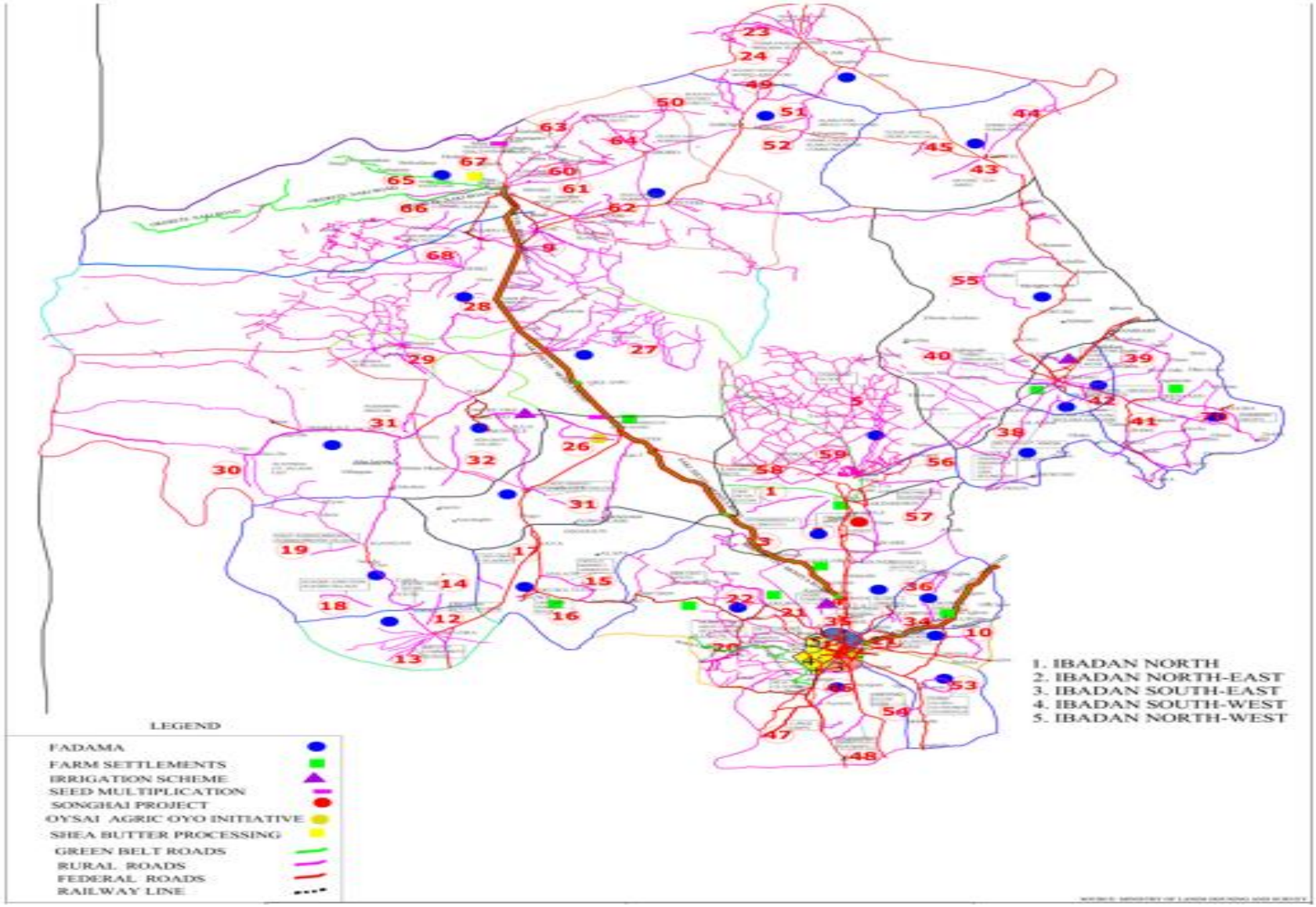


Figure 5. 22: Existing and Proposed Road/Rail Infrastructure for Oyo State – 33 LGAs

Figure 5. 23: Open burning and sampling of dumpsite leacheate at the Abaeku dumpsite

5.11.3 Existing Environmental and Social Pressures/Problems: Material Assets

Ibadan's growing population has created an increasing demand for residential, commercial and industrial development and associated infrastructure. This increased rate of development continues to put pressure on existing material assets, for example, transport infrastructure, water supply, wastewater treatment facilities, dumpsite/ landfill site and associated infrastructure.

Water quality issues are resulting in pressures on economic aquaculture activities, along with fisheries used for recreational purposes. Some of the physical modifications identified as material assets, such as dams and weirs, may also be resulting in pressures on fisheries used for recreational and commercial purposes.

Programmes of wastewater treatment plants and networks, water supply infrastructure, transport infrastructure and power lines etc. are required to be implemented in several areas in order to accommodate recent and future growth.

5.11.4 Evolution in the Absence of the Programme: Hydrology river gauge and Material Assets

In the absence of Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) and channelization activities being implemented, the risk of flooding to the benefiting lands would increase significantly, with resulting potential negative impacts for **material assets located on these lands, including agricultural land, commercial and industrial premises, transport and communications infrastructure, water supply and wastewater treatment facilities and infrastructure**.

Flood damage to these material assets could have potential knock-on social negative impacts and disruptions on human beings, in terms of movement, communication collapse, road cut off etc.

The flood defences maintained are themselves a material asset. In the absence of maintenance works being carried out, such defences would not be kept in proper repair and effective condition, thereby resulting in the loss of a valuable material asset.

(a) An urgent re- assessment of the Hydrologic river gauging network in the State is also necessary. The expected density of the river gauges on the network of Ogunpa, Kudeti, Ona, Omi and Ogbere should be used to propose new gauging stations on these streams, more so for flood warning purposes, as is done in developed countries of the world.

4.11.4.1Relevance in Context of the DMP: Hydrology River Gauge and Material Assets

- The DMP has a compilation of information and data on material assets regarding the implementation of Storm Water Management (SWM) improvement and retrofit opportunities, inspections and maintenance guidelines, and Storm Water Management funding mechanisms.
- The Urban City Master Plan has compilation of information and data on the road's linkages, current and proposed landfill sites.
- Thus, it is important in the implementation of the DMP that it is aligned with the Urban City Master plan to ensure that the material assets have **a coordinated Assets Management Plan and maintenance schedule.**
- The Asset Management Plan will assess Storm Water Management facilities owned and operated by the City to understand the costs and risk associated with providing the level of service that best meets the needs of the City.

5.12 Cultural Heritage and Tourism

5.12.1 Monuments, Sites and Properties

At the centre of the indigenous area of Ibadan is located the ancient Mapo hall and the modern central palace that is a monument tourist centre. The historical Mapo Hall was built on the top of Mapo hill overlooking the vast area of the city enjoying uninterrupted breeze required for relaxation. Others include the Bower's Tower at the crest of the highest Oke-Aremo Hill forest reserve which was redeveloped by the Federal Government as Tourist Center of National importance in the city.

The monuments/ places managed by cultural heritage and tourism groups are registered by the Ministry of Information and Mass Mobilization (the body responsible for Culture of tourism). There are structures or areas that have been passed to the care of responsible bodies for restoration, public access and amenity value that are managed by the State, Federal and international bodies. Table 5.9 provides examples of some of these sites found around the project area.

5.12.2 Tourism

Tourism is one of the least contributors to the national or the state economy. It can however become a significant source of full-time and seasonal employment in the course of implementation of the proposed non-structural measures within the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP).

The inadequacy of these recreational facilities in Ibadan aptly described by Obateru (1981, p.51) has only been slightly modified with recent survey data thus; "***Ideally, Ibadan should***

have at least 500 children playgrounds, but has two: 125 neighbourhood playgrounds but has five miniature ones: 125 neighbourhood parks but three. 31 district parks but none: of the 10 city parks it should have, it possesses only two: the city has two stadia and three mini stadia although one expects the city to have at least 10.

This is not to say that forest reserves in Ibadan did not have recreation component. The pond at "**Agbadagbudu**". The spring had been serving the core area of Ibadan especially Oke-Aremo, Odoye, Oke-Are, Beere and Mapo.

The popular "**Alalubosa Lake"** which used to be flourishing recreation centre during the Easter Holiday is no more. The site was acquired for redevelopment by the Federal Government but it is now sand filled as a result of deforestation and development of GRA plots.

There is an "Ogunpa Lake" (called Dandaru by the Indigenes) at the upper course of Ogunpa River. The State Government had established **Agodi Gardens** near the lake for recreational activities during the public holidays. It is located along the Parliament/Secretariat Road. The Ministry of information and mass mobilization identifies, Package and Promote the Cultural-Tourism potentials of Oyo State with an income generation motive through the cultural heritage groups which are both government and private sectors oriented.

Table 5. 9**:** Sites Maintained by Cultural Heritage Groups

River Channel	Heritages	**Locations**	**Management**
Agodi	Agodi Park and Ogunpa lake	Agodi garden,	Bureau of Investment Promotion and Public Private Partnerships (BIP/PPP
Kudeti	Ancient buildings, old cemeteries,	Apaatere, Kobomoje	Private organisation e.g (Glo heritage, Ibadan Greeters-International Greeter Association)
Ona/ Orogun	IITA lake, NISER, Zoological and Botanical garden, NIHORT,	University of Ibadan	By the respective institutions
Ogunpa	Cultural Centre Ibadan	Mokola	Ministry of Information and Mass Mobilisation

5.12.3 Existing Environmental Pressures/Problems: Cultural Heritage and Tourism

Ibadan's archaeological and historic architectural heritage is a finite resource. This resource is increasingly threatened by urbanization. In general terms, development resulting from economic growth and increasing population is placing pressure on sites and features of known or previously unknown cultural heritage interest. Individually, these developments and their associated infrastructure can increase the potential to impact on sites and features of archaeological and architectural heritage. Cumulatively, this results in increased pressure on the overall cultural heritage resource.

5.12.4 Evolution in the Absence of the Programme: Cultural Heritage and Tourism

- In the absence of Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) and Channelization activities being implemented, the risk of flooding to the benefiting lands would increase significantly.
- The risk of flood damage to features of architectural or archaeological heritage or tourist sites located within these lands would therefore also increase.

5.12.5 Relevance in Context of the Programme: Cultural Heritage and Tourism.

- In more general terms, the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) and channelization works are to reduce the flood risk to benefiting lands, thereby also reducing the flood risk to tourist sites and features of archaeological and architectural heritage located within these lands.
- More importantly is the positive impact expected from improved access and patronage expected with the sustainable urban development aspect of the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP).
- Where ancillary structures such as weirs gates, and pumping stations - some of which may be found to be of architectural heritage interest – they will be repaired or replaced as necessary to maintain their respective operating function. For the channelization work archaeological assessments may be required prior to works commencing.

CHAPTER SIX: STRATEGIC ENVIRONMENTAL AND SOCIAL OBJECTIVES, TARGETS AND INDICATORS

6.1 Introduction

The development and implementation of the DMP must result in a sustainable outcome for the current and future communities of the study area, and as such will require consideration of environmental, social and economic factors.

Strategic Environmental and Social Assessment (SESA) as its name suggests, is set at a strategic level, and is required to consider the significant environmental and social effects of the DMP, and of reasonable alternatives that take into account the objectives and geographical scope of the DMP. It is not appropriate in SESA, and is often impractical, to predict the effects of an individual project-level proposal to the degree of detail that would normally be required for an EIA of a project.

6.2 Development of Strategic Environmental and Social Objectives, Targets and Indicators

6.2.1. Developing the SESA Objectives

An initial suite of objectives was identified during the scoping process, based on an understanding of the issues, constraints and opportunities relating to Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) Development, its channelization and ancillary works and Channels Designation. These have been subsequently refined, through stakeholder consultation, for use as appraisal criteria, both within the option assessment process, and the subsequent SESA evaluation of the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP).

Thus, a review of the interaction between the proposed DMP interventions and the environmental and social baseline environment by the SESA Consultant team using their professional opinion, has identified sets of SESA objectives (Table 6.1).

Table 6. 1: SESA Objectives

No	SESA Objectives
ENVIRONMENTAL	
1	**Ensure sustainable use of terrestrial / freshwater ecosystems.**
2	Protect and enhance environmental settings for biodiversity, flora and fauna of terrestrial and freshwater ecosystem of Ibadan,
3	Ensure setback mapping of forest reserves and protected areas, especially within flood plains and hilly terrains areas of Ibadan.
4	Ensure planning and monitoring of development on all flood plains and hilly terrains of Ibadan
5	Increase afforestation and restore degraded forest in areas of land not allocated for specific masterplan development
6	Protect and enhance where possible Natural Conservation Sites
7	Ensure preservation of soil by implementing resilient agricultural practices.
8	Integrate climate change projections in the implementation of policies, strategies on the DMP
9	Recognize the importance of urban and peri-urban agriculture in Ibadan, and therefore maintain and expand its range and diversity.
10	Maintain existing, and where possible create new, fisheries habitat including the maintenance or

	improvement of conditions that allow upstream migration for fish species
11	Ensure the DMP poses no adverse effects on commercial fisheries
12	**Protect and restore river and lake / reservoir water quality by reducing all pollution sources**
13	eliminate dumping of waste into rivers course
14	Substantially reduce waste generation through an integrated hierarchical waste management system of prevention, reduction, reuse, recycling and safe disposal.
15	reducing the release of untreated waste water through implementation of waste water treatment system
16	Strengthen participation of local communities in improving water and sanitation management
17	Improve potable water quality by substantially increasing the efficient treatment and supply of clean water to all communities in the study area, and at an affordable price.
18	**Ensure identification and preservation of heritage buildings, sites, monuments and areas.**
19	Protect and safeguard all forms of archaeology and cultural heritage within the study area, including through development of site management plans.
20	Ensure that all development and DMP implementation is prepared for the discovery and management of archaeological chance finds.
21	**Increase community education, provision of information, and guidance towards sustainable community livelihoods and flood risk management.**
22	Provide a budget for the education of communities about conservation and sustainable use of valuable ecosystem services.
No	**SESA Objectives**
Socio-Economic	
23	Proactively integrate the population growth and projections of Ibadan for planning of land use and infrastructure requirements in the DMP.
24	Ensure that populations are not exposed to flood waters due to development and construction in flood plains and that economic losses as a result of flooding are limited.
25	Develop and implement disaster risk management and early warning systems, to protect vulnerable populations and to limit economic losses.
26	Encourage flood resilience and flood proofing structures access in housing standards and provisions
27	Improve the living conditions of the physically displaced poor or vulnerable persons through provision of adequate housing, access to services and facilities, and security of tenure.
28	Avoid involuntary resettlement or, when unavoidable, minimise involuntary resettlement by exploring project design alternatives in the implementation of the DMP.
29	Where involuntary resettlement is unavoidable, mitigate adverse social and economic impacts from land acquisition or restrictions on land use, by (a) providing timely compensation for loss of assets at replacement cost, and (b) assisting displaced persons in their efforts to improve, or at least restore, their livelihoods and living standards, in real-terms, to pre-displacement levels.
30	Plan and execute resettlement activities as sustainable development programmes, providing sufficient investment resources to enable displaced persons to benefit directly from the project.
31	Ensure that resettlement activities are planned and implemented with appropriate disclosure of information, meaningful consultation and the informed participation of those affected.
32	Provide access to safe, affordable, accessible and sustainable housing systems for all, with special attention to the needs of those in vulnerable and remote situations.
33	**Recognise the economic necessity to develop and expand commercial agriculture in Ibadan.**
34	Recognise the importance of the developing livestock sector in Ibadan by providing support especially to fish and poultry farming.
35	Implement science-based sustainable aquaculture management plans for fish farmers, and so improve fishing productivity and resource exploitation.

36	Ensure access of micro-, small- and medium-sized enterprises (including agriculture and fisheries) to financial services, including affordable credit.
37	Substantially expand vocational training and information and communications technology education in all communities within the Ibadan study area to sustain the DMP, early warning system and sustainable urban systems.
38	Provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable and remote situations.
39	**Develop effective, accountable and transparent institutions at all levels.**
40	Ensure responsive, inclusive, participatory and representative decision-making at all levels (particularly with regard to urban and rural communities directly impacted by all the three masterplan interventions) namely the DMP, ICMP and the SWMP.
41	Develop, activate and maintain a Stakeholder Engagement Plan (SEP) appropriate to all levels of Ibadan society (ministerial, business and industry, community) throughout the lifetime of the project (2016 to 2036 and beyond).
42	Ensure public access to information and protect fundamental freedoms, in accordance with national legislation and international agreements.
43	**Develop and promote sustainable tourism that creates jobs and promotes local culture and products.**
44	Ensure access of tourism enterprises to financial services, including affordable credit.
45	Utilize the implementation of DMP to Increase the education of youths and adults (male and female), to ensure they have the relevant skills for decent employment and business entrepreneurship in communities and in flood risk management and resilience.
46	Substantially expand vocational training and information and communications technology education in all communities within the Ibadan study area to sustain the **DMP, early warning system and sustainable urban systems.**

The development of SESA objectives provides a set of clear statements that embody the identified environmental and social concerns relating to implementation of the DMP and assists in comparison of the effects of alternative DMP scenarios. They serve a different purpose to the objectives of the DMP, (Table 6.2) although they will overlap in a number of areas.

The SESA objectives and the DMP objectives therefore required a filtering process to identify potential synergies and inconsistencies, in order to identify SESA objectives that are directly relevant to the DMP implementation.

Table 6. 2: DMP Objectives

The Drainage Master Plan sets a process to mitigate the flood risks in the Ibadan city today and over the next 20 years to 2040 (DARS REPORT). The objectives of the DMP project as stipulated in its Terms of Reference are as follows:	
1.	Develop a robust understanding of present and future flood risk for the entire city, taking into account social, environmental and economic factors.
2.	Develop an overarching flood risk management strategy and drainage master plan that sets out the policies, regulations and institutional arrangements needed to manage flood risks
3.	Develop a city wide flood risk management plan that sets out the approach to managing flood risks across the city that protects life as well as promoting the city economy and ecosystems
4.	Develop flood risk management plan that adopts a mix of structural and non-structural measures and seek to make space for water and work with natural processes rather than against them
5	Capacity building within the government and communities of Ibadan.
6	Actively engage stakeholders and communities in the decision making process to encourage buy-in.

The following specific objectives can be adopted for the implementation of the DMP:

i. Understanding of present and future flood risk for the entire city
ii. Implement an overarching flood risk management strategy and drainage master plan
iii. Mitigate the flood risks in the city today and over the next 20 years to 2040.
iv. Take into account social, environmental and economic factors in flood risk management
v. Sets out the policies, regulations and institutional arrangements needed to manage flood risks
vi. Protects life, and promote the city's economy and ecosystem.
vii. Adopts a mix of structural and non-structural mitigation measures for flood protection
viii. Make space for water and work with natural process rather than against them
ix. Provide Capacity building within the government and communities of Ibadan
x. Actively engage stakeholders and communities in the decision-making process to encourage buy-in

6.2.2 Compatibility of SESA Objectives with DMP Objectives

The compatibility of the DMP objectives with the SESA objectives is indicated in table 6.2 Where a relationship between both sets of objectives is strong and relevant to the implementation of the master plan, the colour green, is provided; where there is a relationship, but it is minor, there is colour light blue; and where there is no obvious relationship there is no colour (Table 6.3).

Table 6. 3: Colour key for Harmonisation of the SESA and DMP objectives

Color key for harmonization of SESA/DMP Objectives	
Major positive	
Minor or Neutral	

It should be recognised that some SESA objectives cover areas that are beyond the scope of the DMP. They are important to the development of a sustainable society, but require adoption by means other than the masterplan. For example, SESA Objective 32 "Provide access to safe, affordable, accessible and sustainable housing systems for all, with special attention to the needs of those in vulnerable and remote situations." Whilst it is recognised that access to safe, affordable, accessible is an important socio-economic objective, it is not the place of the masterplan to develop this.

Table 6. 4: Compatibility of SESA Objectives with DMP Objectives

SESA Objectives		Drainage Masterplan Objectives									
		1	2	3	4	5	6	7	8	9	10
No.	**Description**	**understanding of present and future flood risk for the entire city**	**taking into account social, environmental and economic factors that**	**Develop an overarching flood risk management strategy and drainage master plan**	**sets out the policies, regulations and institutional arrangements needed to manage flood risks.**	**To protects life, and promote the city's economy and ecosystem**	**adopts a mix of structural and non-structural mitigation measures for flood protection**	**To provide adequate utility infrastructure for the existing and future population.**	**To make space for water and work with natural process rather than against them**	**To provide Capacity building within the government and communities of Ibadan**	**To Actively engage stakeholders and communities in the decision making process to encourage buy-in**
1	**Ensure sustainable use of terrestrial / freshwater ecosystems.**										
2	Protect and enhance environmental settings for biodiversity, flora and fauna of terrestrial and freshwater ecosystem of Ibadan,										
3	Ensure setback mapping of forest reserves and protected areas, especially within flood plains and hilly terrains areas of Ibadan.										
No.	Description	understanding of present and future flood risk for the entire city	taking into account social, environmental and economic	Develop an overarching flood risk management	sets out the policies, regulations and institutional	To protects life, and promote the city's	adopts a mix of structural and non-structural	To provide adequate utility infrastructure for the existing and	To make space for water and work with	To provide Capacity building within the government	To Actively engage stakeholders and

			factors that	strategy and drainage master plan	arrangements needed to manage flood risks.	economy and ecosystem	mitigation measures for flood protection	future population.	natural process rather than against them	and communities of Ibadan	communities in the decision making process to encourage buy-in
4	Ensure planning and monitoring of development on all flood plains and hilly terrains of Ibadan										
5	Increase afforestation and restore degraded forest in areas of land not allocated for specific masterplan development										
6	Protect and enhance where possible Natural Conservation Sites										
7	Ensure preservation of soil by implementing resilient agricultural practices.										
8	Integrate climate change projections in the implementation of policies, strategies on the DMP										

No.	Description	understanding of present and future flood risk for the entire city	taking into account social, environmental and economic factors that	Develop an overarching flood risk management strategy and drainage master plan	sets out the policies, regulations and institutional arrangements needed to manage flood risks.	To protects life, and promote the city's economy and ecosystem	adopts a mix of structural and non-structural mitigation measures for flood protection	To provide adequate utility infrastructure for the existing and future population.	To make space for water and work with natural process rather than against them	To provide Capacity building within the government and communities of Ibadan	To Actively engage stakeholders and communities in the decision making process to encourage buy-in
9	Recognize the importance of urban and peri-urban agriculture in Ibadan, and therefore maintain and expand its range and diversity.										
10	Maintain existing, and where possible create new, fisheries habitat including the maintenance or improvement of conditions that allow upstream migration for fish species										
11	Ensure the DMP poses no adverse effects on commercial fisheries										
12	**Protect and restore river and lake / reservoir water quality by reducing all pollution sources**										

13	eliminate dumping of waste into rivers course										
No.	Description	understanding of present and future flood risk for the entire city	taking into account social, environmental and economic factors that	Develop an overarching flood risk management strategy and drainage master plan	sets out the policies, regulations and institutional arrangements needed to manage flood risks.	To protects life, and promote the city's economy and ecosystem	adopts a mix of structural and non-structural mitigation measures for flood protection	To provide adequate utility infrastructure for the existing and future population.	To make space for water and work with natural process rather than against them	To provide Capacity building within the government and communities of Ibadan	To Actively engage stakeholders and communities in the decision making process to encourage buy-in
14	Substantially reduce waste generation through an integrated hierarchical waste management system of prevention, reduction, reuse, recycling and safe disposal.										
15	reducing the release of untreated waste water through implementation of waste water treatment system										
16	Strengthen participation of local communities in improving water and sanitation management										
17	Improve potable water quality by substantially increasing the efficient treatment and supply of clean water to all										

	communities in the study area, and at an affordable price.										
No.	Description	understanding of present and future flood risk for the entire city	taking into account social, environmental and economic factors that	Develop an overarching flood risk management strategy and drainage master plan	sets out the policies, regulations and institutional arrangements needed to manage flood risks.	To protects life, and promote the city's economy and ecosystem	adopts a mix of structural and non-structural mitigation measures for flood protection	To provide adequate utility infrastructure e for the existing and future population.	To make space for water and work with natural process rather than against them	To provide Capacity building within the government and communities of Ibadan	To Actively engage stakeholders and communities in the decision making process to encourage buy-in
18	**Ensure identification and preservation of heritage buildings, sites, monuments and areas.**										
19	Protect and safeguard all forms of archaeology and cultural heritage within the study area, including through development of site management plans.										
20	Ensure that all development and DMP implementation is prepared for the discovery and management of archaeological chance finds.										
21	**Increase community education, provision of information, and**										

	guidance towards sustainable community livelihoods and flood risk management.										

SESA Objectives		**Drainage Masterplan Objectives**									
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
No.	**Description**	**understanding of present and future flood risk for the entire city,**	**taking into account social, environmental and economic factors that**	**Develop an overarching flood risk management strategy and drainage master plan**	**sets out the policies, regulations and institutional arrangements needed to manage flood risks.**	**To protects life, and promote the city's economy and ecosystem**	**adopts a mix of structural and non-structural mitigation measures for flood protection**	**To provide adequate utility infrastructure for the existing and future population.**	**To make space for water and work with natural process rather than against them**	**To provide Capacity building within the government and communities of Ibadan**	**To Actively engage stakeholders and communities in the decision making process to encourage buy-in**
23	Proactively integrate the population growth and projections of Ibadan for planning of land use and infrastructure requirements in the DMP.										
2 4	Ensure that populations are not exposed to flood waters due to development and construction in flood plains and that economic losses as a result of flooding are limited.		√								

25	Develop and implement disaster risk management and early warning systems, to protect vulnerable populations and to limit economic losses.										
No.	**Description**	**understanding of present and future flood risk for the entire city,**	**taking into account social, environmental and economic factors that**	**Develop an overarching flood risk management strategy and drainage master plan**	**sets out the policies, regulations and institutional arrangements needed to manage flood risks.**	**To protects life, and promote the city's economy and ecosystem**	**adopts a mix of structural and non-structural mitigation measures for flood protection**	**To provide adequate utility infrastructure e for the existing and future population.**	**To make space for water and work with natural process rather than against them**	**To provide Capacity building within the government and communities of Ibadan**	**To Actively engage stakeholders and communities in the decision making process to encourage buy-in**
26	Encourage flood resilience and flood proofing structures access in housing standards and provisions							√			
27	Improve the living conditions of the physically displaced poor or vulnerable persons through provision of adequate housing, access to services and facilities, and security of tenure.										

28	Avoid involuntary resettlement or, when unavoidable, minimise involuntary resettlement by exploring project design alternatives in the implementation of the DMP.										
29	Where involuntary resettlement is unavoidable, mitigate adverse social and economic impacts from land acquisition or restrictions on land use, by (a) providing timely compensation for loss of assets at replacement cost, and (b) assisting displaced persons in their efforts to improve, or at least restore, their livelihoods and living standards, in real-terms, to pre-displacement levels.										
30	Plan and execute resettlement activities as sustainable development programmes, providing sufficient investment resources to enable										

	displaced persons to benefit directly from the project.										
31	Ensure that resettlement activities are planned and implemented with appropriate disclosure of information, meaningful consultation and the informed participation of those affected.										
32	Provide access to safe, affordable, accessible and sustainable housing systems for all, with special attention to the needs of those in vulnerable and remote situations.										
33	**Recognise the economic necessity to develop and expand commercial agriculture in Ibadan.**										

34	Recognise the importance of the developing livestock sector in Ibadan by providing support especially to fish and poultry farming.										
No.	**Description**	**understanding of present and future flood risk for the entire city,**	**taking into account social, environmental and economic factors that**	**Develop an overarching flood risk management strategy and drainage master plan**	**sets out the policies, regulations and institutional arrangements needed to manage flood risks.**	**To protects life, and promote the city's economy and ecosystem**	**adopts a mix of structural and non-structural mitigation measures for flood protection**	**To provide adequate utility infrastructure e for the existing and future population.**	**To make space for water and work with natural process rather than against them**	**To provide Capacity building within the government and communities of Ibadan**	**To Actively engage stakeholders and communities in the decision making process to encourage buy-in**
35	Implement science-based sustainable aquaculture management plans for fish farmers, and so improve fishing productivity and resource exploitation.										
36	Ensure access of micro-, small- and medium-sized enterprises (including agriculture and fisheries) to financial services, including affordable credit.										

37	Substantially expand vocational training and information and communications technology education in all communities within the Ibadan study area to sustain the DMP, early warning system and sustainable urban systems.										
38	Provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable and remote situations.										
39	**Develop effective, accountable and transparent institutions at all levels.**										
No.	**Description**	**understanding of present and future flood risk for the entire city,**	**taking into account social, environmental and economic factors that**	**Develop an overarching flood risk management strategy and drainage**	**sets out the policies, regulations and institutional arrangements needed to**	**To protects life, and promote the city's economy and ecosystem**	**adopts a mix of structural and non-structural mitigation measures for**	**To provide adequate utility infrastructure e for the existing and future**	**To make space for water and work with natural process**	**To provide Capacity building within the government and**	**To Actively engage stakeholders and communities in the decision**

				master plan	**manage flood risks.**		**flood protection**	**population.**	**rather than against them**	**communities of Ibadan**	**making process to encourage buy-in**
40	Ensure responsive, inclusive, participatory and representative decision-making at all levels (particularly with regard to urban and rural communities directly impacted by all the three masterplan interventions) namely the DMP, ICMP and the SWMP.										
41	Develop, activate and maintain a Stakeholder Engagement Plan (SEP) appropriate to all levels of Ibadan society (ministerial, business and industry, community) throughout the lifetime of the project (2016 to 2036 and beyond).										
42	Ensure public access to information and protect fundamental freedoms, in accordance with national legislation and international agreements.										

No.	Description	understanding of present and future flood risk for the entire city,	taking into account social, environmental and economic factors that	Develop an overarching flood risk management strategy and drainage master plan	sets out the policies, regulations and institutional arrangements needed to manage flood risks.	To protects life, and promote the city's economy and ecosystem	adopts a mix of structural and non-structural mitigation measures for flood protection	To provide adequate utility infrastructure e for the existing and future population.	To make space for water and work with natural process rather than against them	To provide Capacity building within the government and communities of Ibadan	To Actively engage stakeholders and communities in the decision making process to encourage buy-in
43	**Develop and promote sustainable tourism that creates jobs and promotes local culture and products.**										
44	Ensure access of tourism enterprises to financial services, including affordable credit.										
45	Utilize the implementation of DMP to Increase the education of youths and adults (male and female), to ensure they have the relevant skills for decent employment and business entrepreneurship in communities and in flood risk management and resilience.										

46	**Recognise the importance of commercial agriculture in Ibadan in the DMP implementation and provide necessary support for its development and expansion**										

6.2.3 Strategic Environmental and Social Indicators and Targets

Each of the SESA objectives, most relevant to the DMP where appropriate, is divided into more specific sub-objectives relating to each topic. For each aligned DMP and SESA objectives, a framework of associated environmental and social indicators and targets were established as indicated in table 6.1; thus, enabling the use of the objectives as appraisal criteria within the option assessment process.

Assigned to each of these objective themes is at least one high-level Strategic Environmental and Social Objective that specifies a desired direction for change, e.g. reduce number of property loss to flood. These high-level Strategic Environmental or Social Objectives (SESOs) are then paired with specific Targets. The progress towards achieving these Targets is monitored using Indicators, which are measures of identified variables over time

The overall purpose of environmental and social indicators in the SESA is to provide a way of measuring the environmental and social aspects & recommendations for implementing the DMP. Environmental and social Indicators are also used to track the progress in achieving targets set in the SESA in tandem with the DMP. The proposed indicators have been selected bearing in mind the **availability of data** as presented in the proceeding chapters of this report and the feasibility of making direct links as provided in section 6.2.2. between any changes in the social and physical environment and the implementation of the Programme.

Limitations of **obtaining data** across MDAs include; insufficient human, digital and financial resources. Regular collection & analysis of data could be time consuming also, hence digital methods should be encouraged.
Targets were considered over the duration of the baseline data collection and assessment, and throughout the consultation process, in order to meet the Strategic Environmental and Social Objectives as well as the objectives of the Flood Risk Management Programme. **In each case, any target that is set is attributable to the implementation of the Programme**. The SESA objectives for Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) and ancillary Channels Designation, and their associated sub-objectives, indicators and targets are presented in Table 6.5

Table 6. 5: Aligned DMP and SESA Objectives, Sub-objectives, Indicators and Targets

DMP Objectives)	SESA Objectives	Indicators	Targets[24]	Responsible Government Ministries and Agencies for achieving the targets, strategies and plans	Existing Supporting National/ State Policies, Plans, Strategies & Environmental Objectives (Being the Source of Derivation of themes and objectives)
1. Reduce flood risk to human population	• **Protect human life, health and population from flood Risk and attendant consequences** • Ensure that economic losses as a result of flooding are limited, • Reduced water contamination •Accessible Health services •accessible water sanitation and hygiene facilities	•Extent and frequency of flooding in drained catchments and flood relief schemes •Deaths/injuries/epidemics and health impacts due to flooding • Flood proofing taking and standards of flood protection considering climate change •Indicative or vulnerable floodplains	•Number of new flood events (previously unrecorded). •No increase in number of deaths/injuries/epidemics due to new flooding disasters •Demographic trends inform Housing and Population growth forecast. •Flood adaptability by taking into account climate change and flood resilient planning and housing structures. •Length of Channel maintained, and Number of 'Designation' projects carried out annually in employment land areas or greenfield land.	**MENR (Responsibility for achieving the targets, strategies and plans is mainly the MENR in conjunction with other line agencies on a need basis.)** **MENR & Land management and urban planning** **MENR & Public works**	**National Climate Change Policy and response strategy 2015** • Protect and improve the human health from the natural calamities (e.g. floods, droughts, tropical storms). • Access health vulnerabilities of the communities in areas most likely to be affected by adverse impacts of climate change and build their capacities to reduce their health vulnerabilities to climate change **National Sustainable Development Goals Strategy 2016** • Take immediate preventive measures to prevent spread of diseases and epidemics especially the rising incidence of climate-triggered epidemics. • Minimize the risks to the country's population and national economy arising from expected increase in frequency and intensity of extreme events and disasters such as floods, droughts, tropical storms etc.

[24] The DMP is planned till 2040 over a period of 20 years.
Cost of achieving the DMP is laid out over each of the planned four phases both in the DARs and SESA Report. The itemised aligned targets of the DMP and SESA are means to verifiable measures. The priorities aligned were compiled from stakeholders concerns and existing government programs as conveyed in the relevant policies. Furthermore, from the SESA standpoint section 8.1.1 focused on the relevant objectives and implementing the components over a time frame of next 3-7 years (after approval year)
See section 8.1.1 and Figures 8.5-8.7 for time frame for implementing the components.
Priorities have been considered and the total estimated cost for implementation have been included for each priority. See details in section 8.6.1 and Annex 6

					Draft Oyo State Disaster Contingency Plan 2015 • Reduce disaster risks and vulnerabilities, particularly those of the poor and the marginalized groups of people in the country.
2.Protect Material Assets and Critical Infrastructure	• **Protect public utilities, properties, economic and agricultural areas, and critical infrastructures-** • Passenger and freight rail services, airport linkage and public transport • Services provision for existing and new developments including water, wastewater, gas, telecommunication. • Road infrastructure demands and planned project,	• Number of public utilities, parks and recreational facilities at risk of flooding • Number of properties, agricultural areas, water and power supply networks, roads and transmission lines at risk of flooding • Reported damages to public utilities, irrigation structures and critical infrastructures •Number/length of key strategic transport assets at risk of flooding	• Decrease in number of public utilities, parks and recreational facilities at risk of flooding • Decrease in number of properties, agricultural areas, water and power supply networks, roads and transmission lines at risk of flooding • No reported damages to public utilities, irrigation structures and critical infrastructures • No change in agricultural land use	**MENR.** **MENR, Agriculture & Transport**	**DMP 2019** • Give priority to areas of potentially higher economic flood hazard or human suffering like cities, irrigation works or other vital infrastructure.
2b) Reduce Damage to Infrastructure: •Residential & commercial buildings •Roads, drainages, utilities, etc. • Economic Activities: •Sources of livelihoods. •Employment generation	• improved housing supply and flood proofing structures, including affordability, tenure and dwelling type. •improved education and training trends and opportunities for existing and new population in flood risk mitigation measures.	•Number of residential buildings, vulnerable properties at risk of flooding. •Number of social infrastructure assets at risk from flooding (e.g. educational institutions, fire stations, facilities). • No of farms or shops or livestock inundated or lost • Reported losses to crops	•Decrease in number of residential buildings, high vulnerability properties at risk of flooding (e.g. hospitals, health centres, nursing) • the ratio of skilled to unskilled labour force and trends and /or gaps taking cognisance of local content •Livelihood trends and improvements •Employment generation statistics in construction areas and in watershed planning and management.	**Land management and urban planning,** **Public works,** **Planning and Budget,** **Women, children and youth affairs**	**Resettlement Policy Framework on the Ibadan Urban Flood Management Project** **DMP 2019**
	Community effects such as displacement of persons, Migration •Minimise land take and involuntary displacement of	•Compliance to the resettlement policy framework and preparation of a resettlement action plan where there will be temporary or permanent involuntary resettlement	• Level of compliments/ complaints from Community Councils and concerned residents or their spokesperson as it affects their land, properties, recreational or	**Information, Communication and broadcasting**	

	people. Where unavoidable make provision for compensation and restoration of livelihood • Protect and improve existing waterside access for recreational, commercial and community facilities during Drainage construction, channelization Scheme and Maintenance operations. •floodplains are characterized by a variety of migration dynamics, including periodic movements to high ground for shelter and temporary work as well as permanent migration where people's livelihoods are more severely affected'' •Minimise, a real "flood-migration nexus" "both at the city level with an increasing displacement of rural populations to urban areas and at the state level with important migration to Ibadan"	•Maintain and/ or improve existing historical access routes along waterways. • Community services and facilities to support a diverse population including youth's services, aged care, childcare and disability services. • Learning and local enterprises to improve skills and opportunities for local people and business with consideration for gender integration	community lifestyle. •Resettlement action plan implementation records and report • Increased number of community family friendly services or facilities including youth, educational facilities and skill centres •In such cases, floods reoccurring year after year reduce the quality and the yields of the crop fields. When farmers start to struggle to make a living, they sell their field, thus becoming "landless farmers". •Decrease in the number of landless farmers who might permanently migrate to urban centres in order to find other sources of revenues.	**MENR** **MENR & Education, Youths and sports,** **MENR and Agriculture**	
3.Promote sustainable Land use	• Promote and enhance environmentally friendly land use	• change in use of marginal lands in watershed and floodplains of River basins • deforestation • change in agricultural practices • encroachments in basin watershed and floodplains	• decrease in use of marginal lands in watershed and floodplains of River basins • no conversion of forest land into agricultural land • no illegal settlements in basin's watershed and floodplains	**Land management and urban planning & MENR**	**National Environmental Policy 2016** • Promote re-afforestation, soil conservation and improvement in land use of the catchments of storage reservoirs. • Managing land use change to protect Ibadan's wetland resources (flora and fauna). Promote land use planning for SLM (Sustainable Land Management) at village, city/ Town, local government and State levels • Promoting sustainable use of
	•Conserve and protect Biodiversity (flora & fauna, habitats, ecosystems) • Protect and enhance environmental settings for biodiversity, flora and fauna • Protect and enhance where possible Natural Conservation	• Reported conditions of designated protected areas (though none designated within the watershed of Ibadan as of the report writing) • Reported damages to designated sites • Number of proposed schemes and projects for the conservation and protection of biodiversity	• No adverse impacts on designated national and international protected areas • Increase in number of actions to protect and enhance biodiversity • Creation of new habitats • No decrease and where	**MENR**	

	Sites • Maintain existing, and where possible create new, fisheries habitat including the maintenance or improvement of conditions that allow upstream migration for fish species • Ensure no adverse effects on commercial fisheries.	• Reported actions made to protect fish species[25] • Reported actions made to protect threatened bird species[26] • Number of new habitats created • Reported projects and schemes to conserve endangered species of flora and fauna.	possible increase the area of fisheries habitat and reduction in barriers to upstream migration • Increased areas of species habitat to ensure protection of endangered species and decrease in anthropogenic activities with adverse effects on threatened species • Decrease in the number of threatened fish and bird species in upper and lower basin of the Ona, Ogunpa, Ogbere, Omi basins	**MENR & Agriculture & Fisheries**	Nigerian 's wetland natural resources (flora and fauna) . **National Forest Policy 2006** • Ensure Conservation of biological diversity, protection and sustainable use of indigenous flora and fauna. **National Climate Change Policy and response strategy 2015** • Take necessary measures to establish nature reserves in areas that are rich in biodiversity to preserve their existence. • Establish protected areas in all vulnerable ecosystems particularly in coastal and marine areas. • Ensure managing, protecting and connecting forest fragments to increase resilience and minimize the impacts from external pressures. • Expand protected areas in the city with respect to ecological parameters including conservation of wildlife and its habitats **National Biodiversity Strategies and action plan 2007** • Preserve the biodiversity of natural resources • Give priority to preventing deterioration of fragile ecosystems with large downstream effects. • Minimize adverse effects on natural ecosystem and environment • Conserve life support systems, habitats, species and genetic diversity as the assets of mankind

[25] Fish species e.g *Hepsetus odoe (Ega),* Tilapia and *Chrysichthys nigrodigitatus*), some shrimps *Gymnarchus niloticus, Hydrocynus forskalii,* mormyrids, *Synodontis* spp., *Barbus* spp., *Schilbe mystus Clarias lazera, Pelmatochromis (Chromidotilapia) guentheri* and *Hemichromis fasciatus,*)

[26] Bird species (e.g. Lesser Kestrel, Snow partridge, Sociable lapwing)

					and promote tangibly defined efforts such as increase of 25% of forest cover by 2020, as envisaged in the plan • Conserving and enhancing the natural resource base while protecting biodiversity and managing fragile ecosystems through an integrated natural resource management approach. • Promote farm forestry in catchments, floodplains and targeted ecosystems.
Promoting sustainable Land use	**Conserve and protect Cultural Heritage** • Protect and enhance where possible historic, cultural and archaeological features, sites and buildings.	• Number of buildings, monuments and archaeological sites at risk of flooding • Number of evaluating studies as result of implementation of SESA/ DMP. • Arts, Culture and Heritage programs to support sustainable urban drainage systems in communities	• No increase in number of buildings, monuments and archaeological sites at risk of flooding • Minimize damaging impacts on cultural heritage • Repair and maintain the affected sites Production of evaluation studies • Number of community art culture and heritage programs on Sustainable urban drainage systems.	Culture and religion	• Maintain and preserve cultural heritage sites, buildings and architectural units
	Protect and enhance Landscape& Visual Amenity • Protect and enhance where possible geological features, landscape characters, recreational sites and visual amenity	• Protect and enhance where possible geological features, landscape characters, recreational sites and visual amenity. •Contribute to the development and maintenance of attractive, accessible and safe waterway corridors of designated landscape areas • recreation and public open spaces to support existing and new development	• No significant impacts on characteristics visual amenity, and features of landscape (qualitative target) • No adverse changes in character of length of waterway corridor qualifying as a • Landscape • Protection Zone within urban areas as a result of 'drainage' project. • Number of such recreational , open spaces,	Land Management and urban planning, MENR	• Promote the conservation and protection of natural resources, biodiversity, habitats and landscape.

			scenic sites		
	• Promote Climate Change Adaptability • Adapting to climate change vulnerability, impacts and flexibility for future responses	• Integrating climate change concerns in flood planning and reported studies in the implementation of the DMP	• Integrating stakeholder concerns/ suggestions, expert opinions etc in building flood resilient communities • Flood adaptability indication • Improved Flood proofing structures	**MENR** **Emergency planning** **Planning & Budget,** **Economics and finance** **Public Works**	**Draft Oyo State Disaster Contingency Plan 2015** • Promoting development planning that considers and addresses disaster risks alongside environmental and climate change concerns.
4.Conserve and protect Water Resource and Watershed	• Protect and improve the quality of surface and ground water resources • Restore and improve watersheds by promoting plantation • Protect and enhance wetlands by ensuring minimum fresh flows	• Variation in surface and ground water quality (NESREA and MENR standards) • Variation in chemical and biological components in water (NESREA and MENR standards) • Number of potential contamination/ pollution sources (e.g. wastewater treatment plants, regulated/ licensed sites, landfill sites) at flood risk (to assess impact on water quality). • Projects reported for integrated watershed management • Indications for minimum freshwater flows to wetlands	• Maintain and improve the quality of surface and groundwater where required • No detrimental change in water quality • Compliance with the NESREA and MENR Standards • Indicative achievement of set target for good environmental status or potential (GES/GEP) by 2030 • Indicative decrease in land erosion in watershed • Community-based increased plantation in watershed	**MENR**	**National Water Supply and Sanitation Policy 2000 and Draft National Water Policy 2016** • Ensure protection and conservation of water resources • Promote the development of natural water bodies, where possible, for recreational use. • Improve the quality of water bodies including groundwater. **National Environmental Policy 2016and Oyo State Policy on Environment 2013** • Promote integrated watershed management • Ensure minimal exploitation of declared sensitive watershed areas. • Explore the possibility of joint watershed management of trans-boundary catchment areas with neighboring states. • Promote integrated watershed management including ecological conservation practices in uphill watersheds. • Protect and preserve water 'catchment' areas, and reservoirs against degradation, silting and irrigation system contamination. • Ensuring improvement of water quality in Ibadan's wetlands, especially rivers, lakes and coastal zones

5.Conserve and protect Soils	• Protect and enhance where possible fluvial landforms in Ona, Ogbere, Omi, Orogun, Ogunpa, watershed. • Restore riparian corridors, watershed /catchments, floodplains, including connectivity and natural processes	• Indicative eroded areas in floodplains, riparian corridors and watersheds • Number of schemes and projects reported for the restoration of eroded land • Community-based rehabilitation of Ona, Ogbere, Omi, Orogun, Ogunpa watershed	• No increase in eroded land • Minimize land Erosion • Increase in community-based plantation of flood/ erosion trees, shrubs, and grasses located next to rivers, streams, lakes, or other natural bodies in Ona, Ogbere, Omi, Orogun, Ogunpa watershed		**National Climate Change Policy and response strategy 2015** • Afforest barren and degraded lands as well as uphill watershed areas to control sediments and various types of soil erosion; • Identify and declare uphill fragile watershed areas (e.g Jerusalem Arulogun areas) as sensitive and bring them under special silvicultural management to check floods and siltation of water reservoirs; • Arresting water, land/soil erosion

CHAPTER SEVEN: ALTERNATIVES

7.0 Introduction

One of the critical roles of Strategic Environmental and Social Assessment is to assess the reasonable alternative options, considering the objectives and geographical scope of the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) and the significant environmental and social effects of the proposed alternatives.
A key aim of the drainage master plan was to determine how much drainages would be provided in Ibadan city over the period to 2040 and where the drainages should go.

7.1 Drainage Alternatives

Identified drainage alternatives following the schematic steps in Table 7.1 were:

- No new drainage beyond existing status in the city
- Drainage numbers: XXX units per year;
- Form of Drainage: structural or non-structural
- Whether or not some drainages could be built on existing employment land[27] (i.e those areas designated in an official plan for clusters of business and economic activities including, but not limited to, manufacturing, warehousing, offices, and associated retail and ancillary facilities.)
- Alternative general areas for development on greenfield land[28]: extend current channels only; extend to selected settlements; extend to all settlements broadly reflecting their current scale; or develop a new settlement;
- Strategic sites on greenfield land – as shown on the map (figures 8.5, that prioritize the four phases).

Early choices between alternatives (e.g. drainage numbers) shaped the range of subsequent lower level alternatives (e.g. form of drainage and strategic sites).
The alternatives can be identified in different combinations depending on the need of the receiving ecosystem as defined in the DARs report *(N16011-0100D-RPT-ENV-15 REV 1, 2018)* and their role in protecting and enhancing the physical biological and the social environment. The alternatives proposed for Ibadan Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) are based on the findings of situation analysis comprising mix of structural and non-structural measures (being the form of drainages) and recognising the entire Ibadan river basin as a single strategic site that can be further divided into three segments of upper, middle and lower basins.

The key aim of the Identification of alternatives is to avoid, reduce or minimize adverse environmental and social impacts on the various environmental and social receptors in the Ibadan city. The schematic diagram (Figure 7.1) shows steps followed in the identification of flood management alternatives for this DMP. All the rivers in Ibadan flows from the north to the south. For this, integrated flood management approach adopted is by considering entire Ibadan river basin as a single unit but divided into three segments (upper, middle and lower basins) as the strategic sites depending on the hydrological and morphological features of each river. A set of actions adapted to the prevailing conditions of the River Basins are elaborated in Table 7.1. These measures present a combination of structural and non-structural measures to develop sustainable flood management strategy.

[27] employment lands are lands which are designated for employment uses including land designated as industrial and business park in local official plans
[28] Greenfield land is undeveloped land in a city or rural area either used for agriculture or landscape design, or left to evolve naturally. These areas of land are usually agricultural or amenity properties being considered for urban development.

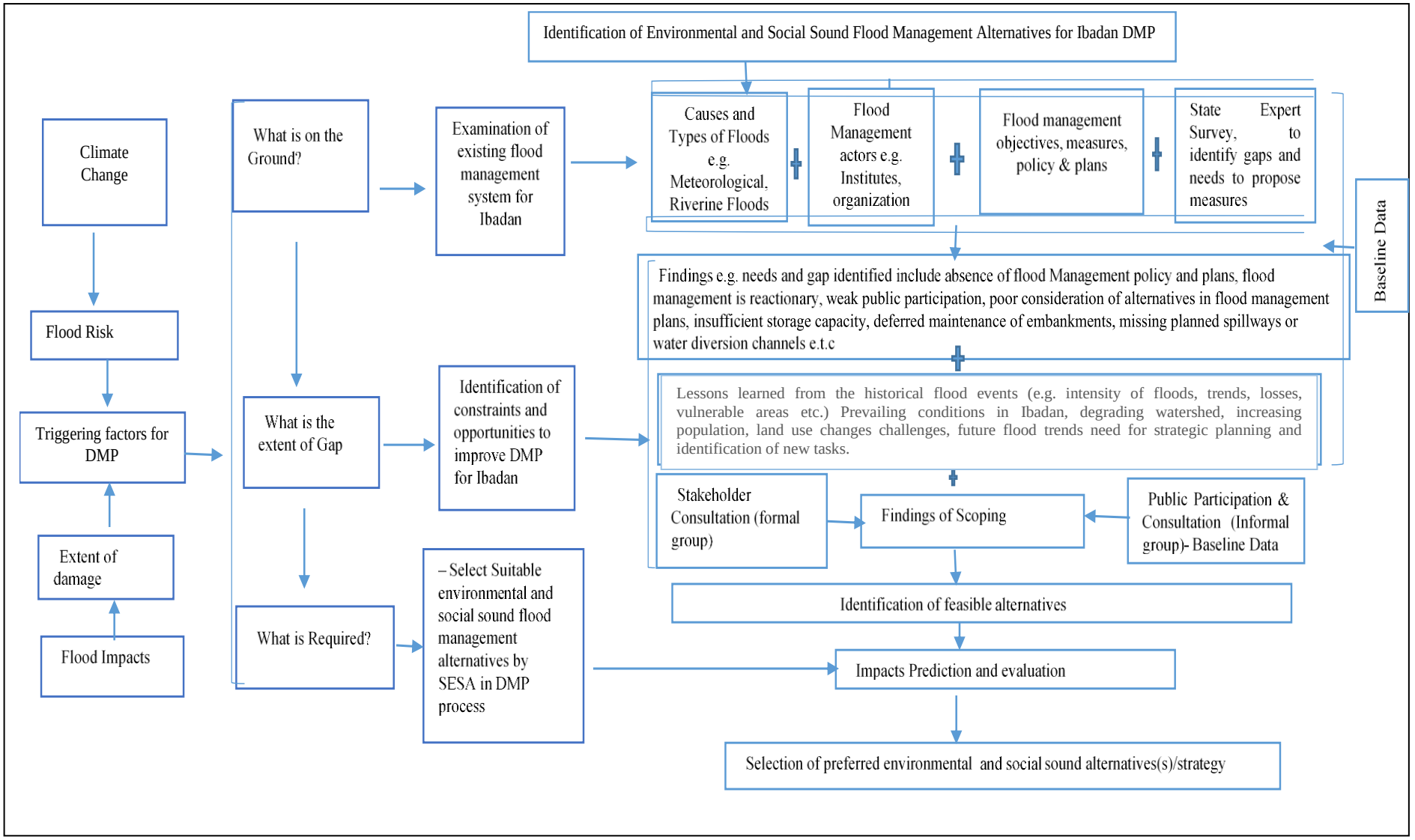


Figure 7. 1: Steps involved in the identification of flood management alternatives by SESA for the Drainage Master Plan process

Table 7. 1: Alternatives proposed by SESA for flood management of River basin in Ibadan under the DMP

Alternative	Details	Rationale
No Action	**No action** 1- This alternative is considered as standard alternative against which all other alternatives will be assessed. It means that no more flood protection actions will be taken in future, however; other development activities (e.g. land use change due to urbanization, agricultural activities etc.) will continue to grow	This simply to maintain status quo irrespective of the DMP.
Rationale for upper, middle and lower basins: *Active development of floodplains must consider the river basin as a whole. In fact, the way a specific infrastructure is operated in one location may have an impact on flood characteristics of other parts of the basin, transferring flood risk.*		
Upper basin of River- Ona, Ogunpa, Ogbere, Omi, Kudeti,	**Strategic Watershed Management (structural and non-structural measures)** 2- **Increasing flood protection by exploring opportunities** to enhance flood/water storage capacity by constructing dams/dikes/reservoirs/off-channel retention or detention basins. (The DMP" has identified 22 various sites for different dikes, off-channel reservoirs mainly on Ona and Kudeti. As for now, no baseline information is available about these sites. Therefore, this alternative is proposed with general approach without considering any particular potential site identified in the relevant catchment). 3- **Non – structural measure** that is community-based watershed management. This is by implementing awareness raising schemes to carry out the following functions: tree/vegetation plantation, preventing over-exploitation of natural resources (fauna and flora), no conversion of forest land into agricultural land and finding alternative options for fuel wood. This is applicable to all the river basin but not sufficient alone to reduce flood risk in a growing urban population. The introduction of a Pilot Watershed Management Plan for Ona River which consists dikes and longer channel could further strengthen the above mentioned measures.	The upper basins of the identified rivers are new areas of development in Ibadan. With demographic growth and urbanization trends, human occupancy of the floodplains is becoming more intensive. As identified in the DMP 22 different dykes are proposed upstream for flood water storage, it is important in the planning of the embankments, that both benefits for the protected area and potential negative effects should be evaluated. In fact, such an intervention can have impacts far beyond its target area. For example, how prepared are upstream areas readiness to deal with backwater effects? thus there is need for non-structural measures to complement some embankments on both sides of the river for protection to manage impacts
Middle and Lower River- Ona, Ogunpa, Ogbere, Omi, Kudeti	**Deployment of only Structural Measures to existing ones** 4- **Maintain and improve existing flood protection structures** (embankments, culverts, channels etc): this means to maintain and improve existing structures where required along the river channels as it has been identified across the city river basin in the DMP. It is a temporary reactive approach that works with availability of funds but may lose the holistically overview from the entire DMP and SESA perspectives, especially with more upland and upper basin development across the city. 5- **Flood diversion through bypass/diversion channels**: this will occur towards depressions of some of the abandoned river channels without disturbing the existing canal network, (e.g on the ogbere and omi river basin) where it can be developed to carry large amount of discharge, which can be spread in the retention areas. This natural facility is intended to be used to the maximum capacity. But no baseline information is available in literature relating to these sites to be used for impact assessment of the alternative. Therefore, this alternative is also proposed with general approach without considering any particular potential site identified within Ibadan river basins. **Non-structural Measures** 6- **Improve Floodplain Management:** community-based plantation and corrective and preventive measures including zoning and introducing laws and ordinances specifically for future development activities including residential and business infrastructure. This is applicable to all the river basin and	Middle and lower basins of identified rivers are the core areas of Ibadan with infrastructural development. The lower basins have witnessed more uncontrolled development of informal settlements being in the high-risk floodplain areas. Thus it is critical when exposure cannot be avoided, flood protection should be more focused on reducing hazard and vulnerability as required by alternative option 4 and 5. Building standards and codes tend to be under a stronger local inspection regime in Ibadan than floodplain regulations. Therefore, compliance is more likely to be enforced. It is advisable to consider building codes as crucial elements of flood-damage reduction strategies when reforming the flood-management system. Therefore, considering that land-use management has a crucial role in the management of infrastructure, assets and population density located in

	should be part of the flood risk management, not a standalone.	flood-prone areas. Equilibrium needs to be found between the reduction of exposure to flood by avoiding any socioeconomic development of flood-prone areas and the operation of activities relying on benefits provided by floodplain characteristics. Hence the alternatives 6.
Upper, middle and lower River-Ona, Ogunpa, Ogbere, Omi, Kudeti,	**Non-structural measure** 7- **Improve and extend flood early warning system (FEWS):** the overall improvement or strengthening of existing FEWS in general and extension of FEWS in upper basin in particular for Ona, Ogunpa, Ogbere, Omi, Kudeti, River basins. This approach is needed to engage the communities along the flood plains and reduce the loss in lives and properties	Are downstream areas prepared to convey or store parts of the enhanced flood flows? Are opposing banks of the river prepared with the same safety standards? in any jurisdiction, improving the knowledge of flood early warning systems is key to communities along all the river basins to reduce human losses and physical damages.

CHAPTER EIGHT: EVALUATION OF ENVIRONMENTAL AND SOCIAL EFFECTS

8.1 Introduction

The identification and evaluation of the environmental and social effects of the DMP and its subsequent programmes is a key aspect of the Strategic Environmental and Social Assessment process. This process ensures the integration of environmental and social considerations into the proposed DMP or programme, while the identification of any adverse environmental and social effects at an early stage allows the formulation of mitigation measures that may be used to prevent, reduce or offset these effects before implementation of the works.

The characteristics of assessment in the SESA puts emphasis on meeting environmental objectives, with broad perspective, and often lower level of detail to provide vision and overall framework. The multi-stage process focus on sustainability agenda, gets at sources of environmental and social deterioration.

8.2 Impact Prediction and Evaluation

The impact prediction followed the following principles:

- Clear understanding of relevant baseline conditions (e.g. existing and future for environment and social conditions)
- Focusing on direct and indirect impacts of each option specifically small environmental and social impacts as most of the cumulative impacts are consequences of multiple, small and indirect actions e.g. loss of habitat, biodiversity or change in landscape., population, urbanization and land use of flood plains.
- Consideration of cumulative impacts on the diverse environmental and social receptors expected from the other completed, on-going or planned development activities.
- Comparative assessment of alternatives in context of environmental and social impacts associated with each alternative to identify best option(s) with comparatively better environmental and social performance; and
- Identification of feasible environmental and social preferred alternative(s) meeting the needs of flood management environmental and social protection

Assessment Criteria

The assessment criteria for SESA of DMP is based on;

- the knowledge of social and environmental receptors,
- SESA/DMP objectives and indicators identified at scoping and all consultation stages, and
- A number of key questions/issues to assess each SESA/DMP objective to develop more consistent approach for the assessment and evaluation of the alternative as indicated in Table 8.1.

Table 8. 1: Assessment criteria

Themes (SESA/DMP Objectives	Sub-objectives	Key questions/issues prompt for assessment
Protect human life	Protect and improve the human health	Will this option protect human health and life

health and population	from the natural calamities	from flooding in Ibadan?
	Reduce flood risk to human population	Is there any likelihood that population will be adversely affected? With respect to social disruptions? Source of livelihood? Involuntary resettlement? etc Will this option impact transport networks, parks and recreational facilities?
Protect material assets and critical infrastructure	Protect public utilities, economic infrastructure and properties	Will this option affect material assets/property or critical infrastructure? Reduce flood risks to critical infrastructures? Ensure protection to public facilities e.g gas and water supplies, power and telecommunications network etc.?
Conserve and protect biodiversity(flora& fauna, habitats, ecosystem)	Protect and enhance environmental settings for biodiversity	Is this option likely to affect the protected areas, wetlands, migratory routes for international birds, or any other designated site? Support and provide opportunities to protect and enhance biodiversity? Is the option likely to have impacts on the ecological zones, species or habitats protected under biodiversity action plan (BAP)?
Conserve and protect cultural heritage	Protect and enhance where possible historic, cultural and archaeological features, sites and buildings.	Is this option likely to affect cultural heritage including archaeological buildings, monuments and historical carvings in upper and lower basins of the rivers?
	Protect and enhance where possible natural conservation sites.	Is there potential for the loss of cultural heritage with the implementation of DMP?
Protect and enhance landscape & visual amenity	Protect and enhance where possible geological features, landscape characters, recreational sites and visual amenity	Is the option likely to affect the river basins at local or city level? Will the option have impacts on designated landscapes?
Promote climate change adaptability	Adapting to climate change vulnerability, impacts and flexibility for future responses	Will the option reduce flood risks and the impacts on identified environmental receptors and within the scope of SESA?
Conserve and protect water resource and watershed	Protect and improve the quality of surface and ground water resources	Is this option likely to affect water quality of the rivers or its tributaries?
	Restore and improve watershed by promoting plantation	Will this option reduce soil erosion and sedimentation caused by floods?
	Protect and enhance wetlands by ensuring minimum fresh flows	Will this option reduce flood risk and its impact on environmental and social receptors?
Conserve and protect soils	Protect and enhance where possible fluvial landforms in the Ona, Ogunpa, Ogbere, Omi watersheds.	Will this option improve the structure and function of soil by reclaiming degraded/eroded land?
	Restore riparian corridors, watershed/catchments, floodplains, including connectivity and natural processes.	Will this option contribute to the rehabilitation of degraded watershed to reduce siltation in reservoirs?

Within the above context, the SESA identified:

- Impacts of DMP or flood protection measures on each environmental and social receptor
- Impacts of DMP or flood protection measures on inter-relationships of environmental and social receptors scoped in.
- Impacts of DMP or flood protection measures on values and uses of environmental and social resources (e.g. fisheries, farms, forests, transportation, labour etc.) within Ibadan.

- Environmental and social conditions and opportunities to protect and enhance Ibadan city; and
- Available techniques and approaches to substitute or compensate un-avoided loss or damages to certain environmental and social receptors e.g. loss of habitat or properties.

8.3 Methods for Impact Prediction and Evaluation

SESA prediction and evaluation are generally broad-based and qualitative. It is also recognized that quantitative and qualitative predictions are equally valid depending on the context of flood management policy instruments subject to SESA. Thus, an objective-led approach has been applied in identification of cause-effect links which determine the pathways from the source of impacts i.e. flood management options, current environmental and social conditions/ trends (e.g. related with climate change, land use planning, population, pressure on natural resources) and to outcomes for environmental and social receptors as shown in Figure 8.1. The methods used in identifying the impacts included matrix, checklist and brainstorming.

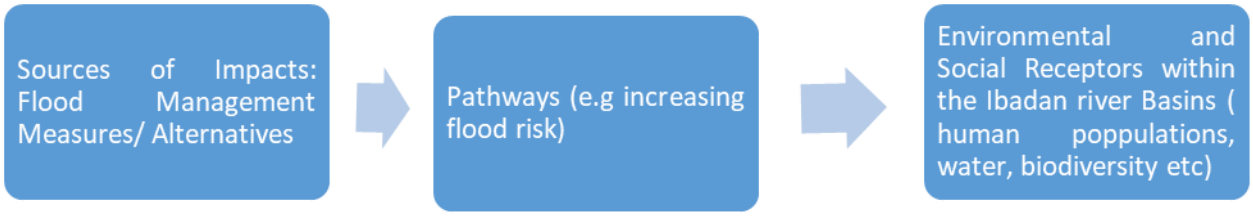


Figure 8. 1: Cause-effect links between Flood management alternatives and impacts on environmental receptors

Opportunities and extent to which certain environmental and social factors can be mitigated, compensated, or substituted depend upon the type, nature, magnitude and scale of the change caused by the DMP, and the potential changes that would occur as a result of the plan implementation or each flood protection measure. Three parameters, in practical, are considered to determine and evaluate significance of the impacts of the alternatives:

- **Impact Magnitude**: the potential environmental and social impacts of the alternatives can be categorized as **major, moderate, minor or negligible** based on the consideration of different parameters such as: duration of the impact, spatial distribution of impact, reversibility; and likelihood.
- **Sensitivity of Receptor**: can be determined by reviewing vulnerability of the receptors including impact magnitude.
- **Assigning Significance:** following the assessment of magnitude and the sensitivity of the receptors, the significance of the potential impacts can be established by considering geographical scale at which impact is considered e.g. state-wide, citywide and local.
- Furthermore, it is important to consider that impact magnitude, sometimes, is low or minor, but due to the importance of receptor e.g. archaeological sites in upper basin or material asset in lower basin should be given significant impacts. This can be achieved by expert judgment.

- Following the development of the geographical importance and magnitude of scale for determining significance of the impacts of the assessment, different symbols and colour coding is selected to be used in matrices as presented in Table 8.2 and 8.3.

Table 8. 2: Determining Significance of the Impacts

		Magnitude		
Importance		High	Medium	Low
	State-wide	Major	Major/ Minor	Minor
	City wide	Minor	Major/ Minor	Minor
	Local	Minor	Minor	Neutral / Negligible

Table 8. 3: Symbol and Colour Coding determining significance of each option against SESA/ DMP objectives

Major positive	▲	Major negative	▲
Major/Minor positive	▲	Major/Minor negative	▲
Minor positive	▲	Minor negative	▲
Neutral	○		

The alternatives are subjected to environmental and social assessment by using matrix-based approach and taking cognisance of duration of either short, medium or long term. The matrices provided an initial assessment of significance of the impacts which ranged from negligible - high in the context of overall performance of each option against the SESA/ DMP objectives.

The assessment results include both negative and positive impacts related with the alternatives assessed. The detail impact assessment matrices, overall performance of the SESA/ DMP objectives and mitigation measures are presented in annex 5. On completion of the assessment the preferred alternative(s) are given brief justification in table 8.13.

8.4 Impact Assessment Results

8.4.1 Summary of Key Findings of Assessment

The key findings from the assessment for each alternative are summarized in Tables 8.5- 8.11 and table 8.4 – indicates the colour key for overall performance of the options against SESA/ DMP objectives.

Table 8. 4: Colour key for Overall performance of the options against SESA/DMP Objectives

Major positive	
Moderate positive	
Minor positive	
Positive/ negative	
Neutral	
Major negative	
Moderate negative	
Minor Negative	

Table 8. 5: Summary of environmental and social assessment of **Alternative-1: No Action**

SESA/DMP Objectives	Impact Prediction and Evaluation			
	Short term	Medium term	Long term	Overall performance of option
Protect human life, health and population	▲	▲	▲	
	▲	▲	▲	
Protect Materials Assets and Critical Infrastructure	▲	▲	▲	
Conserve and protect Biodiversity(flora & fauna habitats ecosystems)	○	▲	▲	
	○	▲	▲	
Conserve and protect Natural &Cultural Heritage	▲	▲	▲	
Protect and enhance Landscape &Visual Amenity	▲	▲	▲	
Promote Climate Change Adaptability	▲	▲	▲	
Conserve and protect Water Resources and Watershed	▲	▲	▲	
	▲	▲	▲	
	○	▲	▲	
Conserve and protect soils	▲	▲	▲	
	▲	▲	▲	
Promote sustainable land use	▲	▲	▲	

Flood disasters result from the interaction between extreme hydrologic events and environmental, social and economic processes. Floods not only have negative consequences but positive impacts as well.

Positive impacts include;

- They provide valuable natural resources, thereby supporting livelihoods and economic activities.
- Historically, flood plains have been a preferred place for human settlement and socio-economic development because of their proximity to rivers, guaranteeing rich soils, abundant water supplies and means of transport, and because floods replenish wetlands, recharge groundwater and support fisheries and agriculture systems.

- Floods are natural hydrologic processes and provide variable river flows and are an intermittent source of freshwater supply, filling natural depressions and recharging groundwater. Inundation of the flood plains helps recharge the groundwater, which is an important source of drinking water and is essential for agriculture. They are an important source for restocking local man-made water sources such as ponds, reservoirs, dams and irrigation channels, meeting round-the-year demand.
- Floodwaters carry nutrients and sediments, which are deposited on flood plains, enriching the soil; artificial nourishment such as fertilizers is not required. Fadama areas in the city are sometimes flooded deliberately to take advantage of this natural fertilization process
- The river basins are ecological unit interconnecting upstream spawning habitats with downstream rearing habitats for a variety of species and other aquatic systems. Seasonal habitats on the flood plain, created by variable flow regimes, are essential for various stages of the life cycle of species, thus floods provide an ecological trigger for both the spawning and migration of certain species. Some species spawn on the flood plain itself, whereas others migrate upstream to spawn in the river channel, providing an abundant supply of fish and alternative income sources at the household level.
- The river ecosystem is a critical habitat for the biota: fish, wildlife and waterfowl. Seasonal variability and variable sediment and flow regimes help maintain ecological biodiversity the in rivers and flood plains. Wetlands or swamps located in flood plains serve as natural buffer zones for excessive flood flows and play host to many birds, fish and plants.
- Supplementary livelihoods in the form of recreational and eco-tourism activities can be made possible by the presence of the rich river ecosystem, bestowed with abundant flora and fauna.
- Surface runoff and flooding can help wash down pollutants and contaminants deposited on land caused by the intensive use of pesticides and fertilizers. They also flush out accumulated organic substances brought by untreated drainage water from farmlands, stockyards, factories and domestic use and restore the ecological health of stagnant rivers and streams by diluting them and providing clean water.
- The option would include some positive impacts on natural ecosystem and riverine forests such as (Eleyele wetland, Onigambari, IITA forest reserve, Olokemeji etc).
- The wetlands would be rejuvenated by increasing freshwater supplies during floods.
- Increasing flood risk is foreseen to enhance soils by creating new landforms and will protect soils by increasing connectivity between the river and floodplains

Unfortunately, despite the positive impacts mentioned, emphasis is generally placed on the destructive nature of floods because it is more visible. These adverse impacts are highlighted below.

Negative impacts include;

- Flood hazards produce the most severe impacts on the economy and people's safety.
- **In "No Action" scenario/ alternative**, the sense of insecurity arising out of the high risks due to recurrence of floods in flood prone but fertile plains dissuades farmers from making long-term investments in farming. It also dissuades other investors, including government

agencies, from making investment in infrastructural projects. From this point of view "flood is an inhibiting factor in the process of agricultural growth of areas subject to frequent flooding".

- Consequently, without flood protection, flood prone areas receive low levels of investment in both the farming and non-farming sectors. These result in low levels of economic development thereby perpetuating the vulnerability of the people.
- Flood risk will continue to increase over time increasing potential health risks to the increasing human population in Ibadan city, (particularly to the vulnerable informal settlements along flood plains), and potential damages properties and to other receptors including material assets – road network, biodiversity and cultural heritage.
- Increasing flood risk would have adverse impacts on landscape and visual amenity as a consequence of tree uprooting and land erosion.
- The no action option will exacerbate the social and environmental impacts/ issues associated flood risk with climate change in the following areas:

Decreased purchasing and production power: Damage to infrastructure potentially causes long-term impacts, such as disruptions to clean water and electricity, transport, communication, education and health care. Loss of livelihoods, reduction in purchasing power and loss of land value in the flood plains lead to increased vulnerabilities of communities living in the area. Production in agriculture, manufacturing and other sectors may suffer owing to the direct impact of flooding or to physical inability of the workforce to attend the workplaces, or due to ill health. Loss of livelihoods further reduces purchasing power and may indirectly affect production. Flooding can also result in loss of sales and trade. The additional cost of rehabilitation, relocation of people and removal of property from flood-affected areas can divert the capital required for maintaining production.

Mass migration: Frequent flooding, resulting in loss of livelihoods, production and other prolonged economic impacts and types of suffering can trigger mass migration or population displacement. Migration to developed urban areas creates overcrowding in the cities. These migrants swell the ranks of the urban poor and end up living in marginal lands in cities that are prone to floods or other risks. Selective out-migration of the workforce may create complex social problems. In a majority of cases where able-bodied males' members are forced to migrate, the safety of women, children, the elderly and the disabled who are left behind becomes an important issue. It may damage the community function and social structure and further increase the vulnerability of the population.

Psychosocial effects: The huge psychosocial effects on flood victims and their families can traumatize them for long periods of time. The loss of loved ones can generate deep impacts, especially on children. Displacement from one's home, loss of property and livelihoods and disruption to business and social affairs can cause continuing stress. The stress of overcoming these losses can be overwhelming and produce lasting psychological impacts.

Hindering economic growth and development: The high cost of relief and recovery may adversely impact investment in infrastructure and other development activities in the area and in certain cases may cripple the frail economy of the city. Recurrent flooding in the city may discourage long-term investments by the government and private sector alike. Lack of livelihoods, combined with migration of skilled labour, may have a negative impact on the city's economic growth. Loss of resources can lead to high costs of goods and services, inflation and loss of economic growth of the city, delaying its development programmes.

Political implications: Ineffective response to relief operations during major flood events may lead to public discontent or loss of trust in the authorities or the state and national governments. Lack of development in flood-prone areas may cause social inequity and even social unrest. Such disparities and unequal economic growth can produce regional, social, economic and political tensions.

- Water quality is likely to be impacted by increased flooding as the SESA field survey indicated approximately75% of the private drinking water supply in Ibadan is provided by groundwater (well) (section 5.6 of report);
- A no action alternative encourages encroachment upon floodplains with the increasing growth population.

Table 8. 6: Summary of Environmental and Social assessment of **Alternative-2:** Increasing flood protection by exploring opportunities to enhance flood/water storage capacity

SESA/DMP Objectives	**Impact Prediction and Evaluation**			
	Short term	**Medium term**	**Long term**	**Overall performance of option**
1.Protect human life, health and population	▲	▲	▲	
	○	▲	▲	
2.Protect Materials Assets and Critical Infrastructure	▲	▲ / ▲	▲	
3.Conserve and protect Biodiversity(flora &fauna habitats ecosystems)	▲	▲ / ▲	▲	*
	▲	▲	▲	
4.Conserve and protect Natural &Cultural Heritage	▲ / ▲	▲ / ▲	▲ / ▲	
5.Protect and enhance Landscape &Visual Amenity	▲	▲ / ▲	▲ / ▲	
6.Promote Climate Change Adaptability	▲	▲	▲	

7.Conserve and protect Water Resources and Watershed	▲	▲	▲	
	▲	▲	▲	
	▲	▲	▲ / ▲	
8.Conserve and protect soils	▲	▲	▲	
	▲	▲	▲	
9.Promote sustainable land use	▲	▲	▲	

Alternative-2 Scenario of Increasing flood/water storage capacity is certain to reduce potential human health risks and losses and damages to material assets.

Positive impacts include;

- This option would reduce temporary peak flood flows, to settlements thus reducing impacts, damage or losses on humans and material assets.
- There is reduced seasonal variability of flow, i.e. low flows increased and high flow decreased
- Increased flow fluctuations at hourly and daily timescales
- Change in frequency and timing of floods (impacts depend on reservoir capacity and dam design and operation).
- Floodplain structure and functioning is changed, as flooding is reduced or eliminated.
- Health issues and burdens reduced because of less contamination/ pollution of water resources from flood water.
- This option as proposed for the 22 dyke/ dams in the DMP for the upper basins of Ona in particular would include both beneficial social improvement through provision of mini water supply for communities, creation of new habitat from attenuation, economic and social benefits to aquaculture business or livestock. (There is also need for policy on the multipurpose use of dams).
- It seems that moderate beneficial impacts are likely, considering climate change projections and enhancing flood/water storage capacity.
- Mixed impacts are likely for naturally conserved sites.

Negative impacts include:

- There is potential land take and involuntary resettlement of displaced persons.
- Potential adverse impacts (e.g. dam sites can result in extinction of endangered species) on biodiversity. On the extreme is dyke or dam failure.
- Initially adverse, but in medium- and long-term mixed impacts are assessed. The significance of impact depends upon the biodiversity richness of the area and location of the dam sites. For instance, the potential sites identified for off-channel flood storages in upper Ona basins may or may not have dispersed biodiversity with a potential for minor or moderate adverse and /or beneficial impacts

- Downstream impact on biodiversity in lower Kudeti could also have moderate to major adverse impacts. For example, potential river species will largely be replaced by dyke/dam species. The natural native river species reliant on natural flow regime will disappear downstream of the dyke/dam because changes in thermal regime affects many species, e.g. invertebrates and short-term flow fluctuations (de-watering) result in stranding of organisms, in case of the dyke /dam being considered for hydropower.
- Furthermore, most silt and organic matter is retained in reservoir, instead of fertilizing flood plains. This also has ecological effects in the fluvial, estuarine ecosystems
- Floodplain structure and functioning is changed, as flooding is reduced or eliminated. Though this displaces some trees and animals
- Finally, dykes/Dams sever the longitudinal connectivity of the river which impedes or hinders the passage of fish and invertebrates along the river course, and also of some terrestrial animals along the river corridor. Exotic species can displace the locally adapted natives due to dam operations reducing extreme flows (both low and high), and/or extreme environmental conditions (e.g. high turbidity
    - Thus on the SESA/ DMP objective with respect to Biodiversity, the mix impacts are represented by the two colours of minor to moderate negative impact as indicated in table 8.6.
    - If the storage basin is used only during flooding there is little impact. There is need to develop a policy to ensure the designs does not affect minimum freshwater flow, sediment regimes in the main channel, regular water flow discharge into river basins as dam construction will store additional water otherwise wasted every year
    - More advanced information is required regarding the current status of biodiversity and natural resources in the basins.
- Enhancing flood storage capacity is likely to carry moderate adverse impacts on water resources, soil protection and sustainable land-use.

Table 8. 7: Summary of environmental and social assessment **of Alternative-3:** Community-based watershed management

SESA/DMP Objectives	**Impact Prediction and Evaluation**			
	Short term	**Medium term**	**Long term**	**Overall performance of option**
1.Protect human life, health and population	○	▲	▲	
	○	▲	▲	
2.Protect Materials Assets and Critical Infrastructure	○/▲	▲/▲	▲/▲	
3.Conserve and protect Biodiversity (flora & fauna habitats ecosystems)	▲	▲	▲	
	▲	▲	▲	
4.Conserve and protect Natural &Cultural Heritage	▲	▲	▲	

5.Protect and enhance Landscape &Visual Amenity	○	▲	▲	
6.Promote Climate Change Adaptability	▲	▲	▲	
7.Conserve and protect Water Resources and Watershed	▲	▲	▲	
	▲	▲	▲	
	○	▲	▲	
8.Conserve and protect soils	▲	▲	▲	
	▲	▲	▲	
9.Promote sustainable Land use	▲	▲	▲	

Alternative-3 scenario: Community-based watershed management

Community based watershed management consists of interventions that affect the hydrological processes and includes introduction of suitable soil-protecting vegetation and crops, possible land use regulations, forestation, better forest management, controlling of shifting cultivation in conjunction with minor engineering works, e.g. check dams, trenches, contour bunds, etc.

However, the impact of community based watershed management measures is limited to small floods, with decreasing effects for larger drainage basins. The most important contribution of catchment management is the reduction in the silt load contributed to rivers aggrading in nature.

- Initially the option will probably have no significant impacts, but over the time plantation and other flood protection schemes in watershed will slow-down the flood speed and thus may lead to minor positive impacts on human life.
- A watershed flood management approach starts with setting goals that are largely guided by city/community development objectives and driven by the need to reduce flood risks, secure livelihoods, sustain economic development and preserve environmental quality.
- This option facilitates designing the process for stakeholder participation, and decisions regarding the degree of risk that people are prepared to take and pay for with respect to preserving the environment. By involving the stakeholders' ethical considerations regarding equitable development, distribution and sharing of risk and decisions as to who should finance flood risk mitigation can be made.
- Even though the small watercourses and their surroundings represent often unique and irreplaceable ecosystems from the perspective of a number of scientific disciplines, the biggest problem remains in their social perception. Humans especially strongly perceive only the local character of small streams (the extent of area influenced by stream is

seemingly very small), which causes the perceived insignificance of these landscape components for common decision-making level (usually the spatial equivalent of catchment of the 1st order stream).

Watershed management has **positive effects;**

- To reduce runoff from activities and structures
- Improving vegetation cover in watershed is expected to reduce turbidity and sediments pollution on the basins, particularly on the Agodi;
- It seems that initially watershed management would maintain the current status of flood protection for biodiversity, but overtime will improve by planting trees and implementing community-based watershed management schemes.
- Watershed management schemes are likely to improve the current status of habitats and for endangered species in upper basins of the river catchment of Ona, Ogbere, Omi, Agodi, Ogunpa, Kudeti, but no significant impact on naturally conserved areas in lower basin.
- Those whose source of livelihood is dependent on ecosystem resources, sand mining, herbal medicines, fisheries are beneficiaries of watershed management.
- The option appears to have no immediate impacts on landscape features but improving vegetation and community-based plantation schemes **will enhance visual amenity and livelihoods of those living on the ecosystem over time with ecosystem service careful management.**
- Considering climate change impacts, watershed management will have minor positive impacts on geomorphological processes, flood velocities and flood impacts.

Negative effects;

- Though Forests and vegetation play an important role in determining hydrological processes in the basin by seasonally stabilizing river flows. Extreme flood events, in terms of peak flow and total volume of runoff are, however, not influenced by the absence or presence of forest or vegetation cover, thus increasing floods will continue to inundate floodplain, lakes (Agodi) and wetlands.
- The option is not likely to have any significant impacts on soil protection or enhancement.
- Though Wetlands have a significant influence on the processes of the hydrological cycle through storage of water, transfer of water to an aquifer or recharge of groundwater. But not all wetlands attenuate floods to the same degree.
- Increasing flood risk is likely to increase potential damages/loss to cultural heritage specifically in lower basins of the river.
- The option is not expected to have beneficial impacts on material assets. Increasing flood risk will continue to increase damaging/loss potential for various public utilities and agriculture. while increasing flood events will continue over-bank flows and thus increasing risk for water pollution.
- Based on field survey limited changes are expected to current watershed regime. Individual watershed management actions/non-structural measures are unlikely to hold any significant impacts on land use change in the city.

Table 8. 8: Summary of environmental assessment of **Alternative-4**: Maintain and improve existing flood protection structure (embankments)

SESA/DMP Objectives	**Impact Prediction and Evaluation**			
	Short term	**Medium term**	**Long term**	**Overall performance of option**
Protect human life, health and population	○	▲	▲	
	○	▲	▲	
Protect Materials Assets and Critical Infrastructure	○	▲	▲	
Conserve and protect Biodiversity (flora & fauna habitats ecosystems)	▲	▲	▲	
	▲	▲	▲	
Conserve and protect Natural &Cultural Heritage	▲	▲	▲	
Protect and enhance Landscape &Visual Amenity	▲	▲	▲	
Promote Climate Change Adaptability	○	▲	▲	
Conserve and protect Water Resources and Watershed	▲	▲	▲	
	N/A	N/A	N/A	
	N/A	N/A	N/A	
Conserve and protect soils	○	○	○	
	○	○	○	
Promote sustainable Land use	○	○	○	

Alternative-4 Scenario: Maintain and improve existing flood protection structure (embankments).

- Improving embankments initially would have no impacts on human population and health risks; but in medium to long term, the moderate beneficial impacts are likely by improving flood protection level if some mitigation measures.
- Embankments should be planned in conjunction with other structural measures such as dams and detention basins, as well as non-structural measures. Spacing of embankments should allow for the morphological lateral movement of the river. Embankment designs should minimize the disruption in lateral connectivity by setting balanced standards of protection based on economic and environmental criteria. Setting embankments farther back from river channel depending on land use conditions, Removal of embankments separating flood plain from river in combination with land use planning, if the flood plains are not occupied by human development.

Positive impacts include;

- Initially the level of flood protection for material assets will remain same, but will improve moderately over time with the increase in level of protection associated with raising embankments.
- Improved embankments would have moderate beneficial impacts on social life, transportation networks, biodiversity, naturally protected sites and cultural heritage because of potential improved flood protection level.
- Raising height of embankment are likely to maintain the current status of landscape and visual amenity in long terms but may have localized visual impacts and can also provide opportunities to improve degraded and damaged landscape or site features.

Negative impacts include;

- There are possibilities of land take or involuntary resettlements that must be addressed with compensatory measures and livelihood restoration.
- Embankment rising is likely to result in contaminant release during construction phase which can have minor adverse impacts on water quality in short term.
- Flood peaks increased downstream.
- The option raises potential loss of connectivity between river and flood plain, loss of pool and riffle patterns and other heterogeneities in channel form, Increased erosion possible (both local scour and overall degradation), Possible sedimentation downstream, of material eroded in embanked reach.
- Loss of floodplain refuges and spawning areas for river species, Loss of floodplain forests (timber, fruits, medicines), All floodplain structures, processes and species needing frequent inundation are affected, No more silt deposition on flood plain, No more habitat creation on the flood plain.
- Improving embankments would have neutral impacts on conserving soils and promoting sustainable land-use.

Table 8. 9: Summary of environmental assessment of **Alternative-5:** Flood diversion through bypass/ diversion channels

SESA/DMP Objectives	**Impact Prediction and Evaluation**			
	Short term	**Medium term**	**Long term**	**Overall performance of option**
Protect human life, health and population	O	▲	▲	
	O	▲	▲	
Protect Materials Assets and Critical Infrastructure	O	▲	▲	
Conserve and protect Biodiversity (flora & fauna habitats ecosystems)	O	▲	▲	
	O	▲	▲	
Conserve and protect Natural &Cultural Heritage	▲	▲	▲	

Protect and enhance Landscape &Visual Amenity	▲	▲	▲	
Promote Climate Change Adaptability	○	▲	▲	
Conserve and protect Water Resources and Watershed	▲	▲	▲	
	N/A	N/A	N/A	
	○	▲	▲	
Conserve and protect soils	▲	▲	▲	
	○	▲	▲	
Promote sustainable Land use	▲	▲	▲	

Alternative-5 scenario: Flood diversion through bypass/ diversion channels

- Construction of bypass/diversion channels initially is likely to maintain the current status of protection for human life and health risks but will improve significantly overtime. There will be less social disruption and potentially improves safety of populations in the environment. A mitigation measure where the channels are of natural.

Positive impacts include;

- This option is likely to maintain the current status of protection for material assets, but will increase moderately over time.
- There is little impact if the bypass channel is used only during flooding for bypass.
- Reduced river flow, stage and velocity in the bypassed reach if the water diverts flows permanently into the bypass channel.
- Channel construction will significantly reduce increasing flood risk associated with climate change by providing alternative paths for flood alleviation in lower river basins in Ibadan
- Channels construction will result in new engineering intervention that is unlikely to enhance the landscape features of the area, but overtime the system will get mature to improve the landscape features.
- Little impact on river water quality in the original channel.
- Little impact on biodiversity in the main channel.
- Initially the option would not have significant impacts on soil protection but overtime deposition along channel banks will enhance landforms.
- Construction of channels would result in new engineering structures (e.g. bunds) that would be unlikely to enhance environmental and social friendly land use, but over time with plantation and creation of habitats will improve sustainable effects of land use in mid and long terms. Thus channelization as an option for flood mitigation, if adopted, should consider the use of soil bioengineering and soft revetments, so that flood management objectives are not compromised while mitigating impacts on the socio economic environment of the city.

Negative impacts include;

- There are possibilities of land take or involuntary resettlements that must be address with compensatory measures and livelihood restoration
- Increased channel slope, flow velocity, lower stages, reduced residence time, leading to increased flooding downstream (faster travel times and lower peak attenuation. A bypass channel can be planned in conjunction with a detention basin downstream of the bypass channel, in case the altered flow largely increases flooding downstream
- Possible aggradation in the bypassed reach, if the bypass takes only flood water but does not allow for intake of its share of bed load into the bypass channel. Potential river bank and bed erosion (scour and degradation). Sedimentation problems downstream. Total loss of heterogeneity in channel form
- Despite diversion channels or bypass flood protection measures, flash flood run off from unmanaged watershed in hilly terrain can still allow flooding to continue in out-flow of river bank leading to water pollution, but over-time as the new system get stabilized the water polluting issues will reduce
- Diversion/bypass channels are likely to have minor to moderate adverse impacts on biodiversity, river ecology, and fisheries downstream but with mitigation measures in the creation of new habitats the significance of the impacts will be reduced.
- Initially the current state of naturally conserved areas will be maintained. But the Channel construction can have direct moderate adverse impacts on protected sites and fisheries, through loss of river habitat diversity, backwaters and refuges; loss of native river species, loss of in-stream and water vegetation, loss of organic material input, lowering of floodplain water tables, affecting vegetation and floodplain wetlands which can be reduced by considering suitable channel designs and creating new habitats.
- Construction of channels might have adverse impacts on cultural heritage depending on the location of the historical buildings or archaeological features within river basins. Such impacts can be minimized with the implementation of local cultural heritage protection projects and cognizance of chance find procedures in the cause of construction (if any).

Table 8. 10: Summary of environmental and social impacts on **Alternative 6:** to improve floodplain management

SESA/DMP Objectives	**Impact Prediction and Evaluation**			
	Short term	**Medium term**	**Long term**	**Overall performance of option**
Protect human life, health and population	○	▲	▲	
	○	▲	▲	
Protect Materials Assets and Critical Infrastructure	○/▲	▲/▲	▲/▲	
Conserve and protect Biodiversity (flora & fauna habitats ecosystems)	▲	▲	▲	
	▲	▲	▲	
Conserve and protect Natural &Cultural Heritage	▲	▲	▲	

Protect and enhance Landscape &Visual Amenity	▲	▲	▲	
Promote Climate Change Adaptability	▲	▲	▲	
Conserve and protect Water Resources and Watershed	▲	▲	▲	
	▲	▲	▲	
	▲	▲	▲	
Conserve and protect soils	▲	▲	▲	
	▲	▲	▲	
Promote sustainable Land use	▲	▲	▲	

Alternative 6 scenarios: to improve floodplain management

Positive impacts include;

- Minimizing settlement in areas subject to flooding and living with floods" – an age-old practice in many parts of the world – recognizes that while it is not possible to completely eliminate floods, their negative impacts can be reduced through an understanding of flood risks, by working towards modifying this risk-generation process in a holistic manner. Improving flood plain management, in conjunction with non-structural measures such as land use planning, flood forecasting and warning and emergency planning, can help keep the adverse impact on the socio- economic environment to a lower level. The concept of "living with floods", rather than fighting them, is the most effective way of preserving ecosystems.

- Initially improving floodplain management will maintain the current level of flood risk and associated health risks but gradually improve over time in addition to the implementation of other flood protection works and schemes.
- It is expected that improving flood management will maintain the existing status of protection for material assets but gradually improve over time with the implementation of other flood protection works and schemes.
- Increasing floods will provide opportunities to supply fresh flows to water deprived protected sites, ecosystems, wetlands and riverine forests, thus improving ecological features and biodiversity.
- Floodplain management including flood plain regulations and zoning for future development will help to cope with climatic factors.
- It appears that the option is not likely to improve water quality significantly, but plantation fitting local environment would have positive impacts, community food security, on geomorphological processes and ultimately on quality of water.
- Increased flooding will continue to increase inundation of lakes and wetland that will contribute improving ecological health of these systems.

- Floodplain management would have minor positive and localized impacts on landscape features

Negative impacts include;

- Initially the floodplain management option will maintain the current flood risk level, but considering climate change and increasing flood risk/frequent floods events and geomorphological changes would have negative impacts on the habitats.
- Climate change projections and increasing flood risk will increase potential damaging impacts e.g. tree uprooting, land erosion, and damages to flood protection infrastructure and buildings, thus resulting in adverse impacts on landscape.
- Increasing flood risk will continue to increase damaging risks for cultural heritage or historical buildings except cultural heritage sites could be protected by local heritage protection schemes/works
- Increasing flood risk associated with climate change would result in damaging impacts on material assets and agriculture.

Table 8. 11: Summary of environmental assessment of **Alternative-7:** Improve and extend FEWS

SESA/DMP Objectives	**Impact Prediction and Evaluation**			
	Short term	**Medium term**	**Long term**	**Overall performance of option**
1.Protect human life, health and population	▲	▲	▲	
	▲	▲	▲	
2.Protect Materials Assets and Critical Infrastructure	▲ / ▲	▲	▲	
3.Conserve and protect Biodiversity (flora & fauna habitats ecosystems)	○	▲	▲	
	○	▲	▲	
4.Conserve and protect Natural &Cultural Heritage	▲	▲	▲	
5.Protect and enhance Landscape &Visual Amenity	▲	▲	▲	
6.Promote Climate Change Adaptability	▲	▲	▲	
7.Conserve and protect Water Resources and Watershed	▲	▲	▲	
	▲	▲	▲	
	○	▲	▲	
8.Conserve and protect soils	▲	▲	▲	
	▲	▲	▲	

9.Promote sustainable Land use	○	▲	▲	

Alternative-7 scenario: Improve and extend FEWS

- Participatory planning is a prerequisite for FEWS and emergency planning. At each level, all stakeholder groups concerned must come together to develop an emergency plan.
- Risk and vulnerability assessments, distribution of specific roles and responsibilities, resource analysis and mobilization are critical components of emergency planning which call for the participatory process. Results are then shared with all the stakeholders. Basin communities residing in flood-prone areas should be informed of the local risks to motivate them to take action to develop their own resilience.
- The emergency preparedness plan is a detailed document containing sub-plans that address, among other things, preparedness for, response to and recovery from flood emergencies. Its primary aim is to clearly identify the responsibilities of various players during an actual flood.

Positive impacts include;

- It supplements almost all other structural as well as non-structural measures. Flood forecasting involves estimating when a flood is likely to cause damage or loss of life, what its magnitude will be (usually in terms of its maximum stage at a given location) and how long it will last. Flood forecasts are formulated and issued with a certain lead time, allowing concerned authorities to take preventive and emergency measures. Authorities can respond appropriately with dam operations, opening and closing the gates of various flood management structures, anticipatory releases to increase reservoir storage capacity, etc.
- The effectiveness of a flood forecast and warning system is as much a function of the accuracy, timeliness and outreach of the forecast as of the response behaviour and preparedness. Inflow forecasts for reservoirs, detention basins, bypass channels, etc., play an important role in flood peak alleviation. It is important to draw reservoir operation guidelines covering various scenarios and effect managed flood releases based on these forecasts
- The option is expected to have positive impacts on human life and safety by timely disseminating flood warnings in flood affected areas thus reducing human losses.
- The option guides property owners and government to provide flood proofing to properties and to protect material assets.
- It fosters decentralization of disaster management responsibilities. Once considered helpless, disaster victims are now viewed as stakeholders who play an active role in disaster management planning and decision-making. (Building community cohesion, recognizing the special needs of excluded individuals or social groups such as women, disabled persons, elderly people and ethnic minorities and providing opportunities for increased stakeholder involvement in decision-making can increase community resilience and reduce their risks

- FEWS/non-structural measure would have no direct impact on biodiversity but climate change and increasing floods will continue inundation of floodplains, riverine forests and other ecosystem thus providing favourable conditions for water-deprived ecosystems.
- In 'FEWS' scenario increasing flood events would speed up geomorphological processes that would contribute to the enhancement of landforms. Inundation along the riverbanks will also contribute to the enhancement of landforms by deposition process.

Negative impacts include;

- Non-structural flood management measures such as flood forecasting and warning; and disaster prevention, preparedness and response mechanisms; have limited negative environmental and social consequences and should be actively considered as viable options, both as independent or complementary measures.
- The negative impact is the reality of "After a flood": -
    - the cleaning operations to be undertaken at an emergency level,
    - little attention that may be paid to the dumping of rubbish and debris when not planned in advance, thus, end up in drainage channels, ponds, wetlands or rivers, impacting the natural ecosystems.
    - Recovery of drinking water supply, tube wells, sewerage systems and health infrastructure that becomes the priority.
    - The often spread of chemicals during floods and potential catastrophic consequences on terrestrial ecosystems and other cleaning operations that often require special attention in the post recovery phase to avoid long-term ill effects.
- Considering the option alternative alone and climate change projections severe flood risk will continue to increase with a potential for more dramatic/super flood events like in 2011.
- Climate change and increasing flood events and out-flow of the riverbanks would increase water pollution.
- Current regime of land use will be maintained, but increasing flood risk, population and food security issue will increase burden on land use resources.
- Thus, the option alone is unlikely to promote sustainable land use.

8.5 Summary of Impact Assessment and Selection of Preferred Options

The impact assessment in previous section has shown that there are number of environmental and socially acceptable alternatives that could be suggested for the progress of SESA/DMP process.

Alternative 1- No Action: is not considered environmental and socially acceptable option, as it results in increasing flooding with potential to cause major damages to human, material, social and environmental assets.

Alternative 2- Enhancing Flood Storage Capacity: developing storages in upper river basins of Ona particularly, can result in significant environmental and social consequences,

however it is difficult to assess at this stage, as no exact information is available regarding the identification of potential sites and the relevant baseline data (it is important environmental and social site assessment is done for the proposed 22 sites). Therefore, mostly minor and moderately significant impacts are predicted as the severity of the significance of the impacts when related with the significance of the siting of the storage. Although, the experience of 2011 floods, current Sustainable Development goals 2030 stresses the need for enhancing water storage capacity across the country, to which Ibadan city can take advantage of to explore the water storage potential for the proposed site in the DMP.

In all the upper basin for which the proposed storage sites are being considered there are already marked infrastructural development of residential estates/ commercial ventures, considering this further development of flood storages can have significant cumulative impacts. Therefore, this option should only be considered if there is not any other substitute possible.

Alternative 3- Improve watershed Management: is an environmental and socially **acceptable** option, as it helps to alleviate flood risk to human life, material assets (to some extent), provides support to local communities in terms of job creation and food security and recreational services with minimal environmental consequences but improved social support for affected populations in the environ. Although, it does not help to reduce flood risk to cultural heritage and water quality.

Alternative 4- Maintain and Improve Embankments: is considered as an environmental and socially **acceptable** option, as it helps to reduce flood risk to human, material and environmental assets and no significant impacts on soil protection and sustainable land use. It has the potential for land take and involuntary resettlements.

Alternative 5- Flood diversion through bypass/diversion channels: is considered to be environmental and socially **preferred option,** as it results in reducing flood risk and major benefits to human, material assets and mix impacts on naturally protected areas, habitats sites. In parallel to 'Alternative2' more appropriate predictions of impacts at this stage is impossible, as no potential site and relevant baseline information is available. It has the potential for land take and involuntary resettlements. It has potential to create access issues between communities as well. Although, the upcoming DMP aims to explore opportunities for flood diversion in abandoned river pathways. Therefore, considering the benefits of the option, it should be considered for progress.

Alternative 6- Improve floodplain Management: similar to alternative 3, it is also an environmental and social acceptable option, as it helps to alleviate flood risk to human life, material assets (to some extent), water resources, soil protection, sustainable land use and biodiversity (to some extent). It provides social supports for flood plain inhabitants and users and the ecosystem.

Alternative 7- Improve and extend Flood Early Warning System: is socially **acceptable** as it helps to alleviate flood risk to human safety by timely dissemination of flood warnings.

Therefore, this option should be considered in combination with other structural and non-structural measures.

8.6 The Preferred strategy for Ibadan River Basins under the DMP

Following the environmental, social, technical and economic assessments of the proposed alternatives, the next step involves putting forward preferred flood management strategy/alternatives for Ibadan River basin. This section describes the preferred options for the River basins of Ona, Ogunpa, Ogbere, Omi, associated environmental and social implications and potential cumulative impacts. Logically, the preferred strategy should be subject to further detailed assessment process with respect to site specific projects in the course of implementation of the DMP.

From the foregoing, the justification for selecting the preferred options include that the River basins has been divided into reaches e.g. 3-R1, 3-R2 represents the 1st and 2nd reaches of System no. 3, refer to Figure 4.8.of the DMP's report of N17036-0100D-RPT-ENV 26-Rev0 January 2019. Reaches which serve areas of sizes 5 to 50 km2 shall be designed for a 50 years return period. However, analysis shall be done to ensure that the proposed channel can convey 100 years return period peak flow. This can be performed by providing an adequate free board height for that purpose.

Channels with greater watersheds (> 50 km2) are divided into two parts, a structural section and a non - structural section:

- The structural section of the channel is designed on a 25-year return period,
- The non-structural part is the flood fringe; this part is designed to accommodate the 100-year return period. Following the concept of "making space for water", Flood plains of channels lying in rural reaches shall be demarcated in order to restrict the construction of any buildings and to define the stream's right-of-way.

As mentioned earlier, there are 188 systems comprising of Rivers and Tributaries that are proposed for channelization under the DMP. These channels lie in different areas in Ibadan. In order to organize the design in coherent way; each group of channels are gathered in a specified sub basin. In addition, each channel is divided into a set of reaches. New reaches are identified when there is either a change in the size dimensions, a crossing structure dividing the channel or a change in the system numbering. In other words, only one structure is located on a single reach. However, it is not necessarily that a reach includes a crossing structure.

There are reaches with high system losses in upper basins and in lower basins- (**DMP's report of N17036-0100D-RPT-ENV 26-Rev0 January 2019**-) resulting in heavy floods and affecting sustainable water resource management within the River basins. Considering this, developing flood storage in upper basins (with many potential sites) and watershed management seems to be viable options for the system. With respect to the lower basin with flat topography construction of reservoir is not possible and thus embankments, diversion channels and non-structural measures fit the characteristics of the local environment.

Except the 'No Action' alternative, all other options are taken to be part of preferred strategy as summarized in Table 8.12

Table 8. 12: Summary of Preferred Strategy

Strategic Options/ Alternatives	Upper River Basin (Ona, Ogbere, Ogunpa, Omi Watershed)	Middle and Lower River Basins of Ona Ogbere, Ogunpa, Omi Watershed)
Flood Storage (s)	+	
Improved Watershed Management	+	
Maintain and Improve existing flood protection structures		+
Flood diversion through bypass/ diversion channels		+
Improve floodplain management		+
Improve and extend FEWS	+	+

8.7 Summary of key environmental and social implications associated with preferred strategy

The key environmental and social impacts associated with preferred strategy for the river basins are divided into two main parts:

1-Flood Management Strategy/alternatives for Upper River Basin:

- One structural (flood storage) and two non-structural interventions (community-based watershed management and FEWS) are taken forward for flood management in the upper basin of the Ona, Ogbere, Omi, Ogunpa Orogun at watershed level.
- Construction of storage is generally linked with significant environmental and social consequences particularly in downstream segments of the river basins particularly if there is a dam/ dyke failure (e.g that of dyke failure at Kayode Esho farm at Igbo Elerin in Arulogun Ojo Area. However, the storage development can provide opportunities to reduce flood risk to human health, material assets and develop new habitats for the enhancement of biodiversity or as compensation to lost habitat.
- The storage development can become an economic asset for water supply and other productive uses- irrigation fed farming, recreation etc
- Preferably existing or on-going storage development in upper river basins (i.e. multipurpose) should be adapted to accommodate floods that will ultimately reduce overall environmental, social and cumulative impacts and serve economic purposes and sustainable development, rather than developing separate flood storages. Considering potential adverse impacts associated with dam/reservoir, construction can be mitigated by proposing suitable and practicable mitigation measures to improve the overall performance of the option.
- The potential land takes and resettlement issues with dam construction will require adequate mitigation measures. Beyond that, is the need for safety net in emergency planning and preparation skills that needs to be ensured is in place with downstream communities.
- Implementation of non-structural measures (i.e. FEWS and watershed management schemes/plans) is generally considered with no physical environmental impacts on the ground but with positive social impact on human safety and community support. FEWS

and watershed management contributes to human safety and good health impacts respectively.

- Community-based watershed management interventions are likely to have minor and small-scale impacts on both environment and social aspect that should be managed by careful training and awareness raising schemes before the implementation of the strategy.

2-Flood Management Strategy/alternatives for Middle and Lower river Basins:

- Two structural and two non-structural flood management measures are recognized for middle and lower river basin of Ona, Ogbere, Orogun, Ogunpa, and Omi.
- Non-structural measures including FEWS and floodplain management would have no physical environmental and social impacts on the ground. Although, community-based interventions in floodplain management can have minor and small-scale impacts considering the local environmental sensitivities of the area. This issue can be better addressed by involving local people in the selection of desirable schemes and design of proposed interventions to fit in the local environment and its sustainability in the long term.
- With respect to third option i.e. improve and maintain embankments have minimal environmental and social impacts. Although, embankments have diverse environmental and social impacts, but this option considers the maintenance and improvement of existing structures, rather than building new ones. In doing so, there may be minor and local scale impacts, but it can also provide opportunity to improve the deteriorating environmental conditions around the existing embankments, thus invariably reducing the road cut off that create social disruptions.
- The fourth option i.e. floods diversion through bypass/diversion channels can have diverse environmental and social consequences, for example, excavation activities will produce wastes that needs to be deposited carefully not by developing new landfills rather using the existing landfill/depositing sites. Similarly, removal of vegetation can have impacts on landscape characteristics of the area but in short term and by planting new vegetation will integrate the channels into the landscape, taking into account mitigations for any loss to biodiversity or wildlife. Construction of channel can cause disruption to existing commercial e.g. Aquaculture farms in the neighbourhood- fishing and cassava processing thus affecting source of livelihoods. It can also cause the need for land take and acquisitions, involuntary resettlement and gender based violence within local communities because of labour influx. However, it will also create new recreational sites with new social and economic opportunities to meet public needs. In parallel, this option can have both beneficial and adverse environmental and social impacts that could be predicted precisely with the identification of potential site and environmental sensitivities of the area.

8.8 Mitigations and Recommendations for selected alternatives

SESA provides opportunities for early consideration of mitigation measures by following the sequence **of avoid-reduce-mitigate-compensate-enhance environment and social issues**.

(a) Anticipate and avoid risks and impacts;

(b) Where avoidance is not possible, minimize … reduce risks and impacts to acceptable levels;

(c) Once risks and impacts have been minimized or reduced, mitigate; and
(d) Where significant residual impacts remain, compensate for or offset them, where technically and financially feasible.

In addition, it also identifies those significant impacts which are expected to remain after the application of recommended mitigation measures. Such impacts can be avoided by changing plan e.g. deleting, adding new alternatives or changing combination of the alternatives in particular region of the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) area.

This SESA report provides framework to forward such measures and recommendations for ESIA at project level for detailed mitigation plan. It is also significant to consider that the mitigations are flexible and are forwarded knowing the perspectives of the local people as they are more familiar with the surrounding environment than the decision-makers. Although the mitigation measures have already been proposed for all alternatives where required during impact assessment process as documented in annex 5. However, it is evident that some of the preferred options have significant environmental and social impacts that need to be mitigated to become acceptable options. Therefore, the proposed mitigation measures for preferred options, indicated in table 8.13 ensured consideration of uncertainties related with climate change projections and broad principles as at this planning stage of the DMP for Ibadan River basins since there is no single alternative with detailed design.

However, at project level the principle of the mitigation measures should be used to develop a detailed mitigation strategy.

Table 8. 13: Impacts and mitigation options for the preferred strategy.

Option	**Impact/ Issues**	**Mitigation and its Hierarchy**
Watershed management and floodplain management	General impacts are associated with community- based interventions	Extensive public consultations Awareness raising scheme and training programmes to achieve the goals of community-based interventions. These would facilitate avoidance of impacts where feasible and reduce potential impacts where not feasible.
	Changes in landscape features	Careful and well-designed plantation that meets social economic and cultural needs. Extensive local consultation with skill strengthening for plantation maintenance and sustenance
	Changes in cultivation patterns	Consulting and encouraging community to abandon conversion of forest land into cultivation land, while providing awareness and support for alternatives, sustainable intensification & interventions that can encourage land-sparing. Other interventions may include securing land tenure for peoples in the local communities. These are to mitigate impacts to acceptable levels.
	Changes in fuel consumption	Consulting and encouraging local peoples to find alternative fuel consumption pattern instead of using fuel wood. This is to avoid impacts from reduced natural ground cover, as well as minimizing rate of runoff. The formalization of informal activities is a means to address the production and consumption patterns with supportive policies (e.g., protected harvest areas) in place. However, the application of such policies depends upon sector

		formalization– factors like secure tenure, formalized production management, and strategic harvesting plans.
	Coping with floods, involves living with floods, flood proofing and emergency response mechanisms and may result in the following • Likely spread of pollutants and chemicals impacting health • Fertility of land may be impeded due to spread of sand or chemicals onto fertile lands • Stagnant water may result in spreading of disease and weeds	Supportive Community capacity-building which starts with identifying a community's level of knowledge, their attitudinal behaviour and understanding of risk perceptions. It focuses on building awareness of flood risks in a catchment community, flood plain management activities to mitigate flood hazards and local environmental issues aimed at improving natural resources. This can be achieved through a variety of measures, including the dissemination of public awareness materials, community meetings, sharing information on websites, TV and radio programmes, commemoration of well-remembered flood events and support for programmes undertaken by schoolchildren. Social or cultural forums as a platform for these activities and/or creating new forums aimed at bringing members together if none exist should be identified and used for that purpose. Community events should be used to disseminate the information. An effective way is to promote cross learning between communities and arrange exchange visits to other communities that have successfully initiated or implemented innovative programmes.
	Impacts on cultural heritage(where it exists)	Consulting the local community with respect to protecting vulnerable cultural heritage.
Enhancing flood Storage Capacity	Resettlement issues	A **resettlement action plan** should be prepared for the well-planned resettlement of the displaced people in flood protected areas where there are planned ancillary works and channelization once there is land take or involuntary resettlement or displacement. Ensure justifiable financial compensation for the loss of valuable properties, agricultural and business etc. under the land use Act 1978. Livelihood restoration plan for communities affected Emergency mitigation plans and capacity skills
	Loss or damages to habitats specifically of migratory birds	Updated research is required to assess number of species of birds to be affected and cost of damages/ losses to habitats. Compensatory habitats sites must be developed/ designed into project at suitable places thereafter.
	Impacts on agriculture	Introducing water resistant crops at inundated areas
	Impacts on fisheries	Promoting fisheries in reservoirs and training on its maintenance for users Financial compensations where other mitigation measures are not workable Allowing for fish passage over weirs and dams, in both directions
	Impacts on cultural heritage	Consult local residence to determine best way of protecting cultural heritage. Consult the State experts to know how to protect any state heritage site from flood risk
	Reduction in river flows to the natural wetland of the various basins	Ensure minimum water flows to these systems by establishing Standard Operating Protocols to follow Managed flow releases by reservoir operation, leading to seasonal variability of flow

		Multiple and/or depth-selective intake structures for maintaining the natural seasonal temperature regime of released flows in reaches below dams, as well as water quality Appropriate sediment bypassing devices
	Effectiveness of early warning systems installed	Involve community representatives in early warning systems. As simple as a river gauge will improve awareness and there are volunteer's waiting to be trained in the affected communities
	Impacts on landscape	Carefully planned community-based plantation
Flood diversion through bypass or channel	Impacts on biodiversity and habitats	Ensure compensatory and targeted habitats associated with the proposed project designs
	Impacts on fisheries	Financial compensation
	Impacts on cultural heritage	Consult local residence to determine best way of protecting cultural heritage
	Impacts on landscape and visual amenity	Ensure high quality design for the proposed project

8.9 Cumulative Effect Assessment (CEA)

In addition to impacts identified for each receptor in the matrices, the two components of Cumulative effect assessment were considered being (1) the anticipated future condition, which is the total effect of the other existing, and predictable future developments and external natural environmental and social drivers, and (2) the contribution of the development under evaluation to the cumulative impacts. The anticipated other sources (e.g. other activities, Policies, Programs Plans) which can have adverse or beneficial impacts include dam, for irrigations, aquaculture, hydropower project, the planned circular roads and erosion amelioration projects in the same watershed).. On the development under evaluation, individual minor negative impacts are generally acceptable but can become major or unacceptable together. Potential cumulative impacts include the following:

- Secondary or induced social impacts, such as in-migration, or more traffic congestion
- and accidents along community roadways owing to increases in transport activity in the project's area of influence.
- Shift in livelihood and sustainability of livelihoods
- Additional incidents of disease, alcohol and drugs problems, and crime leading to compromised community health and wellness; safety and security
- Increases in pollutant concentrations in a water body or in the soil or sediments, or
- their bioaccumulation.
- Reduction of water flow in a watershed due to multiple withdrawals.
- Increases in sediment loads on a watershed or increased erosion.
- Interference with migratory routes or wildlife movement.
- the natural movement of spawning fish downstream and juveniles upstream would first be impacted by several projects under construction in the lower reaches of the river.
- Increased pressure on the carrying capacity or the survival of indicator species in an ecosystem.
- Wildlife population reduction caused by increased hunting, road kills, and forestry operations.
- Depletion of a forest as a result of multiple logging concessions for project development.

Multiple and successive environmental and social impacts from existing developments, combined with the potential incremental impacts resulting from the various proposed and/or anticipated future developments, may result in significant cumulative impacts that would not be expected in the case of a stand-alone DMP development.

With this background it is difficult, in practical, to ensure accurate prediction of cumulative effects of the proposed strategy or plan with other programmes or policies or plans as identified during scoping phase. This is due to the fact that there are many factors which contribute to the uncertainties for example, non-availability of exact timescales and detailed designs information of these policy instruments.

CHAPTER NINE: SESA/ DMP IMPLEMENTATION

9.1 Implementing the Preferred Strategies

Following the four review sessions and revised documentations of the SESA findings, the last stage in SESA/ DMP is proposing the implementation and monitoring plan. The ultimate outcomes for implementing the DMP taking cognizance of strategic environmental and social factors is to have a liveable Ibadan city, that is flood resilient and economically competitive.

This as enunciated in the preceding chapters requires engagement of the local people and public space users in the watershed of the river basins and communities in the holistic management of the public space life cycle, the drainage and its operation and maintenance (O&M).

The fact that part of SESA recommendations are already being implemented is a good fall out knowing that the SESA has been used in two complementary ways:

1. To provide inputs into a proposed DMP as an integrating tool or mechanism to support, and facilitate the actual development of the drainage masterplan (so environmental and Social dimensions were addressed effectively) – this is where this SESA have been most effective, and
2. As a monitoring tool – to track the development and implementation of the DMP and other policies, plans and programmes (PPPs), and to provide learning and feedback. The implication here is that there is a willingness to consider changes or adjustments to PPPs.

Preparation of a pilot watershed management plan particularly for upper stream of Ona is different from the DMP. Please see outline in annex 21

Globally, cities with liveable urban environments take on a wide range of development pathways to implement Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP). This is because the whole life cycle of every public space—from its planning, creation, implementation, and O&M to its replacement or rejuvenation is a well-thought out approach.

In the case of the DMP the implementation of non-structural green infrastructure—which uses nature-based solutions to manage storm water, has vast potential to integrate public-space elements. Conversely, public-space elements can be implemented in residual spaces alongside structural -grey infrastructure such as conventional storm water drains. Infrastructure that integrates public spaces for community activities, not only helps build city resilience against floods, but also adds value to the surrounding areas by improving access, connectivity, and aesthetics.

The scale may vary, from one that is space-specific (and based on the place's individual history) to systematic and -strategic management of a network of public spaces and its drainages-. In either case, responsible entities and stakeholders should ask a set of critical questions:

- *Who* are the actors, and how are they involved? (e.g figure 9.2 and figure 3.1)
- *What* public-space assets within the Ibadan watershed does the city own?
- *Which* implementation approaches should be taken? (e.g Sections 9.1.1-9.1.3)

- *How* can public spaces within the watershed be funded and managed sustainably?(e.g section 9.3)

Figure 9.1 indicates the set of available data documented in the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) report in a framework to manage flood risk in Ibadan while Figure 9.2 is the integration of the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) and the SESA report flow of responses that can lead to liveable and resilient outcomes in the short to long term. This section discusses the processes involved, from strategic approaches to funding to management and governance.

A global scan of different types of public spaces reveals that the ownership and management of public spaces can be combined into three main groups:

- *Public* ownership and management
- *Private* ownership and management
- *Mixed* ownership and management—that is, either public ownership and private management or private ownership and public management-.

In delivering public spaces within the watershed for implementation of the DMP, Ibadan city can go beyond the common scenario of public management and funding and rely on alternative means of creating and sustaining the public-space assets within its watershed.

For example, public spaces owned and managed by city governments often face challenges of insufficient funding to ensure adequate operations and free access for the public. At the other end of the spectrum, privately owned public spaces (POPS), while better managed in general, often fall prey to access restrictions. In general, public spaces are especially good arenas for cooperation between city governments, private sector partners, and citizens. Examples of models to manage public space within the watershed through various public and private arrangements is given in table 9.3.

With the DMP and earlier approved urban city master plan, Ibadan is one of the few cities that have any spatial data on their public physical assets, whether from inventories or from land-use maps that consolidate all the public space assets that local governments own and manage.

The detailed inventory with asset information on individual sites such as the type, size, condition, and quality of these spaces; their ownership; their current management structure; and financial information such as O&M expenses and revenues **can be used to inform investment decisions, design choices, and management structure changes-.** Aggregating site-level and spatial characteristics (such as location, type, and size) at the neighbourhood and city levels helps to identify gaps in service provision to communities. Such analysis (when layered over existing land uses, master plans, mobility patterns, population and census data, real estate metrics, urban maps, and use patterns) can significantly enhance urban planning, design, and the prioritization of neighbourhood improvements-. With already developed spatial databases and analysis of the public spaces within the Ibadan watershed and urban areas under the DMP and the urban city master plan Projects of the IUFMP, the city can proceed to improve the management of selected drainages and public spaces in the

watershed or to better plan new ones within the framework depicted in figure 9.1 as considered under the preferred strategy for the alternatives.

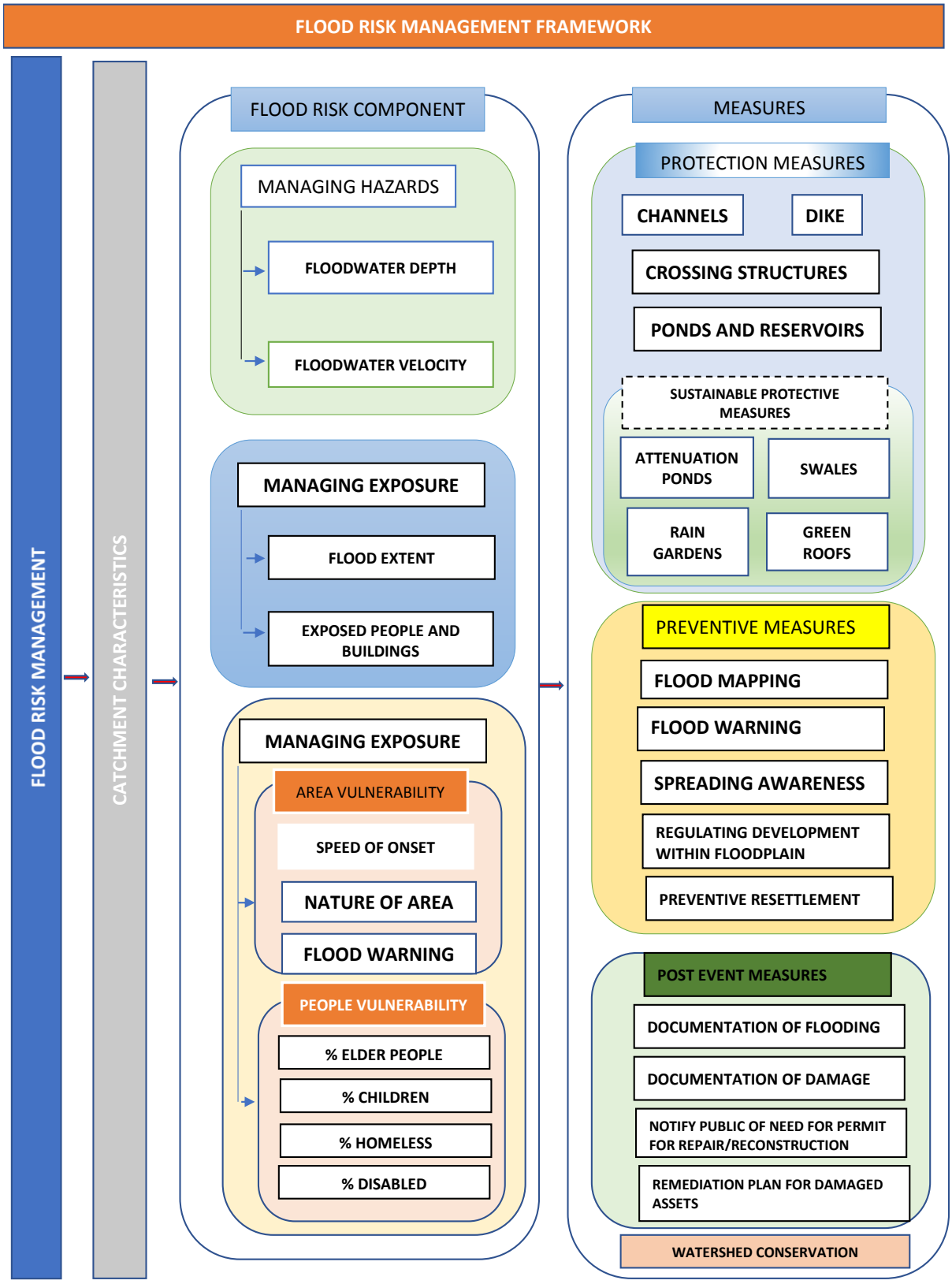


Figure 9. 1: Framework for Conceptualizing and Managing Drainage and Public-Space Assets in the Ibadan watershed river basins

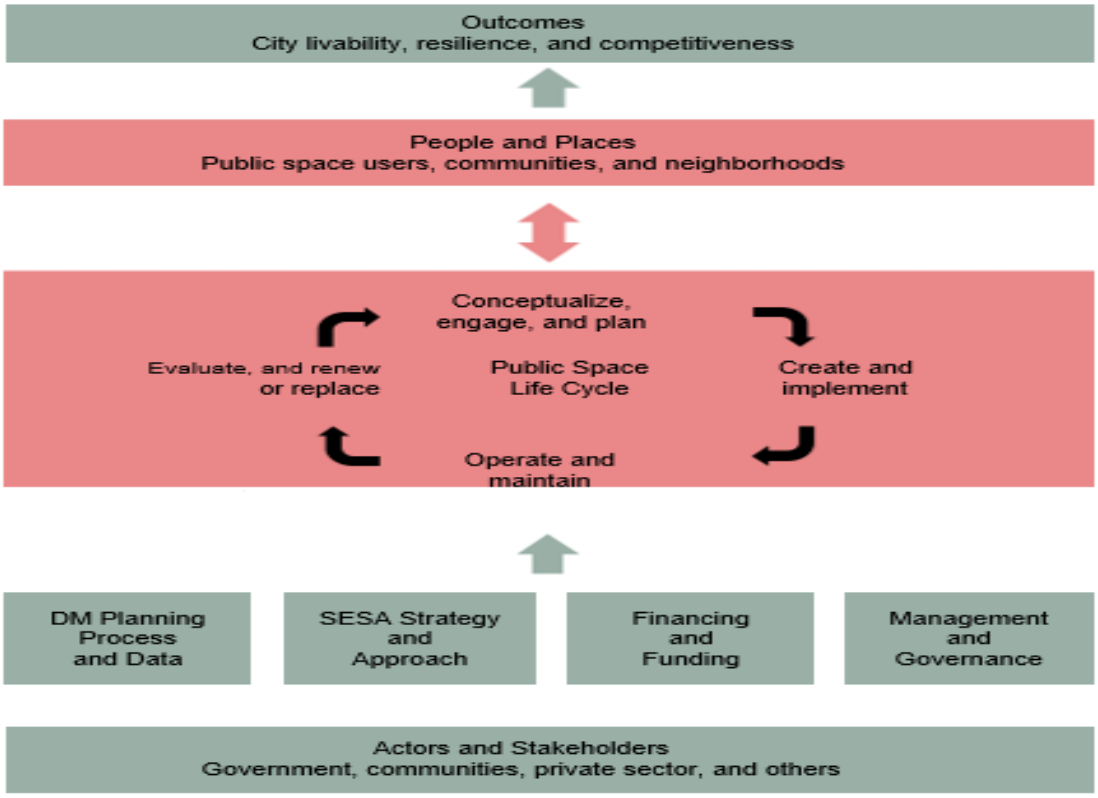


Figure 9. 2: Examples of Models to Manage Public Space within the Watershed through Various Public and Private Arrangements

Implementation	Ownership	Management	User Access	Examples
Developed by government	Owned by Government	Managed by government or outsourced	Public or Limited	Public parks and facilities
Developed by private sector	Transferred to government or public entities	Managed by government or Outsourced	Public or limited	Public amenities in large-scale developments (e.g. Irrigated farms Water sports/ recreation)
Developed by private sector	Privately Owned	Managed by government or Outsourced	Public or limited	Library or sporting space leased from private property
Developed by private sector	Privately Owned	Privately Managed	Public	POPS and easements
Developed by private sector	Privately Owned	Privately Managed	Limited or private	Roof gardens in private commercial property

Figure 9. 3: Examples of Public Space Creation through Various Public and Private Arrangements

Note: POPS = privately owned public spaces-. - "Public" refers to spaces without fees or other access limitations. "Private" refers to spaces not accessible by the general public. "Limited" refers to spaces that limit access time or require an entrance fee or registration.

There are three key steps proposed in the implementation of the preferred strategy including time period for each step

9.1.1 Prioritization of flood protection projects and funding

- Following the approval of SESA/ DMP, IUFMP in consultation with relevant stakeholders at the State, city and local government levels relevant to flood management planning, implementing authorities, departments will need to identify and prioritize project and funds for implementation being guided by the phases of prioritization of the intervention projects and the SESA implementation action plan in section 9.6.
- The DMP has indicated the four phases of prioritization of the intervention projects as indicated in figure 9.5 and the required cost to implement it. The total Number of Systems are 188, with total Lengths of 383 KM and total Cost of 466 Million USD, approximately (142.2 Billion Naira).
- The drainage intervention projects have also been overlaid on the urban city master plan on a system basis as indicated in figures 9.6 and 9.7 for system 86 and 34 respectively.
- Then these flood protection projects and designs will be assessed at project level involving public consultations process using the following five prioritization and weight selection criteria defined in the DMP as indicated below:
  - Population: Systems serving the largest population and highest density are given the highest priority (100%) while rural areas are given the lowest priority (0%).
  - Transport facilities: Expressways, Main Roads and Railway facilities are given the highest priority (100%) while secondary roads are given less priority (50%). Local Roads are given the lowest priority (0%).
  - Channel Degree: Main channels (the backbone of the drainage system) are given the highest priority (100%) while minor streams get lower importance.
  - Importance of Location: Locations that experience previous flooding, causalities or the location includes public offices of special importance are given the highest priority (100%).
  - Facility Condition: the condition of the structures like culverts and bridges with bad conditions will be given high importance (100%). Facilities/structures with good conditions will be given lower importance (0%)

The weights for each criterion is indicated in figure 9.4.

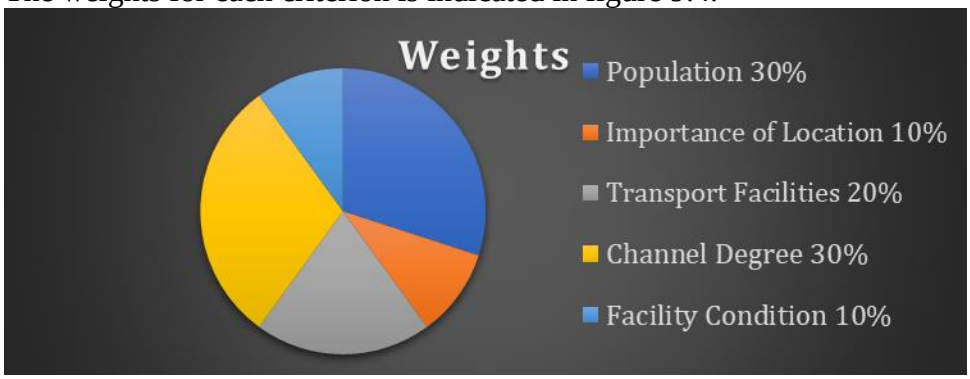


Figure 9. 4: Prioritization and weight selection criteria

It will take next 3-7 years (after approval year) to finalize all relevant components.

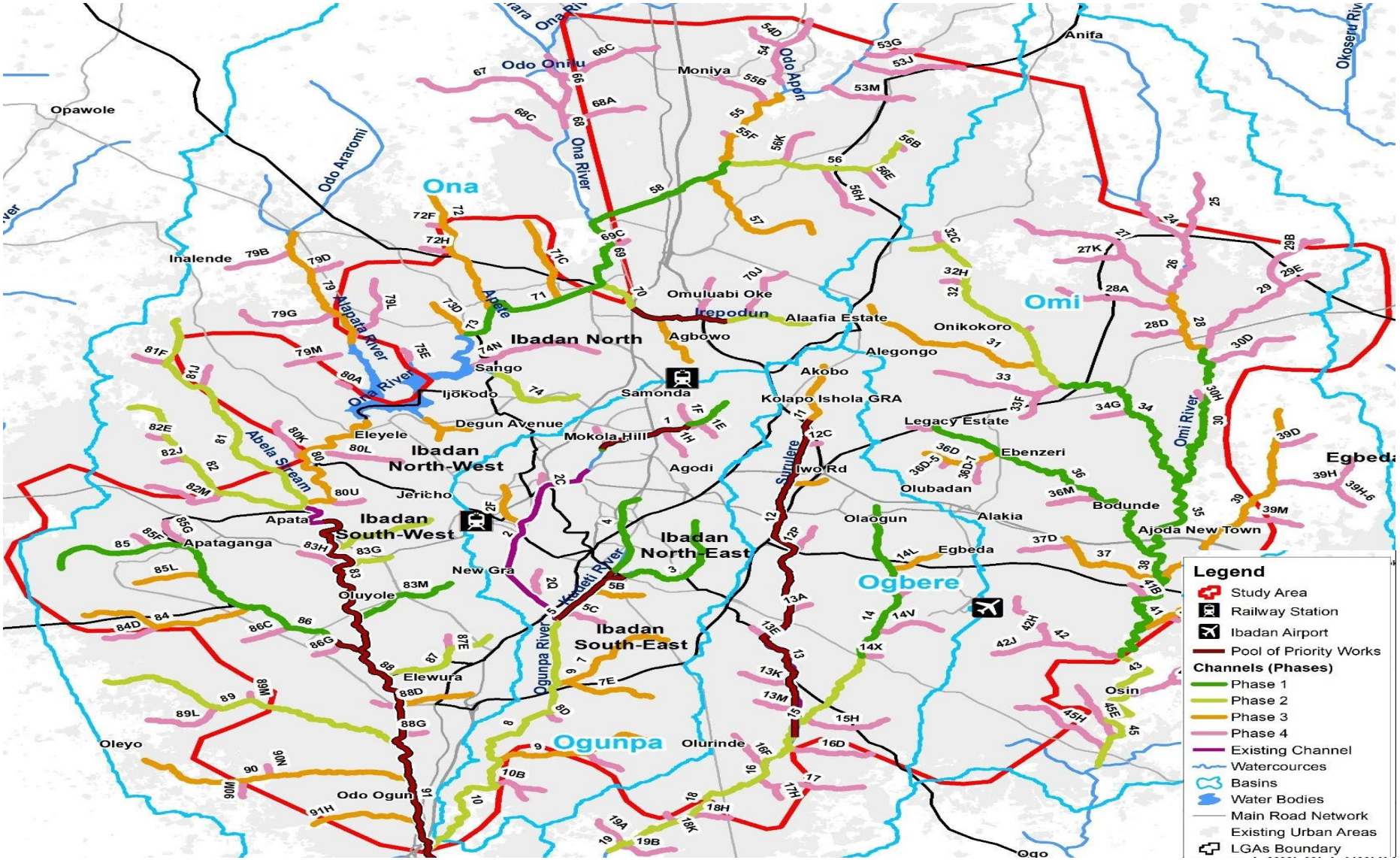


Figure 9. 5: The DMP Four Phases of Prioritization of the Intervention Projects

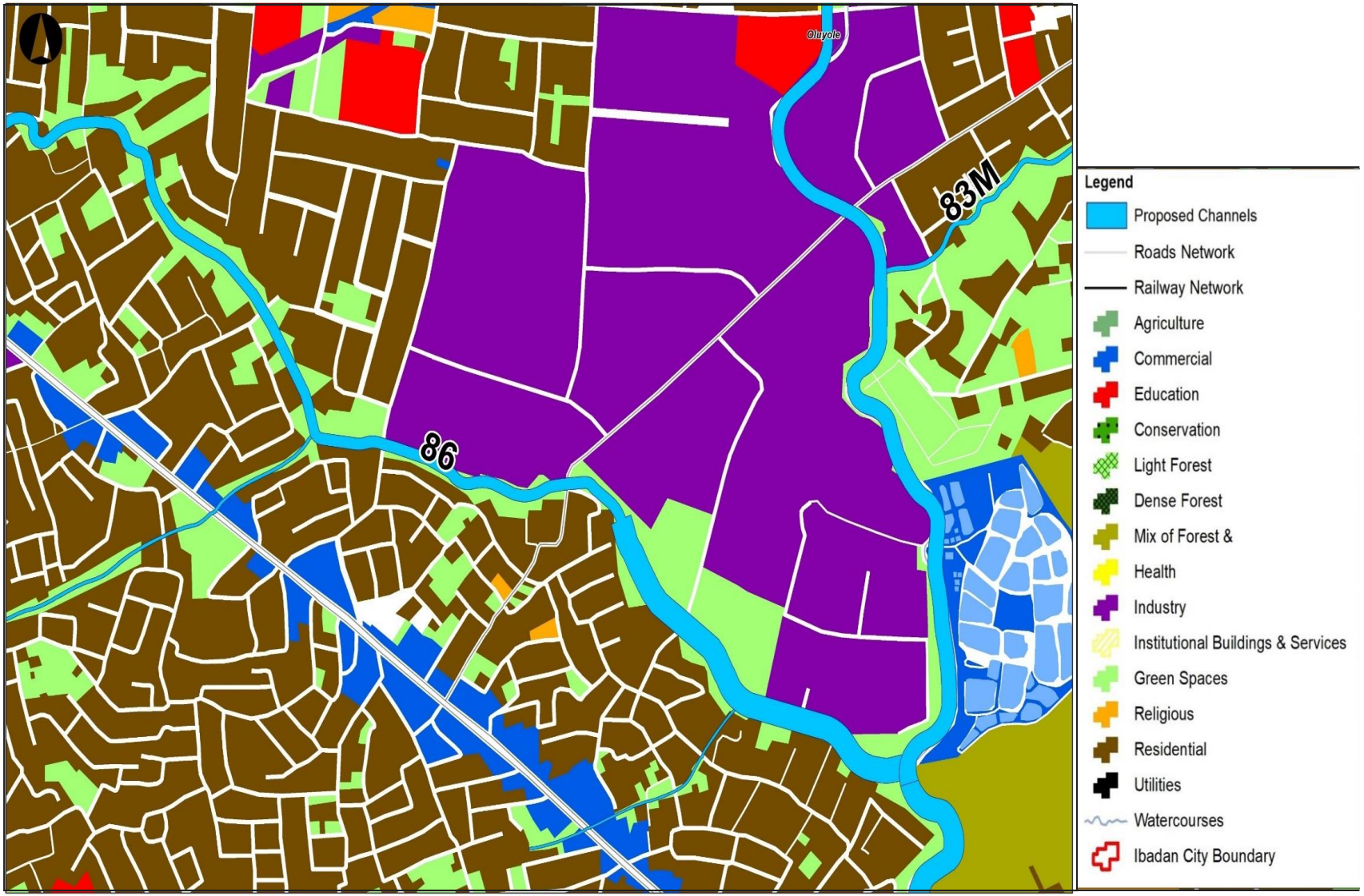


Figure 9. 6: The DMP Overlaid on the Urban Master Plan for System 86

Phase 1From 2021 to2025 Urban Masterplan Relevance

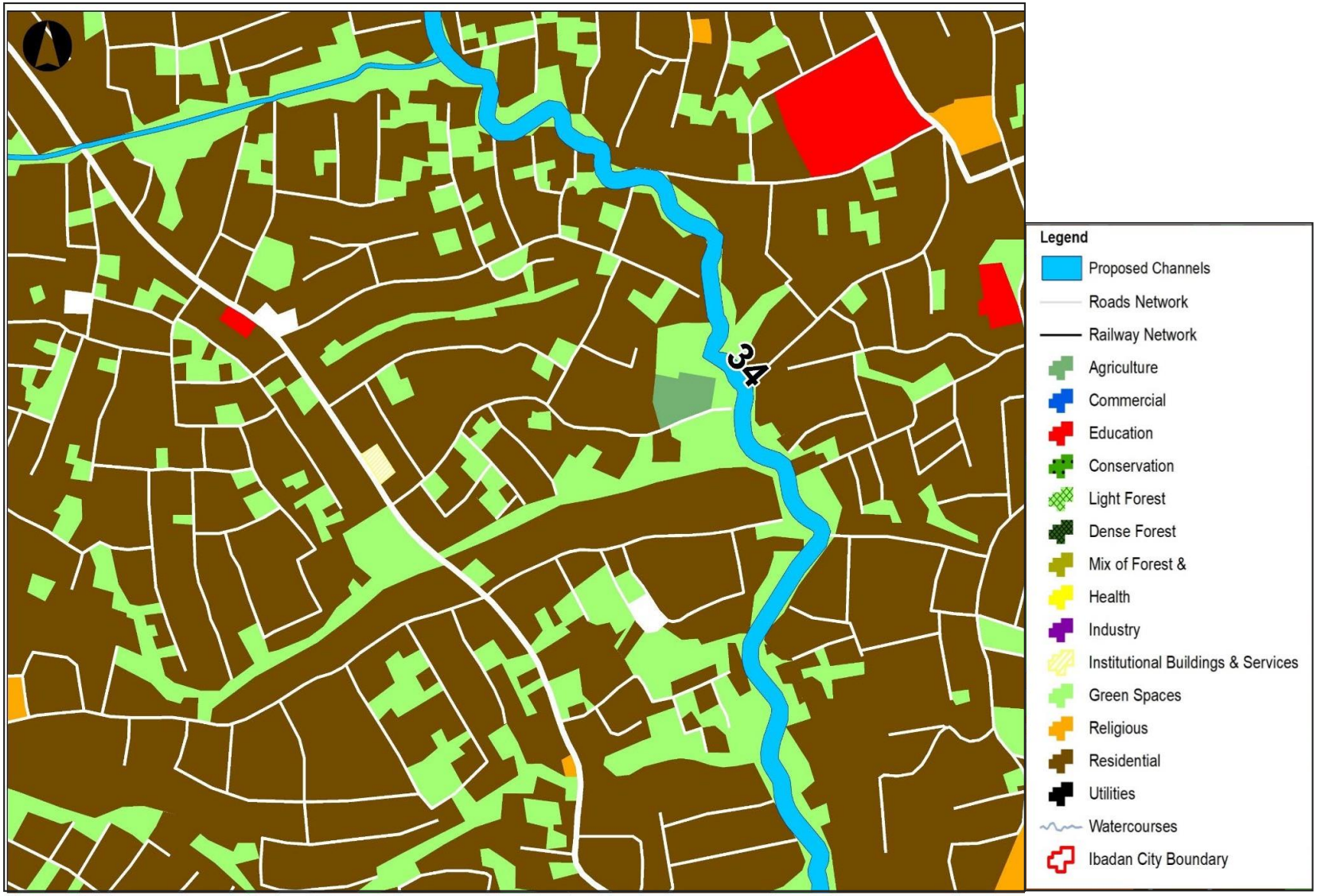


Figure 9. 7: The DMP Overlaid on the Urban Master Plan for System 34

9.1.2 Regular review of the strategies

Regular review of all future flood management and relevant policies, plans and programmes (PPP) is recommended to consider changes in the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) with necessary linkage to the city master plan for Ibadan

Integrating the findings of the monitoring and evaluation to enhance and improve the outcomes of the SESA/ DMP is key to its successful implementation. Environmental and social NGOs on a need basis should be involved to maximize the environmental and social benefits

This is also expected to take place every three years in line with development plans and agenda.

9.1.3 Climate change adaptation

Climate change in relation to land use has become one of the potential factors for flooding in Ibadan. Climate change projection using modelling techniques needs to be assessed for comparative review

The effectiveness of watershed and floodplain management components should be assessed to ascertain that such measures are playing role in compensating climate change impacts as highlighted in flood impact assessment reports of 2011 floods and as anticipated at present. This aspect of the component will take the next 10 to 25 years but requires documentation from year one of its implementation to make informed decisions.

9.2 Linking SESA and EIA and Addressing Environmental Issues

In view of the environmental and social sensitivity of Ibadan, it is anticipated that EIA would be carried out at project level specifically before implementing structural measures forwarded by the strategy i.e. construction of flood storages and diversion channels.

Site specific screening will need to be concluded for future subproject for EIA/ESIA/RAP/LRP along the water shed catchment of the six basins (Ogunpa, kudeti, Orogun, Ona, Ogbere and Omi) covered under the Drainage Master Plan to improve their quality, including alternatives to locations, design consideration, construction and its operation in the overall watershed management and flood risk mitigations.

In general, non-structural measures including watershed and floodplain management are unlikely to require formal EIA application; nevertheless, environmental and social impacts associated with community-based measures should be given due considerations. In this regard, this SESA serves as pre-requisite information and data required for succeeding EIAs.

9.3 Financing and Funding

The expectations that the structural and non-structural measures of the DMP should be funded by governments are common. However, financing from public budgets poses challenges because State and local governments usually suffer from chronic shortages of funds and have numerous other competing investment needs (such as water, sanitation, and so on) and therefore cannot fully fund large public-space such as the DMP investments.

9.3.1 Capital Funding, O&M Funding, and Management

A common practical solution is to make capital investment in implementing the DMP in public spaces a joint undertaking, in one form or another, between government and either the private sector or the community.

One option is the **outsourcing of -public-space development and management** to private investors for a period long enough to recoup their capital expenses and turn a profit. However, to be feasible and successful, such public-private partnership (PPP) arrangements require both a robust regulatory framework (which needs to be in place before year 2021 **under the combined efforts of the Bureau of Public Procurement, and Bureau of investment Promotion Ibadan**) and projects that have revenue generation potential. **Alternatively, management contracts bring private expertise into the management and operation of public space assets.**

Philanthropy or community in-kind contributions are also important sources of capital funding or capital works -in-kind.

Very often, State and local governments fail to consider future operations and management arrangements when they plan and finance public spaces.

Specifically, State and local governments do not plan who (which organization) will manage this new asset and do not estimate the impact of required O&M expenses on their operating -budgets. This commonly leads to a lack of proper O&M after a public-space project has been implemented, causing a rapid deterioration of the -asset. This needs to be avoided with respect to managing flood risk and the investment on the DMP and the environmental and social capital gained in the course of this SESA development in Ibadan city.

Adequate budgeting for O&M is critical for sustainable operations, maintenance, and service delivery within public -spaces. Like capital funding of public spaces, community organizations and private companies have roles to play: for example, partnering community organizations can help with effective fund-raising, while private operation of a public space often enables more innovative and intensive use for revenue generation, which helps cover the O&M costs. The latter approach can also defray or reduce O&M expenses from the public budget-. Although the management and sources of O&M funding can take on many combinations, there are several common scenarios:

- *O&M performed by governments* or subsidiary departments or companies and funded from the local budget
- *O&M outsourced to a community-based organiz*ation (CBO) and financed from the local budget or with an expectation of fund-raising by the CBO
- *O&M outsourced to a private company* through a management contract and paid from the local budget
- *O&M covered through a concession contract* wherein the management, operations, and maintenance of public spaces are outsourced to a private company, along with the right to generate revenues from the public space and an obligation to cover O&M costs-.

Ibadan may not be able to take advantage of all four scenarios because outsourcing to private companies can be more complex to launch than government-performed O&M and requires

reasonably established systems of public procurement and well-established enforcement of written contracts in the public sector. Nonetheless, going forward on financing and managing the investment thus far on flood risk management in Oyo State will require such specialized expertise that are available in the country and supported through the World Bank financing.

9.3.2 Land-Based Financing Instruments and Land-Value Capture (LVC)

When public spaces are created within territories that are implementing special land development or redevelopment projects, they are funded together with other infrastructure through land-based financing instruments. These instruments such as land readjustment, tax increment financing (TIF) to fund development, and, in some cases, transit oriented development (TOD) (particularly in the redevelopment of blighted communities in the inner core areas of Ibadan that have recorded the highest impacts of flood events.) are based on the increased land value from such projects. **See figure 9.8 and figure 9.9 that shows the scenarios of relationships between housing density and runoff at site level and at watershed level.** The idea behind it is simple; public subsidies to stimulate economic growth, but the execution can be sometimes difficult, and even controversial. A part of this increase is captured and channelled to fund the proposed drainage infrastructure and public spaces through LVC. These instruments require strong local institutions and a sound legislative and planning framework to be implemented effectively.

SCENARIO A **1 house/acre**		
Impervious cover = **20%**	**Total runoff (5699.76m^3/yr x** **8 acres) = 45598.08m^3/yr**	**Runoff/house =** **5699.76m(meters)**
SCENARIO B **4 houses/acre**		
Impervious cover = **38%**	Total **runoff (7559.04 m^3/yr x** **2 acres) = 15118.08 m^3/yr**	**Runoff/house =** **1889.76 m^3/yr**

Scenario C		
		
Impervious cover 65%	Total runoff = 12070.08 m^3/yr	Runoff/house = 1508.76 m^3/yr

Figure 9. 8: Housing density and runoff at site level (Adapted from EPA 231-B-05-002.)

Land readjustment is a planning and financing instrument that have been used in East Asian East Asian countries such as Japan and the Republic of Korea-. It has also been used in Germany to assemble privately owned land at the peri-urban fringe and in India to assemble rural land for urban development-.

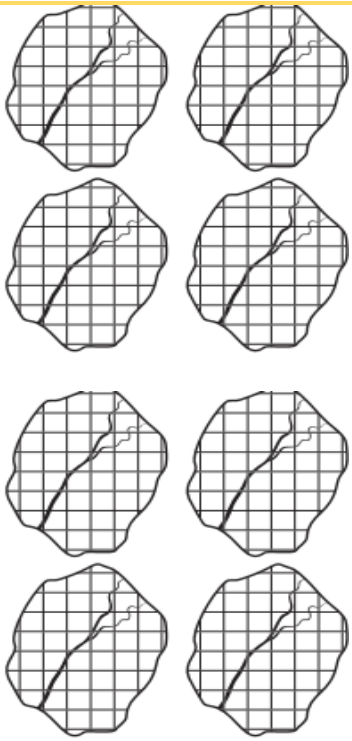
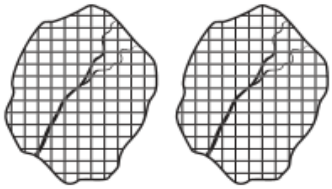
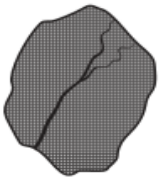
Scenario A	**Scenario B**	**Scenario C**
		
At one house per acre, 80,000 houses require 80,000 acres, or 8 watersheds, translating to: **80,000 acres x 1 house x 5699.76 m^3/yr of runoff** **0.455980.8 billion m^3/yr (metre) of storm water runoff** **8 watersheds at 20% impervious cover**	**At four houses per acre, 80,000 houses require 20,000 acres, or 2 watersheds, translating to:** **20,000 acres x 4 houses x 1889.76m^3/yr of runoff** **151180800m^3/yr of storm water runoff** **2 watersheds at 38% impervious cover**	**At eight houses per acre, 80,000 houses require 10,000 acres, or 1 watershed, translating to:** **10,000 acres x 8 houses x 1508.76 m^3/yr of runoff** **120.7 million (m^3/yr) metres of storm water runoff** **1 watershed at 65% impervious cover**

Figure 9. 9: Housing density & runoff at watershed level (from EPA 231-B-05-002.)

The instrument is based on the concept of pooling privately owned land parcels within a demarcated area and parcelling them based on a master plan or detailed development plans, into a more efficient and rational layout that also allocates a certain amount of land for public infrastructure and services (such as roads, drainage and public spaces). Some land parcels are also reserved for auctioning on the market to recover costs-. The government returns to each landowner a land parcel smaller than the original parcel, but it has a higher value because it is now on serviced urban land. This approach allows the government to avoid a massive up-front investment to acquire land. However, some challenges do exist, such as obtaining the consent of all existing landowners and the valuation of land.

TIF is a financing technique that government agencies have used to fund projects focused on urban regeneration. They do so by borrowing against the anticipated future increase in property tax revenues generated by the project to fund public infrastructure, including public spaces. This financing approach is possible when a municipal bond market exists and when a new development is of a sufficiently large scale, accompanied by a large enough increase in the value of surrounding real estate generated by the new project.

TOD revolves around the creation of compact, walkable, pedestrian-oriented, mixed-use communities, centred around high-quality transit systems that attract people and businesses. In some TOD projects, local authorities set higher floor area ratios (FARs) surrounding these nodes to allow for densification and to generate revenue streams that they can capture to finance infrastructure and public spaces.

9.4 Management and Governance

An Asset Management Approach

Ibadan City can do much better in the sustainable management of the entire life cycle of public spaces with the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) including design, implementation, and O&M.

As noted earlier in the "Financing and Funding" section, the options ranges from governments' common practice of publicly financing and operating public spaces include entrusting O&M to community organizations or outsourcing it to a private company that specializes in programming and managing drainage facilities. **Cases of successful asset management of public spaces indicate that specific good governance elements must be built into the life cycle as a foundation for success: a sound regulatory environment, a cost-- effective ownership structure, and sustainable management and oversight arrangements**. This requires strengthening and improving the current governance structure existing in Ibadan to manage the DMP (see Annex 4 for other strategies).

9.4.1 Regulatory Environment

A sound regulatory environment (such as policy instruments, laws and regulations, and contract enforcement) is a prerequisite to support the creation of viable drainage facilities and adjoining public spaces, especially with PPPs or private operating models. For example, regulations governing impact fees and incentive zoning are critical to enable the delivery of public spaces as part of new development or revitalization projects. Specific laws and

regulations will also be needed to govern contracts for the management of drainage / flood control structures and public spaces and determine the options and avenues available for creating, funding, and managing the public space initiatives.

9.4.2 Ownership Structure

Land ownership is an important determinant for the creation of public spaces. Public spaces can be created on land that the government already owns (including repurposing of old, government-owned infrastructure and facilities) or on land acquired from the private sector through voluntary instruments such as purchase at market value from private owners; land swaps; private land donations (as long as they are not coercive); land readjustment; or compulsory requirements such as expropriation, right of pre-emption, or public easements on private land.

Another channel, as described earlier, is the creation of Privately Owned Public Spaces as a part of private land development wherein developers dedicate land for public spaces (and services) through development exactions. This instrument exists in cities in many regions around the world and is based on either (a) incentives for developers, such as the ability to exceed permitted land-use density in exchange for creating a public space; or (b) regulation requiring that public space be provided in conjunction with large land development.

9.4.3 Management and Oversight Arrangements-

The responsibility for managing the Drainage facilities and adjoining public space, including O&M responsibilities, can be assigned to a range of actors including government agencies, the private sector, not-for-profit organizations, or community organizations. Such management arrangements, coupled with a corresponding oversight structure, can be deployed or modified depending on the context such as the available funding sources and the characteristics of the public space interventions.

9.5 Institutional and Management Arrangements

A broad range of stakeholder coordination mechanisms feasible in the context of Ibadan city to harmonize the joint efforts of public agencies, private owners, and communities in reducing and managing flood risk could take any of the following arrangements depending on if flood risk management is taken holistically into the development planning in Ibadan or handled as a sector or project.

They are often set up in the planning stages and deployed during the implementation stages. Some specific types of institutional arrangements include public initiatives (such as, Parastatal or government agency or development corporations) or private initiatives (such as *Business Improvement Districts* (BIDS) or trusts, including formal and informal structures), as illustrated below:

- ***Steering committees-***. Usually made up of high-level stakeholders or representatives, steering committees provide guidance on key -issues. For instance, the Steering Committee could be created to coordinate across different government agencies, or to implement a project as with the IUFMP.
- ***Parastatal or Government Agency: -e.g. Flood Risk Mitigation Agency to prevention and manage of flood risk and watershed Management.***

- ***Development Corporations***-Oyo state has ample experience of Development Corporation with respect to housing structures. The same can be deployed to the drainage facilities and public space. Such stated owned enterprise investment company becomes the implementing entity of the DMP project in Ibadan. The corporation will organize a partnership platform to attract private and technical resources and link the city government and private sector. One of the enterprises main objectives will be to attract private sector investments and participation by seeding the funding of selected assets.
- ***Business Improvement Districts*** typical BID is a defined area within which a special fee is imposed and collected from businesses inside the BID to fund or maintain specific assets and services benefiting all businesses within the BID territory
- ***MOUS and Other Public or Private Arrangements***-. Other arrangements include memorandums of understanding (MOUs) and other types of arrangements between government entities and the private -sector (e.g. where the planning studies were funded by the private company, while the government (state or local) funded the execution of the project) similar to arrangement aftermath the Executive Order 007 2019 signed by the President Muhammadu Buhari on Road Infrastructure Development and Refurbishment Investment Tax Credit Scheme that enables the Federal Government of Nigeria leverage private sector funding for the construction or refurbishment of eligible road infrastructure projects.

9.6 SESA Action Plan for Implementation of the DMP

The success of the SESA with respect to managing environmental and social impacts related to Ibadan river basins and particularly to the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) development can be measured by the capacity of the Oyo State government to implement proactive regulatory mechanisms and activities to govern watershed catchment and flood plain developmental activities. A mind mapping of the required operational aspect of implementing the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) taking cognisance of the SESA is as indicated in the figure 9.10 below. All the site specific ESIAs/ESMPs/RAPs concluded, ongoing and future should be reviewed alongside the SESA report by the IUFMP and the MENR to ensure holistic measures are being put in place without working in silos. Furthermore, there is need to build up and also strengthen the capacity of existing staff to deliver the implementation of the DMP and the SESA deliverables. Annex 11 is indicative of considerations in a training needs assessment based.

This chapter proposes the outline of an Action Plan that should be implemented as immediate follow-up to the SESA. As recommended, there should be a Flood Risk Mitigation and Management Agency whose focus is only along the flood plain or Watershed. This should have a governing board which has a similar structure with the IUFMP steering committee to facilitate the participation of the relevant MDAs in the implementation of SESA. In the course of SESA Studies and consultation. This proposal for flood management governance was welcomed at general consultations and the two high level steering committee meetings held under the SESA.

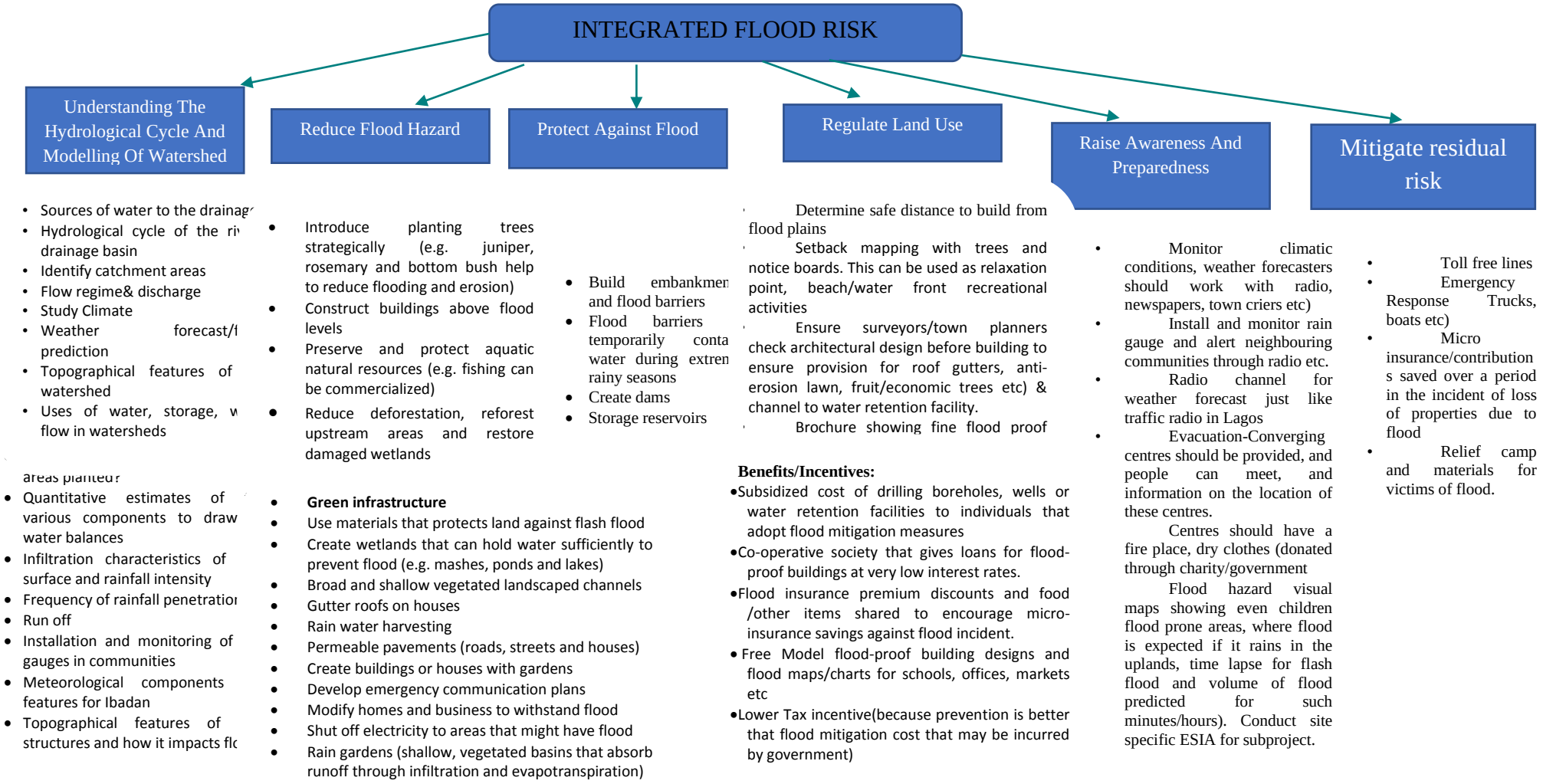


Figure 9. 10: Operational Aspects related to drainage infrastructural development and Activities taking cognisance of SESA.

9.6.1 Priorities of the Action Plan

In order to encourage practical application of the SESA findings, the recommendations were categorized in order of their priority of implementation. The first of the three tables below show the recommendations which are considered top priority in order to create conditions and acquire the regulatory and institutional framework that will allow application of the other recommendations; while the second and third tables show the recommendations which should be adopted respectively over the short and medium to long term.

- Priority 1 (DMP & SESA)
- Priority 2 (SESA)
- Priority 3 (SESA)

PRIORITY 1: IMMEDIATE ACTION

- R1: Strengthening Environmental Responsibility and Establish State Flood Risk Mitigation, Control and Management Agency.
- R2: Improved Management of SESA and EIA Process for the watershed Catchment Development and Flood Plains.
- R3: A pilot Watershed Management plan for the upper stream of Ona
- R4: Implement Comprehensive Training for Watershed Catchment Development and flood mitigation programmes for environmental and land officers.
- R5: Improve the Policy, Legal and Regulatory Framework for Watershed catchment development, flood mitigation, control and management.
- R7: Enforce Building Regulations and Land Use Planning with Involvement of Private Sector/ Community Participation
- R9: Develop and Implement Flood Prevention, Proofing, Mitigations and Response Programmes and projects; and
- R10: Regularly Update and Implement the Drainage Master.

The following table shows estimated time frames for Priority 1 actions:

Table 9. 1: Action Sequence – Priority 1

#	Recommendation (Year /Quarterly Basis)	2020				2021				2022				2023				2024			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Priority 1																					
R1	Streamlining Environmental Responsibility with Improved Financial Resource (Establish State Flood Risk Mitigation, Control and Management Agency)																				
R2	Improved Management of SESA and EIA Process for the watershed Catchment Development and Flood Plains.																				
R3	A pilot Watershed Management for the upper stream of Ona																				
R4	Implement Comprehensive Training for Watershed Catchment Development and flood mitigation programmes for environmental and land officers																				
R5	Improve the Policy, Legal and Regulatory Framework for Watershed catchment development, flood mitigation, control and management																				
R7	Enforce Building Regulations and Land Use Planning with Involvement of Private Sector/ Community Participation																				
R9	Develop and Implement Flood Prevention, Proofing, Mitigations and Response Programmes and projects																				

R10	Regularly Update and Implement the Drainage Master			

PRIORITY 2: SHORT-TERM ACTION

- R6: Establish a Dedicated Spatial Information System and flood Alert Warning System that is community integrated.
- R11: Establish a Trust Fund for Ecosystem and Watershed Conservation.
- R12: Establish Environmental Damage Liability.
- R13: Require Environmental Insurance Coverage particularly for all structures within rivers setbacks; and
- R14: Improve the Consultation and Community Engagement Process.

The following table shows estimated time frames for Priority 2 actions:

Table 9. 2: Action Sequence – Priority 2

#	**Recommendation (Year/Quarterly Basis)**	**2020**	**2021**	**2022**	**2023**	**2024**
		1 2 3 4	**1 2 3 4**	**1 2 3 4**	**1 2 3 4**	**1 2 3 4**
Priority 2						
R6	Establish a Dedicated Spatial Information System and flood Alert Warning System					
R8:	State-wide SESA Cooperation Program with other development programs in the watershed catchment.					
R11	Establish a Trust Fund for Ecosystem and Watershed Conservation					
R12	Establish Environmental Damage Liability					
R13	Require Environmental Insurance Coverage					
R14	Improve the Consultation and Community Engagement Process and Dialogue between Government, Civil Society and water sector Industry					

PRIORITY 3: MEDIUM TO LONG-TERM ACTION

- R15: Creation of a – Community Water Marshal Private Sector Operators Group;

The following table shows estimated time frames for Priority 3 actions:

Table 9. 3: Action Sequence – Priority 3

#	Recommendation	**2021**	**2022**	**2023**	**2024**	**2025**
		1 2 3 4	**1 2 3 4**	**1 2 3 4**	**1 2 3 4**	**1 2 3 4**
Priority 3						
R15	Creation of a Community Water Marshal Private Sector Operators Group (can serve to deter waste dumping and early warning monitor and flood plain development)					

Table 9. 4: The total estimated cost for implementation of Priorities 1, 2 & 3 is (see annex 6 for details)

Total Cost of Priority 1:	$2,640,000
Total Cost of Priority 2:	$885,000
Total Cost of Priority 3:	$280,000
Total Cost	**$3,665,0000**

9.7 Effective and Realistic Cost Implementation

Realistically, it will not be possible to implement all measures suggested in this Action Plan due to cost and resource limitations. Therefore, the SESA team recommends that the following three key Priority 1 measures be implemented immediately.

Table 9. 5: Three key priority 1 measures

Recommendation	**Amount in US$**
R3: A pilot Watershed Management plan for the upper stream of Ona (because of the proposed 17 dikes)	$390,000
R1: Streamlining environmental responsibility and Establish State Flood Risk Mitigation Management Agency	$950, 000
R6: Establish a Dedicated Spatial Information System and flood Alert Warning System that is community integrated.	$255, 000
TOTAL	$1,595,000

The rational for this decision is as follows:

- There is need for realignment of responsibility and strengthening of the MENR to deliver and implement the SESA as a prerequisite for flood mitigation in this present time and in future. This also includes creation of a State Flood Risk Mitigation and Management Agency (FRMMA) which will enforce and manage the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP)s.
- Creation of a FRMMA was recommended as a means of establishing a monitoring and follow-up capacity for the requisite Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) activities. This FRMMA should be established as part of realignment of environmental responsibilities but given the current low level of Watershed Catchment Management and antecedent Drainage development activity in Ibadan this should be done at a modest level, but fully coordinated with other ongoing responsibilities of MENR. Thus, the steering committee as constituted under the IUFMP would serve as a governing board to facilitate participation of relevant MDAs in the implementation of SESA.

  Figure 9.11 is a schematic diagram for the proposed institutional arrangement to support the implementation of the DMP in sustainable manner.

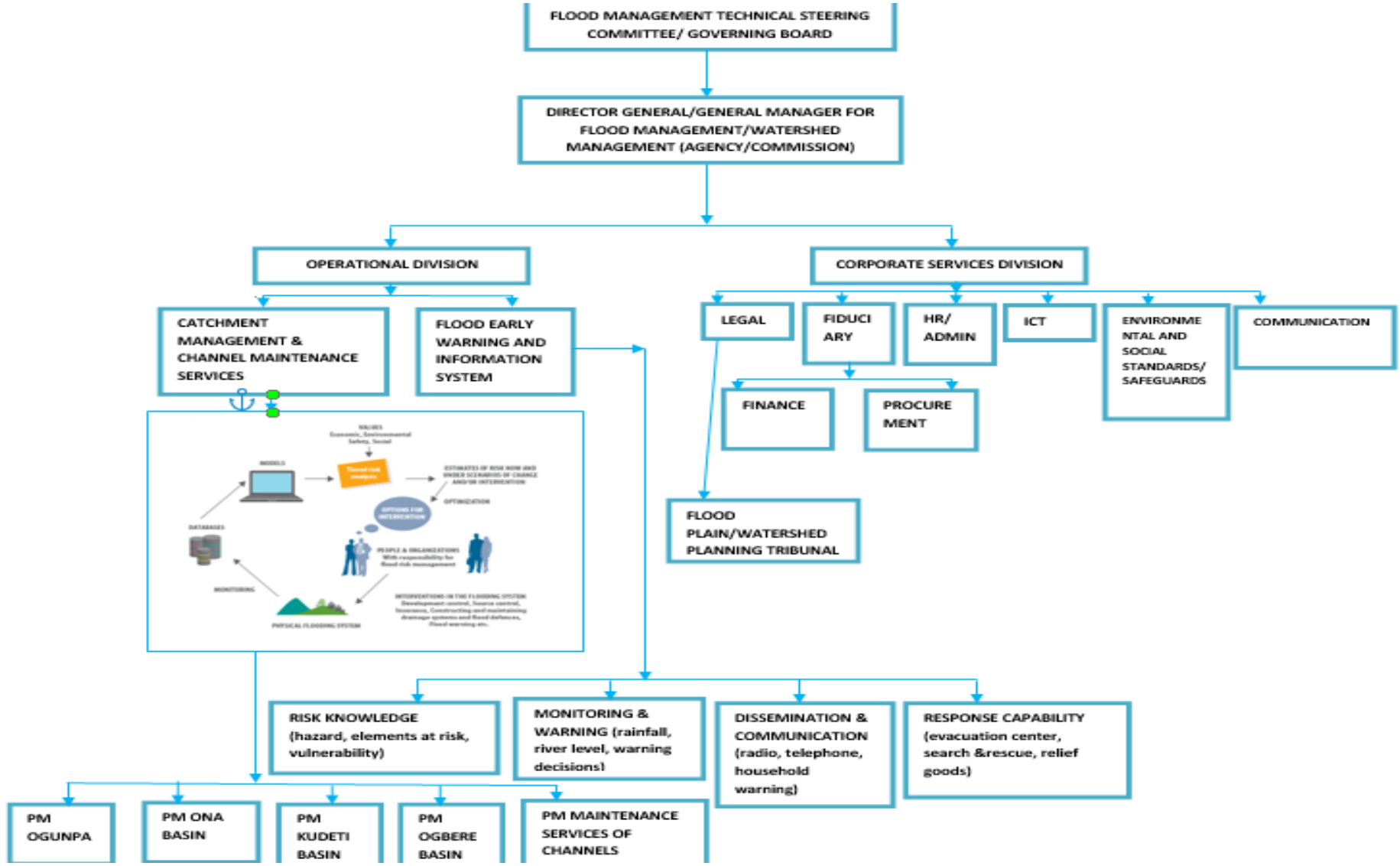


Figure 9. 11: Institutional Arrangement for Ibadan Flood Risk Management

9.8 Summary of the strategies to implement the drainage facilities and adjoining public spaces in sustainable environmental and social manner.

Three broad areas of focus to implement the preferred strategies for creating great drainage facilities and public spaces for people, are:

- *Stakeholders and partnerships:* Creation of public spaces for communities and their well-being in ways that ensure the inclusive engagement of different groups of actors and users
- *Policies, planning, and design:* Equitable and inclusive spatial distribution, quantity, and design quality that enhance access to drainage facilities and public spaces across the city
- *Management, governance, and finance:* Sustainable financial and organizational arrangements for creating and managing public-space assets during their life cycles-.

Thus cumulative effects should be refined for each specific project phase of preferred options when detailed information is available about each receptor within the preferred strategy.

CHAPTER TEN: MONITORING AND EVALUATION PLAN

Monitoring plan is the fundamental component of SESA report. The monitoring plan aims to monitor the extent to which SESA objectives and recommendations made in SESA reports are being met. The monitoring process also helps to assess the effectiveness of the mitigation measures by ensuring that no unforeseen impacts are predicted. In addition, monitoring also addresses any uncertainties or gaps highlighted in the data by the assessment through the provision of a more detailed baseline for the review of the strategy.

In view of the basic purpose of the monitoring, this section of SESA report proposes the monitoring process including timing and registering what has to be monitored by developing certain set of indicators and targets.

Environmental and Social Impact Assessment (ESIA) is a fairly well established practice in Nigeria, and has been widely applied in activities supported under the IUFMP. The operational experience of applying ESIA in design and implementation of individual projects under the IUFMP includes:

- *Better environmental planning and design of project proposals*: A well-designed project by ESIA has minimised risks and impacts on the environment and people, avoided associated costs of remedial treatment or compensation for damage that could cause delays and cost over-runs.
- *Ensuring compliance with environmental standards*: Compliance with environmental standards reduces damage to the environment and disruption to communities.
- *Saving in capital and operating costs*: ESIA was able to avoid the undue costs of unanticipated impacts. An 'anticipate and avoid' approach is much cheaper than 'react and cure'.

Increased project acceptance by the public: An open and transparent ESIA process employed, with provision of opportunities for public involvement helped to generate a sense of ownership in the people who are most directly affected by and interested in the outcomes of the project.

The results are then opened to the public to obtain opinions, both from citizens and from local governments. An appropriate project scheme has been developed incorporating various viewpoints received and addressing the critical issues. To further strengthen the project scheme in its operational monitoring annex 8 is provided.

Likewise, SESA for basin flood management planning provides a range of opportunities that help integrate environmental consideration –alongside social and economic– into strategic decision-making. This SESA has been used in two complementary ways:

- To provide inputs into a proposed DMP as an integrating tool or mechanism to support, and facilitate the actual development of the drainage masterplan (so environmental and Social dimensions were addressed effectively) – this is where this SESA have been most effective, and

- As a monitoring tool – to track the development and implementation of the DMP and other policies, plans and programmes (PPPs), and to provide learning and feedback. The implication here is that there is a willingness to consider changes or adjustments to PPPs.

10.1 Proposal for Digital Environmental Monitoring System

Within the above context, there is need to assemble all the data sets as provided in the DMP, SESA, and the urban city master plan into a Digital Monitoring System comprising two sets of data:

(i) GIS based monitoring maps (e.g. maps for land-use change, environmentally sensitive zones, social data set on the watershed), and

(ii) Descriptive and tabular data (e.g. water quality readings, sediment flow rates) as presented in Table 10.1. The monitoring of SESA/DMP considers the set of indicators and targets identified during objective settings as monitoring criteria.

10.1.1 Design and Development of the Digital Integrated Monitoring System (DIMS)

The Monitoring unit (M&E) of IUFMP will develop Digital Integrated Monitoring System (DIMS) with the help of other relevant organization. In particular, the IUFMP, being the Proponent will develop 'Environmental and Social Monitoring Checklist' to decide on what is to be monitored based on Table 10.1 on a need basis as the DMP implementation progresses in the various watershed and by whom. Regular monitoring of DMP is carried out by Monitoring Cells of relevant implementing and operating agencies in the form of data sets for decision making.

Therefore, these agencies will be the key monitoring authorities, but their roles must be strengthened in terms of SESA related monitoring. In addition, the MENR and many of the institutions identified can be involved in monitoring of 'indicator' specific monitoring directly related with their sector and functions. Again, it will be the voluntary contribution of each stakeholder as they will not be provided additional financial assistance for this coordination.

Once the volunteer stakeholder agrees, the IUFMP will assign responsibilities to each of them according to their sector and mandate for the monitoring, collection and dissemination of 'indicator' specific information to the IUFMP. In this context, the responsible entities can also interlink their existing Digital Databases with the proposed DIMS. However, such institutions need to create a special icon containing 'indicator' specific monitoring information to make the system user-friendly. The information collected by IUFMP will be processed and analyzed before preparing evaluation reports comprising analytical and descriptive data, tables and thematic maps. These three data sets will be compiled to generate DIMS as shown in Figure 10.1.

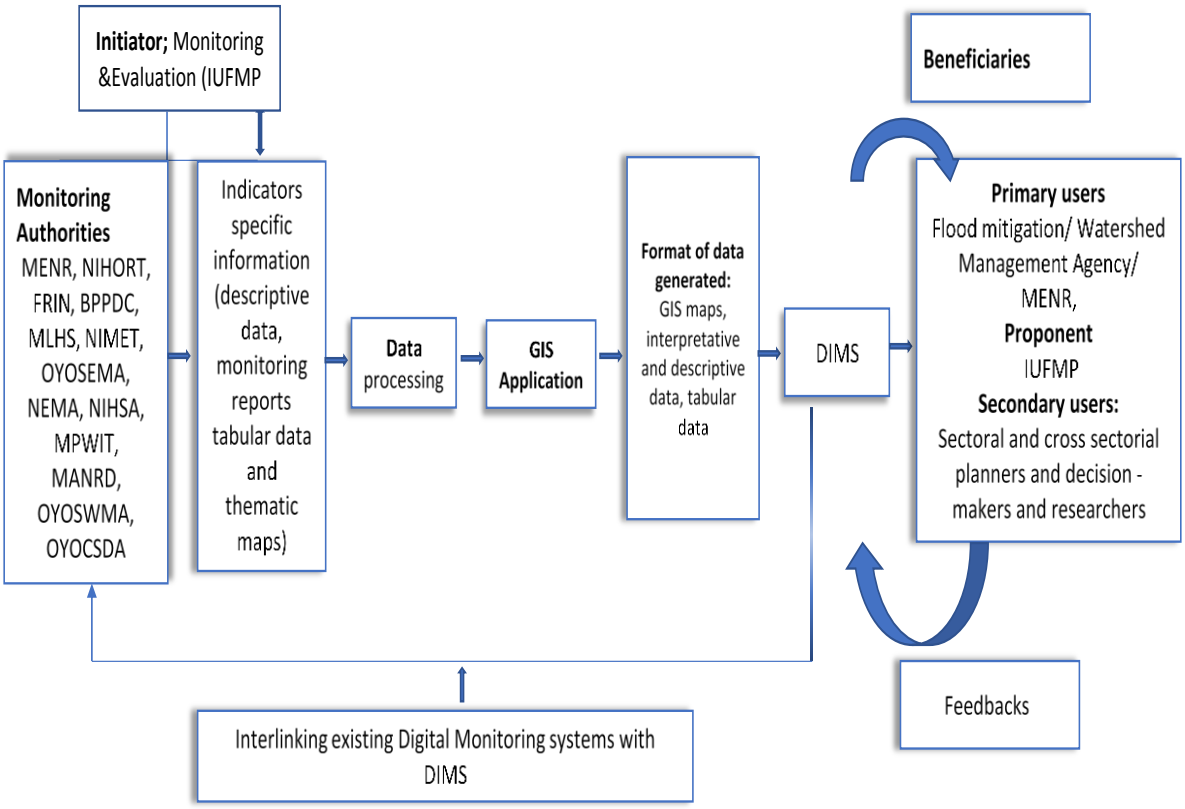


Figure 10. 1: Schematic Diagram for the Development of Digital Integrated Monitoring System (DIMS).

Since the conclusion of the SESA Studies, the IUFMP has leverage on the SESA outcomes and priorities to build vast IT and GIS resources aligned for a GIS framework for Ibadan/Oyo State as follows:

- Three GIS laboratories have been set up with full compliments of digital infrastructures. The GIS Laboratories are situated at the PIU, Office of the Surveyor General, and the Urban Renewal, Enforcement, Monitoring and Compliance Department of the Ministry of Lands, Housing and Urban Development. Each of these three laboratories has on-site server Machines with Enterprise ArcGIS Server software installed and other Open Source GIS server programmes. The laboratories also have 24/7 internet facilities provided with optic- fiber internet and other hardware equipment.

- Basic and advanced training on GIS software have since the SESA studies been given to Selected Staff members of the relevant MDAs including Ministry of Environment and Natural Resources, The Ministry of Lands Housing and Urban Development and Oyo state Emergency Management Agency(OYSEMA).

- Geoportal was developed to host the 236 datasets generated for the Ibadan City Master Plan and the Flood Risk and Drainage Master Plan prepared by the IUFMP. www.ibadanflood.oyostate.gov.ng was developed to enable online access to Ibadan City Master Plan and the Ibadan Flood Risk and Drainage Masterplan data set. The website is hosted on Oyo state domain and it is linked to other websites.

- Currently the Master Plan Unit of the UREMC is currently scanning and uploading the private development plans into a common database for electronic archiving of all Building plans in the state

10.2 Communication and Disclosure of SESA document

Dissemination of information and feedbacks would be done during consultations, emails, letters, telephone calls, social/ mass media channels, toll free lines, suggestion box etc.

The project is responsible for dissemination of the documents in the project area in a form and language understandable to the local populations.

Adverts shall be placed in national daily newspaper of documents displayed in the following locations:

- Ibadan Urban Flood Management Project Office
- Oyo State Ministry of Environment
- Ibadan South East Local Government Area Secretariat
- Federal and State Ministry of Environment

After this process of disseminating information to the project community and country, the PIU would provide the Bank with accurate proof of disclosure and advise the Bank to disclose on its website.

Table 10. 1 below presents the SESA Monitoring Plan for DMP.

Table 10. 1: SESA Monitoring Plan for DMP

Themes (SESA/ DMP Objectives	**Indicator**	**Targets**	**Monitoring to be undertaken**	**Responsible Institutions /agencies**	**Findings**
1.Protect Human life, health and population	Number of residential buildings at risk of flooding. -Indicative or vulnerable floodplains -Deaths/injuries/epidemics and health impacts due to flooding - triggered Involuntary resettlement	-No increase in number of residential buildings at risk of flooding -No increase in number of deaths/injuries/epidemics due to environmental disasters Integrate safeguards instruments into engineering design	Flood mapping to assess the extent of floods -Record all deaths/injuries and epidemic diseases related with floods -Record number of residential buildings inundated Resettlement action Plan and livelihood restoration plan	IUFMP will develop GIS based flood extent maps from the data baseline in the DMP and subsequent updated ones and will share with relevant MDAs – Ministry of Health, MENR will monitor flood related health issues and will provide data to IUFMP -MLHUD, SEMA will monitor damages to residential buildings within their jurisdictions and will disseminate Damage Needs Assessment data to IUFMP	
2.Protect Material Assets and Critical Infrastructure	-Number of public utilities, parks and recreational facilities at risk of flooding -Number of properties, agricultural areas, water and power supply networks, roads and transmission lines at risk of flooding -Reported damages to public utilities, irrigation structures and critical infrastructures -Reported losses to crop	-No increase in number of public utilities, parks and recreational facilities at risk of flooding -No increase in number of properties, agricultural areas, water and power supply networks, roads and transmission lines at risk of flooding -No reported damages to public utilities, irrigation structures and critical infrastructures -No change in agricultural land use	Flood mapping to assess the extent of floods -Flood damages and needs assessment to assess sectoral damages and reconstruction/rehabilitation need	- Ministry of Lands Housing and Urban Development , SEMA will monitor damages to public utilities (DNA) within their jurisdictions and will disseminate DNA data to IUFMP, -MENR and Ministry of Agriculture and rural development will monitor damages to agriculture and irrigation structures,& may also provide GIS maps for affected agricultural zones and irrigation structures within Ibadan, will monitor damages to crops and agricultural land and will disseminate relevant data to IUFMP;	
3.Conserve and protect Biodiversity (flora & fauna, habitats, ecosystems	-Reported conditions of designated national and international protected areas -Reported damages to designated sites -Number of proposed schemes and projects for the conservation and protection of biodiversity -Achievement of objectives of BAP and international	-No adverse impacts on designated state, national and international protected areas -Increase in number of actions to protect and enhance biodiversity -Creation of new habitats -Enhance the protection of endangered species and BAP habitat	- Protected Area sites along the basins -Habitats of Migratory birds -current status of endangered species and post floods -fish spawning areas -protected BAP habitats and species -loss of habitats due to implementation of DMP and	-MENR and NCF, will provide GIS maps for biodiversity, protected areas and habitats - NIHORT and FRIN will provide monitoring data - can also provide forest monitoring maps - and will create new habitats with financial assistance from the Proponent and international donor	

	treaties -Number of new habitats created -Reported projects and schemes to conserve endangered species of flora and fauna.		creation of new habitats		
4. Conserve and protect Cultural Heritage	-Number of buildings, monuments and archaeological sites at risk of flooding -Number of evaluating studies as result of implementation of SESA/DMP	No increase in number of buildings, monuments and archaeological sites at risk of flooding -Minimize damaging impacts on cultural heritage -Repair and maintain the affected sites -Production of evaluation studies	-Flood mapping to assess the extent of floods -Local authority data on designated/listed historical buildings, monuments and archaeological sites (upper and lower river basins) - Heritage sites data -Record any damage or loss to cultural heritage through the implementation of flood protection schemes	-The IUFMP in collaboration with Oyo State Council for Arts and Culture will monitor the cultural heritage in upper and lower basins of the Ona, Ogbere, Omi, Ogunpa,	
5.Protect and enhance Landscape& Visual Amenity	-Assessment of landscape characteristics (qualitative indicator) - designate scenic landscape within the watershed	-No significant impacts on characteristics visual amenity, and features of landscape (qualitative target)	-Keep record of visual survey before and after the implementation of the DMP scheme to monitor the differences in certain set of agreed upon and representative viewpoints - change observed in a vegetation cover as a result of DMP scheme implementation	-Office of the Survey General and the Ministry of Lands, Housing and Development Control; and Survey will monitor map topography and landscape features within Ibadan. - They will also determine the housing density on an acre/ watershed in relation to the run-off of flood water. -MENR will monitor change in vegetation cover in floodplains, watershed and riverine forests	
6.Promote Climate Change Adaptability	- Flood proofing taking and standards of flood protection considering climate change -Integrating climate change concerns in flood planning and reported studies -modelling results to find climate change trends	- Flood adaptability by taking into account climate change and flood resilient planning -Taking advice to build flood resilient communities -Flood adaptability indication	-effectiveness of the watershed and flood management schemes mainly related with community-based measures versus climate change projections	-MENR will monitor watershed management by involving local community and will disseminate data to IUFMP -Meteorological department of NIMET in collaboration with MENR and NIHSA will monitor and collect meteorological and climatological data to assess change trends and effects of the implemented schemes -and also monitors climate change impacts in upper basins of the rivers Ona, Ogungpa, Ogbere,	

				Omi, Orogun	
7.Conserve and protect Water Resource and Watershed	-Variation in surface and ground water quality (NESREA and MENR standards) -Variation in chemical and biological components in water (NESREA and MENR standards) -Projects reported for integrated watershed management -Indications for minimum freshwater flows to wetland	-Maintain and improve the quality of surface and groundwater where required -No detrimental change in water quality -Compliance with the NESREA and MENR -Indicative decrease in land erosion in watershed -Community-based increased plantation in watershed	-Surface and ground water quality monitoring of River basins and main tributaries -water quality compliance with NESREA and MENR records of water pollution -local records of water pollution events -Effectiveness of community-based plantation in watershed to monitor turbidity pollution in the river's basins	-MENR, RUWASSAN will monitor surface and ground water quality - will monitor water flows and distribution -IUFMP will compare the monitored readings with NESREA standards and the MENR limits.	
8.Conserve and protect Soils	Indicative eroded areas in floodplains, riparian corridors and watersheds -Number of schemes and projects reported for the restoration of eroded land -Community-based rehabilitation of watersheds	-No increase in eroded land -Minimize land erosion -Increase in community -based plantation in watersheds	-Bathymetric surveys and data to monitor the morphological conditions of the River basin -Effectiveness of community -based plantation in watershed to monitor restoration of eroded land	-MENR will monitor and record changes in morphological conditions of the Ibadan river basin by using Bathymetric surveys and other tools -MENR will monitor land erosion and degradation in watershed to assess the restoration of the eroded lands	
Promote sustainable Land use	Changes in use of marginal lands in watershed and flood plains of the river basin Deforestation Changes in agricultural practices Encroachment in watershed and flood plains	Decrease in use of marginal lands in watershed and flood plains the Ibadan river basin of Ona Ogunpa, Ogbere, Omi, Kudeti, Orogun. No conversion of forest lands into agricultural lands No illegal settlement on in watersheds and floodplains	Effectiveness of watershed and floodplains regulations to monitor use of marginal lands Deforestation before and after the implementation of scheme Illegal settlement before and after the implementation of the scheme	Monitoring of watershed management by the IUFMP should focus on 1) Enhancement and promoting of environment and social framework by community-based plantation and structure 2) Implementation of land and soil conservation strategies 3) Impacts of flood protection measures on watershed baseline	

CHAPTER ELEVEN: CONCLUSION AND RECOMMENDATIONS

The Oyo State Ministry of Environment and Natural Resources as well as other relevant MDAs have enabling laws which support the objectives of this SESA and have good governance framework/ laws to manage the environmental and social safeguard issues relevant to the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP).

The assessment exercise identified gaps in the mandate of the Oyo State Ministry of Environment and Natural Resources. These gaps needs to be filled and; the State Ministry's capacity needs to be strengthened to assure sustainability of the investment of the IUFMP to mitigate flood in Ibadan.

11.1 Identified Gaps

The Gaps include:

- **a) Absence of Flood Mitigation and drainage policies.**
- Hence the need to consider the creation of policies and binding legislations to guide actions and activities to reduce flood risk and institutionalize the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP).
- The law relating to Flood Mitigation must clearly establish a framework that defines the rights and obligations of institutions and individuals at both the planning and operational phases of all stages of a flood event – before, during and after.
- At the same time, it also needs to provide an equitable framework for development among different sectors of society, including present and future generations, and take account of the need to maintain the life support system provided by natural resources. This framework may address resource sharing, financial support and other practical measures. In addition to general developmental issues, a legal framework should provide for the following specific issues:
  - Coordination and cooperation between the various organizations, institutions, sectors and users;
  - Availability and accessibility of the basic data and information for informed decision-making;
  - Building an enabling environment for all stakeholders to participate and make collective decisions.
- Laws, acts, mandates, regulations, and guidelines are all forms of legal structures established to support policy implementation. Without binding legal enforcement, policies are ineffective. Legal processes must be considered as part of flood mitigation measures e.g. Watershed management, land-use plans, building codes, engineering design, monitoring and control of construction and zonation.
- **b) No delineation /nor designation or Map out of Channel Basin or watershed catchment areas.**
  - Catchment-based management of watercourses encourages the incorporation of land use impacts in watercourse planning, and provides a good foundation for assessing flood risks properly. Flood risk is also affected by the condition of watercourses, especially drainage conditions. Drainage congestion may cause flooding in certain areas.
  - Flood risk maps must take account of drainage capacity, and although they will have to assume that watercourses are unaltered by debris or other blockages, it is essential that a body is identified and made responsible for their maintenance and is enabled to fulfil its duties. As drainage capacity will be an integral element of new developments such as bridge construction, it is imperative that this body is consulted on respective developments**.**
  - The broader question of drainage in the context of irrigation should also be addressed with irrigation groups. The actions of both urban and rural land users may potentially exacerbate or alleviate flood flows, however land users also suffer from their damaging effects

c) Existing Forest Ordinance on Forest reserves aimed to manage the topography and protect the watershed, have been modified without policy support for green infrastructure to reduce run off and consequential flash floods

d) No Mapping of Setbacks and therefore no clear demarcation for no development zones in both the Environment and Physical Planning Laws.

e) Physical Planning Regulations yet to consider architectural designs suitable for the flood prone areas in the land use permits.

- Given the enormous influence of land use on flood risk and water management in general, it is imperative that land use planning and water use allocation are properly coordinated. Land use in both urban and rural areas can affect flood risk elsewhere in the basin. The consequences of forestry and especially uncontrolled logging on flood risk can be significant, in particular concerning the erosion processes and to a limited extent and locally on flood peaks. The consequences of agricultural land use practices, such as topsoil compaction, may also have similar deleterious effects on downstream river regimes. Consequently, forestry policy and planning should be subject to flood risk assessment

- **f) Inadequate capacity within the Ministry to obtain flood risk data, store data and utilize the data for mitigating flood risk along the catchment.**
  - Flood hazards maps contain the basic information on the magnitude of flood hazards within a basin and are the starting point of land use planning and regulation. The DMP has prepared the initial flood hazard maps to be regularly updated. Such maps should not only demarcate the extent and magnitude of flooding but also the sensitivity of such demarcations to various land uses and drainage conditions. (Based on the hydro meteorological and physiographic information of the basin and the drainage capacities of the watercourse, flood hazard maps should be developed by national hydrological agencies, indicating the areas at risk of flooding from surface waters).
  - This should also take into account information from drainage authorities regarding the properties and capacity of the drainage infrastructure available in particular areas.
  - In order to integrate flood management and land use, planning authorities must identify and take into account those factors that increase or affect the risks of flooding when making decisions regarding new developments, changes of land use and new structural flood controls. This obligation may be set out in legislation or, in binding policy documents from the government (which have been through the processes outlined above in relation to government integration). Legislation or policy documents may set out the bodies that must be consulted with respect to certain types and magnitudes of proposed development, along with those that have a right to have their views considered. Where reliable flood hazard maps are in place, the presumption should be that planning authorities do regulate development in areas of high risk. This presumption may be rebutted in some cases, for example where government policy demands strategic regeneration, but preventive measures will have to be implemented to protect such sites, and these measures must not increase flood risk elsewhere
  - Raising the awareness of property owners and stakeholders on the risks of flooding is of paramount importance. If stakeholders fail to understand the risks to which they are subjected, they are less likely to participate in the planning process. The flood hazard maps, plans, programmes and strategies form the basic information that should be made available to all stakeholders as part of the efforts to ensure pre-flood participation.

11.2 Recommendations

a. Flood management covers a number of phases: prevention and mitigation, preparedness, response and recovery. Too often, the response phase has received the most emphasis. Oyo State Government would need to put more resources invested in prevention and mitigation strategies, which can result in lives being saved, injuries being minimised and damages to infrastructure and the economy being reduced.

b. Stakeholder participation and flood risk assessment should be inherently linked processes. This relates both to identifying who would be the most affected by floods of a certain magnitude through flood hazard mapping as well as stakeholder involvement in verifying the results of such assessments by local knowledge on past floods.

c. In designing participatory mechanisms for flood management it is essential to enable the most flood-affected sectors of society to make their voices heard. These are traditionally the poorer sectors of society, including the elderly, women and children, that are obliged to occupy flood prone land. Such involvement is indispensable in building the resilience of communitiesEffective stakeholder participation in pre-flood preparedness and planning processes can be implemented at different levels through formal or informal means.

d. It is proposed the DMP implementation will take cognizance of SESA to facilitate a form of Impacts & Benefits Agreement (IBA). Depending on the specific context, these agreements go by a range of names, including: Community-Based Agreements, Community Development Agreements, Benefit Sharing Agreements, Partnering Agreements, Indigenous Land Use Agreements, Empowerment Agreements, Community Contracts, Shared Responsibility Agreements, and Good Neighbour Charters. However, Impacts & Benefits Agreements seems to be the most appropriate term as it is the most apt description of what it is. This can be achieved through effective engagement of community stakeholder participation and coordination.

e. The formal approach will set out the rights, obligations and powers of the public, whether individuals or particular groups, in some form of legislation. It will also detail the relevant procedures to be followed by the authority responsible for the decision to involve other parties. It may be that provisions setting out general rights of access to information and public participation are set out in dedicated legislation, with the more procedural aspects relating to specific issues being set out elsewhere. This leaves the courts to rule on whether or not the general rights of access apply to a certain situation or not.

f. Informal methods of encouraging participation may set out broad provisions related to taking into account the views of others, taking care an obligation to consult a particular group or organization does not become a worthless exercise, decision-making authorities should be placed under an explicit duty to take into account, or give consideration to, the views of consultees and to provide a written explanation as to why the concerns raised have been ignored or accepted.

g. This should be accompanied by details of all the responses from consultees, which will enable the public to gauge the extent of the popularity of certain opinions. Appropriate deadlines must also be applied to the submission of responses and the making of the decision similar to the procedures established in the EIA Act.

h. Implementing the **DMP** taking full cognisance of the strategic environmental and social objectives will require addressing some barriers to flood risk management and strengthen them as enablers of good flood risk management in the following aspects:

- Competence Capacity building and Strengthening Coordination
- Funding for Flood Mitigation
- Data management and services:

- Infrastructure data management.
- Mapping: geological, surface and settlement.
- Geographical Information Systems (GIS).
- Preparation of risk maps showing areas liable to flood and other hazards.
- Provision of public information.
- Establishment of an adaptive management programme by a designated authority
- Strengthening of designated authority to Deliver Appropriate Risk Communications
- Partnership of designated authority for flood risk management to develop working partnership programmes and
- stakeholder outreaches in the flood plain communities
- Continuous coordination of the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) with the Detailed Urban Plans for Ibadan and the Entire Oyo State.

ANNEXES

ANNEX 1: MANNING REQUIREMENT OF THE DEPARTMENT OF ENGINEERING SERVICES AND BEAUTIFICATION THAT HAS SOME RESPONSIBILITY IN MAINTENANCE OF THE DRAINAGE CHANNELS.

Table 1: Department of Environmental Engineering and Beautification

S/N	Actual Number In Post 2016	Approved Estimate 2017	Proposed Estimate 2017	Personnel Service Division	Approved Estimate 2016	Proposed Estimate 2017
1	-	-	-	Director, GL, 16		
2	1	1	1	Principal Secretariat Assistant 1, GL, 10		
3	1	1	1	Clerical Officer, GL, 05		

Table 2: Environmental Engineering Unit

1	1	1	1	Deputy Director, GL 15		
2	-	-	1	Secretariat Assistant		
3	-	-	1	Clerical Assistant		
4	-	-	1	Assistant Director GL 14		
5	-	1	1	Chief Civil Engineer, GL 13		
6	-	1	1	Principal Civil Engineer, GL12		
7	-	1	1	Senior Civil Engineer, GL 10		
8	-	2	2	Civil Engineer, Grade 1/II, GL 09/10		
9	-	1	1	Chief Technical Officer, GL 14		
10	-	1	1	Assistant Chief Technical Officer, GL 13		
11	-	1	1	Principal Chief Technical Officer, Grade I, GL 12		
12	-	1	1	Principal Chief Technical Officer, Grade II, GL 10		
13	-	1	1	Senior Technical Officer, GL 09		
14	-	2	2	Higher Technical Officer, GL 08		
15	1	2	2	Technical Officer, GL 07		
16	-	2	2	Assistant Technical Officer, GL 06		

Table 3: Environmental Beautification Unit

1	-	1	1	Deputy Director, GL 15		
2	-	-	1	Secretariat Assistant		
3	-	-	1	Clerical Assistant		
4	-	1	1	Assistant Director, GL 14		
5	-	1	1	Chief Forest/Agricultural Officer, GL 13		
6	1	1	1	Principal/Agricultural Officer, GL 12		
7	-	-	1	Senior Forest/Agricultural Officer, GL 10		
8	-	-	1	Forest/Agricultural Officer, Grade 1/II GL 09/08		
9	-	2	2	Higher Works Superintendent GL 08		
10	-	2	2	Works Superintendent GL 07		
11	2	2	2	Assistance Works Superintendent GL 06		
12	-	1	1	Chief Parks & Gardens Superintendent GL 14		
13	-	1	1	Assistance Parks & Gardens Superintendent GL 13		
14	-	1	1	Principal Parks & Gardens Superintendent GL 12		
15	-	1	1	Principal Parks & Gardens Superintendent GL 10		
16	-	1	1	Higher Parks & Gardens Superintendent GL 08		
17	-	1	1	Parks & Gardens Superintendent GL 07		
18	-	1	1	Parks & Gardens Superintendent GL 05/06		
19	-	2	2	Parks & Gardens Warden-in-Training GL04		
20	54	60	60	Head Gardeners, GL 03		
21	-	2	2	Parks Attendant, GL 02		
22	-	60	60	Gardener, GL 02		

STAFFING LEVEL (2021)

STAFF POSITIONS FOR E&B [ENVIRONMENTAL ENGINEERING AND BEAUTIFICATION]
WRM [WATER RESOURCES MANAGEMENT]

Position	No. Required	No. Filled	Balance
Civil Engineers	12	7	5
Hydrologists	8	2	6
Technologists(Civil)	15	2	13
Surveyors	5	1	4

Geologists	5	1	4
Technicians	20	3	17
Craftsmen	30	1	29
Community Officers	20	2	18
Secretariat Assistants	10	2	8
Clerical Staff	8	2	6
Drivers	5	1	4
Forest/Agricultural Officers	12	1	11
Parks and Garden Superintendents	15	1	14
Landscape Architects	3	1	2
Park Attendants	100	50	50
TOTAL	268	77	185

** However, it should be noted that variations in the current list and the previous list earlier forwarded is due to retirements of some officers and lack of recruitment to bridge the gap in the deficiency created by the departure of the retired staff.

Table 4: Ministry of Environment and Natural Resources – Department of Environmental Engineering and Beautification

S/N	DEPARTMENT/UNIT	SCHEDULE OF DUTIES	REMARKS
1	Director	Directs and Coordinates all activities of the Department in line with government policies and programmes	Duties are shared among all available members of staff. Most officers scheduled are not in position presently
2	Deputy Director (Env. Beautification)	Attends to the environmental beautification issues in the State. These include: supervision of the activities /works of gardeners who maintain the green habitat of the public places and space	
3	Deputy Director (Env. Engineering)	Designing, constructing, operating and maintaining sewerage, waste treatment plants, pumping stations, solid waste disposal facilities and other related structures	
4	Assistant Director (Env. Beautification)	Prepare the master plans for landscaping and management of public places and spaces in the State and ensure the implementation of such plans	
5	Assistant Director (Env. Engineering)	Prepare the master plans for landscaping and management of public places and spaces in the State and ensure the implementation of such plans	
6	Chief Architect (Landscape)	Propose appropriate landscape designs in tandem with the immediate environment and supervise the implementation of same	
7	Chief Civil Engineer	Identifying, designing, constructing and supervising and supervising the dredging channelization of flood prone rivers/streams and rehabilitation flood/erosion degraded sites in the State	
8	Principal Architect/Horticulturist	Determine public locations that require beautification / introduction of parks and gardens statewide	
9	Principal Engineer	Carry out all necessary studies and engineering design	
10	Senior Engineer/Engineer I/II	Produce tender documents and contract specifications, engage consultants/contractors, supervise beautification works, develop post-construction maintenance strategies.	
11	Other Technical Staff		

ANNEX 2: TERMS OF REFERENCE

IBADAN URBAN FLOOD MANAGEMENT PROJECT

Consultancy Services for the provision of Environmental and Social Safeguards Services to prepare the Social and Environmental Strategic Assessment (SESA) of the Ibadan Integrated Flood Risk Management and Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP)

1.0 BACKGROUND

The World Bank is supporting the Government of Nigeria and the Oyo State Government to prepare the Ibadan Urban Flood Management project (IUFMP) that aims at developing a long-term flood risk management framework by initiating risk assessment, community awareness, and providing enough flexibility in the project design to make changes based on learning. The project also supports capacity building for flood risk management in the city of Ibadan. It reinforces Oyo State government's early warning and response capabilities and leverages existing World Bank projects in Oyo State in support of the IUFMP.

Specifically, the Bank's support will finance some priority investments related to improving the infrastructure of Ibadan City, especially those destroyed by August 26, 2011 floods. The Bank's support will help Ibadan reduce flood risks, improve waste collection and treatment, while developing and improving the quality of existing infrastructural assets.

The project would be designed to keep a good balance between urgent post disaster needs (dredging, reconstruction of bridges, roads, etc.) and medium-to-long term needs (institutional support, upgrading existing and building new infrastructure to upgrade services and mitigate future risks). Selected sub - projects should comply with regional and local government plans, address critical issues described above to integrate planning and operational aspects that maximize the benefits of infrastructure investments to the beneficiary communities in the long run.
The Project Development Objective (PDO) is to "improve the capacity of Oyo State to manage flood risk and to respond effectively and promptly to flooding in the city of Ibadan".

In Oyo State, IUFMP activities involve medium-sized civil works such as construction of infrastructure and/or stabilization or rehabilitation in and around the Ibadan city. These could result in environmental and social impacts thus triggering the World Bank's Safeguard Policies including Environmental Assessment OP 4.01; Involuntary Resettlement OP 4.12; Natural Habitats OP 4.04; Physical Cultural Resources OP 4.11, and Safety of Dam.

IUFMP's Objectives

The overall objective of the project is to "improve the capacity of Oyo State to manage flood risk and to respond effectively and promptly to flooding in the city of Ibadan".

The project consists of three main components, namely:

COMPONENT 1: FLOOD RISK IDENTIFICATION, PLANNING, AND PREPAREDNESS

The objective of this component is to assess flood risk in the city, plan risk reduction measures, and finance non-structural measures to enhance preparedness to floods. This will be achieved, on one hand, through a number of sector-specific and specialized master plan studies, and on the other hand by designing and establishing an integrated flood early warning and response system. This component consists of the following four sub-components;

Sub-Component-1.1: ***Design of Flood Risk Management Investment Program****:* This sub-component will finance (1) the preparation of a flood risk management investment program building on the three key Master Plans for the city namely; Ibadan's Integrated Flood Risk Management Master Plan, Ibadan City Masterplan, and Ibadan SWM Masterplan; (2) carrying out feasibility studies and detailed engineering designs and construction supervision services for works to be carried out under component 2 of the project,(3) preparation of emergency preparedness plan for Eleyele Dam as well as ESIA'S and ESMP's.

Sub-Component-1.2: ***Development of an Oyo State Long-Term Flood Resilience Strategy****:* This sub-component will support the preparation of a long-term Oyo State Flood Resilience Strategy.
This component will build on the institutional analyses carried out by the World Bank during project preparation and will provide recommendations on the policy, regulatory and institutional reforms required so as to clarify the legal and institutional mandates of the various stakeholders and MDAs with regards to flood risk management in the city of Ibadan.

Sub-Component-1.3: ***Establishment of an Integrated Flood Early Warning and Response System:*** This sub-component finances:(1) the design and establishment of an Integrated Flood Early Warning and Response System for the city of Ibadan with the aim of providing timely flood alert to communities and ensuring effective government and community response; (2) the procurement and installation of one weather radar and software for development of hydraulic and hydrological modelling,(3) community based awareness and disaster risk reduction and preparedness activities by organizing training programmes in targeted communities and Community Development Associations(CDAs) living in high risk areas of Ibadan.

Sub-Component- 1.4 Contingency Component: Following an adverse natural event that causes a major disaster, the Government of Oyo State may request the Bank to re-allocate project funds to support mitigation, response, recovery and reconstruction. This component would draw resources from unallocated expenditure category and/or from other components to partially cover emergency response and recovery costs. This component could also be used to channel additional funds should that become available as a result of an eligible emergency. This component will also be used to channel resources from rapid restructuring of the project to finance emergency needs under an Integrated Response Mechanisms.

COMPONENT 2: FLOOD RISK REDUCTION

The objective of this component is to ensure flood risk mitigation through public infrastructure works and community-based resilience measures and investments. The component will finance flood mitigation and drainage improvements works through three sub-components:

Sub-Component 2.1: ***Priority Infrastructure Improvement:*** This component will finance critical infrastructure improvements in priority secondary and tertiary sub-catchments and will include: (i) *Priority urban drainage infrastructure improvements* involving the rehabilitation of priority infrastructure in fourteen (14) identified sites, including rehabilitation of culverts, drains, (ii) necessary works needed to restore the flood damaged Eleyele Dam for safety.

Sub-Component 2.2: ***Long-term Integrated Flood Risk Mitigation:*** This sub-component will be based on the recommendations of the Integrated Flood Risk Management Master plan (initiated in Sub-Component-1.1), and will finance major rehabilitation and construction of robust infrastructure in targeted project sites.

COMPONENT 3: PROJECT ADMINISTRATION & MANAGEMENT SUPPORT

Sub-component 3.1: ***Project Administration*** through: (i) the procurement of office furniture, ICT equipment, transport vehicles for PIU and; procuring a comprehensive set of Project maps (geospatial, soil, topography, etc.); and (ii) the hiring of external Financial and Technical Audits which will monitor the project execution periodically and reporting directly to PIU/Steering Committee.

Sub-component 3.2: Project Implementation Support through: (i) the procurement of Project Management Services Consultancy Contract, (ii) the procurement of Construction Supervision Consultancy Services for both Phase-I and Phase-II investment plans; and preparation and implementation of Resettlement Action Plans in project affected areas.

2.0 SCOPE OF WORK FOR THE CONSULTANCY ASSIGNMENT

Under sub-component 1.1, The project aims at preparing the Ibadan's Integrated Flood Risk Management and Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP), which as part of it, the identification of long-term investments for Ibadan City.

Under this exercise, safeguards documents will be needed to accompany the conduct of the Integrated Flood Risks Management and Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) (IFMDM), specifically:

a) Preparation of a Strategic Environmental and Social Assessment;
b) Preparation of Safeguards Instruments for 3 Works Batches identified under the IFMDM;
c) Supervision of Safeguards Instruments Implementation

The Scope of this terms of reference (TOR) is to prepare the Strategic Environmental and Social Assessment (SESA) to accompany the preparation of the Drainage and Flood Risk Management Masterplan under the IUFMP.

Subject to satisfactory performance, of the SESA, the Project will consider the consultant to conduct: (i) the preparation of Safeguards Instruments for 3 Works Batches identified under the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP); and (ii) the supervision of Safeguards Instruments Implementation.

Justification for the SESA

A preliminary assessment by the World Bank and Oyo state Government identified multiple and interconnected reasons which contribute to the growing challenges of flooding in Ibadan. The assessment identified a complex combination of different factors: prolonged and torrential rainfall, (ii) a landscape typified by small rounded hills and relatively flat bottomed valleys, (iii) a highly connected drainage network, and (iv) unplanned and uncoordinated rapid urbanization which includes poor solid waste and waste water management, which inevitably creates significant flood risk in the city.

Therefore, formulation of an effective and sustainable urban flood risk management strategy for Ibadan is a long and complex process requiring a mutually agreeable understanding of the various factors contributing to the problem.

The Government of Oyo State is launching the preparation of a Drainage and Flood Risk Management Masterplan which will help identify short to long-term interventions in the areas of Drainage, and institutional recommendations for the improvement of the sector.

In addressing this complex process, an understanding of the cumulative environmental and social impacts of the intervention of the IUFMP is very important and therefor the need for a Strategic Environmental and Social Assessment (SESA)

A SESA provides the opportunity to examine cumulative environmental and social issues associated with formulation of an effective and sustainable urban flood risk management strategy for Ibadan. This can be achieved b assessing the strategic dimensions of the project and anticipate implications over the medium and long term of the proposed interventions and related government financed interventions. Where there are strategic or technical options for the sector, these can also be explored in the SESA.

3.0 OBJECTIVES OF THE CONSULTANCY

The overall objective of this consultancy is to prepare a Strategic Environmental and Social Assessment (SESA) for the Urban Drainage and Flood Risk Management Masterplan, to examine the sector-wide environmental and social issues associated with structural and non-structural measures to enhance preparedness to floods. The SESA would give priority to assessing the cumulative impacts stemming from the proposed flood urban management project activities.

The main challenge is to make sure that positive impacts are enhanced and negative impacts are properly mitigated are being addressed at the individual project activities, through the preparation of Environmental and Social Impact Assessments (ESIAs) in accordance with Nigerian law and regulations and World Bank safeguards policies. It can be made more efficient and effective, however, through a sector-wide examination of potential impacts, leading to preparation of guidelines to improve not only the analytical aspects of project-specific ESIAs but also the impact management approaches and measures that will be applied in developments in the sector. This is one focus of the SESA. There are also opportunities to integrate principles of sustainable development in order to influence decision-making in the sector. These have to be examined at the strategic level because they involve the establishment or formulation of broad options for development planning and management for the entire sector. The strategic level is the second focus of the SESA.

The specific objectives of this SESA include:

- Description to the extent known, of the various activities of the Drainage and Flood Risk Management Masterplan;
- Description in general of the environmental and social characteristics of the city of Ibadan in which the various activities are to be located;
- Identification of the typical potential beneficial and adverse environmental and social impacts and risks of the types of activities under consideration;
- Outline the typical measures and approaches by means of which the adverse environmental and social impacts will be avoided, minimized and or mitigated, including through sound site selection, choice of technology;
- Based on the preceding points, formulate guidance to be used by individual project activity operators on site selection, choice of technology, and preparation of ESIAs, and by Oyo State Ministry of Environment and Water Resources, other relevant MDAs World Bank and any other reviewing/approving authorities in the review of development proposals and ESIAs;
- Review existing legal, regulatory, and institutional frameworks, including roles and responsibilities, and the necessary reporting procedures, for implementing the SESA and managing and monitoring the environmental and social concerns related to the various activities;

SCOPE OF WORK

The Consultant will conduct the preparation of the SESA in five stages: *scoping*; *identification of impacts and issues; description of the regulatory and institutional framework and assessment of capacity*; *formulation of recommendations; and final consultations; review and approval*.

The Consultant will prepare interim outputs at the end of each stage, to be compiled into a draft report for final consultations, a final draft for review, and eventually the final report. The IUFMP and the World Bank TTL will supervise the Consultant's work.

Stage 1: Scoping

The objective of Scoping is to frame the content and methodology of the SESA, with substantial stakeholder inputs, based on the Consultant's preliminary reviews of: environmental and social impact management experience in the sector; the legal, regulatory and institutional framework within which the sector operates; and an overview of the environmental and social characteristics of the areas that are most likely to be affected by sector activities. The Scoping Stage would require eight (8) weeks. The individual tasks are described below.

1. Review some ESIAs and Environmental and Social Management Plans (ESMPs) prepared for project activities supported by IUFMP Project, and look at their operational experience.

2. Review the preliminary outcomes of the Drainage and Flood Risk Management Consultants' work, including but not limited to: plans and trends in flood management that are likely to have environmental or social impacts; the policy, legal, regulatory and institutional framework for the sector; and the main stakeholders that should be consulted.

3. The Consultant will identify the key stakeholders and analyse their interests and incentives. The intent of the stakeholder analysis is to identify the main interest groups that prevail in the sector and to formulate a work plan for consultations that will ensure that their interests, concerns and advice are taken into account in the SESA.

4. Prepare a draft report covering the proposed scope of the SESA, the table of contents for the SESA report, the schedule and methodology for conducting the work, and plans for stakeholder consultation.

5. Conduct two scoping workshops. SESA is a participatory process that will involve relevant stakeholders, both to develop understanding and ownership of the process and to obtain valuable inputs. The Workshops will engage consultations with stakeholders; e.g. community associations, interested NGOs, and representatives of State and local governments.

6. Prepare the final Scoping Report, incorporating workshop results, for review by IUFMP, the Consulting firm in charge of the Drainage and Flood Risk Management Masterplan (PCT) and other relevant agencies and the World Bank. The Scoping Report will serve as the Consultant's inception report and should therefore include:
   (i) The institutional arrangements and timing agreed with IUFMP and PCT to carry out the SESA;
   (ii) The SESA work plan describing the main activities for data collection and analysis, including consultation/validation with stakeholders; and,
   (iii) The expected products and reports schedule.

Stage 2: Identification of Environmental and Social Impacts and Issues and Possible Mitigation Measures

1. Based on the Suggested Scenarios and Activities in the Drainage and the Flood Risk Management Masterplan, the Consultant will prepare a description of the environments in the planned or probable locations of project activities. This description involves: (i) the physical environment (i.e. topography, geology, climate and , surface water, hydrology); (ii) biological environment (i.e. flora & fauna types and diversity, rare and endangered species within or adjacent to projects intervention sites, including wetlands, sensitive habitats); (iii) socio-economic and cultural environment, including present and projected, where appropriate (i.e. population, land use, planned development activities, community structure, employment and labour market, sources and distribution of income, cultural properties – such as historical and archaeological significant sites, indigenous people, and traditional tribal lands and customs, etc.).

2. The Consultant should identify and describe in a tabular format, all potential significant negative and positive environmental and social impacts such as construction and installation of bridges and culverts. These impacts may be as a result of land acquisition leading to involuntary resettlement, social conflicts and or disturbances, threats to land and natural resources, biodiversity, natural habitats, air and water quality, safety and health issues. Pay particular attention to cumulative impacts of the proposed intervention along the dumpsites, bridges and rivers of interest that need to be thoroughly assessed. The impacts should be differentiated between short, medium and long-term impacts.

3. Potential mitigation measures and monitoring requirements will be identified for overall and when needed each potential impact and summarized in tabular form. Measures to avoid impacts through sector strategy and policy changes, sound site selection, and other "upstream" measures are to be included. Where there are tradeoffs, the environmental and social pros and cons should be presented. Where there are benefits, the Consultant will recommend measures to enhance them. The Consultants will combine the outputs of this stage with that of stage 4.3 described below and produce an interim report.

Stage 3: Description of the Regulatory and Institutional Framework and Assessment of Capacity

1. The Consultant shall contextualize the Drainage and Flood Risk Management Masterplan implications and their proper management pertinent laws, regulations and standards governing environmental quality, health and safety, protection of sensitive areas, protection of endangered species, at international, national, regional and local levels. These will include:
   - The World Bank Safeguard Policies (www.worldbank.org/safeguards)
   - World Bank group Environmental, Health and Safety guidelines, (www.ifc.org),
   - The Regulations, Guidelines and Standards of Federal/State Ministries of Environment concerning Flood Urban Management, drainage management and dam safety in Nigeria,
   - The laws, regulations, guidelines and standards of Federal Government of Nigeria on Land expropriation, compensation for land and resettlement.
   - All International Conventions on Environmental Protection and treaties which Nigeria is a party to.

2. The Consultant will assess the adequacy of State Level public agencies, Local Government, and NGOs to manage and address the potential impacts of Drainage infrastructure development. The results of this stage will be combined with those of stage 2 (above) into an interim report. Keeping the focus of the assessment on the effects of sector policy and regulatory development and on environmental and social issues, the following institutional and governance issues will be covered by the Consultant:

   - Gap analysis of mandates, capacity, incentives and transparency in permitting, monitoring and enforcing environmental regulations in the sector.
   - Coordination between the Dam Department of the Federal Ministry of Water Resources (FMWR) and the environment and natural resource management institutions such as the Federal Ministry of Environment and State Ministry of Environment;
   - Accountability of decision makers and authorities with competence for granting environmental permits.
   - Organizational and institutional capacity of stakeholders affected by or vulnerable to activities in the sector.
   - The specific challenge of ensuring that decision-makers receive comprehensive impact-assessment information on an Irrigation Scheme with ancillary.

3. Conduct a round of consultations on the interim report through a State Level workshop. This workshops must serve to capture the perceptions of relevant stakeholders on environmental and social priorities related to Flood Urban Management, and on the corresponding proposed orientations and interventions or policies needed to address them. The Consultant must ensure that the perceptions of weaker and vulnerable stakeholders are taken into account and incorporated into the analysis. Upon completion of the workshop, the Consultant will revise the first interim report and submit it for review by IUFMP, PCT, and the Bank.

Stage 4: Formulation of Recommendations

1. The Consultant will draft the technical recommendations. These will consist of but not be limited to a free-standing set of guidelines for development planning, ESIA and impact management in the sector, including guidance in identifying and managing cumulative impacts, and any recommended additions to or changes in Nigerian or/and State-Level environmental standards governing the sector. The Consultant should apply experience and judgment in identifying other appropriate technical outputs.

2. The Consultant will recommend any appropriate changes in or additions to policy, legislation, regulations and guidelines, and provide a policy, legislative, and regulatory matrix comprising recommendations and an action plan for their implementation and monitoring.

3. The Consultant will draft a plan for capacity-building, including changes in or additions to the existing institutional structure and institutional development, also formulated as a matrix of recommendations and an action plan.

4. The Sectoral guidelines will be a free-standing document. The other outputs of this stage will be compiled into a second interim report for review by IUFMP and the Bank.

Stage 5: Final Consultations, Review and Approval

1. The Consultant will combine the interim reports and key elements of the scoping report into a draft report for dissemination to stakeholders by IUFMP.

2. The Consultant will present the draft final report –at a State and city Level workshop to obtain stakeholder comments. IUFMP, will organize the workshop.

3. Following the workshop, the Consultant will revise the draft report based on stakeholder inputs, document the consultations and their results in the report, and submit a draft final report to IUFMP-PCU, with a copy to World Bank, for review and approval. The Bank will submit its comments to IUFMP-PCU before the approval decision.
4. The Consultant will prepare the final report, incorporating revisions suggested by the Oyo State Government, IUFMP and by the World Bank. The Consultant may be required to participate in key follow-up discussions necessary to further disseminate and explain the findings and recommendations of the SESA, particularly to the government and donor community.

4.0 LEVEL OF EFFORT, DELIVERABLES AND SCHEDULE

This activity is expected to require a Five Man-Months level of effort to be spread across the consultancy duration.

The Consultant will be expected to participate in working meetings and presentation meetings of the Drainage and Flood Risk Management Consulting firm to ensure close collaboration and coordination of efforts.

The consultant will have to follow the respective timeline of the preparation of the Integrated Flood Risk Managemnet and Drainage Master Plan (IIFRMDMP) to benefit from its respective outputs, and provide inputs to its reflections as highlighted in the proposed methodology. The total duration of this consultancy to align with the Masterplan of 16 months. Level of efforts will be spread across this duration unequally.

Deliverable	***Integrated Flood Risk Managemnet and Drainage Master Plan (IIFRMDMP) SESA***
Scoping/Inception Report	end of week 8
First Interim Report	end of week 22
Second Interim Report	end of week 34
Draft Final Report	end of week 50
Final Report	end of week 60

The deliverable dates are to be modified depending on susceptible milestone changes of the Drainage and Flood Risk Management Masterplan. The consultants will have to work closely with the consulting firm (PCT) leading the Masterplanning exercise to ensure 100% synchronization.

5.0 CONTRACT EXTENSION CONDITION

In the event of delays in the preparation of the Integrated Flood Risk Management and Integrated Flood Risk Managemnet and Drainage Master Plan (IIFRMDMP), the consultancy may be extended to ensure the instruments incorporates any such changes in the Plan as may be required.

In addition, and as mentioned earlier, if the conduct of this consultancy is considered satisfactory, the consultant might be considered for preparing additional safeguards instruments. The scope and duration of those will be directly discussed with the consultant when and if time comes.

6.0 RESPONSIBILITIES OF IUFMP

- The Consultant shall report to the Project Coordinator of the Project Implementation Unit of IUFMP.
- The PIU will facilitate the work and collaboration of the Consultant with the Consulting firm in charge of preparing the Drainage and Flood Risk Management Masterplan.
- All documents prepared by the Drainage and Flood Risk Management Masterplan will be shared, as well as all other documents the consultant will find needed.
- The PIU would review and discuss the Inception report with the Consultant and necessary adjustment will be made.
- The Consultant would especially carry the PIU along in the Stakeholders consultative forum.
- The Consultant may seek Technical assistance from the PIU Specialists, especially the Safeguards Specialists of the PIU.
- The Draft Report would be reviewed by the PIU and relevant MDAs and comments will be provided to the Consultant.
- In addition to the supervision and other responsibilities contained in the contract for this consultancy, the IUFMP shall provide the consultant with the following:
    - ✓ All relevant project instruments ;
    - ✓ Project Appraisal Document
    - ✓ Project Implementation Manual
    - ✓ World Bank safeguards policies;
    - ✓ Previous ESSC, ESIAs, ESMPs, A/RAP carried out by the Project as demanded;
    - ✓ Access to relevant officials, groups and communities of the assignment.

7.0 STAFF REQUIREMENTS

Qualifications and team composition

The Consultant shall at a minimum, provide the key staff described below. Curriculum Vitae shall be provided in respect of each key staff Experience and a track record in complex World Bank safeguard policies work; entailing legacy, corporate risk, and highly complex projects is highly desirable. Experience with working with international development institutions-funded like the infrastructure related projects.

Team Leader (Environmental Specialist /Engineer): 15 Years' Experience

Experience in environmental assessments preferably related to Flood urban Management projects, a significant portion of which has been in Sub-Saharan Africa. S/he should possess demonstrated expertise in most aspects of environmental and/or social impact assessments including SESAs, ESIAs, EMPs and RAPs, together with experience in financial and institutional issues. S/he should have demonstrated skills working effectively with public sector clients and delivering products in a timely and professional manner.

Main tasks would be as follows but are not limited to:

- Overall responsibility for management and execution of the consultancy.
- Coordinate and manage field work, assessments and report preparation tasks.
- Ensure effective communication within the team and with the client.
- Review and assure timely compilation and submission of all reports.
- Lead elaboration of the SESA

Consultations including the promotion of effective participation and decision-making processes.

Sociologist, Social Development Expert, with experience in Social Impact Assessment and Resettlement

He/ She must possess a Master's Degree in Social Sciences from a recognized University with at least fifteen (15) years practical post-qualification experience in social analysis and social work. She/he will have demonstrated expertise in the design and implementation of census surveys and socio- economic data collection and analysis to support the preparation of Resettlement Action Plan (RAPs) required by national government and international lending agencies. She/he will have demonstrated skills in working effectively with public sector clients, and in implementing effective consultation and participation at project and community levels, especially in Nigeria. He/she should have served in a similar capacity and with relevant experience in preparation and implementation of Strategic Environmental and Social Assessments, Resettlement Action Plans among others. Familiarity with Bank safeguards standards and best practice in involuntary resettlement is necessary.

Hydrologist/Geomorphologist/10 years' experience

She/he must possess an MS degree in Engineering, with preference in hydrology, water resources or equivalent, with at least 10 years' experience in flood management area.

Civil society / community engagement professional:
He/ She least five years' experience in public participation in Nigeria, including community and grass-root engagement and consultation. Must be knowledgeable and have expertise with the similarities and differences for effective community consultation and participation. Must be familiar with existing policies and regulations regarding stakeholder communication / consultation / engagement, and preferably with experience in communication policymaking.

Other Experts
Other experts that might be needed to support the work of the key experts. The consultants are free to develop a complete staffing for their proposal and working plan.

8.0 RECRUITMENT OF CONSULTANTS

The consultants will be recruited using the Selection based on Consultant Qualification CQS procedure. The short-listed firms are strongly encouraged to associate or make joint ventures with eligible national consulting firms and institutes for carrying out this assignment.

Technical Proposal Contents
In the technical proposal, the Consultancy firm should:

a) Demonstrate that the firm can deliver the required training and technical assistance with both CVs of the professional staff proposed for the assignment, and descriptions of at least four relevant recent assignments in West Africa, preferably Nigeria.
b) Provide a detailed work plan for delivering the required anticipated work.

ANNEX 3: WATER QUALITY INDEX

Water quality index (WQI) provides a single number that expresses the overall water quality at a certain location and time based on several water quality parameters. The use of water quality index (WQI) simplifies the presentation of results of an investigation related to a water body as it summarises in one value or concept a series of parameters analysed. In this study, weighted arithmetic water quality index method was used. Weighted arithmetic water quality index method classifies water quality according to the degree of purity by using the most commonly measured water quality variables. For the calculation of the WQI in this study, 12 different water quality parameters were used. They are pH, electrical conductivity (EC), total dissolved solids (TDS), chloride, sulphate, nitrate, total Hardness, Ca, Mg, dissolved oxygen (DO), total suspended solids (TSS) and total alkalinity. The WQI was calculated using guidelines of drinking water quality recommended by the World Health Organization (WHO) and Indian Council for Medical Research (ICMR). Further, quality rating or sub-index was calculated using the following expression;

$WQn = [\Sigma QnWn]/[Wn]$
$Qn = 100[Vn - Vio] /[Sn - Vio]$
(Let there be n water quality parameters and quality rating (qn) corresponding to nth parameter is a number reflecting relative value of this parameter in the polluted water with respect to its standard permissible value)
Qn = Quality rating for the nth Water quality parameter
Vn = Estimated value of the nth parameter at a given water sampling station
Sn = Standard permissible value of the nth parameter
Wn = Unit weight
The rating of water quality according to this WQI is given in Table 1. The WQI of the water collected at different points along the river water channels in Ibadan is presented in Table 2. Calculated WQI ranged from 24-58.6, which was from excellent water quality to poor water quality as shown in Table 1

All the water samples collected at different points around the river channels in Ibadan had good water quality except water collected at IIR with excellent water quality while BER and AKI had poor water quality.

Therefore, public education and enlightenment and continuous periodical monitoring of the water quality is necessary to safeguard public health and appropriate steps may be taken for water resource management practices in Ibadan.

Table 1: Water Quality Rating as per Weight Arithmetic Water Quality Index Method

WQI value	Water quality rating	Grading
0-25	Excellent water quality	A
26-50	Good water quality	B
51-75	Poor water quality	C
76-100	Very poor water	D
Above 100	Unsuitable for drinking purpose	E

Table 2:WQI of water around the river channels in Ibadan

Sample codes	WQI	Water quality rating
OR1	28	Good
JR1	28.3	Good
AOR	25.8	Good
IIR	24	Excellent
ODGR	29.4	Good
DHR	26	Good
SER	33.7	Good
KR	36.3	Good
NR	39.3	Good
APR	32.4	Good
7UP	40.6	Good
OZR	43.1	Good
OCR	38.6	Good
OOA	37.2	Good
BAR	40.2	Good
MS	40.8	Good
MOR	43.2	Good
KUD	47.1	Good
APN	48.3	Good
BER	56.2	Poor
ADE	45.9	Good
FOR	49.5	Good
AKI	58.6	Poor

ANNEX 4: STRATEGIES AND RECOMMENDATIONS FOR UNLOCKING THE POTENTIAL OF URBAN PUBLIC-SPACE ASSETS

Stakeholders and partnerships	
Strategies	**Recommendations**
Seek champions and build coalitions	• Identify local leaders within the government, community, and private Sector • Empower and build ownership with the community, and engage Stakeholders • Seek private partners for innovation and resources
Coordinate across stakeholders	• Define a shared vision, purpose and the roles of stakeholders •Adopt suitable stakeholder coordination mechanisms and feedback channels
Adopt appropriate planning, design, and place makingapproaches	Explore suitable planning and design approaches in the short and long terms, based on needs and envisaged outcomes Build in participatory and co-creation approaches with stakeholders
Manage unintended outcomes	• Develop practical approaches for managing stakeholder friction during a project's life cycle, and instances of "nimbyism" • Adopt equitable and inclusive measures to address potential displacement, resettlement, and mitigate the effects of gentrification
Policies, planning, and design	
Create for people, and build sense of place	Connect neighborhoods with a mix of public spaces, focusing on spatially underserved areas
Preserve valuable public spaces from urbanization pre-pressures and make existing public spaces accessible	Design human-centered public (most spaces to address safety, inclusion, cases) outdoor comfort, and access for all Promote urban health through the active use of public spaces
Leverage policy instruments and work with land and real estate markets	• Review and apply effective planning and land-use policy and/or regulatory instruments available to the city for creating and managing public spaces and POPS • Deliver public spaces through land-based financing, as part of a broader development approach (such as TOD)
Adopt an evidence-based decision-making process	• Take stock of public-space asset inventories, adopt tools to measure spatial characteristics and user activity patterns at the city level • Prioritize public-space programs and investments using data-informed spatial planning strategies, local knowledge, and align with broader areas' development plans • Actively evaluate and monitor the impact and outcomes of public-space interventions, and reiterate solutions
Integrate with resilient city infrastructure	• Protect natural urban greenery, biodiversity, and ecological assets (including urban forests and wetlands); and integrate public spaces into green and gray infrastructure • Green the city, by protecting matured trees, and through initiatives such as tree-planting programs and community gardening • Adopt sustainable development principles such as green buildings and resource efficiency, starting their implementation with public facilities
Seek synergies with other city assets and urban systems	Leverage public art, tangible and intangible cultural heritage, and historic areas for urban rejuvenation. •Enhance urban food systems with public spaces (markets and hawker centers, urban agriculture) for food security and urban health.
Reclaim streets for pedestrians	• Prioritize, and design complete streets for safe mobility and non-motorized transportation. • Reclaim and reconfigure street and parking spaces for human-centered activities through permanent or temporary interventions.
Strategies and Recommendations for Unlocking the Potential of Urban Public-Space Assets (Continued)	
Strategies	**Recommendations**
Creatively repurpose existing, old, or vacant public infrastructure	• Identify potential public spaces, and and creatively transform infrastructure into usable public spaces •Seek innovative business models and I/3 and III/8 feasible design ideas from the private sector and communities through appropriate platforms
Management, governance, and finance	
Plan and design for flexibility and	Deploy innovative design solutions or place making interventions that optimize limited

resource efficiencies	operations and maintenance (O&M) resource's Consider developing public-space asset management policies to improve resource (energy, water, and other) efficiencies Activate and design public spaces to accommodate multiple functions, more intensive uses, and other spontaneous activities
Adopt a public-space life-cycle Management framework	Adopt a comprehensive asset management framework and oversight to ensure financial and organizational sustainability of public spaces throughout their life cycles Build institutional capacity to manage new public spaces that may require new expertise
Seek feasible financing and funding models	Ensure that the capital planning needed for public spaces is built into the city's overall capital investment planning Adopt sustainable and efficient organizational and O&M funding models through partnerships between government entities, communities, and the private sector Leverage appropriate financing, development, and land value capture models compatible with the regulatory environment and management instruments
Factor in long-term costs and risks in decision-making	• Factor in costs avoided from disasters and poor health (such as flooding and urban heat islands) mitigated by the preservation of open spaces, greenery and wetlands, and water bodies in urban areas • Address the risks of the disposition of public spaces that hold high value with community groups (such as historic public spaces) into other uses
Anticipate opportunities and challenges arising from future trends and disruptive technology	• Leverage innovative and appropriate technological approaches to manage and monitor public spaces • Anticipate how technology and user trends will change how public spaces are used and calibrate policies Accordingly

Note: POPS = privately owned public spaces. TOD = transit-oriented development.

ANNEX 5: THE IMPACT ASSESSMENT TABLES

Color key for Overall performance of the options against SESA/DMP Objectives	
Major positive	
Moderate positive	
Minor positive	
Positive/ negative	
Neutral	
Major negative	
Moderate negative	
Minor Negative	

Duration of Impacts	
Short term	0-10 years
Medium term	10-25 years
Long term	25-50 years

Table 1: Impact of Assessment of Alternative-1 No action

SESA/D MP Objectives	Sub-Objectives	Sources of Impacts	Pathway	Impact on Receptors	*Significance of environmental impacts* Positive (major/minor Negative (major) major/minor Minor) Neutral -			Comments for overall performance of the options against objectives (without mitigation)	Mitigation Measures proposed for further improvement and enhancement
					Short Term	Medium Term	Long Term		
Protect Human and health and population	Protect and improve the human health from the natural calamities	-Climate change -Extreme weather events	Increasing flood risk	Severe flood risk will continue to increase with a potential for increasing threat to public health and life					
	Reduce flood risk to human population	Climate change Extreme weather events	Increasing flood risk	Several flood risk will continue to increase with a potential threat for public health and life					

2. Protect material Assets and critical infrastructure	Protect public utilities properties economic and agricultural areas and critical infrastructures	Climate change Extreme weather events	Increasing flood risk	Increasing flood risk for frequent flood events would have adverse impacts on infrastructure, livestock, agricultural lands and standing crops				Moderate to high adverse impacts are assessed as increasing flood risk is associated with climate change. However, projection may vary overtime e.g drought events except future flood protection scheme are in place to mitigate such flood risk	
3.conserve and Protect biodiversity(flora&	Protect and enhance environmental settings for flora and fauna, habitats and ecosystems	-Climate change -Extreme weather events	Increasing flood risk	Inundation would increase dynamic system of the river that would lead					
4	Protect and enhance where Possible Natural Conservation sites	Climate change -Extreme weather events	Increasing flood risk	Increased flood events would result in many environmental changes e.g land erosion, sedimentation, chemical and biological composition of water, surface and ground water levels could impact the associated habitats and existing flora. The maintenance of other wild life sanctuaries would be costlier. Although in short- term the issues would be less significant, but over time with the increasing in significance negatively impacting the dignity and quality of naturally conserved and protected areas. The extent and duration of the stagnant water will be another factors contributing to significance of the impacts.					
4. Conserve and protect natural &cultural Heritage	Protect and enhance where possible historic, cultural and archaeological features, sites and buildings.	Climate change -Extreme weather events	Increasing flood risk	Increased flooding to cultural heritage sites such as Agodi gardens (lower Ogunpa) and other archeological features could result detrimental to their structures and quality. Agodi gardens was submerged in flood in 1980 considering this and climate change impacts, flood risk will continue to increase with a potential for more damaging impacts on cultural heritage in long term					Cultural heritage protection plan is required to protect these site from blood

5. protect and enhance landscape & visual amenity	Protect and enhance geological features landscape characters recreational sites and visual amenity	Climate change -Extreme weather events	Increasing flood risk	More frequent flash and fluvial flood events particularly in hilly terrain and watershed of Ibadan river basin would have negative impacts on the landscape e.g land sliding uprooting of tree, land erosion, debris sedimentation and damages to buildings.	▲	▲	▲		Landscape management plan is required in potential footprint areas (watershed catchments, and floodplains)
6. Promote climate change adaptability	Adapting to climate change vulnerability impact and flexibility for future responses	Climate change -Extreme weather events	Increasing flood risk	Severe flood risk will continue to increase with a potential for more dramatic super-floods event like 2011	▲	▲	▲		
7. Conserve protect water resources and watershed	Protect and improve the quality of surface and ground water resources	Climate change -Extreme weather events	Increasing flood risk Water Pollution	Increasing flood event and outflow of the river- banks would increase water pollution. Increasing connectivity with the floodplain and nutrient would develop favorable condition for eutrophication over time, as the flood protection structures (existing or proposed) fail overtime, to natural rivers conditions.	▲	▲	▲		
	Restoring and improve watersheds by plantation	Climate change -Extreme weather events	Increasing flood risk Trees uprooting Soil erosion Sedimentation Water pollution	Increasing flood risk would generate flash flood in Ibadan hilly watershed & river basins leading to negative impacts on the already degraded watershed by increasing land sliding tree uprooting and soil erosion, sedimentation capture in downstream reservoir. Increased turbidity and water pollution.	▲	▲	▲		Community based watershed management plan is required including Awareness raising scheme to reduce tree cutting for timber and fuel and promoting alternatives for fuel Avoid over grazing Planting of new trees Restriction conversion of forest land into agricultural land
	Protect and enhance wetland by ensuring minimum fresh water flows	Climate change -Extreme weather events and frequent flood events	Increasing flood risk Fresh water flows to wetlands	Increasing flood risk would supply fresh water and nutrient to wetland which will improve the overall ecological health of the wetland and lakes	◎	△	△		
8. Conserve	Protect and enhance where possible	Climate change	Increasing flood risk,	-landforms are developed as a result of geomorphological processes such as land	△	△	△		

	fluvial landforms in Ibadan River basins & watershed and floodplains	-Extreme weather events and frequent flood events	- land erosion, -Sediment in soil, -Deposition in flood plains/around river- banks.	erosion and depositions. In "No Action" scenario increasing flood events would speed up actions and reactions processes which would contribute to the enhancement of landforms. -Fluvial floods would enhance the formation of such features downstream. with diverse sediment and landforms composition -The establishment of new landforms will naturalize and improve over time					
	Restore land/soil quality riparian corridors, watershed, catchments and floodplains	Climate change -Extreme weather events and frequent flood events	-Increasing flood risk -Land erosion, - soil deposition in floodplains	Increasing inundation would increase interconnectivity between the river and floodplain, but would be controlled by flood protection structures.	▲	▲	▲		
9. Promote sustainable Land use	Promote and enhance environmental friendly land use	Climate change -Extreme weather events and frequent flood events	Increasing flood risk -Encroachment upon floodplains -conversion of forests land into agricultural areas	Increasing flood risk, population encroachment upon flood plain, and increasing food security will encourage conversion of flood plains into and watershed forest into agricultural land that will have significant impact on sustainable land use in Ibadan river basins.	▲	▲	▲		Awareness raising scheme to reduce tree cutting for timber and fuel and promoting alternatives for fuel Avoid over grazing Planting of new trees Restriction on conversion of forest land into agricultural land Promote cultivation across the terrace slopes and sustainable land use.

Table 2: Impact of Assessment of Alternative-2 - Enhancing Flood Storage Capacity

SESA/DMP Objectives	Sub-Objectives	Sources of Impacts	Pathway	Impact on Receptors	*Significance of environmental impacts* ▲ Positive-(▲ maj	Comments for overall performance of the options against objectives	Mitigation Measures proposed for further improvement and enhancement

					major/minor Negative (major/ major/minor Minor) Neutral				
					Short Term	Medium Term	Long Term		
Protect Human and health and population	Protect and improve the human health from the natural calamities	-Land use change, -Dam construction, -Dam failure	No increase in flood risk to vulnerable communities and residential area in upper and lower river basins in Ibadan. -Increased flood risk with the probability of dam failure	Improved flood protection, -Stagnant water would have localized negative impacts, -Dam failure can result in heavy flood leading to loss of life and injuries				Meets objectives the potential benefits would increase over time	-Resettlement and evaluation of proposed dam/reservoirs construction must be addressed under land Acquisition under the Land Use Act 1978 and application of the Resettlement Policy framework (at project level), Public participation can play significant role in solving such issues.
	Reduce flood risk to human population	Land use change -Dam construction	Increasing flood risk to vulnerable communities and residential areas in upper and lower river basins in Ibadan	Residential areas and properties will be at reduced flood risk				Meets objectives the potential benefits would increase over time	
Protect material Assets and critical infrastructure	Protect public utilities properties economic and agricultural areas and critical infrastructures	Land use change and land acquisition. -Failure of dam can result in damages and loss of services	-Construction of dam to alleviate floods -Conversion of property land into dam -No increase in flood to property assets and agricultural lands	-Improve the standards of infrastructure protection -Increase attraction for development -Loss of property/ agricultural land due to land use change (depending on the sitting of dam/ dyke/ retention ponds)		/			
3.conserve and Protec	Protect and enhance environmental	-Land use change and land acquisition	Conservation of forest/habitat lands dams	-sitting of dams/dykes can lead to extinction of endangered species.				The significance of impact depends upon the biodiversity richness	There is need to develop a policy to ensure minimum freshwater flow, regular

	settings for flora and fauna, habitats and ecosystems	-Failure of dam can result in damage and loss of services		-Spread of exotic species -Reduced water flows to wetlands in lower river basins would have negative impact on habitat of local and migratory birds and other biodiversity Adverse impact on endangered fish species in lower river basin Reduced water flows would adversely impact on endangered riverine forests in lower river basins of Ibadan Creation of new habitats e.g. for birds Opportunities to promote fisheries in reservoir Sitting of dam can also minimize extinction of important species e.g birds		/		of the area and location of the dam sites. For instance, the potential sites identified for off-channel flood storages in upper Ona basins may or may not have dispersed biodiversity with a potential for minor or moderate adverse and /or beneficial impacts Downstream impact on biodiversity in lower Kudeti could also have moderate to major adverse impacts	water flow discharge into river basins as dam construction will store additional water otherwise wasted every year There is also need for policy on the multipurpose use of dams. More advanced information is required regarding the current status of biodiversity and natural resources in the basins
									Alternative habitat should be developed for the vulnerability species affected by dam/reservoir construction.
	Protect and enhance where possible natural conservation of sites	Land use change Dam construction	Conversion of forest habitats lands into dams	Reduces fresh -water flow to riverine forest in lower river basins would have negative impacts on the local and migratory bird species and other biodiversity Sediment trap in reservoir would have adverse impacts on the development other natural ecosystem				Positive and negative impacts are assessed in the medium long term depending on the size, time of retention, location of the reservoir and environmental significance and social factors of the area.	Carefully controlled and specific minimum amount of water and nutrient to wetland
4. Conserve and protect natural &cultural Heritage	Protect and enhance where Possible Natural historic, cultural and archeological features, sites and buildings	-Land use change -Dam construction	No increase in risk to cultural heritage Land acquisition for dam construction	Reduced flood risk would improve protection for historical buildings and sites at lower river basins. Loss or damage to historical heritage in upper river basins e.g old rock carving(depending on the site location)				The proposed dams on the river basins needs to be ascertained will not threaten cultural heritage. The construction of these dams may result in loss of some rocks carvings	

5. protect and enhance landscape & visual amenity	Protect and enhance geological features landscape characters recreational sites and visual amenity	-Land use change -Dam construction		Significant impacts on local landscape geological features and visual amenity in short term Sitting of dams could also provide opportunity to improve visual amenity by creating recreational sites Plantation and landscape management would reduce negative impacts	▲	/	/	Positive and negative impacts depends on the location of dam sites and significant, geological features or visual amenity of the landscape	Landscape management plan is required including tree plantations to fit to the local environment
6. Promote climate change adaptability	Adapting to climate change vulnerability impact and flexibility for future responses	Increasing rainfall events and flood frequency -Dam construction	Conversion of catchment land into dam Land acquisition for dam construction	Increasing water storage capacity would alleviate floods peaks -Increasing flood adaptability	▲	▲	▲		
7. Conserve protect water resources and watershed	Protect and improve the quality of surface and ground water resources	-Dam construction -Enhancing storage capacity to alleviate peaks	Eutrophication from biomass and weed decay, Turbidity, pollution from sediments	Change in stream bed flow decreased in fresh flows to lower basins -Increase in surface water pollution -Change/ fluctuation in ground water discharge in upper and lower basins	▲	▲	▲	Do not meet objectives	
	Restore and improve watersheds by plantation	Constructions activities -deforestation	Conversion of catchment land into dam -Loss of vegetation	Clearance of vegetation cover in catchment /upper basin -change in watershed hydrology and sediment yields based on magnitude and liming of catchment runoff increase in land erosion, and situation in downstream channels and reservoir turbidity and water pollution	▲	▲	▲	Do not meet objectives considering mitigation measures would have potential to improve the outcome	
	Protect and enhance wetland by ensuring minimum fresh water flows	Dam construction	Charge in flow regime Change in run-offflow	Reduced fresh water flow to wetlands downstream Impact on river ecology and morphology Creation of new wetland and ecosystem	▲	▲	/	▲	Specified controlled fresh water flows are required for the wellbeing of wetland, lakes and small water bodies
8. Conserve	Protect and enhance where	Land use change Dam construction	Soil erosion loss of vegetation	-initially significant impacts on watershed landforms by clearing	▲	▲	▲	Does not meet objectives considering	Immediately there would be no significant impacts on

	possible fluvial landforms in watershed	vegetation in watershed /deforestation		existing vegetation leading to soil erosion and sedimentation Permanent loss of certain land area covered under reservoir				measures would have potential to improve the outcome	trivial landforms but overtime as river reaches dynamic equilibrium with the existing sediment and hydrological regimes. The trends are likely to increase deposition in new floodplains Climate change is likely to continue to heavy river flow post-construction process but no impact on watershed landform
	Restore land/soil quality riparian corridors, watershed, catchments and floodplains	Land use change Dam construction deforestation in watershed	Soil erosion change in catchment runoff	Increasing inundation would increase interconnectivity between the river and floodplain but would be controlled by flood, but would be controlled by flood protection structures.	▲	▲	▲	Does not meet objectives considering measures would be having potential to improve the outcome	Ensure the quality and restoration of not cover post-construction (considering wet soil condition and excavation dredging and excavation, dredging and exploitation operation)
Promote sustainable Land use	Promote and enhance environmental friendly land use	Land use change Construction activities Deforestation	Land acquisition conversion of forest land into dam Attraction for development in catchment and flood plains conversion of forest land into agricultural land	Land acquisition, resettlement and compensation issue Loss of vegetation cover increased development pressure in catchment and floodplain	▲	▲	▲		There is need to formulate land use planning policy and further guideline to provide strict rules for land-use practices in watershed and environmentally sensitive zones

Table 3: Impact of Assessment of Alternative-3: Improve Watershed Management

SESA/ DMP Objectives	Sub-Objectives	Sources of Impacts	Pathway	Impact on Receptors	*Significance of environmental impacts* ▲ Positive (▲ major ▲ major/minor ▲ Negative (▲ major ▲ major/minor ▲ Minor) Neutral ○	*Comments for overall performance of the options against objectives*	Mitigation Measures proposed for further improvement and enhancement

					Short Term	Medium Term	Long Term		
Protect Human and health and population	Protect and improve the human health from the natural calamities	-climate change -Extreme weather event and increase flood frequency	Increasing flood risk	On a short term level, flood risk and health risk remain same but gradually improve overtime with the slowdown of flood velocities downstream and implementation of other flood protection					-
	Reduce flood risk to human population	climate change Extreme weather event and increase flood frequency	Increasing flood risk	In a short term level flood risk and health risk remain same but gradually improve overtime with the slowdown of flood velocities downstream and implementation of other flood protection					
2. Protect material Assets and critical infrastructure	Protect public utilities properties economic and agricultural areas and critical infrastructures	climate change Extreme weather event and increase flood frequency	Increasing flood risk	In a short term level flood risk and health risk remain same but gradually improve overtime with the slow-down of flood velocities downstream and implementation of other flood protection work and schemes Increasing flood risk would have adverse impacts on agriculture and standing crops depending upon the resistance capacity of the crops species.	 	 	 		
3.conserve and Protect biodiversity(flora& fauna, ecosystems)	Protect and enhance environmental settings for flora and fauna, habitats and ecosystems	- climate change Extreme weather event	Increasing flood risk Plantation and vegetation	Initially the flood risk will be maintained but watershed management measures (i.e plantation, protection, vegetation cover using alternative fuel sources and preventing conversion of forest land into agricultural land) would have positive impacts on the biodiversity and habitat in watershed over the long term					The significance of the positive impacts depends on the richness of the local biodiversity as well as appropriate community-based interventions

	Protect and enhance where possible natural conservation of sites	climate change Extreme weather event Vulnerability of protected /designated natural conservation site	Increasing flood risk	Improve watershed management supports conservation of species and medicinal plants along the entire river basins.	▲	▲	▲	Habitats are protected and biodiversity in short medium and long term along the entire river basin	
4. Conserve and protect natural &cultural Heritage	Protect and enhance where Possible Natural historic, cultural and archeological features, sites and buildings	Land use change Natural resource management Loss or damage to cultural heritage	-Reforestation -Clearing historic Building/ structures/features	Taking into account the current status of flood protection. The flood risk will continue to increase leading to increasing risk for cultural heritage sites except if protected by local heritage protection schemes/works	▲	▲	▲	The significance of the predicted impact depends upon the existence and historical values of the culture heritages along the river basins except for some rock carvings	Construction works adjacent to historical sites should be designed to be sensitive to the historic features of the area, with Flood protection measures for important archeological structures sites
5. protect and enhance landscape & visual amenity	Protect and enhance geological features landscape characters recreational sites and visual amenity	Land use change watershed management measures	Significant impacts on local landscape geological features and visual amenity in short term Sitting of dams could also provide opportunity to improve visual amenity by creating recreational sites Plantation and landscape management would reduce negative impacts	In short term the existing flood risk would remain same but the watershed management by planting trees. Protecting conversion of forest land into agricultural land would reduce tree uprooting, land erosion, and finally slow-down flood velocities and resulting impacts overtime Contribution to the enhancement of visual amenity	◎	▲	▲		Community –based compensatory measure should be introduced to enhance the characters and visual amenity of the watershed landscape
6. Promote climate change	Adapting to climate change vulnerability impact and flexibility for future responses	Climate change Extreme weather events	Increasing flood risk Implementing watershed Management plan	watershed management will have positive impact on geomorphological processes, flood velocities and flood impacts	▲	▲	▲		
7. Conserve protect water	Protect and improve the quality of surface and ground water resources	Climate change Extreme weather events	Increasing flood risk	Plantation will reduce land erosions debris and sedimentation generation that would improve water quality by reducing visibility turbidity impacts	▲	▲	▲		Additional measures being not a part of DMP to reduce water pollution sources surrounding the river body are required

				flooding in downstream river will continue to flow out of river banks deteriorating water quality Climate change projections and associated high flood risk would exacerbate the water quality deteriorating impact					
	Restore and improve watersheds by plantation	Climate change Extreme weather events	Increasing flood risk Flood plain/water shed management by plantation	Watershed and floodplain management by introducing flood and erosion control vegetation and plants fitting local environment would have positive impact on geomorphological processes and equally on quality of water	▲	▲	▲		
	Protect and enhance wetland by ensuring minimum fresh water flows	Natural connectivity between flood plains and river system	Continuity nutritional replenishing cycle	Initially the existing level of water flows to wetland will be maintained, but increasing flood risk will increase fresh water flows to wetlands	◎	▲	▲		
8. Conserve and protect sons	Protect and enhance where possible fluvial landforms in watershed and floodplains	Climate change Extreme weather events	Increasing flood risk	-increased flooding will continue to increase inundation of lakes and improving ecological health of these system	▲	▲	▲		
	Restore land/soil quality riparian corridors, watershed, catchments and floodplains	Changes in watershed management regime	Implementation of watershed management plan	Limited changes are expected to current watershed regime. Individual watershed management actions/non-structural measures are unlikely to have any significant impact	▲	▲	▲	Considering many watershed management works it is difficult to predict the impact of individual measures.	
Promote sustainable Land use	Promote and enhance environmental friendly land use	Changes in floodplain regime	Implementing floodplain management regulations	Limited changes are expected to current watershed regime individual watershed management actions /non-structural measures are unlikely to have any significant impact on land use change	▲	▲	▲	Considering many watershed management works it is difficult to predict the impact of individual measures	

Table 4: Impact of Assessment of Alternative-4:Maintain and Improve existing flood protection structures

SESA/ DMP Objectives	Sub-Objectives	Sources of Impacts	Pathway	Impact on Receptors	*Significance of environmental impacts* ▲ Positive-major ▲ major/minor ▲ Negative-major ▲ major/minor Minor) Neutral ◎			Comments for overall performance of the options against objectives (without migration)	Mitigation Measures proposed for further improvement and enhancement
					Short Term	Medium Term	Long Term		
Protect Human and health and population	Protect and improve the human health from the natural calamities	-climate change increase flood frequency of rainfall events	No Increase in flood risk vulnerable communities and residential areas along river banks and in flood plain	Improve the current standards of flood control protection The current local people would be protected in the short term to long term	◎	▲	▲	Meet objectives, the potential benefit would increase overtime	-
	Reduce flood risk to human population	climate change Extreme weather event and increase flood frequency	No increase in flood risk to vulnerable communities and residential area along river banks and in flood plains	Residential areas and properties would be at low risk	◎	▲	▲	Meet objectives, the potential benefit would increase over time	
2. Protect material Assets and critical infrastructure	Protect public utilities properties economic and agricultural areas and critical infrastructures	Failure of embankments/overlapping can result in damages and loss of services	Improving embankments structures	Improves the current standard of protection for public utilities and infrastructures	◎	▲	▲		

3.conserve and Protect biodiversity (flora& fauna, ecosystems)	Protect and enhance environmental settings for flora and fauna, habitats and ecosystems	- establishment raising to improve protection	Maintenance of current fluvial flood risk New operation works close to embankment	Maintenance of existing Sop will protect biodiversity, habitat and ecosystem Operational works have potential to disturb bird habitats in short term or can cause damages to wetlands and floodplains connectivity and interchange	▲	▲	▲	Current status of protecting is maintained in short and mid-term, there is concern that in long-term some habitat may become isolated from the wetland, therefore moderate positive impact are assessed in long term	
	Protect and enhance where possible natural conservation of sites	climate change and increased flood frequency due to heavy rain	No increase in the flood risk to historical building and archeological sites	Improve the protection standards of historical building and archeological sites	▲	▲	▲		
4. Conserve and protect natural &cultural Heritage	Protect and enhance where Possible Natural conservation sites	Climate and increased flood frequency due to heavy rains	Reduction of flood risk to protected sites	Maintenance of existing Sop will protect biodiversity, habitats and ecosystems Operational works have potential to disturb sites and natural migratory-bird Habitats in short term or can cause damages to wetland protected areas, and natural connectivity between the component of the ecosystem	▲	▲	▲	Provided that status of the sites/ features notified at designation will be maintained in short and medium term in long term concern raises that habitats may become isolated from wetland/main ecosystem and therefore moderate positive impacts have been assessed	

5. protect and enhance landscape & visual amenity	Protect and enhance geological features landscape characters' recreational sites and visual amenity	Up gradation/raising embankment	Maintenance of current protection standards Onsite impact due to raising of the structure and increased footprint	Raising height of embankments would maintain the current status of land scape and visual amenity in long term but may have localized visual amenity in long terms but have localized visual impact opportunities to improve degraded and damaged landscape or site features	▲	▲	▲	Positive impacts depend upon the current status of the site. Minor contribution towards achievement of the objective	To enhance the achievement of sub-objective, it is to create harmony between natural amenity of the landscape and structural elements Promoting adaption of building /infrastructure to natural land recreation status of the landscape
6. Promote climate change adaptability	Adapting to climate change vulnerability impact and flexibility for future responses	Increase of frequency of extreme weather event	Increased fluvial flood risk due to increase in glacier melt and torrential rains		◎	▲	▲	In short term the vulnerability to climate change is natural in long term impact positive due to rise in embankments considering mitigation measures for construction works minor contribution towards achievement of the objectives	
7. Conserve protect water resources and watershed	Protect and improve the quality of surface and ground water resources	Flood works structural measures local construction works	Flood resulting in contamination of surface water	Contamination released during phase with short term impacts	▲	▲	▲		
	Restore and improve watersheds by plantation	No impact identified	N/A	N/A	N/A	N/A	N/A		
	Protect and enhance wetland by ensuring minimum fresh water flows	No impact identified	N/A	N/A	N/A	N/A	N/A		
8. Conserve and	Protect and enhance where possible fluvial landforms in	Embankment raising /construction	No changes in the ongoing /existing processes	Protecting the current fluvial regime	◎	◎	◎	Current regime is maintained but no enhancement	

	watershed and floodplains								
	Restore land/soil quality riparian corridors, watershed, catchments and floodplains	Embankment raising /construction	No changes in the ongoing /existing processes	Maintain status-quo no restoration	◎	◎	◎	Current regime is maintained but no enhancement	
Promote sustainable Land use	Promote and enhance environmental friendly land use	Construction activities	Raising embankment	No land use charge	◎	◎	◎	Current regime maintained but no enhancement	

Table 5: Impact assessment of alternatives-5: flood diversion through bypass/diversion channels

SESA/DMP Objectives	Sub-objectives	Source of impacts	Pathway	Impact on receptors	Significance of environmental impacts ▲ Positive-(▲ major/minor ▲ Negative-(▲ major/minor Minor) Neutral -◎			Comments for overall performance of the option against objectives(without mitigation)	Mitigation measures proposed for further improvement and enhancement
					Short term	Mid term	Long term		
1. Protect human life, health and population	Protect and improve the human health from the natural calamities	Land use change	change in flood risk overtime	Existing level of health risk currently remain same, but will significantly improve overtime in mid and long term	◎	▲	▲		
	Reduce flood risk to human population	Land use change	change in flood risk overtime	Levels of flood risk would remain same for the short time, but will improve gradually taking into account future flood protection works and schemes	◎	▲	▲		

2. Protect material assets and critical infrastructure	Protect public utilities, properties, economic and agricultural areas, and critical infrastructures	Land use change	Construction of channels-change in flood risk overtime	-existing level of protection for infrastructure would remain same, but will improve gradually taking into account future flood protection works and local development activities -Existing protection level improve overtime in mid-term but may change in long term due to climate change and increasing development	O	▲	▲	Detailed assessment of fisheries/aquatic animals to be diverted in bypass channel would help for better impacts assessment of impacts exploring opportunities to create new habitat	Creation of targeted habitats and landscape associated with the proposed project designs
3. Conserve and protect biodiversity (flora & fauna, habitats, ecosystems)	Protect and enhance environmental settlings for flora and fauna, habitats and ecosystems	Land use change -loss of existing flora/fauna -new vegetation -creation of new habitat	Construction of channels -plantation	-Existing protection conditions for wild life and other biodiversity would remain same in short term -Water supply from main river would reduce overtime and there could be loss or damage to wetlands ecosystem in mid term -opportunities to create new habitats would reduce such impacts in long term	O	▲	▲	Detailed assessment of fisheries/aquatic animals to be diverted in bypass channel would help for better impacts assessment of impacts exploring opportunities to create new habitat	Creation of targeted habitats and landscape associated with the proposed project designs. Backwards and fish screening will be needed at the entrance to ensure retention of specific fish specials in main river to prevent dispersal of endemic species in suboptimal habitats

	Protect and enhance where possible natural conservation sites	Land use change -loss of existing flora/fauna -new vegetation -creation of new habitat	Construction of channels -plantation -introducing fisheries/habitats	-current conditions would remain same for wildlife and other biodiversity in short term -construction of channels would disrupt commercial fisheries in main river -channel construction could result in direct impacts on protected areas, but proper channel design would result creation of new habitat in adjacent areas. -Creation of new habitats for biodiversity would minimize negative impacts in long terms and mixed outcomes (positive and neutral) can be observed -new channels and habitats would naturalize overtime in long term	▲	▲	▲	Likely improved protection of biodiversity depends on the existing diversity and richness of the flora and fauna in the area.	
4. Conserve and protect natural heritage	Protect and enhance where possible historic, cultural and archaeological features, sites and buildings	-land use change -loss or damages to cultural heritage	Construction of channels	-Exiting flood risk would persist for cultural heritage with potential flood impacts/damages, although local schemes and projects. E.g future projects to protect cultural heritage can reduce high flood risk -construction of channels and re-profiling might have minimum impacts on historical buildings -new opportunities to restore and protect exposed archaeological features /historical buildings -reduced flood risk as a result of channel construction will continue to protect cultural heritage	▲	▲	▲	Likely improved protection level for cultural heritage depends on the existence and significance of cultural heritage. Otherwise construction of channel cans also result and loss of archeological features.	-construction works adjacent to historical sites should be designed to be sensitive to the historic features of the area. -Flood protection measures should include protective measures for important archaeological structures/sites. -extensive mitigation would be required during construction phase including geophysical studies, GIS maps, data recording.

5. Protect and enhance landscape & visual amenity	Protect and enhance geological features, landscape characters, recreational sites and visual amenity	-land use change -construction of channels	Changes in landscape/landforms	-construction of channels would results in new engineering structures (e.g. bunds) that would be unlikely to enhance landscape features in short term, but overtime the system will get mature to improve the landscape features. -in long term plantation would become a part of landscape features and would contribute to enhancement	▲	▲	▲		Careful selection of vegetation and plantation is required fit for the local environment and landscape characteristics. Compensatory measures and plantation would enhance landscape characteristics and connectivity between floodplains and river.
6. Promote climate change adaptability	Adapting to climate change vulnerability, impacts and flexibility for future responses	-climate change -extreme weather events and increasing frequency of floods	No increase in flood risk overtime	-construction of channel would result in significant reduction in flood risk, with increasing floodplain management the significance of the objective overtime will increase. Although resource consumption and energy use patterns needs to be compatible.	▲	▲	▲		
7. Conserve and protect water resource and watershed	Protect and improve the quality of surface and ground water resource	-climate change -extreme weather events and frequent floods -deforestation and land erosion in watershed.	Increasing flood risk overtime		▲	▲	▲		
	Restore and improve watersheds/floodplains by promoting plantation	N/A	N/A	N/A	N/A	N/A	N/A		

	Protect and enhance wetlands by ensuring minimum fresh water flows	Channel construction	Land use change changes in water pathways	-current conditions would remain same for wetland ecosystem in short term -water supply from main river would reduce overtime and there could be loss or damage to wetlands ecosystem in midterm -with creation of new floodplains, new wetlands can be created. Climate change is likely to result in heavy river flows and will reduce water shortage impacts on existing wetlands	O	▲	▲		
8. Conserve and protect soils	Protect and enhance where possible fluvial landforms in watershed and floodplains.	Land use change	Channel construction	-immediately there would be no significant impacts fluvial landforms but overtime as river reaches dynamic equilibrium with the existing sediments and hydrological regime, the trends are likely to increase deposition in new floodplains -Climate change is likely to contribute to heavy river flows in summer and thus would increase deposition process, but no impact on watershed landforms.	▲	▲	▲		It is envisaged that only strictly required engineering would be carried out during construction phase this can affect sensitive landscape, but will naturalize overtime by improving connectivity between floodplains and channels this will improve ecological values and thus no ecological values and thus no additional mitigation measures are required.

	Restore land/soil quality riparian corridors, watershed, catchments and floodplains	Land use change	Channel construction	-immediately there would be no significant impacts considering other measures in particular floodplain management. -the construction of new channels would encourage inundation of new floodplains and thus would improve connectivity of floodplains in midterm. -considering climate change impacts and increased river flows in summer would enhance the positive effect of connectivity.	O	▲	▲		It is envisaged that only strictly required engineering would be carried out during construction phase. This can affect sensitive landscape, but will naturalize overtime by improving connectively between floodplains and channels, this will improve ecological values and thus no additional mitigation measures are required.
9. Promote sustainable land use	Promote and enhance environmental friendly land use	-land use change -construction activities	Channel construction	-construction of channels would results in new engineering structures (e.g. bunds) that would be unlikely to enhance environmental friendly land use, but over time with plantation and creation of habitats will improve sustainable effects of land use mid and long terms					It is envisaged that only strictly required engineering would be carried out during construction phase. This can affect sensitive landscape, but will naturalize overtime by improving connectively between floodplains and channels, this will improve ecological values and thus no additional mitigation measures are required.

Table 6: Impact assessment of alternatives-6: flood diversion through bypass/diversion channels

SESA/DMP Objectives	Sub-objectives	Source of impacts	pathway	Impact on receptors	Significance of environmental impacts ▲ Positive-(maj ▲ major/minor ▲ Negative-(maj, ▲ major/minor Minor)	Comments for overall performance of the option against objectives(without mitigation)	Mitigation measures proposed for further improvement and enhancement

					Neutral ○				
1. Protect human life, health and population	Protect and improve the human health from the natural calamities	-climate change -extreme weather events and increased flood frequency	Increasing flood risk	-In a short term level of flood risk and health risks remain same but gradually improve overtime with the implementation of other food protection works and schemes	Short term	Medium term	Long term		
	Reduce flood risk to human population	-climate change -extreme weather events -loss/damages to material assets	Increasing flood risk	-In a short term level of flood risk and health risks remain same but gradually improve overtime with the implementation of other food protection works and schemes	○	▲	▲		
2. Protect material assets and critical infrastructure	Protect public utilities properties, economic and agricultural areas and criticalinfrastructure.	-climate change -extreme weather events -loss/damages to material assets	Increasing flood risk	In short term,level of flood risk for public utilities and infrastructure would remain same but gradually improve overtime with the implementation of other food protection works and schemes. -increasing flood risk would adverse impacts on agriculture and standing crops depending upon the resistance capacity of the crop species.	○	▲	▲		
					▲	▲	▲		
3. Conserve and protect biodiversity(flora & fauna	Protect and enhance environmental settlings for flora and fauna, habitats and ecosystems	Climate change -Extreme weather events	-increasing flood risk	-initially the flood risk level will be maintained, but considering climate change and increasing flood risk/frequent floods events and geomorphological changes would have negative impacts on the habitats	▲	▲	▲		Ensuring freshwater supply during flood season would protect and enhance biodiversity at local and regional level

	Protect and enhance where possible natural conservation sites.	Climate change -extreme weather events - vulnerability of protected/designated natural conservation sites	Increasing flood risk	-improve the protection standard of protected areas -Improve river ecology -improve health of wetlands by providing fresh water in flood season -improve protection and health of riverine forests and habitats local wildlife -improve the food security and spawning habitat for international and local migratory birds	▲	▲	▲		Ensuring freshwater supply during flood season would protect and enhance biodiversity in short, medium and long term.
4. Conserve and protect cultural heritage	Protect and enhance where possible historic, cultural and archaeological features, sites and buildings.	-land use change -Natural resource management -loss or drainage to cultural heritage	-reforestation -clearing historic buildings/structures/features	Taking into account the current status of flood protection, the flood risk will continue to increase leading to increasing risk for cultural heritage or historic buildings, some cultural heritage sites could be protected by local heritage protection schemes/works.	▲	▲	▲	The significance of the predicted impacts depends upon the existence and historical values of the cultural heritage	Construction works adjacent to historical sights should be designed to be sensitive to the historic features of the area. -flood protection measures should include protective measures for important archaeological structures/sites. -Extensive mitigation would be required during construction phase including geophysical studies, GIS maps, data record and keep watching during construction of channels.
5. Protect and enhance visual landscape amenity	Protect and enhance geological features, landscape characteristics, recreational sites and visual amenity	-land use change -extreme weather events	Change in vegetation and cultivation patterns	In short term the existing flood risk would remain same, but climate change and increasing flood risk will increase potential damaging impacts e.g. tree uprooting, land erosion, damages to flood protection infrastructure and buildings	▲	▲	▲		Community based compensatory measures should be introduced to enhance the characters of the river systemby connecting it with landscape

6. Promote climate change adaptability	Adapting to climate change vulnerability, impacts and flexibility for future responses	-climate change -extreme weather events	-increasing flood risk -implementing floodplain managements and regulations	-considering climate change impacts , flood plain regulations zoning and future development would reduce flood impacts	▲	▲	▲		
7. Conserve and protect water resource and watershed	Protect and improve the quality of surface and ground water resources	-climate change -extreme weather events	Increasing flood risk	Flooding will continue to flow out of the river bank deteriorating water quality. -climate change projections and associated high flood risk would exacerbate the water quality deteriorating impact.	▲	▲	▲		Additional measures, being not part of a DMP to reduce water pollution sources surrounding the river body are required.
	Restore and improve watershed footprint/flood plains by promoting plantation	-climate change -extreme weather events	Increasing flood risks -floodplain watershed management by plantation	Watershed and floodplain management by introducing new vegetation's and plants fitting local environment would have positive impacts geomorphological processes and thus on quality of water	▲	▲	▲		
	Protect and enhance wetlands by ensuring minimum fresh water flows	-natural connectivity between floodplains and river system	-continuity of nutritional replenishing cycle	Initially no significant impacts but gradually the connectivity between the river and floodplains will improve over time leading to improved river ecology.	▲	▲	▲		
8. Promote sustainable land use	Protect and enhance where possible fluvial landforms in watershed and floodplains	-climate change -extreme weather events	Increasing flood risks	Increased flooding will continue to increase inundation of lakes and wetlands that will contribute improving ecological health of these systems.	▲	▲	▲		
	Restore land/soil quality, riparian corridors, watershed, catchments and floodplains	Changes in floodplain regime	Floodplain management regulation	Limited changes are expected to current floodplain regime. Individual floodplains management actions/non-structural measures are unlikely to have any significant impacts.	▲	▲	▲	Considering many floodplain management works it is difficult to predict the impacts of individual measures	

9. Promote sustainable land use	Promote and enhance environmental friendly land use	Changes in floodplain regime	Implementing floodplain management regulations	-limited changes are expected to current floodplains regime. Individual floodplains management actions/non-structure measures are unlikely to have any significantly impacts on the restoration connectively or riparian corridor. -considering climate change and increasing flood risk, the connectivity between floodplains and the river will improve overtime	▲	▲	▲	Considering many floodplain management works it is difficult to predict the impacts of individual measures	

Table 7: impact assessment of alternative -7: improve and extend FEWS

SESA/DMP Objectives	Sub-objectives	Source of impacts	Pathway	Impact on receptors	Significance of environmental impacts ▲ Positive-(▲ major/minor ▲ Negative-(▲ major/minor Minor) Neutral -○			Comments for overall performance of the option against objectives(without mitigation)	Mitigation measures proposed for further improvement and enhancement
					Short term	Medium term	Long term		
1. Protect human life health and population	Protect and improve the human health from natural calamities	No impacts identified	N/A	-improve the standard of protection by early dissemination of flood warnings -reduce injuries and the loss incidents overtime	▲	▲	▲		
	Reduce flood risk to human population	No impacts	N/A	Improve the standard of protection by early dissemination of flood warnings	▲	▲	▲		

2. Protect material asset and critical infrastructure	Protect public utilities, properties economic and agricultural areas, and critical infrastructures	No impacts	N/A	-Limited opportunities to protect important and precious belongings -loss of public utilities, buildings, agricultural and standing crops	▲/▲	▲	▲		

Mitigation hierarchy

(a) Anticipate and avoid risks and impacts;
(b) Where avoidance is not possible, minimize or reduce risks and impacts to acceptable levels;
(c) Once risks and impacts have been minimized or reduced, mitigate; and
(d) Where significant residual impacts remain, compensate for or offset them, where technically and financially feasible.

ANNEX 6: PRELIMINARY COST ESTIMATES FOR IMPLEMENTING THE DMP TAKING COGNIZANCE OF SESA PRIORITIES.

The following tables show the estimated costs involved in implementing the SESA. Costs are established in consideration of the following elements:

- Human Resources.
- Materials and Equipment.
- Training.
- Administration.
- External Consultants; and
- Other.

These costs should be considered as preliminary estimates only and should be refined by the steering committee on a need basis during initial implementation of the SESA.

Table 1: Cost Summary – Priority 1

Recommendation	Cost
R1 Streamline Environmental Responsibility with improved Financial Resource;(Establish State Flood Risk Mitigation Control and Management Agency)	$950,000
R2 Improved management of SESA and ESIA process for the watershed catchment development and flood plains	$200,000
R3 A pilot watershed for management plan for upper Ona;	$390,000
R4 Implement Comprehensive Training for Watershed Catchment Development and flood mitigation programmes for environmental and land officers	$400,000
R5 Improve the Policy, Legal and Regulatory Framework for Watershed catchment development, flood mitigations, control and management	$200,000
R7 Enforce Building Regulations and Land Use Planning with Involvement of Private Sector/ Community Participation	$250,000
R11 Develop and Implement Flood Prevention , Proofing Mitigations and Response Programmes and projects	$250,000
R10 Implement Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) with regular updates	as stated in DMP report
Sub total	**$2,640,000**

Table 2: Cost Summary – Priority 2

Recommendation	Cost
R6 Establish a Dedicated Spatial Information System and flood Alert Warning System	$255,000
R8 State wide SESA Cooperation Program with other development programs in the watershed catchment	$100,000
R11 Establish a Trust Fund for ecosystem and Watershed Conservation	$80,000
R12 Establish Environmental Damage Liability	$150,000
R13 Require Environmental Insurance Coverage	$150,000
R14 Improve the Consultation and Community Engagement Process and dialogue between government, Civil Society and the Water Sector Industry.	$50,000
Sub-total	**$885,000**

Table 3: Cost Summary – Priority 3

Recommendation	Cost
R15 Creation of a Water Marshall Private Sector Operators Groups	$280,000
Sub total	**$280,000**

The total estimated cost for implementation of Priorities 1, 2 & 3 is:

	Total Cost of Priority 1:	$2,640,000
	Total Cost of Priority 2:	$885,000
	Total Cost of Priority 3:	$280,000
	Total Cost	**$3,805,000**

ANNEX 7: INSTITUTIONAL GAPS TO DELIVER FLOOD RISK MANAGEMENT MANDATE IN IBADAN

S/N	Flood Risk Mitigation Institution Responsibility	Gaps in current Institutional framework	Available Information Resources from Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP) Project to Support	Flood Mitigation & Management Outcomes
1	Establish and Map out Channel Basin and Catchment	No delineation / Nor designation or Map out of Channel Basin or watershed catchment	Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP)	Develop Catchment Laws, Regulations, Standards and guidelines on land use by the floodplain, hilly terrain drainage infrastructure and landscape setbacks to reduce risks of Floods
		Existing Forest Ordinance on Forest reserves have been modified without policy support for green infrastructure to reduce run off and consequential flash floods		Integration of DMP and FRM concerns in critical infrastructure development. Integration of the DMP with the Ibadan urban city masterplan
2	Map out the Setbacks and ROW on channels	No Mapping of Setbacks and therefore no clear demarcation for no development zones in both the Environment and Physical Planning Laws.	SESA Report and Concepts on Landscape and setback mapping and the Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP)	Enforce the no development zone along the setback of the channels / catchment. Integration of DMP and FRM concerns in critical infrastructure development. Integration of FRM concerns in social development and protection planning
3	Develop Flood Mitigation Programmes and measures along the Channels and Catchments to include: Green infrastructure requirements for structure in flood plain and hilly terrains adjoining flood plains, Enlighten the public on flood proofing and flood mitigation requirements Liaise with Communities along catchment and channels for water stewardship and catchment management plans	Physical Planning Regulations need to consider architectural designs suitable for the flood prone areas in the land use permits. Poor floodplains regulations: New policy guidelines and regulations are required to address: - Restrictions for use of floodplains, and river reaches.	SESA Report and Concepts on Green Infrastructures and Reducing Flood Hazards and Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP)	Enforce Flood proofing, flood mitigation requirements along the catchment and channels Relevant stakeholder involvement and community participation and consultation in DMP implementation. Defined Penalties for violator
4	Developing and implement structural and non -structural infrastructures to manage and reduce flood risk Develop, design and procure embankment and flood barriers infrastructures to protect against flood Maintain and manage the structural and non- structural infrastructures against flood	Inadequate flood storage capacities: new dikes and reservoirs (preferably serving multi-purposes) are required to enhance water storage capacity in the Ibadan. Inadequate flood regulation/diversion channels: construction of new flood diversion channels or escape channels	Channelization works, Crossing Improvement, Potential Flood Balancing Weirs and Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP)	Improve Conveyance of Flood Water Planned and Budgeted Infrastructural Maintenance

		Inadequate flood retention basins: it is required to explore suitable sites for emergency and retention basins to alleviate flood peaks Weak flood early warning system (EWS): there is need to strengthen and extend FEWS to ensure early dissemination of flood warnings for better protection of human lives.		
5	Understanding the phases of flood disaster cycle (TIMING) Enlighten the public and implement the community based early warning system Develop and implement messages for public information targeting Flood Disaster Preparedness	Inadequate capacity within the Ministry to obtain, store data and utilize the data for mitigating flood risk along the catchment.	Hydrological Studies and Data on all the Channels	Flow regime of Channels
		No installation of Simple River Gauge, Non-involvement of Community where such are available. No interaction	Installation of River Gauges on Channels	Early Warning system
6	Determining what and who are at risk of flooding along all the channels and its catchment	The Ministry of Environment and/ or the Ministry of Lands, Housing and Urban Development literarily have to go on all the channels and flood plains to determine who is at risk because of inadequate manpower and capacity to use google and GIS software's on land use	Flood Damage Estimation Approach Development of Asset Valuation and Classification Damage Losses Evaluation Methodology Damage Loss Procedure and Results	Flood Hazard Map Dynamic information of location, frequency of flood event Land use/ Shape file Integration of climate change challenges in DMP;
7	Mitigate Residual Risk from Flood among others Determine and implement measures to improve coping and adaptive capacities of vulnerable groups in the catchments, Determine resources allocated for aftermath flood event rehabilitation and its integration into community basin development, Oversight functions for household insurance programme for properties on the flood plain.		SESA Environmental Report	Evacuation points and plans in place Post-disaster impact assessment to develop inventory of environmental receptors vulnerable to flood risk and potential damages

ANNEX 8: CHECKLIST OF ENVIRONMENTAL AND SOCIAL

	Impacts	Dams and reservoir			Detention/retention basins			Embankments / dikes			Bypass/ diversion channels			Channelization		
		Upstream	Impoundment	Downstream	Upstream	On-site	Downstream	Upstream	On-site	Downstream	Upstream	On-site	Downstream	Upstream	On-site	Downstream
(1)	Stream bed changes	○	○	○		○		○	○	○	○	○	○	○	○	○
(2)	Catchment run-offs and erosion			○			○									
(3)	Denudation e.g. flood plains and effect on traditional agriculture			○			○			○	○		○			
(4)	Inundation impacts e.g. farms, forest lands and mineral areas		○			○				○	○		○			○
(5)	Impacts on aesthetic, cultural, scenic or historical sites		○			○			○	○		○			○	
(6)	Pollution			○		○	○				○		○			
(7)	Inundation impacts e.g. loss of vegetation, wildlife habitat/species		○	○		○	○		○	○				○	○	○
(8)	Weeds proliferation/ riparian vegetation		○			○			○		○		○	○	○	○
(9)	Fisheries e.g. migration effects	○	○	○	○	○	○		○		○	○			○	
(10)	Water quality, salt intrusion		○	○									○			○
(11)	Seismicity		○													
(12)	Groundwater level/ recharge and salt intrusion		○	○					○		○	○			○	○
(13)	Health issues		○	○		○	○		○			○				
(14)	Impact on settlements- e.g. municipality	○	○	○	○	○	○		○	○		○			○	
(15)	Physical Displacement, land take	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
(16)	Economic displacement	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

Table 2: Environmental impact of structural flood management measures

	Item	Environmental Issues
1.	Stream bed changes	Assess stream bed changes due to flow regime change as a result of structural measures
2.	Catchment run-offs and erosion	Analyse watershed hydrology and sediments yields based on timing and magnitude of flood run offs dues to land use changes , deforestation etc.
3.	Denudation e.g. flood plains and effect on traditional agriculture	Evaluate changes in land use. Increases in population dues to planned or unplanned resettlement from inundated areas may increase cultivation fuel collection, and logging.
4.	Inundation impacts e.g farms, forest lands and potential mineral areas	Assess impacts on species diversity and watershed, Inundated vegetation may lead to loos of valuable timber and important or rare species. Proliferation of weeds can increase disease vectors; affect water quality, fisheries, and navigation
5.	Impacts on aesthetic, cultural, scenic or historical sites	Document implication on archaeological , historic, palaeontologic, religious and aesthetic or natural sites and unique values, which need to be conserved or salvaged
6.	Pollution impacts	Assess pollution from settlements and cultivation. This should be looked at in the context of fisheries, recreation(tourism), perennial waterways and rivers; advantages for drinking and irrigation recreation
7.	Inundation impacts e.g loss of vegetation, wildlife habitat/endangered species	Analyses site implication. Siting may minimize extinctions leading to loss of important species, including species, including birds. Discuss mitigation measures. Biotic rescue can assist.
8.	Weed proliferation/riparian vegetation	Make assessment for weed proliferation, which can increase disease vectors, and enhance transpiration, impair fish and water quality (e.g Water Hyacinth (Eichorma), Water lettuce (Pistia), Clogging impair navigation, recreation and irrigation.
9.	Fisheries e.g migration effects	Acquire information on migratory fish stocks (if any), which may be impacted without passage facilities. Protect fish species from being endangered Fish promotion in the reservoir can mitigate and produce more than prior to the project
10.	Water quality, salt intrusion	Analyse potential for salt intrusion into estuarine and lower river basin areas. This may result from sustained or season reduction in river flow. Depending on what happen upstream and retention time within reservoir, water quality may be affected by salt accumulation with reservoir for example, Eutrophication from weeds biomass decay, turbidity, pollution from sediments may result.
11.	Seismicity	Assess the situation for induced seismicity and tectonic movements may increase due to structural measures; monitoring is to be on routine basis
12.	Ground water level/ recharge	Estimate groundwater levels. Higher levels of due to the high water levels in the reservoir for example. Downstream, in old flood plain areas, the groundwater level may fall but in irrigated areas, it may rise
13.	Health issues	Asses implication of water-borne disease, which may increase without precautionary measures implemented (e.g vector control, prevention) schistosomiasis, encephalitis, and malaria. Similar problem may result in the reservoir itself, primary from irrigation and associated canals
14.	Impact on settlements-e.g municipality	Evaluate impact of possible inundation on houses, villages farms, infrastructure including navigation problems and transmission lines. Can projects become regional development projects, which integrate rural development for people e.g for vulnerable ethnic minorities, with watershed management and irrigation? Involuntary resettlement imposes major social and economic cost

ANNEX 9: STAKEHOLDERS INVOLVED IN IFM

Government Ministries and agencies	**Areas of interest and responsibilities**
• Agriculture and fisheries	• Planning for seasonal crops, decisions relating to frequency of flooding the fields for replenishment of nutrients, controlling the usage of pesticides and fertilizers, vaccination of livestock, management of rice and seed banks • Planning for fish spawning, enforcement of rules on restricted fishing in certain parts of the basin
Water management Resources and responsibilities	Monitoring water quality and quantity, construction and maintenance of flood mitigation structures, ensuring the proper utilization of water resources responsibilities
Public works	Building and maintenance of urban infrastructures, flood damage assessment, repair of flood-damaged structures
• Transport	• Improved river navigation systems, construction and maintenance of bridges, roads, railways and waterways, flood protection of such structures and subsequent repairs
• Communication and broadcasting	• News releases on latest flood situation, providing weather and flood forecasts on radio and TV, education and public awareness of flood issues
• Environment and natural resources	• Conservation of natural resources, identification of renewable energy, rapid environmental assessment after a flood event, enhancing public awareness
• Home affairs and foreign affairs	Liaison with countries sharing transboundary basins, international non-governmental organizations, and external donors and funding agencies
• Health departments	• Provision of health services, overseeing medical relief efforts Such as the distribution of medicine during floods, treatment of injuries and illness, prevention of epidemics, raising public awareness of waterborne diseases and of the importance of clean water and personal hygiene
• Rural development	• Construction, maintenance and repair of rural infrastructures
• Land management and urban planning	• Enforcement of proper land use planning, development planning in urban areas of the river basin
• Military and police Force	• Flood fighting, search and rescue, relief distribution
• Economics and finance	• Budget allocations for flood mitigation at various levels and river basin development
• Planning	• National state or district development plans in which flood management should be incorporated
• Women, children and veteran affairs	• Development of special flood protection programmes for vulnerable groups, welfare of these groups, public awareness campaigns targeting these special groups
• Culture and religion	• Maintenance and protection of important religious and cultural sites, public awareness raising religious centres offering safe haven for flood victims, organizing voluntary groups
• Education	• Schools as centres for dissemination of information on water resources management and flood preparedness to the public, safe shelters, and as a place for public awareness activities targeting children and teachers, incorporation of flood risk management concepts into school curriculum
Government disaster management institutions	**Areas of interest and responsibilities**
• Disaster management offices at national, state and district levels	• Development and implementation of disaster management plans at various levels, public awareness campaigns, capacity-building for disaster management practitioners and the communities, issuance of warnings, construction and maintenance of safe shelters and areas, preparing for flood emergency management and coordination with external aid agencies
Flood-prone communities	**Areas of interest and responsibilities**
• Landowners or Farmers	• Understanding the local hazards in order to protect crops, land and other property from flood damage, complying with land use management laws, understanding the consequences of malpractice of land use issues, knowing how to voice their concerns

• Rural and urban residents	• Understanding existing risks; knowing how to protect lives and properties; recognizing the signs of impending hazards (indigenous knowledge); responding to flood situations; being aware of escape routes and location of shelters; understanding the links between water, land use management and floods, temporary shelters and information sources; participating in emergency drills
• Fishermen	• Being aware of flood situation and knowing what to do to save their livelihoods, understanding key environmental concerns, knowing how to voice their concerns
Other basin communities	**Areas of interest and responsibilities**
• Water user associations	• Having a good understanding of land use regulations, having knowledge of drainage conditions, understanding functions of flood moderation requirements of multi-purpose reservoirs, knowing how to voice their concerns
• Watershed and forest management committees	• Knowing potential hazards of inadequate watershed and forest management policies and practices relating to landslides and mudflow risks in the areas, knowing where to find hazard information and how to react, helping provide assistance to victims in such situations
• River basin organizations	• Development and implementation of basin development plans, improvement of facilities for preserving water retention, working closely with governments of riparian countries and relevant line agencies, providing a common platform for the basin communities such as government agencies, communities and NGOs, in order to meet and share ideas, information and lessons learned
Scientific institutes or organizations	**Areas of interest and responsibilities**
• Meteorology and Hydrology	• Monitoring weather conditions, water levels in rivers and tributaries, generating and issuing flood forecasts
• Water resources management research centres and institutes	• Monitoring of water quality to find means to preserve the water ecosystem, monitoring of resources in the river basins (consumption rates, how much reserves left, how to preserve, recycle), sharing findings with relevant government and non-governmental agencies and other users, ensuring that data disseminated are user friendly
• Environmental Research institutes	• Environmental impact assessments, impact monitoring, environmental preservation and pollution control research, raising public awareness of environmental preservation, sharing findings with relevant governments, non-governmental agencies and other users
• Irrigation and agricultural research centres	• Finding ways to improve crop yield with minimum usage of fertilizers and pesticides, improvement of crop varieties in the region to withstand flood inundation, provision of training to farmers and other users in farming techniques in flood-prone areas
• Climate change and hazard related research institutes	• Research on climate change and its impacts on increased Frequency and severity of floods, public awareness raising of hazards and their impacts, capacity-building programmes
Registered Non-governmental organizations (NGOs)	**Areas of interest and responsibilities**
• Flood and Emergency management centres or groups, human and environmental interest groups	• Understanding and advocating IFM in national, state and district development plans, assisting national, state and district authorities to develop and implement suitable flood management programmes, facilitating participation of communities in such decision-making processes, raising public awareness, performing community need assessments, assisting them in conveying their needs to decision makers, planning flood emergency preparedness and response, providing capacity-building for all stakeholders, working closely with the community to develop and implement community-based flood preparedness programmes, coordinating with other NGOs
• Technical and Professional societies or associations	• Providing capacity-building at various levels, technical know- how to local government in monitoring and evaluation of flood management plans and technical support to flood and emergency management groups

• Humanitarian relief organizations	• Distributing relief supplies to flood victims
• Development Agencies(international, regional, national, local)	• Advocating adoption of IFM at the basin or national level, greater public participation in IFM planning, linking macro-scale international capabilities and experience to the individual needs of a particular country or a community
• National Red Cross Societies	• Establishing and maintaining Red Cross volunteer networks; providing community-based emergency preparedness, first-aid training and flood fighting and emergency response; making quick damage and loss assessments after a flood event, providing capacity-building for the community and volunteers
• Mass organizations (Women's Union, Youth Union, Farmers' Union)	• Ensuring the welfare of special focus groups, protecting them and providing assistance in maintaining their livelihoods, raising public awareness of the focused groups, undertaking specific tasks, for instance women's groups managing emergency kindergarten, youth groups forming search and rescue groups, Farmers' Union, establishing grain banks in villages
Voluntary Organizations	**Areas of interest and responsibilities**
• Red Cross volunteers	• Coordinating with various voluntary organizations, faciliting community-based emergency preparedness, search and rescue, carrying out flood fighting and emergency response, performing rapid damage and loss assessment after a flood event, providing capacity building for the community and volunteers, educating the public on basic flood response and preparedness
• Other voluntary organizations	• Distributing relief supplies to flood victims, faciliting community based emergency preparedness, flood fighting and emergency response, implementing focused activities related to flooding, for example, rapid environmental assessment by a team of volunteers from a local university, retrofitting of individual houses by volunteer groups of engineers
Private sector	**Areas of interest and responsibilities**
• Transportation and shipping companies	• Facilitating transport of commuters and goods, ensuring maintenance of vehicles, vessels and roads in accordance with the law, assisting in relief and emergency response operations as needed
• Construction companies, private developers and real estate agencies	• Proper land use management, such as ensuring conformity to existing rules, protection and flood-proofing of buildings, coordination with flood insurance companies, understanding the risks of unplanned development, costs and benefits of flood protection
• Waste management and utilities	• Providing standardized waste disposal systems, preventing interruption of utility services, providing adequate safeguarding measures, carrying out post-flood recovery operations
• Industrial sector and industrial organizations	• Installing appropriate waste disposal schemes, providing alternative jobs for the community, proper land use management, building awareness of risk caused by diffusion of stored toxic chemicals
• Logging companies	• Having sufficient understanding of deforestation and environmental impacts and being able to rectify the problems, for example, replanting trees in upstream areas, avoiding logjams through proper management
• Agriculture and Aquaculture production farms	• Understanding the impacts on the environment and preserving it through installation of appropriate waste disposal methods
• Small local businesses	• Understanding the risks in the area and employing schemes such as flood-proofing and flood insurance to protect them against risks
• Hydropower	• Operating reservoirs to keep flood risks in view and maintaining environmental flows

ANNEX 10: VULNERABILITY REDUCTION STRATEGIES

Vulnerability conditions	Cause	Strategy
Physical/Material		
• Initial well-being	• Malnutrition, lack of	• Raising awareness of flood

	clean water and sanitation, exposure to waterborne diseases, lack of medical facilities and knowledge of how to protect oneself, no food stock saving	related health issues such as the importance of clean water and sanitation and how to achieve it, distribution of water purifiers, pills and food, setting up of emergency health units in flood prone areas.
• Weak infrastructures	Unsafe, flimsy houses, lack of flood-proofing knowledge • Non-compliance with building codes or lack of building codes • Lack of sanitation • Lack of lifelines (electricity, water, roads) • Lack of means of transportation	• Granting government-subsidized building of safer houses for the poor, creating awareness of affordable flood-proofing practices • Enforcing building codes • Improving of infrastructures • Promoting transportation facilities
• Occupation in a risky area (insecure/ risk-prone source of livelihoods)	Lack of skills, poverty • Lack of access and control over means of production • Lack of market access	• Providing skill improvement training, market access and other means of fighting poverty
• Degradation of the environment	Illegal logging and fishing, improper garbage disposal	Regulating logging and fishing practices and installing waste treatment systems through incentives and trade-offs, water quality monitoring, raising public awareness of environmental conservation and management (why and how)
Constitutional/Organizational		
• Lack of leadership, initiative, organizational structures	• Lack of capacity development and institutional set-ups	• Training courses for community leaders. Organizational set-ups with clear assignment of Responsibilities
• Lack of or limited access to political power and representation	• Lack of legal frameworks and national government support, totalitarian regimes, fear of failure, lack of initiative	• Training of community leaders in community organizing, skill improvement training to reduce poverty
• Lack of or poorly resourced national and local institutions	• Lack of support from National government, lack of, or poor human, financial and material resources	• Strengthening local institutions through training, seeking external help for more effective technology transfer and financial support, seeking government and international support, establishing support networks for information and knowledge sharing
• Unequal participation in community affairs	• Unequal opportunities for women and ethnic minorities • Lack of organizing skills, lack of information on local hazards and associated risks, no support from national government to enhance	• Sensitizing the government to set public participation policy in disaster management and planning, awareness raising at the community level • Establishing legal and institutional frameworks, compelling development activities to seek community participation, advocating adoption of the public participatory process at the

		national level
• Inadequate skills and educational background	• Lack of capacity-building resources	• Training for community supported by local and national government
• Weak or non-existent social support networks	• Lack of support from the government after disasters, lack of social institutions such as NGOs, lack of unity and cooperation	• Application of social welfare system, third-party involvement (RBOs and NGOs), participatory risk and need assessments at community level
• Limited access to outside world	• Remote locations, lack of communication facilities, lack of knowledge and willingness to learn	• Strengthening basic Infrastructures such as communication and transportation facilities, awareness raising of community
Motivational/attitudinal		
• Lack of awareness, certain beliefs and customs and fatalistic attitudes	• Remote location with no communication facilities, lack of education	• Raising awareness of disaster mitigation and preparedness, participatory risks and needs assessments at community level, improving basic infrastructures such as communication and transportation facilities
• Heavy dependence on external support	• Lack of confidence to overcome the situation and external support for independence; only ad hoc • Support for disaster. • Devastating impacts of disasters in which community members lose everything, poorly planned relief activities, indolence, lack of skills to obtain alternate livelihoods, extreme poverty	• Microcredit schemes, skill improvement training • Appropriate exit strategies for relief Operations

ANNEX 11: TRAINING NEEDS ANALYSIS FOR PROJECTS IMPLEMENTATION TEAMS ON THE IUFMP

Introduction

For training to be effective, it should be designed to meet

- the requirements for improving Safeguard instruments being SESA ESIA, ESMP, ARAP, RAP practice on the project; and
- the specific needs of the people who attend the training session or course.

The success of the safeguard training also depends upon the skills of those designing and presenting the courses. They need to be knowledgeable about the country's safeguard processes and experience and have an understanding of their relationship to key characteristics of the societal setting.

The training needs analysis in this section is intended to assist the trainer/course designer in compiling the information that is required to design an effective safeguards training strategy, one that will build institutional and human capacity. Even if specific safeguard training needs have been already identified undertaking all or part of this analysis will still be useful. Current or recent safeguard instruments training and capacity building activities should be reviewed. This will help to determine the feasibility of any proposed safeguard training; for example by identifying priorities and demands for which there is no, or insufficient, provision. Specifically, the training needs analysis establishes:

- the purpose and scope of safeguard instruments training;
- the groups who require training; and
- the type and level of training that should be provided for each group.

The training needs analysis also examines the influence of the broader setting (including political, institutional, social, and environmental conditions) on the feasibility of and options for Safeguard Instruments training. Some of these conditions may constrain the introduction and/or implementation of the Safeguard Instruments process or elements such as public consultation. Others may provide opportunities for the use or strengthening of Safeguard Instruments, for example, to address pressing issues of sustainable development or to meet international lending or aid requirements. This information indicates how the design and delivery of Safeguard Instruments training are related.

Who needs to be trained?

Anyone with an involvement, or an interest, in the Safeguard Instruments process can benefit from training. However, experience indicates that the demand for training is more frequent from those stakeholders who have key roles in the Safeguard Instruments process. They also require more intensive training and stand to gain the most benefit from this.

Key target groups for Safeguard Instruments training include:

- Practitioners — Safeguard Instruments project managers and environmental specialists who undertake the impact studies and analyses;
- Contractors — who handle specific projects for which a safeguard instruments have been developed;
- Administrators — who manage the implementation of the Safeguard Instruments process, or ensure quality control of key aspects, such as public consultation, review of Safeguard Instruments reports; and
- Decision-makers — who approve (or modify) proposals subject to Safeguard Instruments, and often need to be sensitized to the benefits of the Safeguard Instruments process.

Other participants in the Safeguard Instruments process, such as **development planners and proponents, those involved in specialist areas such as social impact analysis and economic appraisal, local administrators and public, community and environmental interest groups may also require and benefit from training, but usually not in as much detail as the above groups**.

Approach to training needs analysis

The approach to the analysis of training needs on this project requires a minimum of expertise on the part of the trainer/course designer. The training needs analysis is best carried out as a group process, most of the activities listed in this section can be undertaken directly by the trainer/course designer using telephone, mail and/or personal contacts.

The training needs analysis package provides guidance on the collection of background information and materials on Safeguard Instruments trends and experience on the project and the project area of influence. Resource aids and materials for undertaking and documenting the training needs analysis are provided at the end of this section.

Gathering information about the Safeguard Instruments system and experience

This part of the training needs analysis contains a checklist of information to collect and questions to be answered, and a table which, when completed, will give a sample of typical Safeguard Instruments. Some of this information may be known already by the trainer; the rest can be sought from government officials, practitioners, NGOs, academics, professional societies, published literature etc.

Overview of the Safeguard Instruments system and experience

Use the following points as a checklist of information to obtain an overview of the Safeguard Instruments system. The extent and comprehensiveness of this profile will depend upon the record of Safeguard Instruments experience to date on the project or state concerned.

Obtain key Safeguard Instruments documentation such as:

- copies of current Safeguard Instruments legislation, guidelines or policies; and
- a flowchart of the Safeguard Instruments process that identifies the key components and relationships

Summarize the history and evolution of Safeguard Instruments by reference to:

- important factors in the introduction (or non-introduction) of Safeguard Instruments;
- key dates and stages of Safeguard Instruments process development, including the introduction/revision of legislation, guidelines, policies etc.;
- the roles and relationships of key agencies in the Safeguard Instruments process, including those primarily responsible for the preparation of Safeguard Instruments reports;
- the number and type of Safeguard Instruments which have been undertaken, with a breakdown by development sector;
- examples of Safeguard Instruments application and their main features and results; and
- whether Safeguard Instruments is mandatory or discretionary, and under what circumstances it is applied (or not applied).

Characterize the Safeguard Instruments process by:

- summarizing the main principles of any Safeguard Instruments legislation, guidelines or policies;
- outlining the main features/provisions/requirements of Safeguard Instruments procedure;
- identifying any administrative arrangements/procedures for coordinating Safeguard Instruments within or between jurisdictions (e.g. within a federal state);
- noting other policies or strategies (such as a national or state sustainable development strategy) that are relevant to the application of Safeguard Instruments; and
- considering new or proposed directions in Safeguard Instruments process development.

Outline the lessons learned from SAFEGUARD INSTRUMENTS practice by:

- evaluating the quality of Safeguard Instruments reports in terms of their strengths and weaknesses;
- finding out whether Safeguard Instruments commences early or late in the design of the proposed projects and actions;
- noting the usage of Safeguard Instruments methods, such as checklists, matrices etc.;
- describing the nature and types of public participation;
- comparing the benefits and costs of public participation;
- determining the level of acceptance/recognition of the value of Safeguard Instruments by decision-makers;
- noting the use of mitigation measures for impact avoidance, minimisation, compensation and project modification and redesign;
- checking on the level of Safeguard Instruments follow up, including monitoring and management;
- establishing the degree of inter-agency cooperation and communication on Safeguard Instruments; and
- considering the strengths and weaknesses of legal or administrative bases of Safeguard Instruments.

Note: The following review is applicable primarily to situations where SAFEGUARD INSTRUMENTS practice is relatively well established. It can be undertaken directly by the trainer/course designer or provide the basis for a group exercise as part of the training needs analysis.

Evaluate the effectiveness of the Safeguard Instruments system by briefly answering the following questions:

- Is the Safeguard Instruments system based on clear and specific legal provisions?
- Is Safeguard Instruments applied to all proposed actions that are likely to have significant environmental and social impacts?
- Is the proponent required to consider the environmental and social impacts of reasonable alternatives to the proposed action?
- Does the Safeguard Instruments process require the following steps and actions and are they carried out satisfactorily?
  - screening to determine the proposed actions that are subjected to Safeguard Instruments;
  - scoping to identify the environmental and social issues and impacts of proposed actions and to establish terms of reference;
  - mitigation to reduce or offset impacts;
  - preparation of Safeguard Instruments report to meet prescribed information;
  - review of the quality of Safeguard Instruments report prior to its submission;
  - public review of and comment on Safeguard Instruments report prior to its submission;
  - response by the proponent to the results of public consultation and their inclusion in Safeguard Instruments report;
  - final decision making on the proposed action takes account of the findings of Safeguard Instruments report; and
  - terms and conditions established for project implementation and Safeguard Instruments follow up, including, as necessary, requirements for mitigation, monitoring, etc.
- Does the Safeguard Instruments process result in discernible environmental and social benefits?
- Are the financial costs and time requirements of the Safeguard Instruments system reasonable and acceptable to those involved?
- On balance, do the benefits of undertaking Safeguard Instruments outweigh the costs?
- Are programmes, plans and/or policies (as well as projects) covered by the Safeguard Instruments system or by a separate or equivalent process (usually called strategic environmental assessment)?

Review of Major Safeguard Instruments in the project area of influence

When completed, the table below will assist in building a systematic overview of Safeguard Instruments practice in the project area of influence and will help to identify case materials for training.

Review of major Safeguard Instruments in the IUFMP Project area of influence

Project Description and Setting	The IUFMP project is the first of its kind in Ibadan and includes flood control works and activities that are structural and non- structural across various communities in Ibadan.
Responsible Authorities	IUFMP Project Implementation Unit, Relevant Ministry and Departments and Agencies of Oyo State Government
Date Safeguard Instruments started & completed	Since commencement of the Project in 2015
Major Issues/Impacts reviewed	Environmental and social impacts associated with construction works in linear and nonlinear corridor
Safeguard Instruments Studies undertaken	The project has undertaken safeguard instruments on specific site projects and are in the process of translating the Environmental and social management plans into work order for compliance monitoring.
Type of Public Consultation	Focus group discussion, town hall meetings, and public hearing.
Quality and Content of Safeguard Instruments Report	The project has received safeguard reports adjudged as high quality.
Final Decision and Implementation	Need for improving the basic knowledge on safeguard instruments application particularly with respect to contractors and relevant MDAs to assure sustainability of projects outcomes.

ANNEX 12: RIVER/ STREAM SETBACKS AND DAMS IN IBADAN

No	River Name	Setback (m)
1	Odo –Ona Elewe	15
2	Adamo	15
3	Alalubosa	15
4	Sango	15
5	Others	15
6	Oluyole	15
7	Kudeti	30
8	Orogun	30
9	Onire	30
10	Gbaremu	30
11	Alaro	30
12	Ogbere	30
13	Gege	30
14	Ogunpa	45
15	Odo – Ona	45
16	Ona – Ara	45

Source: Oyo State of Nigeria, 2005.

TABLE 2: LIST OF DAMS IN OYO STATE

SN	Name	River	Lon	Lat	Owner	Comp year	Category	Drainage Area (km2)	Runoff height (mm/ year)	Average Inflow Volume (MCM/ year)	Height (m)	Crest length (m)	Gross Storage (MCM)	Active Storage (MCM)
1.	Awon	Awon	3.89230	7.87950	WCOS	1942	L	454	157.9	71.7	13.10		10.0	8.4
2.	Asejire	Osun	4.13314	7.36305	WCOS	1972	L	7,646	231.9	1,773.1	26.20		32.9	30.5
3.	Igboho	Koisin	3.75547	8.81034	OSADEP	1988	L	114	172.9	19.7	11.00	420	1.2	0.9
4.	Ikere Gorge	Ogun	3.73790	8.17718	OORBDA	1991	L	4,704	160.3	754.0	55.00	580	690.0	565.0
5.	Oba	Oba	4.19747	8.16584	WCOS	1964	L	341	181.1	61.8	13.40	500	4.6	4.1
6.	Ofiki(A)	Ofiki	3.34081	8.47072	OORBDA	1983	L	11	131.3	1.4	12.60	580	1.3	1.2
7.	Ofiki(B)	Ofiki	3.34385	8.55996	OORBDA	1961	L	6	137.5	0.8	12.30	550	0.6	0.5
8.	Opeki	Opeki	3.38115	7.51759	WCOS	1967	L	588	130.4	76.7	10.50	253	2.6	1.9
9.	Sepeferi(A)	Owutu	3.64935	8.58517	OORBDA	1984	L	3	106.0	0.3	13.60	685	2.6	2.4
10.	Sepeferi(B)	Agbado Osoruwa	3.63615	8.57903	OORBDA	1989	L	9	105.8	1.0	13.50	720	1.9	1.3
11.	Eleyele	Ona	3.85510	7.41860	WCOS	1942	M	321	233.4	74.9	2.44	235	7.0	5.5
12.	Fofo	Fofo	3.37147	8.68534	WCOS	1966	M	50	170.9	8.5	14.60	262	0.7	0.6
13.	Ogbooro	Ata	3.62591	8.76199	OSADEP	1986	S	13	168.9	2.2	8.00	350	0.3	
14.	Pade	Oniyanrin	4.00450	7.62106		1992	S	2	219.8	0.5	9.50	350	0.7	
15.	Alabata	Ose	3.86636	7.61811		2010	M	59	198.8	11.6	11.00	420	2.0	
16.	Akufo		3.81458	7.48494		2008	S	0	146.2	0.0	8.50	120	0.1	
17.	Sanusi	Seleru	3.79133	7.21056		2007	S	26	169.9	4.3	9.50	250	0.6	
18.	Ajinapa	Oniyele	4.24603	8.27508			S	1	181.1	0.2	8.50	250	0.8	
19.	Ago Amodu	Adu	3.60986	8.62567	OYSADEP		S	21	107.1	2.3	6.00	200	0.1	0.080
20.	Oje Owode		3.48926	8.58532	OYSADEP	1985	S	17	164.5	2.8	7.50	250	0.3	0.290
21.	Ago Are	Owo	3.44148	8.51158	OYSADEP	1984	S	47	145.8	6.9	8.50	350	0.5	0.410
22.	Ayete	Okugba	3.26775	7.57811	OYSADEP	1991	M	10	133.9	1.3	11.00	410	1.1	
23.	Okeho	Ifo-Ile	3.32139	8.00749	OYSADEP	1987	S	21	169.7	3.5	10.00	400	0.8	0.818
24.	Ilero	Ipalo	3.36690	8.09567	OYSADEP	1984	S	6	138.8	0.9	9.50	250	0.5	0.300
25.	Iganna		3.25849	7.97703	OYSADEP	1985	S	28	105.9	3.0	7.60	300	0.2	0.170
26.	Igbojaye	Aye	3.306961	8.222434	FMWR	UC	L	233	124.4	29.0	18.00		5.6	5.2
27.	Kisi				OYSADEP									0.550
28.	Igbetti				OYSADEP									0.518
29.	Irawo				OYSADEP									0.600
30.	Ogboro				OYSADEP									0.319
31.	Ilua				OYSADEP									0.123
32.	Saki				W.C.O.S									0.670
33.	Sanusi(Idiay unre)				OYSADEP									0.624
34.	Alabata (Moniya)				OYSADEP									
35.	Pada Olorunda)				OYSADEP									1.740
36.	Odedele				FMWR									182.600
37.	Asa				OORBDA									
38.	Erelu													
39.	Eruwa													
40.	Awon				WCOS									8.400

Source : Oyo State Ministry of Environment and Natural Resources

ANNEX 13: SESA WORKSHOPS AGENDA

SESA Scoping Workshop on Ibadan Integrated Flood Risk Management and Drainage Master Plan (IIFRMDMP):
Theme: Environmental and Social Strategies for Flood Management in Communities.
Date: 15th August 2017
Venue: Ibadan Business School, Bodija, Ibadan, Oyo State
Agenda

09.00- 10.00	**Registration of participants**
10.00 – 10.15	**Opening of the workshop and welcome of the participants** *IUFMP Environmental Specialist*
10.15 -10.30	**Opening remarks** Honourable Commissioner for Environment and Water Resources
10.30 – 10.40	**Introduction to scoping** Purpose and expected outcomes Card Storming
10.40- 11.00	Tea break
11.00 – 12.00	**Situational Analysis presentation and Q/A session (45mins)** *SESA Consultants*
12.00- 12.20	**Status and Timelines on IUFMP Project** Project Coordinator
12.00 – 13.00	**Flood mitigation measures and Responses** Channelization and recreation Flood preparedness Flood insurance. SESA Consultants
	Scoping opinion Possible structure and content, Q/A session (30 min) *Introductory presentation by SESA consultants* Group work: developing scoping opinion on the pilot SESA scoping report (60 min) *Facilitated by the SESA consultants*
14.00 – 14.30	Lunch break
14.30 – 15.00	Scoping opinion Presentation by working groups and discussion (30 min) *SESA Consultants*
15.00 – 15.45	Concluding session Summary of main conclusions
16.00	End of workshop

ATTENDANCE

Participants in attendance comprised of representatives from Non-Governmental Organization (NGOs) and Community Development Associations (CDA) representatives and Community leaders/members in the DMP study area.), Ministry, Departments and Agencies (MDAs)Total attendance was 59.


SESA Scoping Workshop on Ibadan Integrated Flood Risk Managemnet and Drainage Master Plan (IIFRMDMP):
Theme: Flood Mitigation and Governance Issues
Date: 16th August 2017
Venue: Ibadan Business School, Bodija, Ibadan, Oyo State
Agenda

09.00- 10.00	**Registration of participants**
10.00 – 10.15	**Opening of the workshop and welcome of the participants** *IUFMP Environmental Specialist*
10.15 -10.30	**Opening remarks** Honourable Commissioner for Environment and Water Resources
10.30 – 10.40	**Introduction to scoping** • Purpose and expected outcomes • Card Storming
10.40- 11.00	**Tea break**
11.00 – 12.00	• **Situational Analysis presentation and Q/A session (45mins)** *SESA Consultants*
12.00- 12.20	• **Status and Time lines on IUFMP Project** • **Project Coordinator**
12.00 – 13.00	**Flood mitigation measures and Responses** • **Channelization and recreation** • **Flood preparedness** • **Flood insurance**. SESA Consultants
13.00- 14.00	**SESA draft Scoping Report** *SESA consultants*
14.00 – 14.30	**Lunch break**
14.30 – 15.30	**Scoping opinion** • **Possible structure and content, Q/A session (30 min)** *Introductory presentation by SESA consultants* • **Group work: developing scoping opinion on the pilot SESA scoping report (30 min)** *Facilitated by the SESA consultants*
15.30 – 15.45	**Scoping opinion** • **Presentation by working groups and discussion (15 min)** *SESA Consultants*
16.00	**Concluding session** • **Summary of main conclusions** **End of workshop**

Participants in attendance comprised of representatives from Non-Governmental Organization (NGOs), and Ministry, Departments and Agencies (MDAs). Total attendance was 53

Cross section of participants at the workshop

Cross section of participants at the workshop

(L-R) The Former Hon. Commissioner for Environment, Oloye Isaac Ishola, Permanent Secretary in the Ministry, Mr Oguntola and Mrs Adeleye (Director Pollution control unit, Min. of Environment)

SESA Stakeholder Workshop on Ibadan Integrated Flood Risk Managemnet and Drainage Master Plan (IIFRMDMP), Managing Flood Risk:
Theme: Addressing Institutional, Capacity and Political Economy Constraints.
Date: 31st January & 1st February, 2018
Venue: Ibadan Business School, Bodija, Ibadan, Oyo State

Agenda
Day One

09.00- 10.00	**Registration of participants**
10.00- 10.15	**Opening Prayer/ National Anthem**
10.15 – 10.25	**Opening of the Workshop** **Welcome remarks** **IUFMP Project Update** *Project Coordinator, IUFMP*
10.25 – 11.15	**SESA Objectives** • **Purpose and expected outcomes, (5mins)** • **Managing Flood Risk:** Addressing Institutional, Capacity And Political Economy Constraints **presentation and Q/A session (45mins)** *Facilitated by the SESA consultants*
11.15- 11.30	**Tea break**
11.30 – 13.00	**Theme 1: Reducing Flood hazard (Institutional, Capacity & Political Economy Constraints)** • **Restore Wetlands (15 min)** *Presentation by the SESA consultants* • **Build Green Infrastructure (30 min)** *Facilitated by the SESA consultants*
	Theme 2: Protect Against Flood • **Build Embankment and Flood Barriers (30 min)** *Facilitated by the SESA consultants*
14.00 – 14.30	**Lunch break**

14.30 – 15.00	**Theme 3: Regulate Land Use** • **Build Setback lines** • **Building Restriction and Flood Proofing In place (30 min)** *Facilitated by the SESA consultants*
15.00 – 15.45	**Plenary Discussion & Break out to Working Group Session** *Facilitated by the SESA consultants*
16.00	**Day one Wrap up**

Day Two

09.00- 10.00	**Theme 4: Raising awareness and preparedness (Institutional, Capacity &Political Economy Constraints)** • **Early warning system** • **Evacuation plans** • **Flood Hazard maps** *Facilitated by the SESA consultants & IUFMP*
10.00- 10.15	**Discussion Q &A**
10.15 – 11.15	**Them 5: Mitigate residual Risk and (Institutional, Capacity &Political Economy Constraints)** • **Emergency Response** • **Insurance / Relief Fund** • **Recovery Plan** *Facilitated by the SESA consultants*
11.15- 11.30	**Tea break**
11.30 – 13.00	**Working Group Session**.
13.00 – 13.30	**Lunch break**
13.30– 14.20	Working Group Presentation and discussion (50 min) Facilitated by the SESA consultants
14.20 – 15.55	**Concluding Plenary Session** • **Summary of main conclusions & Communique** • **Vote of Thanks**
16.00	**End of workshop**

SESA State-wide Stakeholder Workshop on Ibadan Integrated Flood Risk Managemnet and Drainage Master Plan (IIFRMDMP),
Theme: Sustaining Integrated Flood Risk Management.
Date: 24th and 25th April 2018
Venue: Ibadan Business School, Bodija, Ibadan, Oyo State

Agenda
Day One

09.00- 10.00	**Registration of participants**
10.00- 10.15	**Opening Prayer/ National Anthem**
10.15 – 10.40	**Opening of the Workshop** **Keynote Address** *Honourable Commissioner for Environment and Water Resources*
10.40 -10.50	**Photo session**

10.50 – 11.55	**SESA Objectives** • **Purpose and expected outcomes, (5mins)** • **Overview of the Strategic Environmental and Social Assessment (SESA) of the Integrated Flood Risk Managemnet and Drainage Master Plan (IIFRMDMP)presentation and Q/A session (45mins)** *Facilitated by the SESA consultants*
11.55- 12.30	**Tea break**
12.30 – 13.30	**Envisaged Policy Requirements, Changes and Next Steps** *Facilitated by the SESA consultants*
13.30 – 14.00	**Break out to Working Group Sessions:** *Facilitated by the SESA consultants*
	Lunch break
14.00 – 15.45	**4 Working Group Sessions:** *Facilitated by the SESA consultants*
15.45- 16.00	**Day one Wrap up Session** *Facilitated by the SESA consultants*

Day Two

09.00- 10.30	**Working Group Session Presentations & Plenary Discussion:** *Facilitated by the SESA consultants*
10.30- 10.45	**Discussion Q &A**
10.45 – 11.15	**Tea break**
11.15- 12.15	**Communique Presentation and Adoption Process**
12.30 – 13.30	**Presentation of Adopted Communique to His Excellency, Oyo State Governor** *Facilitated by SESA Consultants and IUFMP*
13.30– 14.00	**Vote of Thanks** *Facilitated by SESA Consultants and IUFMP*
14.00 – 15.00	**Lunch and End of workshop**

ANNEX 14: SUMMARY OF THE VIEWS FROM SESA WORKSHOPS

STRATEGIC ENVIRONMENTAL AND SOCIAL ASSESSMENT (SESA) – WORKSHOPS ON "Environmental And Social Strategies For Flood Management "And "Managing Flood Risk: Addressing Institutional, Capacity, Political And Economy Constraints" {Draft Communique} Held At Ibadan Business School On 15th-16th August, 2017, 31st January & 1st February, 2018.

The Theme of the first and Second SESA workshop held back to back for scoping the focus of the SESA was titled **"Environmental and Social Strategies for Flood Management" and Flood Mitigation and Governance Issues respectively.** Arrival and registration started between 9.00am- 10.00 am. Participants in attendance comprised of representatives from Non-Governmental Organization (NGOs), Ministry, Departments and Agencies (MDAs) and community members. Total attendance was fifty-nine (59) and fifty-three (53) on 15th-16th August, 2017 respectively.

- The workshop commenced at 10.00am with opening prayer said by a volunteer. This was followed by self-introduction of participants. The Moderator, Mrs. Funmilayo Adesina (Environmental and Safeguard Specialist, IUFMP) welcomed all participants and gave the opening remark.
- For effective Information, Education and Communication of the effect of flooding in Ibadan to stakeholders, the workshop participants went through a 10-minute video documentary showing flood events and their devastating effects in different states in Nigeria and abroad.
- The Honorable Commissioner, Mr. Isaac Ishola gave opening remarks welcomed everyone on behalf of the executive governor of Oyo State, Senator Abiola Ajimobi.
- Participants' questions and other relevant concerns were highlighted and systematically discoursed by facilitators during the question and answer segment that followed at the end of each presentation. These have been discussed in this document.

At the **Third SESA** stakeholders workshop as part of the on-going collaborative efforts between the various stakeholders, government institutions and agencies on the management of environmental issues met on 31st January and 1st of February 2018 to identify and critically discuss possible institutional, capacity, political and economic constraints capable of hindering the successful implementation of the Integrated Flood Risk Managemnet and Drainage Master Plan (IIFRMDMP) being an integral part of the IUFMP's mandate.

- The workshop focused on a central theme: **Managing Flood Risk: Addressing Institutional, Capacity, and Political Economy Constraints**.
- Participants in the stakeholders' workshop include the affected communities, MDAs, NGOs, Regulatory Bodies like Federal and State Ministries of Environment, NESREA etc., the IUFMP Project Implementation Unit (PIU), and other government agencies.
- The meeting started at 10:09am with registration, opening prayer, introduction of participants, the National Anthem and a welcome address by the Honourable Commissioner for Environment and Water Resources, Chief Isaac Ishola, whose reiteration in line with the IUFMP's main objectives border on related issues of assessing flood risk(s) in the city of Ibadan, risks reduction measures, mitigation through structural and infrastructural investments, regulating land-use as well as bringing economic perspectives to managing flood risks among others.
- Thereafter, four educative and highly interactive lectures were facilitated by seasoned experts on environmental management issues on topics such as: flood risk management, green infrastructure building, restoration of wetlands and the need to build flood embankments or barriers.
- Participants' questions and other relevant concerns were highlighted and systematically discoursed by facilitators during the question and answer segment that followed at the end of the lectures. Some of the issues raised are: poor waste disposal and management practice, the construction of flood drains-whose responsibility is it? (government or affected communities), planting of tress (location and recommended types), discrepancies on approved setback scale (land-use), non-compliance to existing regulations on waste disposal and management strategy, lack of political-will in law enforcement mechanism by government agencies, effective community policing through vigilante groups, inclusion of basements in house construction plans, creating awareness, implementation of proposed (Ibadan City) master plan on housing and shared (collective) responsibility towards the enforcement and strict compliance to the necessary environmental management measures, etc.
- Papers presented during the workshop are: Managing Flood Risks, Build Green Infrastructure, Restore Wetlands, Build Embankment and Flood Barriers (Day 1) and Raising Awareness and Preparedness, Mitigate Residual Risk, etc. More so, the need to heed early warning system signs, formidable evacuation plan, flood hazard maps, getting insurance/relief funds, emergency response and recovery plans among others were points of emphasis during the lectures.
- Concerning participants' request for seminar papers, the facilitator – *Sustainability Limited* promised to make all workshop materials available to interested participants at the end of the workshop.
- Thereafter a breakout cum interactive session where workshop participants were sub-divided into four groups and the central task was for each group to further brainstorm in line with the matters arising, (proposed) recommendations and questions raised during the lectures. A brief synopsis of the deliberations within respective group(s) is as reflected below:

Group 1

SUMMARY OF DISCUSSION AND DECISION EXCERPTS

Group membership comprised about 43 participants with a secretary and chairman. The assigned task focuses on channelization, its expected impact on the community, their attitudinal response and other expectation(s) from the government.

- After due consideration, the group embraced the channelization project but suggest that affected communities should give government agencies the necessary support to effectively carry out their job. More so, the bridges should be made higher and water channels widened.
- They further advised that government should grant affected communities a sense of ownership as stakeholders through assigned roles in the project handling and management, build (public) toilet facilities, establish waste collection points and recycle plan, institute supervision groups, encourage tree planting, provide monetary compensation for PAPs or provide alternate housing before commencement of project as well as enlisting representatives from the communities in the course of the project.
- They all agreed on the need for the government to encourage, enlighten (the people) and implement the Insurance policy and any other related government policies and programs.
- The early warning and evacuation plan are laudable ideas, we advise the government to properly enlighten, educate and train the entire volunteer force. They should be adequately equipped e.g. rain coat, rain boot, gloves, face-masks for effective discharge of their duties.
- In addition, we advised that government should create life assurance policy packages for the volunteers to cover any job associated risks or hazards.
- Members of the communities were encouraged to make investigation on the land they want to buy, get approval from Government Authority and obey setbacks.

From recommendations made at the first SESA workshop, it will be the responsibilities of the communities to maintain whatever channelization design provided in their communities by the following:

- Construct drainage in front of their houses
- Maintain the setback on river channel
- Plant trees around houses built in hilly mountainous watershed areas
- Avoid dumping of waste into the channel
- Be Flood Prepared

CHANNELISATION

- Bridge, culverts etc that will be constructed should be supervised by government officials and IUFMP-PIU. Those that channelization affected must be settled by providing accommodation for them.
- To make the refuse collection or disposal to make more effective that dustbin must be provided in most of the community and managed by Sanitary Inspector or handed over to communities. Government will be collecting it once or twice a week.
- The provision of public toilet is laudable during the program. We appreciate the government's effort and we crave their indulgence to consent to communities having local participation by providing Engineers to work with contractors in order to curb cutting corners for profit maximization at the expenses of government and the community. That may likely give the government bad name. If the project does not last, that community will blame the government that is, they discredit them also, town planner should always be involved in approving building plans to avoid the types of mess-up we have in the community.

Group 2

SUMMARY OF DISCUSSION ON LANDSCAPING

- Members of the group strongly agree and support the project objectives.
- Government should take necessary steps that forestalls further delays and the communities should be notified before the commencement of the project and timely completion ensured.
- Also, all forms of obstructions within the channels should be removed.
- The affected persons should not be monetized in cash to avoid thieves taking advantage of beneficiaries by stealing from them as these could result in communal clashes leading to loss of lives and other valuables. So we recommend alternate housing for relocation of affected persons.
- The group identified urbanization and poor handling of similar projects in the past by contractors as some of the challenges facing our communities hence, appealed to the government to ensure strict adherence and use of quality materials so that the completed projects will last.
- The group will be glad to know the likely date for commencement of the project. Also, there is need to review the land tenue system and proper screening to avoid misappropriation of funds were recommended.
- Sustained channel surveillance, telephone line for feedbacks like the (OYOWMA hotlines: **09099581501** and **09032136608),** should be installed, and debris from upstream to downstream during rainy seasons should be considered and the integration of environmental management study modules into the education curriculum should be encouraged at all levels and free textbooks distributed.

- The Ogidi river in Yejide area should be given special attention during the Yejide-Kudeti Channelization project. In addition, Ward Waste Manager (WWM) and Voluntary Environmental Service Vanguard (VESV) should be established at the various Wards to monitor, manage and report indiscriminate dumping of waste.
- They advocate the signing of a Memorandum of Understanding (MoU) between the government, affected communities, contractors and other relevant agencies to ensure quality control.
- They government should establish and enforce laws with clearly written punishment for offenders to forestall indiscriminate dumping of waste. Also, local groups like Voluntary Environmental Service Vanguard should be encouraged to enhance compliance.
- We implore the government to critically review the existing land tenure system especially within impotent areas like Agodi garden, Sports and other recreational activities.
- We recommend the construction of box-bridge, ring-bridge and pillow bridge within designated centers to preserve the water ways in the channels. Also, pedestrian bridges should be built where necessary.
- We urge the government to organize routine training, seminars or workshops where relevant agencies will further engage the communities on topical issues like flood management river-land building modalities, approved land use protocol for setbacks among others.

Group 3

A total number of 47 participants were involved in group 3 discussion. The topics brainstormed upon are waste disposal management, Insurance policy and other issues related to flood management. It was agreed upon that:

SUMMARY OF DISCUSSION ON LANDSCAPING

- There is need for multiple dump-sites and routine collection of waste. Also, each household especially those along the channels must have a waste container that the designated collectors will pick at intervals.
- The communities should be involved in the selection process of waste managers and the fees drastically reduced to encourage patronage.
- We encourage the government to intensify the on-going awareness on proper waste disposal (emphasizing the health implications), environmental management programs and projects such as dredging, building of flood plains, green infrastructure, pollution control etc. Again, this novel initiative should be extended to all parts of the state, as well as the need to register volunteer groups within the affected communities as legitimate waste management agencies with the government as this will generate more revenue.
- Other multi-media channels like the radio, television and the print media should be deployed to ensure wider information dissemination. In addition, government should stipulate a standard fee payable by tenants through their landlords annually for sustained waste management across the state.
- We are appealing to the government to provide waste drums/containers and to increase the number of collection points with adequate man power across the state.
- Burning of waste should be discouraged to reduce air pollution.
- Affordable fees could be charged so as to discourage indiscriminate dumping of waste.
- We want the government to strengthen the "Waste to Wealth" initiative bordering on segregation, recycling and re-use of waste.
- Also, the government should revamp the sanitary inspection service.
- The government should make the waste management plan being developed a community-centered initiative to achieve maximal impact at the grass-root levels.
- The usefulness of flood maps should be thought at all levels and government should provide them for effective flood risk reduction.
- The government can introduce land tenement rates that designate areas or locations as a substitute for waste collection fees to generate finances for holistic waste management.

Group 4

Group four members were thirty-nine (39) participants. The following points were highlighted from their discussion

SUMMARY OF DISCUSSION ON LANDSCAPING

SENSITIZATION:

- We are in support of the landscaping project by the government but sensitization within affected communities must continue so as to ensure the peoples' unreserved compliance with rules and regulations.
- Government should endeavor to follow through with the project as planned without compromising standards at all levels e.g., equipment, building materials and contractors etc.,
- We implore the government to collaborate with landlord associations, department of forestry and horticulturist for sustainable maintenance efforts before, during and after the project is completed.
- Also, perimeter tree planting around the landscaped areas should be implemented.

- Compensation plan for the affected structures. Government should recognize house owners with two or three witness in cases where the house documents couldn't be presented
- We all support Government in their intention/ plan on landscaping
- Government should properly sensitize the affected communities in what they have decided to do.
- Sensitize communities in Ibadan land on laws that govern land scaping and town planning and enforce it

Maintenance of landscaping

- Collaboration between landlord association and government officials for proper maintenance
- Involvement of state Department of Forestry and Horticulturist for proper maintenance
- Empower the landlord association of communities to make arrest of defaulters
- Perimeter tree planting around the landscaping

Refuse Clearing:

- Individual house should have her waste drum
- Collaboration between community leaders, landlord association and project contractors in charge of refuse clearing with government monitoring
- Adoption of Lagos State strategy for refuse removal

Compensation Plan

- Government should recognize house owners with two or three witnesses for verification in cases where the house documents could not be provided.
- We support alternate housing facility as means of compensation in place of money.
- We urge the government to laisse with network providers to ensure prompt sensitization and information dissemination within affected communities in case of emergencies.
- Again, the role of local town criers in the affected communities are encouraged.
- Government should also maximize the media – radio, television and social-media platforms to publicize flood management updates, jingles, news and documentary as well as weather forecast.
- We encourage the government to look into building temporary disaster camps across the state to reduce the burden of displaced persons as the need arises.
- Muster Points should be created and mobilized to function across designated areas.
- Disaster management agencies should designate community representatives across affected zones for effective monitoring and correspondence. Also, association of landlords should set up committee to monitor water gauges.

SUMMARY OF THE VIEWS, CONCERNS, & RECOMMENDATIONS, FROM ALL SESA CONSULTATIONS

S/N	Stakeholders Concerns from consultation engagements	Remarks/ Recommendations
42.	What proportion of one's land can be constructed under land use policy?	Land owners are not allowed to build more than 40% of the land area other town planning law. The remaining area account for boundary from pillar to fence, setback and drainage. The government has been sensitizing the public on proper land use. People were implored to obey setback and patronized government approved town planning authority for genuine approval.
43.	Whose responsibility is the construction of drainages for houses, the government or house owners?	The community is the most affected when there is flood disaster. We should therefore not leave flood prevention and risk mitigation only into the hands of the government. We should all be responsible for the waste we generate. Each house owner should construct drainage for their houses and the different drainages should be well connected to the major water channel.
44.	Can those who engaged in indiscriminate refuse disposal be arrested and punished by the community members without involving the government law enforcement officers?	Community members should hand over offenders of environmental laws to the law enforcement officers in the State to be prosecuted under law.
45.	Are members of the communities allowed to burn or bury their waste instead of patronizing the government approved waste contractors?	The law does not support burning nor burying of waste. Burning of waste results in air pollution or can result in accidental fire outbreak. On the other hand, buried waste can leach into and contaminate ground water. Each house should get a refuse bin and patronize government approved waste contactors for collection and proper disposal.
46.	How can houses constructed downhill be protected from flood?	Setback should be observed. There should be enough river setback for flood overflow.
47.	Who is responsible for tree planting in the process of employing green infrastructure	Tree planting is the responsibility of everyone.

	in preventing flood?	
48.	How can the government tackle non-compliance to environmental and town-planning laws?	Government should ensure enforcement of environmental and town planning laws and avoid political interference
49.	How does the Insurance Company fix the premium for house owners with small buildings/properties?	The property will be valued, and this will determine the amount of premium paid. It is 0.25% normally.
50.	If there is emergency in developed countries there is provision of relief materials (by Insurance Company) for affected people during relocation. Is it also possible here?	When you want to sign up an insurance policy, discuss in details before signing up the documents.
51.	What are the requirements/documents needed to sign up an insurance policy for landed properties?	Some of the documents/papers that will be required include approval from town planning, C of O, Survey plan and any other necessary documents.
52.	How long does it take before compensation is being paid?	When a loss is reported, assessment will be done and the company will act. Also, it depends on the insured if he/she can give the estimate of the damages on time
53.	Will the insurance company compensate an individual whose property is not insured but got affected by helping someone whose property is insured?	As long as the source of the disaster is from the insured, it is covered.
54.	Does Insurance covers Agricultural produce by farmers?	Yes, there is an Insurance policy that covers agricultural produce.
55.	The role of insurance should be appreciated and extended to disaster management including market fire and not limited to flooding.	The insurance will also cover market fires and disaster.
56.	What happens to the premium if there is no disaster?	The Company uses the premium of many to pay few.
57.	Who will be responsible for the payment of premium?	Both the house/property owners and government.
58.	Can a tenant do insurance too?	A tenant can only insure himself and family members. He cannot insure the property since he is not the owner
59.	What of the hidden terms the Insurance Company normally use	Ask questions before signing policy documents because policies don't change. If you are aggrieved, write to National Insurance Commission.
60.	Will houses on the flood plain be demolished for the dredging or canal	Some structures on the flood plain will be affected in the course of channelization works. Appropriate mitigation to the people that will be affected will be taken and a specific study called RAP- resettlement Action Plan is to handled that aspect
61.	Will compensation be paid to those whose houses are affected	Yes, under the Land use Act we all know that those who have all their documentation and complied with the established setback ROW- Right of Way will received the requisite compensation for their land acquisition or land take. However for those within the statutory setback and also without papers, where the proposed World Bank assisted IUFMP project impacts on their structure and land, there will still be a form of resettlement that will be undertaken in the course of the RAP.
62.	When will the construction work start, and how long? Will the inventory of the PAPs be taken before the civil works rehabilitation commencement?	The construction work will be in phases. Also the community committee will be informed about the date of commencement few weeks ahead of time. Yes, inventory will start before commencement of construction work. In other to have a register for those whom the project construction will disturb
63.	Will the project carry everybody, including those not directly affected in terms of employment benefits and all?	The overall project is geared towards improving or restoring livelihoods. This project will carry all stakeholders involved along
64.	Is it possible for the government to include the narrow NIHORT Bridge in the IUFMP projects?	The bridge /Culvert is part of the projects already.
65.	Does Insurance covers natural disasters?	There is a policy called Fire and Special Peril policy that covers natural disasters.

66.	Indiscriminate dumping of waste in water channels should be discouraged at Akinwumi community as well as other communities by constituting Environmental Watch that will arrest and report offenders to appropriate authority.	The government is currently planning on constituting Environmental Neighbourhood Watch who will be involved in enforcing environmental laws. Offenders will be arrested and handed to appropriate authority for prosecution by mobile or magistrate court.
67.	Is there any compensation for houses along flood plains that were marked for demolition but without approval?	IUFMP has planned to compensate owners of houses marked for demolition.
68.	How soon will people affected get their compensation?	Affected individuals would be compensated prior commencement of civil works
69.	Can the participants/ MDAs have a copy of the excerpts of the environmental laws which will help in the enforcement processes?	The regulations are popularized and made available at different levels of MDAs.
70.	What is the Government doing on the problem of waste collection and management in Ibadan.	The Government is partnering with West Africa Energy on waste management and turning waste to Wealth. Comments on the issue of waste collection should be forwarded to the following contacts: 09099581501 (customer service manager); 09023136608 (OYWMA); and 08086435555 (Hon. Commissioner for Environment and Water Resources).
71.	A participant asked if there is need for the community members to write 'Save our soul' letters to the government before works can be done on their culverts/drainages.	There is no need of writing letters again since the communities have been identified.
72.	Will the project on drainage/bridge construction end by the end of 8years duration left for IUFMP to finance it?	No, it will not end. There is still Master plan project for another 20years
73.	A participant asked how the Landlord association in his area can enforce proper drainage for each house within the area	Enforcement is not within the purview of IUFMP. Town planning office and Ministry of Environment should be notified
74.	Which type of drainage/channelization will be done for the identified communities?	The kind of drainage/channelization for each community will depend on factors like topography/terrain of the area etc
75.	Who will be responsible for maintenance of the drainages/culverts	There are relevant government agencies for maintenance under Ministry of works. Community members can also do maintenance works like debris clearing, grass cutting as part of their community development.
76.	Ministry of Women Affair should also be involved in the implementation of OKIC&FF	OKIC&FF was the initiative of Ministry of Environment and water Resources but local government and other relevant authorities and MDAs like Ministry of Women affair will be involved.
77.	What is the basis for the selection of the priority sites?	IUFMP is working in collaboration with relevant MDAs who identified and recommended the most flood affected areas for intervention/rehabilitation before approval by World Bank
78.	What are the plans currently in place for the maintenance of the IUFMP project at the 4 priority sites?	Maintenance of infrastructures is not within the purview of IUFMP. It is the responsibility of MDAs to maintain the infrastructure because the Ibadan Master Plans are long-term projects. Performance contract had been signed by MDAs and submitted before the approval of the project by World Bank.
79.	What is the level of development of the project at the 4 priority sites? There is high expectation from the community members that the project should have been completed since it is World Bank-assisted.	The timeline for the civil work at the four priority sites was 12 months which should have been completed by July, 2017. But some other things came along the line and the contractor requested for 3 extra months for the work to be completed
80.	How much is the state and IUFMP engaging and educating stakeholders like NURTW and market women in order to discourage open dumping of refuse?	IUFMP in collaboration with the State Government has conducted different stakeholders' engagement/forum. Jingles are currently running on radio on proper refuse disposal and there will also be a weekly OKIC&FF drama series on television.
81.	Pollution and contamination of water bodies by leachate from dumpsites, organic and inorganic chemicals should also be considered in the environmental and social safeguard issues.	The Strategic and Environmental and Social Assessment covers health issues and the activities that can result in the pollution and contamination of water bodies including open defecation were included in the report.
82.	Are there any regulations guiding against	Sand mining is regulated under water management. There is also sand mining

	sand mining?	regulation.

RESOLUTION/ COMMENTS FROM THE CONSULTATIONS WITH COMMUNITY HEADS, TRADERS AND COMMUNITY COMMITTEE

25. The town planning Authority should not give approval to landlords of buildings close to rivers without setback and tree planting
26. The relevant agencies should look into the issue of companies/individuals that are fond of fencing setbacks with their landed properties.
27. The government should employ more waste contractors so as to cover the whole city of Ibadan and monitor them for compliance. Any contractors that is defaulting in his duty should be disengaged.
28. Eleyele dam should be reconstructed and be used for generation of electricity.
29. The government should sensitize the general public on green infrastructures through the electronic media
30. There should be strong political will to environmental and town planning law enforcement mechanism by government agencies.
31. Overhauling the existing Institutional frameworks along their respective statutory mandates
32. Political interference should be avoided while enforcing the laws.
33. Government should employ Environmental Health Officers for law enforcement and Emergency management agency within the community.
34. There should be an effective community policing through vigilante groups.
35. Town planning authority should enforce inclusion of basements in house construction plans
36. The government should establish waste management centres within the various wards in the affected communities.
37. Redesigning and making accessible the existing disaster funds to disaster risk managers
38. Good Governance that promotes redistribution of wealth, social justice and behavioral transformation
39. Insurance scheme and policy with regulatory oversight for flood prone areas in Ibadan metropolis needs to be developed with enlightenment for the communities involved.
40. Government should enlighten communities about flood resilience options and support those who have been affected with relocation to a better place.
41. The government should plan ahead and provide adequate financial resources for the project in order to prevent project abandonment
42. River gauges should be erected at all rivers liable to flooding
43. Deployment of ICT for real time response and recovery planning.
44. Ibadan Urban Master Plan should be holistically pursued, implemented and sustained with periodic review.
45. Build Back Better principle should be incorporated in implementing structural design improvements to achieve efficiency and effectiveness in post-disaster rebuilding process.
46. United Nations project should have implementation research. There should also be an inter-sectoral committee on the issue of environment and IUFMP project.
47. Appropriate and affordable technology should be employed in the channelization.
48. Indigenous knowledge and concept of Ibadan city should be employed in solving the flood problems in Ibadan. The project should focus more on the behavioural aspect of mitigating flood risk in Ibadan such as behavioural change communication for the awareness and sensitization of the people on proper waste disposal for the sustainability of the project.

EXTRACT FROM THE POLICY STATEMENTS BY THE GOVERNOR OF OYO STATE, HIS EXCELLENCY SENATOR ISIAKA ABIOLA AJIMOBI ABLY REPRESENTED BY THE HONOURABLE COMMISSIONER OF ENVIRONMENT AND WATER RESOURCES CHIEF ISAAC ISHOLA TO CAP THE WORKSHOP ON SUSTAINING INTEGRATED FLOOD RISK MANAGEMENT PLAN FOR IBADAN

HELD ON THE 24TH – 25TH OF APRIL 2018

AT

THE IBADAN BUSINESS SCHOOL.

- In tackling flood risk in Ibadan until recently, the main focus had been on structural measures coupled with over dependence on imported expertise and technologies.

- Generally, the propensity to award contracts to build more structural flood defenses, canals, embankments, culverts and bridges without sufficient consideration for less costly and more sustainable, non-structural solutions had been the practice.

- The Ibadan Urban Flood Management Project (IUFMP) is the first integrated approach to flood management in Ibadan, Oyo State. It incorporates Urban Renewal, City Master Plan, Drainage Master Plan, Flood Early Warning System, Awareness and Preparedness for Emergency at the Local Level with the introduction of Volunteer Community – based Flood and Waste Marshalls.

- With the right mix of soft elements like advocacy, education, stakeholders' participation, and consultation to engender a sense of project co-production and ownership the proposed flood canals and drainages to be constructed in Ibadan is hoped will not be turned into refuse dumps few years after commissioning.

- **Towards this end, a set of Seven-policy changes and interventions to sustain integrated flood risk management will take place in Ibadan as follows:**
    1. Development of Flood Mitigation Programmes and measures along the Channels and Catchments to include green infrastructure requirements in Ibadan for Building structure in flood plain and Flood-Resilient Housing Design for those who have to build close to the flood plain.

    2. Develop policy improvements at all bridge crossings in Ibadan for the design and embankment procurement for flood barriers infrastructures to protect against future flood.

    3. Implement the community based early warning system with the Installation of an early warning and response system including river gauges at critical priority sites on the channels.

    4. Collaborate with stakeholders such as the Nigerian Insurance Association (NIA) National Insurance Commission (NAICOM) amongst others, to design and promote a State-wide Flood Insurance Programme.

    5. Develop the Environmental Monitoring System within the context of an Environmental Management Information System (EMIS) to provide real-time data for environmental planning and flood forecasting with appropriate Financial budgeting.

    6. Establish a dedicated Institution for Flood Management in Oyo State, the first in Nigeria; thus, reaffirming Oyo as truly the Pace Setter in Nigeria.

    7. Develop and implement messages for public information targeting Flood Disaster Preparedness and change public orientation on waste management.

Chief Isaac Ishola- Honourable Commissioner of Environment and Water Resources delivering the close out remarks with the necessary policy intervention for flood control in Ibadan.

ANNEX 15: SESA WORKSHOP ATTENDANCE LIST FOR THE FIRST, SECOND, THIRD AND FOURTH WORKSHOPS

DATES: 15TH AUGUST 2017;16TH AUGUST 2017; 31ST JANUARY & 1ST FEBRUARY 2018; 24TH & 25TH APRIL, 2018.

MDAS AND OTHER PROFESSIONAL BODIES

S/N	NAME	AGENCY/ORGANISATION	PHONE NUMBER
1.	FOLURIN TAIWO B.	EFFS UI/ RAPPORTEUR	08037798084
2.	OJELABI OLAPEJU A	EFFS UI/ RAPPORTEUR	08067383248
3.	ADESINA F.E	IUFMP ENV SPECIALIST	08062322057
4.	ADEDIGBA MOSES A.	IUFMP M&E SP.	08033533562
5.	DADA A.A.	IUFMP SOCIAL SAFEGUARD	08035025222
6.	BABALOLA DEJI	IUFMP COMM. MOBILIZER	08023658577
7.	ENGR. T.O AKANBI	IUFMP	08039152280
8.	JWB METIBAIYE	IUFMP	08033072527
9.	ADEDAYO AYORINDE	IUFMP	07030263100
10.	FADIPE C.F	IUFMP	08057932412
11.	OLAWALE OLAYEMI	IUFMP	08029689906
12.	OLUSESI OLUYINKA	IUFMP	08130051146
13.	ENGR. M.A AYANWALE	MIN. ENV.& WR	08034783977
14.	OLAWOYE R.F (MRS)	MIN. ENV.& WR	08032566593
15.	ADESOFI O.O (MR.)	MIN. ENV.& WR	08036558574
16.	IKUDAISI S.O	MOE& WR	08033733205
17.	OLAYIWOLA A.S	OYO RUWASSA	08100083310
18.	OLORUNFEMI OLUSHOLA	NESREA	08022220914
19.	FADARE JOHN OLUFEMI A.	NESREA	08038358434
20.	ADERUKE ADEWALE	FED. MIN. OF ENV.	08168734284

21.	GBADAMOSI SARAFADEEN A.	FED. MIN. OF ENV. OYO	08133653365
22.	SALAU JELIU O.	FED. MIN. OF ENV	08081436645
23.	MR. I.A AJANI	NESREA	08174632708
24.	MR. MORENIKEJI AYEGBOYO	NESREA	08052215616
25.	MR. YUSUF AFIS	OYOWMA	08035396413
26.	CHIEF ISAAC A. ISHOLA	MIN OF EVT.& WR, OYO	08086435555
27.	MR. G.O OGUNTOLA	MIN OF EVT.& WR, OYO	08037274625
28.	MRS. M.E ADELEYE	MIN OF EVT.& WR, OYO	0834408224
29.	RAYMOND EVELYN	NCWS	08056184716
30.	SALAMI JEMILAT	NCWS	08078541381
31.	ILORI- OLADELE F	WOMEN AFFAIRS	08035663071
32.	MR A.I AJANI	NESREA	080332333
33.	MR OBAGIRI TOYIN	NESREA	08139397803
34.	ENGR. SANGOSENI	WCOS	08025594503
35.	MRS C.O ADEREMI	WCOS	08032071768
36.	TAIWO O.M	OYOWMA	08105201825
37.	OLATOREGUN O.O	WAE/OYOWMA	08026020601
38.	BARR. OLATUNJI THOMAS	MIN OF JUSTICE	08061200048
39.	ATERE-OYEBANJI BILLY M	SWCHI	08032148629
40.	RAJI OLUWASEUN	BPP& DC	08060278580
41.	ATUEGBU PATRICK, C	NESREA	08034644736
42.	ENGR. ABEL OKEDELE	NESREA	08037287249
43.	IWUAMADI ODIWAO	NESREA	08033247385
44.	AYEGBAYO MORENIKEJI	NESREA	08052215616
45.	OGUNSUKA FEYI	NESREA	07032544515
46.	ADEMOLA ADENIYI	NESREA	08058847117
47.	AKANBI GANIYU O.	MIN OF ENVIRONMENT	08033745925
48.	ADEYEMI OLUSEYI A.	MIN OF ENVIRONMENT	08038498454
49.	OGUNDELE S. OLABISI	MIN OF ENVIRONMENT	08051833105
50.	BOLAJI TOYIN	MIN OF ENVIRONMENT	08052070707
51.	FALANWO OLUWATOYIN H.	MIN OF ENVIRONMENT	07036981672
52.	DR. ADEBOLA A ADEYI	UNIVERSITY OF IBADAN	08037763961
53.	OLAWALE O.M	IUFMP	08029689906
54.	JWE METIBAIYE	IUFMP	08033072527
55.	AJUWON WAHEED	IUFMP	08023108491
56.	K.T OLAWOYIN	IUFMP	08033880180
57.	SUNDAY ADEWALE	IUFMP	
58.	SHOLA AJIBADE	CONTINENTAL INSURANCE	08029562878
59.	OTUNLA I O	OYO RUWASSA	08036833373
60.	ENGR. AREMU O K	MIN OF WORKS & TRANSPORT	08030640218
61.	FEMI AFOLABI	NTA IBADAN	08036321462
62.	OGWU EMMANUEL	NB PLC IBADAN	07068764575
63.	DR (ENG) S.O AFOLAYAN	NIHORT, IBADAN	08069481807
64.	OKELEYE SAMUEL	OYO STATE GOVT.	08065715497
65.	ADEFUKE ADEWALE (MR)	FED.MIN. OF ENV. IBADAN	08168734284
66.	ADETOLA ADUNOLA D.	FED MIN. OF ENV. IBADAN	08035392739
67.	KUTEYI KEM	FED MIN OF ENVIRONMENT IB	08060683495
68.	TIAMIYU WASIU. A	OYOSPC	08063123333
69.	ENGR M.A AYANWALE	ME&WR	08034783977
70.	OYEWOLE J O	ENVIRONMENT	08034929201
71.	IKUDAISI S O	MOE & WR	08033733205
72.	ISOLA D O	HEAD OF SERVICE	08037286744
73.	ARIORI LATEEF.OLANIYI	MIN OF WOMEN AFFAIRS	08025303697
74.	OGUNJIMI O. DOYA	OYSEMA	08066664411
75.	SALAU JELILI OLANIYI	MIN OF ENVIRONMENT OYSG	08081436645
76.	DR O J TAIWO	UNIVERSITY OF IBADAN	08029188696
77.	BUSOLA ADETUNJI	MIN OF INFORMATION	08055303906
78.	BIOLA YUSUF	MIN FOR ENVIRONMENT	08171662171
79.	ADEYENI TOSIN	IUFMP	08062322057

80.	FOLARIN TAIWO B.	IUFMP (RAPPORTER)	08037798084
81.	OLUDEJI OWOYELE	IUFMP	08037726617
82.	BABALOLA, A A	IUFMP	08023658577
83.	ADEOLU OJO	IUFMP	08097360718
84.	ADEOYE O A	IUFMP	08033847029
85.	OWOLABI OLUWOLE	MCHAS	08023390335
86.	BABANUMI A O	IUFMP	07033875959
87.	ENG. ADENIJI S A	IUFMP	08034744797
88.	ABIODUN ADEFIOYE	IUFMP	08029421799
89.	OLANIYAN OLOLADE	IUFMP	08032600475
90.	OJO A O	IUFMP	08074707642
91.	OJELENE GS	IUFMP	08030513064
92.	TOSIN OSO	IUFMP	08060894427
93.	ADEDIGBA MOSES A	IUFMP	08033533562
94.	GBOLAGADE- ADEMOLA	IUFMP	08057114519
95.	OLAYIWOLA SOLOMON O	IUFMP	08032398900
96.	ABIODUN UTHIWOW	IUFMP	08068175152
97.	ALAMU RASAKI OPEYEMI	IUFMP	08108204672
98.	AMINU FUNKE ADEBOLA	IUFMP	08132592771
99.	SURV. OKUNLOLA A O	OFF OF THE SURV. GEN	08033614295
100.	OYELOWO W O	IUFMP	08030441344
101.	AKANI T O	IUFMP	08039152280
102.	IYENI ADENIYI	IUFMP	08026682626
103.	ODIGWE CHIMMA FELIX	IUFMP	07037586929
104.	ADEWUNMI	IUFMP	
105.	ADEWOLE SUNDAY	IUFMP	08057419931
106.	GBENGA AKITOLA	OYSPWD	07060907493
107.	I A ISHOLA	MIN OF ENV/WR	08086435555
108.	IPL(ALH,)W A GBADAMOSI	BPP&DC	08052175076
109.	ALH. (ESV) B T OLADIPO	MLH&S	08037169274

NGOs

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3.	RAYMOND EVELYN	NCWS	08056184716
4.	SALAMI JEMILAT	NCWS	08078541381
5.	SHOLA AJIBADE	CONTINENTAL INSURANCE	08029562878

COMMUNITY

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6.	ADELEKE ADEWALE	EGBERI/OMI	08037205576
7.	ALFA TAJUDEEN BALOGUN AREWA	IREPODUN	08166611550
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11.	ELDER S.A ADEBISI	IFESOWAPO AYANLE L/T	08033679500
12.	NATIMU AMUSAT	JENRIYIN ESTATE	08060352302
13.	LEKAN SALAMI	OORELOPE COMMUNITY	08023381234
14.	SEKINAT DAUDA	ODO ONA KEKERE	08058072833

15.	KUNLE PARIESO	ODO ONA KEKERE	08080723131
16.	ASOGBON TAYO	ODO ONA/ APATA COMMUNITY	08034744585
17.	OLABODE LUKMAN	LAKO COMMUNITY	08052344590
18.	SAHEED ADEMAH	CONTROL COMMUNITY	08055154488
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20.	MR. GBENGA IBIKUNLE	OORELOPE COMMUNITY	08035250787
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22.	PASTOR ODUYAJU	IFESEYE COMMUNITY	08036674240
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25.	CHEIF USMAN OWOLABI	ODOGBO FATOKUN	08163544816
26.	MRS R. OLOOLAJU	ODOGBO FATOKUN	07030163592
27.	OLAYIWOLA KAMORU OLALEKAN	YEJIDE-KUDETI	08038271530
28.	ALFA IKOARUUF HAMZAT	AGBONGNON	08056338287
29.	MR. WALE BALOGUN	BHNC	08057779407
30.	ENGR M. EHMIGHAYA	IFELODUN MONIYA	08067885147
31.	AWELERUN KEMI	GADA COMMUNITY	08074791661
32.	AROJOGBOYE MUYIWA	AKAKO	07068444041
33.	CHEIF ADEREMI OBISESAN	AKINWUMI	08109612548
34.	ALIU OPEOLA	AKINWUMI	08057105271
35.	ADIJA OLANREWAJU	ÀKOREDE	08068843441
36.	ALH NAMIDU OLOGUNJU		08023314203
37.	CHIEF SALIMONU M.O		08098244869
38.	DAUDA AMUSA	OKE-OROGUN	08056664673
39.	DAUDA TIJANI	IFESEYI	08075140750
40.	SAMSON ALABI	OLUNLOYO	08039150523
41.	OLASUPO GEBURELI	OLUNLOYO	08039595786
42.	R. ASHIMOLOWO KAWAWA	YEJIDE MOLETE	08077660464
43.	BABALOLA IDRIS TUNDE	YEJIDE KUDETI	08075206828
44.	ATILOLA B.A	YEJIDE KUDETI	08024458391
45.	MRS. SILIFAT LAWAL	YEJIDE KUDETI	09024567199
46.	MR. SIKIRRU ADEGBORO	IFESOWAPO	07082840398
47.	GBOLAGADE LATEEF	ODO OKUN	0808735018
48.	MONSURA MUSTAPHA	KOBOMOJE	07054860756
49.	WUDIMA ADEGBOLA	FATOKUN OKUSIDE	08055886570
50.	MAKINDE SERAH	OLUNLOYO	07057294699
51.	PST. OLAJIDE RICHARD	GADA COMMUNITY	08038012413
52.	HON. ORE ABOLADE	GADA COMMUNITY	08039666023
53.	ALH FATIMO SULEED	AKINWUMI	08060582100
54.	UMAR OLADEJO AKANJI	AKINWUNMI	07036397963
55.	MRS NIKE IDOWU	OLUNLOYO	08053730281
56.	MOJIDAT OLAJUMOKE	AJIBODE	08186389440
57.	EVANGELIST ISAIAH GANIYU	IREPODUN	08054060575
58.	AKINOLA OLAWALE HABILA	OLUNLOYO	0703450397
59.	TAOFEEK OLANREWAJU	IFESOWAPO IWP ROAD	08057315964
60.	MRS ONI DUPE	IFESEYI	08033699205
61.	DR BAYO AKINOLA	ODOGBO FATOKUN	08017479358
62.	MRS AKANBI F.O	ODOGBO FATOKUN	08095369155
63.	ODETUNDE VICTOR	OGUNGBADE	08033283375
64.	ALFA MUSBAU ADEGOKE	SURLERE AMUDA	08057215046
65.	ALFA SULAIMON OLORIRE	SURULERE AMUDA	08052473406
66.	GBADAMOSI IDRIS OLASUPO	OKE ODO	08036891452
67.	SANUSI NIMOTALLAHI	OKE ODO	08022461288
68.	NAPOLEON UWAYA	JERUSALEM	09090263944
69.	YINUSA SABURI	OYO	08025026080
70.	ADEOSUN RASHEED O.	ADENIJI LAYOUT	08067515376
71.	MR PHILLIP OJELEYE	ADENIJI LAYOUT	07016787263
72.	AKINOLA		
73.	OYEWO I.Z	IFESOWAPO COMMUNITY	08127378448

74.	SOLADEMI OLAOLUWA	YEJIDE COMMUNITY	09063880640
75.	DOGBA OLUWASEYI	KUMAPAIYI	070615888553
76.	MUIDEEN OLANREWAJU	IFELODUN	08189056264
77.	RACHEAL OLATAYO	ONA-ARA	08074978786
78.	ALH. MORIAMO RASHEED	YEJIDE	08051035390
79.	CHIEF AKINBOWALE TAOFEEK	ODO-ONA	07032028055
80.	OLANIPEKUN GBEMISOLA	ODO-ONA	08063735770
81.	ISAIAH GANIYU	JERUSALEM	
82.	ANTHONY ADESOKAN	JENUSAIC CRESCENT	08140375949
83.	BASHIRU BABALOLA	APETE- AWONTAN	08036698956
84.	KABIRU ADELEKE	ODO- OKUN	07030288698
85.	AKINRINSOLA G.O EVANG.	IREPODUN- KAJOREPO	08037161140
86.	ALH. W.O BELLO	APATEERE ZONE LABO	09035034202
87.	CHIEF SALIMONU M.O	AJIBOBE COMMUNITY	08098244869
88.	CHIEF ANBALI AJONI	ODEWEMIA/ AKINWUMI	08053591214
89.	CHIEF REMI OBISESAN	AKINWUMI	08109612548
90.	OLUGBENGA IBIKUNLE	OORELOPE COMMUNITY	08035250787
91.	SIKIRU O. SALAMI	ASSOCIATION	08023381234
92.	MR. M.O ABIOLA	IFELODUN	08121388971
93.	D.T OJUMOOLA	IREPODUN COMMUNITY	08054060515
94.	JOHN ADEGBOLA	ODEWENWA/AKINWUMI	08103484173
95.	SANNI SULEMON	AKINWUMI	07013571944
96.	CHIEF AKINBOWALE TAOFEEK	ODO- ONAKEKERE	07032028055
97.	MUKAILA KOLAPO	IKIMBULEGAN ODO-ONA	08108136940
98.	ADIJA		08068343441
99.	MR. ADEGOKE G.A	ODO- ONA KEKNE IB	08078215545
100.	ALELU IDEYOGU	IFESEYI OLUNLOYO	08036674240
101.	ELDER D.O OGUNBUSOLA	IWO ROAD	08059221954
102.	ADEYAN ADENIJI	ADENIJI LAYOUT	08062992683
103.	MR. O. OJELEYE	ADENIJI LAYOUT	08167872634
104.	ADELEKE ADEWALE	OGUNGBADE/EGBERI	08074287276
105.	ADEGBOYEGA ADETUNJI	JERUSALEM CRESCENT	08033518531
106.	ADELEKE IBIROBGA	SUMAL OLUYOLE	08033806023
107.	PASTOR FEMI AKINOSUN	APATERE LABO	07089162933
108.	IGE KEHINDE ESTHER	ADEYEMO ESTATE	08052213520
109.	OLUWATOBILOBA SOLOMON	ADEYEMO ESTATE	0803847233
110.	PST. ANIJESU OLUYEMI	AKINWUNMI	08034324845
111.	ALH TAJUDEEN BS-ALOGUN	IREPODUN ASS	08166611550
112.	PASTOR IGE DAVID	IREPODUN	08032192521
113.	HAJIA BINTA	AKINWUMI	08060582100
114.	L.A ADEDEJI	IREPODUN COMMUNITY	08062914221
115.	OKEYODE TAIWO	IREPODUN COMMUNITY	08077231640
116.	GBADEBO K.M	IREPODUN COMMUNITY	08034720592
117.	CHIEF M.K.O RAJI	IFESEYI OLUNLOYO	08035453316
118.	CHIEF ALH. BASHIRU	IFESEYI OLUNLOYO	
119.	BABALOLA	APETE	08036698956
120.	AKINRINSOLA G.O	IREPODUN	08037161140
121.	OLALEKAN FALOLA	ADENIJI LAYOUT	07066996856
122.	AINA TIMOTHY O.	JENRIYIN COMMUNITY	08032249170
123.	AMUSAT NATIMU	JERUSALEM COMM.	08060352303
124.	TIMOTHY A. AJALA	JERUSALEM COMM.	08037146310

ANNEX 16: LIST OF CONTACTS PERSONS

S/N	NAMES	AGENCY/ ORGANISATION	E-MAIL	PHONE NO
MDAs (INSTITUTION)				
1.	Ikudasi S.O	Ministry of Environment and Water	daisiolatunde55@gmail.com	08033733205

		Resources		
2.	Olayiwola A.S	OYORUWASSA	Adeniyiolayinola20@gmail.com	08100083310
3.	Adefuke Adewale	Federal Ministry of Environment	adewaleadefuke@gmail.com	08168734284
4.	Gbadamosi Sarafadeen A.	Federal Ministry of Environment, Oyo	olakunlebadmus@gmail.com	08133653365
5.	Salau Jelili .O.	Ministry of Environment And Water resources	salau.jelili@gmail.com	08081436645
6.	Olorunfemi Olushola	NESREA	olushola.olorunfemi@nesrea.gov.ng	08022220914
7.	Fadare John Olufemiu A.	NESREA	phemor2002@gmail.com	08038358434
8.	Mr. F.A Ajam	NESREA		08174634708
9.	Mr. Morenikeji Ayegboyo	NESREA	Morenikeji_tunde@yahoo.com	08052215616
10.	Mr. Yusuff Afis	OYOWMA	afis.yusuff@westafricaenvg	08035396413
11.	Chief Isaac A. Ishola	Ministry of Environment and Water Resources, Oyo	adisco01@yahoo.com	0806435555
12.	Mr. G.O Oguntola	Ministry of Environment and Water Resources, Oyo	Sojioguntola@yahoo.com	08037274625
13.	Mrs M.E Adeleye	Ministry of Environment and Water Resources, Oyo	Dupeadeleye@yahoo.com	08034408224
14.	Mr Moradeyo	Director, Forestry Department, Ministry of Agriculture		
15.	Oguntola G.O	Environment & Water Resources	Permanent Secretary	08037274625
16.	Kehinde G.O	Oyo State Trees & Crops	PM	08033854071
17.	Engr. M.A Ayanwale	Environment & Water Resources	Director (Dam & Water Supply)	08034783977
18.	Oderinu Yinka	Ministry of Agriculture	Assistant Director	
19.	Dr. Tairu T.T.	Oyo State Rural Water Supply & Sanitation Agency	General Manager	08034732640
20.	Adekunle Ajuwon	Oyo State Bureau of Statistics	Acting Statistician General	08067215162
21.	Tpl Taiwo, S.B	MLH & UD Strategic Physical Development Planning	Deputy Director	08033740557
22.	Surv. Bakare A.A	Office of the Surveyor General	Deputy Director	
23.	Kolawole Rasaq	Ministry of Agriculture, Natural Resources & Rural Development	Director (Fisheries)	08033546260
24.	Adeyemo Oluseye	Ministry of Lands	DDLS	08034867899
25.	Engr S.G Adegboyega	Water Cooperation	Acting General Manager	08033883727
26.	S.A Okeleye	Ministry of Industry	Directory (Industry)	08055258629 08065715497
27.	Ajala Omoyiwola	Ministry of Justice	Director, Legal Drafting & Min Counselling	08055161895
28.	Mr Eniade Williams Soji		Head of Service	
29.	Mr Abimbola Adekanmbi		Commissioner for Finance & Budget	
30.	Mr David Olatunde	Ministry of Finance & Budget	Permanent Secretary	
31.	Mrs Adebiyi M.O	State Planning Commission	Executive Secretary	
	IUFMP			
32.	Folarin Taiwo B.	Effs UI (Rapporteur	Taiwoedeyokun@yahoo.co.uk	08037798084
33.	Ojelabi Olapeju A.	Effs UI (Rapporteur	Pejuojelabi@gmail.com	08067383248
34.	Adesina F.E	IUFMP Environmental Specialist	funmievelade@gmail.com	08062322057
35.	Adedigba Moses	IUFMP M&E Specialist	Mabinu378@yahoo.com	08033533562
36.	Dada A.A	IUFMP Social Safeguard	Dadaayanbola4@yahoo.com	08035025222
37.	Babalola Deji	IUFMP Community mobilizer	Babaloladedeji@gmail.com	08023658577
38.	Engr T.O Akanbi	IUFMP Infrastructure Engineer	Akanbi.tajudeen@yahoo.com	08039152280
39.	J. Metibaiye	IUFMP Hydraulic Consultant	jwemati@yahoo.com	08033072527
40.	Adedayo Ayorinde	IUFMP Project Coordinator	Dayo1ayorinde@yahoo.com	07030263100
41.	Fadipe C. F	IUFMP Project Accountant	fadipefolasade@yahoo.com	08057932412
42.	Olawale Olayemi	IUFMP Procurement Specialist	Ywale2002@yahoo.com	08029689906
43.	Olusesi Oluyinka	IUFMP	olusesioluyinka@gmail.com	08130051146
44.	Adediji Rasheedat A.	IUFMP Procurement Assistant	dayodiji@gmail.com	070375851306

45.	Odigwe C. Felix	IUFMP Corper	felixodigwe@gmail.com	08039152280
46.	Engr Adeniji S.A	IUFMP Hydraulic Engineer	Sadeniyi46@yahoo.com	07030263100
47.	Gbolagade Ademola	IUFMP Driver		08063405082
48.	Adebisi Abidoye	IUFMP Driver		07033875959
49.	Bunmi Babanumi	IUFMP Communication Specialist	adebunmibabanumi@yahoo.com	08060894427
50.	Tosin Oso	IUFMP Social Development Consultant	tosinquest@gmail.com	07033875959
51.	Adeolu Ojo	IUFMP Environmental Consultant		
52.	Oyelowo W.O	IUFMP Project Auditor	s.oyelowu@yahoo.com	08057932412
53.	Ajuwon Waheed	IUFMP Project Administrative Manager	Ajuwon67@yahoo.com	08033072527
54.	K. T Olawoyin	IUFMP Procurement Consultant	taiwoolawoyin@gmail.com	08023108491
55.	Sunday Adewule	IUFMP Driver		08033880180
56.	Abiodun Quadri	IUFMP Driver		08068175152
COMMUNITIES				
57.	Chief Akinbowale Taofeek	Odo Ona Kekere		07032028055
58.	Mukaila Kolapo	Ikimbulegan Odo Ona		08108136940
59.	Adija			08068343441
60.	Mr Adegoke G.A	Odo.Ona Kekere		08078215545
61.	Alehi Ideyogu	Ifeseyi Olulayo onahig (Kajorepo)		08036674240
62.	Elder D.O Ogunbusola			08059221954
63.	Adeyemi Adeniyi	Adeniyi Layout		08062992683
64.	Mr O. Ojeleye	Adeniyi Layout		08167872634
65.	Antinny Adesokan	Jerusale Crescent	Thomurdes@gmail.com	08140375949
66.	Alh Tajudeen Balogun	Irepodun Association		08166611550
67.	Pastor Ige David	Irepodun		08032192521
68.	Hajia Binta	Akinwumi		08060582100
69.	L.A Adedeji	Irepodun Community		08062914221
70.	Okeyode Taiwo	Irepodun Community	Tplus007@yahoo.com	08077231640
71.	Gbadebo K.M	Irepodun Community		08034720592
72.	Chief M.K.O Raji	Ifeseyi Oluyo (Kajorepo)		08035453316
73.	Pastor Fasfludin	Ifeseyi Oluyo (Kajorepo)		08033522026
74.	Chief Alh Bashiru Babalola	Apete		08036698956
75.	Chief Salimono O	Ajibode Community	Olacrystal1@yahoo.com	08098244869
76.	Akinrinsola G.O	Irepodun		08037161140
77.	Olalekan Falola	Adeniji Layout		07066996856
78.	Aina Timothy O.	Jenriyin Community	Jenriyin estate	08032249170
79.	Amusal Wajimu	Junrubin Community		08060352302
80.	Timothy A. Ajola	Jerusalem Arulogum Road	waleayala@yahoo.com	08037146310
81.	N. Uwaya			08052202612
82.	Anthony Adesokan	Jerusalem Crescent		08140375949
83.	Bashiru Babalola	Apote-Awontan		08036698956
84.	Kabiru Adeleke	Odo-Okun Community		07030288698
85.	Akinrinsola G.O Evang	Irepodun-Kajorepo		08037161140
86.	Alh W.O Bello	Apateere zone labo		09035034202
87.	Chief Solimonu M.O	Ajibode community	Olacrystal1@yahoo.com	08098244869
88.	Chief Anbali Ajani	Odewemwa/Akinwumi		08053591214
89.	Chief Remi Obisosan	Akinwumi		08109612548
90.	Adeleke Adewale	Ogungbade/Egberi	Adewaleadeleke01@gmail.com	08074287276
91.	Adegboyega Adetunji	Jerusalem Crescent		08033518531
92.	Adeleke Ibirogba	Sumal Oluyole	adelekeibirogba@gmail.com	08033806023
93.	Anita Mene	Akinwumi		08133673150
94.	Pastor Femi Akinosun	Apatere Labo Ib		07089162933
95.	Alh W.O Bello	Apatere Labo Ib		08052213520
96.	Ige Kehinde Esther	Adeyemo Estate		0803847233
97.	Oluwatobilola Solomon	Adeyemo Estate		08142967848

98.	Pastor Anijeru Oluyemi	Akinwumi	Pastoranijesu@yahoo.com	08034324845
99.	Raymond Evelyn	NCWS	toluadebo@gmail.com	08056184716
100.	Salami Jemulat	NCWS		08078541381
PRIVATE SECTOR				
101.	Shola Ajibade	Continental Re Insurance	Sajibade@continental-re.com	085029562878
102.	Bimbo Oguntokun	Spring Paints		07081990000
103.	Sovereign Trust Insurance PLC	Precision House, 87 Obafemi Awolowo way, Oke-Bola, Dugbe. Ibadan		08184785793
104.	Great Nigerian Insurance PLC	No 8, Great Nigerian House, Lagos By-Pass, Oke-Bola, New GRA, Ibadan, Oyo		08023089065
105.	Boff and Company Brokers	Precision House, 87 Obafemi Awolowo way, Oke-Bola, Dugbe. Ibadan		08023260030
106.	Jide Alade	Structuracasa International LLC		08133046782
107.	Lawal Osho	;; ;;;		
108.	Ayankojo Ololade	Developer	ayankojololade@gmail.com	08064702277
109.	Kemi Afolabi	Design Architect		08098231138
110.	Nmadili Okwumabua	Director Southern Sahara USA / Nigeria Founder, CPDI Africa - The Community Planning & Design Initiative Africa **Atlanta, Georgia, USA** CPDI Africa	design@cpdiafrica.org	
111.	Tayo Adelaja	Nigerian Breweries Plc	Public Affairs Manager	08054022522
112.	Edem Vindah	Nigerian Breweries Plc	Sustainability & Regulatory Relations	08055997005
113.	Alfred Emeka	Procter And Gamble		07043319200
114.	Akirinola Alalade Ayinla	St David Church		08055266848
115.	Collins Ejaife	Nigerian Breweries Plc	Brewery Manager	
116.	Dr. Grace Oloukoi	Lead City University, Ibadan	Senior Lecturer (Consultant)	08063685892
117.	Mr Samuel Afolabi	Borehole Drillers Association of Nigeria (BODAN) Akala way, Off Orita New garage Ibadan		08037012057
118.	Male Integrated Nigeria Limited	Renown Plaza Opp. Rehoboth Cathedral, Oluyole Estate Aare Junction, Ibadan, Oyo Nigeria	info@maleintegrated.com	0803 808 85140803 379 844302 231 3708
119.	Waterworkx Borehole Services Limited	6 Olubadan Avenue (Seven Up Road), Mobil, Off Ring Road, Ibadan, Oyo State, Nigeria		0805 941 28320704 012 2435
120.	Prince Drill Services	Plot 6, Prof. Osuntogun Street (Road Beside Aiyefele Music House), Lagelu Estate, Ganiyu Bello, Felele, Ibadan Oyo State Nigeria	info@princedrill.com	+2348034549432 +2348053101922
121.	Safeway Drilling	Plot 3, UCH Secretariat Road, Secretariat Road, Ibadan North, Oyo, Nigeria	Mr Sadeeq	08077067445 08077067446
122.	Water Initiatives Nigeria	1, Poly Eleyele Express Road, Eleyele, Ibadan North, Oyo	Mrs Jimoh	07086155020 08023678208
123.	Lawvic Water Engineering	12, Kunle Busari Street, Off Ring Road, Ibadan North, Oyo, Nigeria	Lawal Victor Emmanuel	08068682994 07031215550
124.	Earth And Fluid Resources Ventures	Km 6, Amuludun Hotel Owode Estate, Ibadan- Abeokuta Expressway, Apata Ibadan, Apata, Ibadan North, Oyo, Nigeria	Mr Solomon	08057817977 08134488550

125.	M Ajala and Sons	6D/A36, Obasa Street, Obasa Compound, Old Bodija, Ibadan North, Oyo,	Mr.Ajala	08034919422
126.	Life Impact Borehole Drilling	3, Adetokun Street, Off Ring Road, Ibadan North, Oyo	Philip Sunday	08107723125 08027002468
127.	Crown Water Consultant	1, Gbadebo Street, Mokola, Ibadan North, Oyo,	Adediran	08066189735
128.	B.O Osabo Plumbing Contractors	U.I-Oyo Road Elewura Sango Ibadan North Oyo	Osabo	08093106472
129.	Anom Ventures Limited	C33, Paat Plaza, Poly Eleyi Road, Off Ring Road, Ibadan North, Oyo	Engr Omirinde	08023439424 08055157315
130.	Golden Horticulturist	Ibadan North, Oyo	Mr Olajide Omolorun	08033706868
131.	Glorious Paths Horticulture and Landscaping Services	Plot 4, Olusoji Elebu road, Oluyole Estate, Ibadan North, Oyo	John Odebiri	08161613188
132.	Green zone horticulture and house maintenance	24, Barika street, off ring road, Ibadan North, Oyo	Mr Olaleye Abiodun	07067664196
133.	BHNC Horticulture	1-5, Custom gate road, Ibadan North, Oyo State	Balogun	08033662162
134.	GT Driving School and Horticulture Service	31A, Road 4, Omolayo Avenue, Akobo Ojurin, Ibadan North		08052336912 08182202319
135.	Prime Horticulture	Eruwa-Eleyele Road Ologuneru Ibadan North west, Oyo	Mr Akinbulumo	08057472106 08184151681
136.	Fatus Horticulture and Multi-Purpose Company	Poly Road Moniya Akinyele Oyo	Fatudimu Jephthah	07068998530 07068950389
137.	Adeboyrufs Horticulture and Landscape Services	Federal College of Forestry Ibadan, Horticulture and Landscape Department	Adeboye Oyewale Rufus	07038660595
138.	Ministry Of Culture And Tourism	State Secretariat Agodi, Ibadan, Oyo State,		+23428103871
139.	Triton Group	No.49, Apapa Oshodi expressway, Ijesha Tedo, Ijesha, Lagos		+23417936322
140.	***Durante Fish Industries Ltd***	Nigerwest Building, Challenge, Ibadan, Oyo		+234 2 313963 08055338080
141.	Ecodawn Fish Consultant	Ashi, Ibadan North.	Boye	08037117685 08070722028
142.	Aquaman		Damilola	08030776243
143.	West Africa ENRG **(Environmental)**	Old OYOMMA Yard, Agodi-Gate, Ibadan, Oyo State		09099581501 +2348159197600
		NGOs IN IBADAN		
144.	Nigerian Environmental Study /Action Team **(Environment)**	1, Oluokun Street, Off Awolowo Avenue Bodija, Ibadan	www.nest interactive.org	08054037672 08033273871
145.	Mrs Titilayo Adefiooye	Community Development Organisation		08069568004
146.	Ikpoghogho Oruoghene	Purity Group **(Health, Events, Electronics)**12, Adenuga New Bodija, Ibadan		08186180814, 07031551913
147.	Olushesan	Discovering and Empowerment Initiative **(Business Center, Education, Consultant, Recruitment)**Ibadan North Oyo,38 Odupa Shopping Center Idi-Ape		08074497062, 07044692362
148.	Akinkunmi Mohammed Sharf	Centre for Youth Initiative on Self Education (**Youth Development)**6, Odeku Close, New Bodija Ibadan.		08065661231, 084362956
149.	Dr. Adeyeye Adewole.	Centre for Organizational and professional ethics cope Africa		08057859711, 08035025878

		(Government Office) Ibadan Suite B12, 13 Josbeed Plaza, Ashi Road Bodija.		
150.	Iyun Abmibola	Jumpstart Academy Nigeria **(Associations, Development services)**Adenuga Street old Bodija, before Bodija Oja-rin off Ring Road Ibadan North Oyo,		07066718499, 08130940552
151.	Youth Enterprise with Innovation in Nigeria **(, jobs, youths, women empowerment)**	Room 39, Federal Secretariat Complex, Ikolaba, Ibadan North Oyo.	Dr. Akinremi	08064407033, 08025318000
152.	Moses Ibi Oyelede	National Poverty Eradication Programme 2nd floor, Federal Secretariat complex, Ikolaba Gate, Ibadan North Oyo		08037132343

ANNEX 17: ATTENDANCE SHEETS FOR SESA WORKSHOPS

15TH AUGUST, 2017

IBADAN URBAN FLOODING MANAGEMENT PROJECT (IUFMP)

A SESA SCOPING WORKSHOP ON ENVIRONMENTAL AND SOCIAL STRATEGIES FOR FLOOD MANAGEMENT

15TH AUGUST, 2017

S/N	NAMES	AGENCY/ORGANISATION	E-MAIL	PHONE NO	SIGN IN	SIGN OUT
1	Alh Tajudeen Balogun	Irepodun Ass.		08166611550	[illegible]	[illegible]
2	Pastor IGE David	Irepodun		08032192524	[illegible]	[illegible]
3	Hajia Binta	Akinwunmi		09060582120	[illegible]	[illegible]
4	L. A ADEDEJI	IREPODUN COMMUNITY		08062911424	[illegible]	[illegible]
5	OKEYODE TAIWO	IREPODUN Community	Tplus17@yahoo	08177231640	[illegible]	[illegible]
6	GBADEBO K.M	IREPODUN COMMUNITY		08034720592	[illegible]	[illegible]
7	CHIEF M.K.O. RAJI	IFESOWO (Egbeda)-Olulojo	[illegible]	08035453314	[illegible]	[illegible]
8	Pastor [illegible]	"	" —	08033522026	[illegible]	[illegible]
9	Chief Aly. BASHIRU BABALOLA	Apete		0803669895	[illegible]	[illegible]
10	Chief Salimonu M.O	Agbode Community	olacrystal1@yah	08098244889	[illegible]	[illegible]
11	AKINRINSOLA G.O.	IREPODUN ✓		08037161140	[illegible]	[illegible]
12	OLALEKAN Falola	ADENIJI LAY OUT		08107066996	[illegible]	[illegible]
13	AINA Timothy O	JEHRIYIN COMMUNITY	Jenrinyin estate	08032249170	[illegible]	[illegible]
14	AMUSA [illegible]	Jenrinyin Community	Jenrinyin	08060352354	[illegible]	[illegible]
15	Timothy A. Ajala	Jerusalem, Amurugan Rd	walegajal@yahoo.co	08037146310	[illegible]	[illegible]
16	M. Uwaya	—do—	—nil—	08052202612	[illegible]	[illegible]

IBADAN URBAN FLOODING MANAGEMENT PROJECT (IUFMP)

A SESA SCOPING WORKSHOP ON ENVIRONMENTAL AND SOCIAL STRATEGIES FOR FLOOD MANAGEMENT

15TH AUGUST, 2017

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1	ADELEKE ADEWALE	OGUNGBADE/EGBERI	adewaleadeleke01@gmail.com	08074287276	[illegible]	[illegible]
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3	ADELEKE IBIRONKE	SUMAR OLUTOLE	[illegible]@gmail	08033806[illegible]	[illegible]	[illegible]
4	PASTOR FEMI AKINOSUN	APATERE LABO IB		07089162933	[illegible]	[illegible]
5	ALH W.O. BELLO	✓ ✓		08052213520	[illegible]	[illegible]
6	Ige Kehinde Esther	Adeyemo Estate	—	0803847233	[illegible]	[illegible]
7	Oluwatobiloba Solomon	✓ ✓		08142967848	[illegible]	[illegible]
8	Pst. Anijesu Oluyemi	Akinwunmi	pastoranijesu@yahoo.com	0803[illegible]	[illegible]	[illegible]

IBADAN URBAN FLOODING MANAGEMENT PROJECT (IUFMP)

A SESA SCOPING WORKSHOP ON ENVIRONMENTAL AND SOCIAL STRATEGIES FOR FLOOD MANAGEMENT

15TH AUGUST, 2017

S/N	NAMES	AGENCY/ORGANISATION	E-MAIL	PHONE NO	SIGN IN	SIGN OUT
1.	Chief Isaac A. Ishola	MIN OF ENVT. & WR, Oyo State	adisco01@yahoo	08086435555	[illegible]	
2.	Mr G.O. Oguntola	"	soji.oguntola@yahoo.com	08037274625	[illegible]	
3	Mrs M.E. Adeleye	"	dupeadeleye@yahoo	08034408224	[illegible]	

IBADAN URBAN FLOODING MANAGEMENT PROJECT (IUFMP)

A SESA SCOPING WORKSHOP ON ENVIRONMENTAL AND SOCIAL STRATEGIES FOR FLOOD MANAGEMENT

15TH AUGUST, 2017

S/N	NAMES	AGENCY/ORGANISATION	E-MAIL	PHONE NO	SIGN IN	SIGN OUT
1	Olugbenga Ilori Kunle	Oorelope Community Dev	glenga_ilikunle@yahoo.u	08035525078		
2	Sikiru O. Salami	Association	sosalami2007@yahoo.com	08023381234		
3	Mr. M. O. Abiola	Ifelodun	—	08121388971		
4	D. T. Ojumoola	Irepodun Comm.		08054060515		
5	Kabiru Adeleke	Osungbekun Commun.	—	07030288698		
6	CHIEF REMI OBISESAN	ODEWOLWA/AKINWUMI Community		08109612548		
7	JOHN ADEGBOLA	ODEWENWA/AKINWUMI COMMUNITY		08103484723		
8	SAMMI SULEMON B	AKINWUMI		07013571945		
9	Chief Akinbowale Thofeek	Odo-onakekere		07032028055		
10	Mukaila Kolapo	Akinbulegan Odo Ona		08108236940		
11	ADIJA			08068343441	ADIJA	ADIJA
12	Mr. Adegoke G.A.	Odo-ona Kekere ib		0807821		
13	Alatu Ideyan	Ifesowapo (Ekapogbo) Olulogo Oranyo		08036624260		
14	Elder D.O. Ogunbukola	Liworoad	—	08059221954		
15	Adeyemi Adeniji	Adeniji Layout		08062992683		
16	Mr. O. Oyeleye	Adeniji Layout		08167872634		
17	ANTHONY ADESOKAN	Jerusalem Crescent	Thramurdes@gmail.com	08140375949		

NGO

IBADAN URBAN FLOODING MANAGEMENT PROJECT (IUFMP)

A SESA SCOPING WORKSHOP ON ENVIRONMENTAL AND SOCIAL STRATEGIES FOR FLOOD MANAGEMENT

15TH AUGUST, 2017

S/N	NAMES	AGENCY/ORGANISATION	E-MAIL	PHONE NO	SIGN IN	SIGN OUT
1	Raymond Evelyn	NCWS	Edwardebs@gmail	08056154715		
2	Salami Jennifer	NCWS	—	08078541384		
	INSURANCE					
1.	Shola Agbade	Continental Re	sajibade@continental-re.com	08029562278		

CHAIRMAN

IBADAN URBAN FLOODING MANAGEMENT PROJECT (IUFMP)

A SESA SCOPING WORKSHOP ON ENVIRONMENTAL AND SOCIAL STRATEGIES FOR FLOOD MANAGEMENT

15TH AUGUST, 2017

S/N	NAMES	AGENCY/ORGANISATION	E-MAIL	PHONE NO	SIGN IN	SIGN OUT
1	ANTHONY ADESOKAN	Jerusalem Crescent		08140375949		
2	BASHIRU BABALOLA	Apete - Awotan		08036698956		
3	Kabiru Adeleke	Odo-Oku Comm.		07030288698		
4	AKINRINSOLA G.O. EVANG.	IREPODUN - KAJOREPO		08037161140		
5	Alh. W. O. Bello	Apatere Zone Labo		09035034202		
6	Chief Salimonu M.O.	Agbede Community	olacrystal Ienal...	08058244567		
7	Chief Anbali Ajani	ODEOGBAMOLA/AKINWUMI		08053591214		
8	Chief Remi Obisesan	Akinwumi		08109612548	Robinson	

IUFMP

IBADAN URBAN FLOODING MANAGEMENT PROJECT (IUFMP)

A SESA SCOPING WORKSHOP ON ENVIRONMENTAL AND SOCIAL STRATEGIES FOR FLOOD MANAGEMENT

15TH AUGUST, 2017

S/N	NAMES	AGENCY/ORGANISATION	E-MAIL	PHONE NO	SIGN IN	SIGN OUT
1	FOLARIN TAIWO B.	FRHS, UI (Rapporteur	taiwoedeyokunf@yahoo.co.uk	08037798084	[signature]	[signature]
2	OJELABI OLAPEJU A.	" "	pejuojelabi@gmail.com	08067383248	[signature]	[signature]
3	Adesina F.E	IUFMP Env. Specialist	funmieyelade@gmail.com	08062322057	[signature]	[signature]
4	Adedigba, Moses A.	IUFMP MPE Sp.	mabinu378@yahoo	08033533862	[signature]	[signature]
5	Dada A.A	IUFMP Social Safeguard	dadaayanbikg@yahoo	08035025271	[signature]	[signature]
6	Babalola Segi	IUFMP Comm. Mobilizer	babalolaradeleseji@gmail.com	08023658577	[signature]	[signature]
~~7~~	~~Fadare John Olufemi A.~~	~~NESREA, SWZ, IBADAN~~	~~[illegible]~~	~~[illegible]~~	[signature]	
7	Engr. T.O Akanbi	IUFMP	akanbi.tojudeen@y	08039152280	[signature]	[signature]
8	Jide Metibaiye	✓	juemati@yahoo.com	08033072527	[signature]	
9	Adedoyin Ayomide	✓	doyin1ayomide@yahoo.com	07030263100	[signature]	[signature]
10	Fadipe CF	IUFMP	fadipefolasade	08057932912	[signature]	[signature]
11	Olawale Olayemi	✓	[illegible]@yahoo.com	08039689946	[signature]	[signature]
12	Olusesi Oluyinka	Min. ✓	oluseriolunyinka@gmail.com	08130051816	[signature]	[signature]
13	Engr. M.A. Ayanwale	MIN. Env. & WR.	amaok.konsult@gmail	08034783977	[signature]	
14	Olaniyi R.F. (Mrs.)	Min. Envt & WR.	ramota_olaniyi@yahoo.com	08032566593	[signature]	
15	Adesoji O.O (Mr)	" " "	olusegunadesoji@gmail.com	08016558574	[signature]	[signature]

MDAs

IBADAN URBAN FLOODING MANAGEMENT PROJECT (IUFMP)

A SESA SCOPING WORKSHOP ON ENVIRONMENTAL AND SOCIAL STRATEGIES FOR FLOOD MANAGEMENT

15TH AUGUST, 2017

S/N	NAMES	AGENCY/ORGANISATION	E-MAIL	PHONE NO	SIGN IN	SIGN OUT
1	IKUDAISI S.O	MOREWR	daisiolatunbosss@gmail.com	08033733205	[signature]	[signature]
2	Olayiwola A.S	OYORUWASSA	adeniyiolayiwola@gmail.com	08100083340	[signature]	[signature]
3	Olorunfemi Olushola	NESREA	olushola.olorunfemi@nesrea.gov.ng	08022220914	[signature]	[signature]
4	Fadare John Olufemi A.	NESREA	phenor2012@gmail.com	08038358434	[signature]	[signature]
5	ADEKUKE ADEWALE	FED. MIN. OF ENV.	adewaleadefuke@gmail.com	08168734284	[signature]	[signature]
6	Gbadamosi Sarafadeen A.	Fed. Min. of Env. Oyo	olakunlesbadmus@gmail.com	08133653365	[signature]	[signature]
7	SALAU JELILI.O.	MIN. OF ENVIRONMENT & Nat. Res.	salau.jelili@gmail.com	08081436645	[signature]	[signature]
8	Mr. I.A Ajani	NESREA	[illegible]@nesrea.gov.ng	08174763	[signature]	
9	Mr. Morenikeji Ayegbayo	✓	morenikeji_tunde@yahoo.com	08052215616	[signature]	[signature]
~~10~~	~~Mrs Popoola Evelyn~~	~~NEWS~~	~~[illegible]@gmail.com~~	~~08056184716~~	[signature]	
~~11~~	~~Salami Semilola~~	~~NEWS~~	~~—~~	~~08078541381~~	[signature]	
10	Mr. Yusuff Afis	OYOWMA	afis.yusuff@nestafrica.org	08035396413	[signature]	[signature]

16TH AUGUST, 2017

IUFMP

IBADAN URBAN FLOODING MANAGEMENT PROJECT (IUFMP)

A SESA SCOPING WORKSHOP ON FLOOD MITIGATION AND GOVERNANCE ISSUES

16TH AUGUST, 2017

S/N	NAMES	AGENCY/ORGANISATION	E-MAIL	PHONE NO	SIGN IN	SIGN OUT
1.	Adesina F. T	IUFMP	funmi.eviel[illegible]@gmail.com	08062322057	[illegible]	[illegible]
2.	Babalola Aeji	IUFMP	adeleyi.babalola@gmail.com	08023658577	[illegible]	[illegible]
3.	Dada A. A	IUFMP	dadaayanbolaga@yahoo	08035025277	[illegible]	[illegible]
4	FOLARIN Taiwo B.	IUFMP	taiwoadeyokun@yahoo.com	08037798054	[illegible]	[illegible]
5	Ojelabi Olapeju A	IUFMP	pejuojelabi@gmail.com	08067583248	[illegible]	[illegible]
6	Adedeji Rasheedat A.	IUFMP	dayodeji@gmail.com	07058515065	[illegible]	[illegible]
7	ODIGWE .C. FELIX	IUFMP	Felixodigwe@gmail.com	07037586929	[illegible]	[illegible]
8	Engr. T.O. Akanbi	IUFMP	akanbi.tajudeen@yahoo.com	08039152280	[illegible]	[illegible]
9	Engr Adeniji S.A.	IUFMP	sadeniji96@yahoo.com	08034794797	[illegible]	[illegible]
10	[illegible] Ayinmodi	IUFMP	[illegible]@yahoo.com	07030263100	[illegible]	[illegible]
11	Gbolagade Adenola	IUFMP		08057114319	[illegible]	[illegible]
12	Adebisi Abidoye	IUFMP		08063405082	[illegible]	[illegible]
13	Bunmi Babanumi	IUFMP	[illegible]@yahoo.com	07033875959	[illegible]	[illegible]
14	Tosin Odo	IUFMP	tosinquest@gmail.com	0806 087 44 27	[illegible]	[illegible]
15	Fadipe C F	IUFMP	fadipefolasade@yahoo.com	08017932412	[illegible]	
16	Oyelowo W. O.	IUFMP	S.Oyelowo@yahoo.com	08030448344	[illegible]	[illegible]
17.	Adedigba, Moses A.	IUFMP	mobimu378@yahoo	08033533562	[illegible]	[illegible]

IUFMP

IBADAN URBAN FLOODING MANAGEMENT PROJECT (IUFMP)

A SESA SCOPING WORKSHOP ON FLOOD MITIGATION AND GOVERNANCE ISSUES

16TH AUGUST, 2017

S/N	NAMES	AGENCY/ORGANISATION	E-MAIL	PHONE NO	SIGN IN	SIGN OUT
18	Olawale O. M	IUFMP	[illegible]@yahoo.com	07029688606	[illegible]	Olawale
19	Jide Nwabuiye	IUFMP	jidemeti@yahoo.com	08033072527	[illegible]	[illegible]
20	AJIWON WAHEED	IUFMP	ajiwon67@yahoo.com	08027168491	W. Ajiwon	W. Ajiwon
21	K. T. OLAWOYIN	IUFMP	[illegible]@yahoo.com	08033680810	[illegible]	[illegible]
22	Sunday Adesola	IUFMP		08057489935	[illegible]	[illegible]
23	Abiodun Bolu	IUFMP			[illegible]	[illegible]

MDAs

IBADAN URBAN FLOODING MANAGEMENT PROJECT (IUFMP)

A SESA SCOPING WORKSHOP ON ENVIRONMENTAL AND SOCIAL STRATEGIES FOR FLOOD MANAGEMENT

16th August 2017 ~~15TH AUGUST, 2017~~

S/N	NAMES	AGENCY/ORGANISATION	E-MAIL	PHONE NO	SIGN IN	SIGN OUT
1.	Kolajo Sunday O.	Min. of Women Affairs	kolajoniyi@yahoo.com	08053002087	[illegible]	[illegible]
2	Ogungbenro Abeato	FOMWAN	oomowunmiade@gmail.com	08067918609	[illegible]	[illegible]
3	Gbadamosi Sarafadeen A	Fed. Min. of Env.	dakunlesbadmus@gmail.com	08133653365	[illegible]	[illegible]
4	ADEFUKE ADEWALE	FED MIN OF Env.+	adewaleadefuke@gmail.com	08168734284	[illegible]	[illegible]
5.	Hon. Oladele F	Min. of Women Affairs	[illegible]@gmail.com	[illegible]	[illegible]	[illegible]
6.	Mr. Yusuff Afis	OYOWMA (WAE	afis.yusuff@wetafrica.com	08035376413	[illegible]	[illegible]
7.	Taiwo O.M.	OYOWMA	tolawale37@yahoo.com	08105201825	[illegible]	[illegible]
8.	Olusesi Oluyinka	IUFMP	oluseseolayinka@gmail.com	08130051146	[illegible]	[illegible]
9.	Olayiwola A.S	OYO RUWASSA	ademoyeolayiwola@gmail.com	08100083210	[illegible]	[illegible]
10	Uclendo Evelyn Mnena	Ministry of Women Affairs		07035590275	[illegible]	[illegible]
11	[illegible] O.D	Oyo SEMA	[illegible]@gmail	0806688[illegible]	[illegible]	[illegible]
12	SALAU JELILI. O.	Min. of Environment & Water Rs	salau.jelili@gmail.com	08081436645	[illegible]	[illegible]
13	IKUDAISI S. O.	MoE&WR	daisiphertunde55@gmail.com	08033733205	[illegible]	[illegible]
14	Tpl (Mrs) Omofunmi	BPP x DC	adelolaomofunmi@gmail	08028455075	[illegible]	[illegible]
15	Tpl. S.B. Tanwo	BPP & DC	sbtanwo2005@yahoo.com	08033740557	[illegible]	[illegible]
16	Busola Adetunyi	Information	adetunyibusola@yahoo.com	07055303906	[illegible]	[illegible]
17	Gade A.E (Mrs)	Ministry of Justice	berbella1961@yahoo.com	08187755354	[illegible]	[illegible]

MDAs

IBADAN URBAN FLOODING MANAGEMENT PROJECT (IUFMP)

A SESA SCOPING WORKSHOP ON FLOOD MITIGATION AND GOVERNANCE ISSUES

16TH AUGUST, 2017

S/N	NAMES	AGENCY/ORGANISATION	E-MAIL	PHONE NO	SIGN IN	SIGN OUT
18.	Adeeni C.O	W.C.O.S	funmilolaadeeni@gmail.com	08032071768	[illegible]	[illegible]
19	Bolaji Dauda	OYOWMA/WAE	bolajialwe@yahoo.com	08032730405	[illegible]	[illegible]
20	olorunfemi olushola	NESREA	olushola.olorunfemi@nesrea.gov.ng	08022220914	[illegible]	[illegible]
21.	Fadare John Olufemi A.	NESREA SWZ Ibadan	[illegible]@gmail.com	08038358434	[illegible]	[illegible]
22	Surv. Okunlola A.O	Office of the Surveyor General	geoceanic2@yahoo.com	08033614295	[illegible]	[illegible]
23	Surv. Jolaoso J.O	✓	Jolaoso.oliyani@yahoo	0808244630	[illegible]	[illegible]
24	Morenikeji Anyegbayo	NESREA	moreayinituke2017	08052215616	[illegible]	[illegible]
25	Adesola Toluwase Love	"	lovelymercy95@yahoo.com	08135898620	[illegible]	[illegible]
26	Afonni F.A	NESREA	swzone@nesrea.gov.ng	08174674708	[illegible]	
27	Maike, S.M.	NESREA, Osun	osun@nesrea.gov.ng	07053545915	[illegible]	
28	Adeosun A A	NESREA	swzone@nesrea	08055224410	[illegible]	[illegible]

31ST JANUARY & 1ST FEBRUARY 2018

IUFMP

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IBADAN URBAN FLOOD MANAGEMENT PROJECT (IUFMP)

OYO STATE

SECOND (2ND) WORKSHOP FOR THE STRATEGIC ENVIRONMENTAL AND SOCIAL ASSESSMENT (SESA) OF THE IBADAN INTEGRATED FLOOD RISK MANAGEMENT AND DRAINAGE MASTER PLAN

31ST JANUARY & 1ST FEBRUARY 2018

ATTENDANCE SHEET

S/N	NAMES	AGENCY/ORGANIZATION	DESIGNATION	PHONE NUMBER	DAY 1 SIGN IN	DAY 1 SIGN OUT	DAY 2 SIGN IN	DAY 2 SIGN OUT
181	Soleolegonbo-Afinola	IUFMP	DRIVER	07057114519				
182	Ajuwon Wahеeda	IUFMP	Admin Manager	[illegible]				
183	Olayiwola Solomon O	IUFMP	Chief Clerk Off.	[illegible]				
184	[illegible]	IUFMP	Driver	[illegible]				
185	Alamu Rasaki Opeyemi	IUFMP	Clerical	[illegible]				
186	[illegible]	IUFMP	Cleaner	[illegible]				
187	Surv. [illegible] A O	Office of the Surveyor General	DIRECTOR	[illegible]				
188	Oyewuwo W-O	IUFMP	Proj. Audit	[illegible]				
189	Akanni T.O	✓	Project Info	[illegible]				
190	[illegible] Adeniyi	✓	Contract mgr	[illegible]				
191	[illegible] Folix	—	Civil-Engr	[illegible]				
192	Adeniran							
193	[illegible]	IUFMP	[illegible]	[illegible]				
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IBADAN URBAN FLOOD MANAGEMENT PROJECT (IUFMP)

OYO STATE

SECOND (2ND) WORKSHOP FOR THE STRATEGIC ENVIRONMENTAL AND SOCIAL ASSESSMENT (SESA) OF THE IBADAN INTEGRATED FLOOD RISK MANAGEMENT AND DRAINAGE MASTER PLAN

31ST JANUARY & 1ST FEBRUARY 2018

ATTENDANCE SHEET

2 (37)

S/N	NAMES	AGENCY/ORGANIZATION	DESIGNATION	PHONE NUMBER	DAY 1 SIGN IN	DAY 1 SIGN OUT	DAY 2 SIGN IN	DAY 2 SIGN OUT
21	OJUOLA I.O.	OYO RUWASSA	D.O	[illegible]				
22	Engr. Aremu, D.K.	Min. of Works & Transport	PCE	[illegible]				
23	[illegible]	NTA Ibadan	Asst. Dir. [illegible]	[illegible]				
24	[illegible]	NB PLC IBADAN	Asst. CONTROLLER	[illegible]				
25	[illegible]	NIHORT, Ibadan	[illegible]	[illegible]				
26	Okeleye Samuel	Oyo State Govt.	Director	[illegible]				
27	ADEFUNKE ADEWALE (Mrs)	FED. MIN. OF ENV. IB.	CHIEF	[illegible]				
28	ADETOLA ADUNOLA D	FED MIN OF ENV. IB	CONTROLLER	[illegible]				
29	Kufeyi [illegible]	FED MIN OF ENV. IB	SSO	[illegible]				
30	Liamiyu Wasiu A.	OYOSPC	DD (MEP)	[illegible]				
31	Engr. M.A. [illegible]	MEPWR	D (WRMgt)	[illegible]				
32	[illegible]	Environment	D (EHS)	[illegible]				
33	[illegible] S.O	MinE&WR	Dir (PRS)	[illegible]				
34	ISOLA, D.O.	Head of Service	Director	[illegible]				
35	ARIORI LATEEFE-OYEDISI	MIN OF WOMEN AFFAIRS	Asst DIRECTOR	[illegible]				
36	Ogunyemi D. [illegible]	ONSEMPA	CSWB [illegible]	[illegible]				
37	SALAU JELILI OLANIYI	Min of Environment OYSG	DD Envt. Mgt.	[illegible]				
38	[illegible]	[illegible]	[illegible]	[illegible]				
39	[illegible]	MIN OF INFORMATION	Deputy Director	[illegible]				
40	[illegible]	Min for [illegible]	[illegible]	[illegible]				

MDAS

IBADAN URBAN FLOOD MANAGEMENT PROJECT (IUFMP)

SECOND (2ND) WORKSHOP FOR THE STRATEGIC ENVIRONMENTAL AND SOCIAL ASSESSMENT (SESA) OF THE IBADAN INTEGRATED FLOOD RISK MANAGEMENT AND DRAINAGE MASTER PLAN

31st JANUARY & 1st FEBRUARY 2018

ATTENDANCE SHEET

S/N	NAMES	AGENCY/ORGANIZATION	DESIGNATION	PHONE NUMBER	DAY 1 SIGN IN	DAY 1 SIGN OUT	DAY 2 SIGN IN	DAY 2 SIGN OUT
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IBADAN URBAN FLOOD MANAGEMENT PROJECT (IUFMP)

SECOND (2ND) WORKSHOP FOR THE STRATEGIC ENVIRONMENTAL AND SOCIAL ASSESSMENT (SESA) OF THE IBADAN INTEGRATED FLOOD RISK MANAGEMENT AND DRAINAGE MASTER PLAN

31st JANUARY & 1st FEBRUARY 2018

ATTENDANCE SHEET

S/N	NAMES	AGENCY/ORGANIZATION	DESIGNATION	PHONE NUMBER	DAY 1 SIGN IN	DAY 1 SIGN OUT	DAY 2 SIGN IN	DAY 2 SIGN OUT
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MDAs

IBADAN URBAN FLOOD MANAGEMENT PROJECT (IUFMP)

SECOND (2ND) WORKSHOP FOR THE STRATEGIC ENVIRONMENTAL AND SOCIAL ASSESSMENT (SESA) OF THE IBADAN INTEGRATED FLOOD RISK MANAGEMENT AND DRAINAGE MASTER PLAN

31st JANUARY & 1st FEBRUARY 2018

ATTENDANCE SHEET

S/N	NAMES	AGENCY/ORGANIZATION	DESIGNATION	PHONE NUMBER	DAY 1 SIGN IN	DAY 1 SIGN OUT	DAY 2 SIGN IN	DAY 2 SIGN OUT
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OTHER AGENCIES

27

IBADAN URBAN FLOOD MANAGEMENT PROJECT (IUFMP)

SECOND (2ND) WORKSHOP FOR THE STRATEGIC ENVIRONMENTAL AND SOCIAL ASSESSMENT (SESA) OF THE IBADAN INTEGRATED FLOOD RISK MANAGEMENT AND DRAINAGE MASTER PLAN

31st JANUARY & 1st FEBRUARY 2018

ATTENDANCE SHEET

3

S/N	NAMES	AGENCY/ORGANIZATION	DESIGNATION	PHONE NUMBER	DAY 1 SIGN IN	DAY 1 SIGN OUT	DAY 2 SIGN IN	DAY 2 SIGN OUT
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OTHER AGENCIES

IBADAN URBAN FLOOD MANAGEMENT PROJECT (IUFMP)

OYO STATE

SECOND (2ND) WORKSHOP FOR THE STRATEGIC ENVIRONMENTAL AND SOCIAL ASSESSMENT (SESA) OF THE IBADAN INTEGRATED FLOOD RISK MANAGEMENT AND DRAINAGE MASTER PLAN

31st JANUARY & 1st FEBRUARY 2018

ATTENDANCE SHEET

S/N	NAMES	AGENCY/ORGANIZATION	DESIGNATION	PHONE NUMBER	DAY 1 SIGN IN	DAY 1 SIGN OUT	DAY 2 SIGN IN	DAY 2 SIGN OUT
		[illegible]						
141	PETER [illegible]	[illegible]	News Dept.	[illegible]				
142	Bisiriyu A. Abiola	Dar - RI - Ibadan	Res. Dar	[illegible]				
143	Ademola Adebayo	Dar - AI - Ibadan	Res	[illegible]				
144								
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Others AGENCIES

IBADAN URBAN FLOOD MANAGEMENT PROJECT (IUFMP)

SECOND (2ND) WORKSHOP FOR THE STRATEGIC ENVIRONMENTAL AND SOCIAL ASSESSMENT (SESA) OF THE IBADAN INTEGRATED FLOOD RISK MANAGEMENT AND DRAINAGE MASTER PLAN
31ST JANUARY & 1ST FEBRUARY 2018
ATTENDANCE SHEET

S/N	NAMES	AGENCY/ORGANIZATION	DESIGNATION	PHONE NUMBER	DAY 1 SIGN IN	DAY 1 SIGN OUT	DAY 2 SIGN IN	DAY 2 SIGN OUT
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NGOs

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IBADAN URBAN FLOOD MANAGEMENT PROJECT (IUFMP)

SECOND (2ND) WORKSHOP FOR THE STRATEGIC ENVIRONMENTAL AND SOCIAL ASSESSMENT (SESA) OF THE IBADAN INTEGRATED FLOOD RISK MANAGEMENT AND DRAINAGE MASTER PLAN
31ST JANUARY & 1ST FEBRUARY 2018
ATTENDANCE SHEET

4 (12)

S/N	NAMES	AGENCY/ORGANIZATION	DESIGNATION	PHONE NUMBER	DAY 1 SIGN IN	DAY 1 SIGN OUT	DAY 2 SIGN IN	DAY 2 SIGN OUT
21								
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NGOs

2

IBADAN URBAN FLOOD MANAGEMENT PROJECT (IUFMP)

SECOND (2ND) WORKSHOP FOR THE STRATEGIC ENVIRONMENTAL AND SOCIAL ASSESSMENT (SESA) OF THE IBADAN INTEGRATED FLOOD RISK MANAGEMENT AND DRAINAGE MASTER PLAN

31st JANUARY & 1st FEBRUARY 2018

ATTENDANCE SHEET

S/N	NAMES	AGENCY/ORGANIZATION	DESIGNATION	PHONE NUMBER	DAY 1 SIGN IN	DAY 1 SIGN OUT	DAY 2 SIGN IN	DAY 2 SIGN OUT
81	Comrade Akintade Adekemi	Women Environmental Programme Nigeria [illegible]	Coordinator	08135202807	[illegible]	[illegible]	[illegible]	[illegible]
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COMMUNITIES

1

IBADAN URBAN FLOOD MANAGEMENT PROJECT (IUFMP)

SECOND (2ND) WORKSHOP FOR THE STRATEGIC ENVIRONMENTAL AND SOCIAL ASSESSMENT (SESA) OF THE IBADAN INTEGRATED FLOOD RISK MANAGEMENT AND DRAINAGE MASTER PLAN

31st JANUARY & 1st FEBRUARY 2018

ATTENDANCE SHEET

5 (84)

S/N	NAMES	AGENCY/ORGANIZATION	DESIGNATION	PHONE NUMBER	DAY 1 SIGN IN	DAY 1 SIGN OUT	DAY 2 SIGN IN	DAY 2 SIGN OUT
81	Ladapo Adeleke	Tealagbona [illegible]	Chairman	07030288 [illegible]	[illegible]	[illegible]	[illegible]	[illegible]
82	Alhaji Fatai [illegible] Salami	Saki Abonna LC	Secretary	0805707514 [illegible]	[illegible]	[illegible]	[illegible]	[illegible]
83	[illegible] Odedele	Kolobinrin [illegible]	[illegible]	0706 [illegible]	[illegible]	[illegible]	[illegible]	[illegible]
84	[illegible]	Ifelodun Comm.	Patron	08121388491	[illegible]	[illegible]	[illegible]	[illegible]
85	AKINRINSOLA G.O.	IREPODUN Town	CHAIRMAN	08037161140	[illegible]	[illegible]	[illegible]	[illegible]
86	[illegible]	[illegible]	Chairman	07005 [illegible]	[illegible]	[illegible]	[illegible]	[illegible]
87	Ajeleke Adewale	Egberi / Omi	Chairman	08037205578	[illegible]	[illegible]	[illegible]	[illegible]
88	Alfa [illegible] Balogun [illegible]	Irepodun Landlord Ass.	P.R.O	08166615550	[illegible]	[illegible]	[illegible]	[illegible]
89	[illegible] Oladeji	Olunloye	Member	08053 [illegible]	[illegible]	[illegible]	[illegible]	[illegible]
90	[illegible] David	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
91	[illegible] Olubayo	[illegible]	Vice Chairman	07030264131	[illegible]	[illegible]	[illegible]	[illegible]
92	Comrade S.O. [illegible]	[illegible] LC	Chairman	08065911861	[illegible]	[illegible]	[illegible]	[illegible]
93	Elder S A Adebisi	✓	Landlord	08053679360	[illegible]	[illegible]	[illegible]	
94	Alatimu Amusat	Janriyi Estate	Chairman	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
95	Lekan Salami	Odekope Community	Secretary	08023381234	[illegible]	[illegible]	[illegible]	[illegible]
96	Sekinat [illegible]	OPO [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
97	KUNLE FARIESS	ODO-ONA KEKERE	SEC.	08080723138	[illegible]	[illegible]	[illegible]	[illegible]
98	Adegbami Tayo	Odo Ona / Apata Community	Secretary	08034744565	[illegible]	[illegible]	[illegible]	[illegible]
99	Olabode Lukman	Lako Com. Comp	Landlord	08052344590	[illegible]	[illegible]	[illegible]	[illegible]
100	SAHEED Adeniran	Lako Community	landlord	08055190238	[illegible]	[illegible]	[illegible]	[illegible]

COMMUNITIES (2)

IBADAN URBAN FLOOD MANAGEMENT PROJECT (IUFMP)

SECOND (2ND) WORKSHOP FOR THE STRATEGIC ENVIRONMENTAL AND SOCIAL ASSESSMENT (SESA) OF THE IBADAN INTEGRATED FLOOD RISK MANAGEMENT AND DRAINAGE MASTER PLAN
31ST JANUARY & 1ST FEBRUARY 2018
ATTENDANCE SHEET

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COMMUNITIES (3)

IBADAN URBAN FLOOD MANAGEMENT PROJECT (IUFMP)

SECOND (2ND) WORKSHOP FOR THE STRATEGIC ENVIRONMENTAL AND SOCIAL ASSESSMENT (SESA) OF THE IBADAN INTEGRATED FLOOD RISK MANAGEMENT AND DRAINAGE MASTER PLAN
31ST JANUARY & 1ST FEBRUARY 2018
ATTENDANCE SHEET

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COMMUNITIES (4)

IBADAN URBAN FLOOD MANAGEMENT PROJECT (IUFMP)

OYO STATE

SECOND (2ND) WORKSHOP FOR THE STRATEGIC ENVIRONMENTAL AND SOCIAL ASSESSMENT (SESA) OF THE IBADAN INTEGRATED FLOOD RISK MANAGEMENT AND DRAINAGE MASTER PLAN

31st JANUARY & 1st FEBRUARY 2018

ATTENDANCE SHEET

S/N	NAMES	AGENCY/ORGANIZATION	DESIGNATION	PHONE NUMBER	DAY 1 SIGN IN	DAY 1 SIGN OUT	DAY 2 SIGN IN	DAY 2 SIGN OUT
161	Mukaila Kolawole	Kembuleyemu	Baba Ijo	08108226240				
162	Mrs Nike Idowu	Odo-Ile [illegible]	President	08056373025				
163	Afusat Olayinka	Apete	Member	08186384440				
164	[illegible]	[illegible]	[illegible]	08057066515				
165	[illegible]	Jericho Community	P.R.O	08023967782				
166	Akinola Bamidele Habib	Olumoye Ayeni	Member	07034450391				
167	Taofeek Olanrewaju	Ife Oluwa [illegible]		08057215964				
168	Ajiba Timothy Olaide	[illegible] Community BOT	Chairman	0805244974				
169	Mrs Oni Dupe	Ife [illegible]	Member	080 [illegible]				
170	Aniketu Amos Olawale	Akinwunmi	Member	[illegible]				
171	Dr Bayo Adebi	[illegible] F.D	Secretary	[illegible]				
172	Mrs [illegible] F.O	[illegible] RD	Member	[illegible]				
173	Odetunde [illegible]	[illegible]	Chairman	[illegible]				
174	Alh [illegible]	Sun [illegible] Community	Secretary	[illegible]				
175	Alh [illegible]	[illegible]	Chairman	08052477400				
176	[illegible]	Oke Ado Community	Secretary	[illegible]				
177	Samuel [illegible] T	Oke Ado Council		08022161298				
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COMMUNITIES 5

IBADAN URBAN FLOOD MANAGEMENT PROJECT (IUFMP)

OYO STATE

SECOND (2ND) WORKSHOP FOR THE STRATEGIC ENVIRONMENTAL AND SOCIAL ASSESSMENT (SESA) OF THE IBADAN INTEGRATED FLOOD RISK MANAGEMENT AND DRAINAGE MASTER PLAN

31st JANUARY & 1st FEBRUARY 2018

ATTENDANCE SHEET

S/N	NAMES	AGENCY/ORGANIZATION	DESIGNATION	PHONE NUMBER	DAY 1 SIGN IN	DAY 1 SIGN OUT	DAY 2 SIGN IN	DAY 2 SIGN OUT
201	[illegible] Udaya	Teraeden Community	Chairman 2nd	09090263974				
202	Yinusa Saburi	OYO	Member	08025026050				
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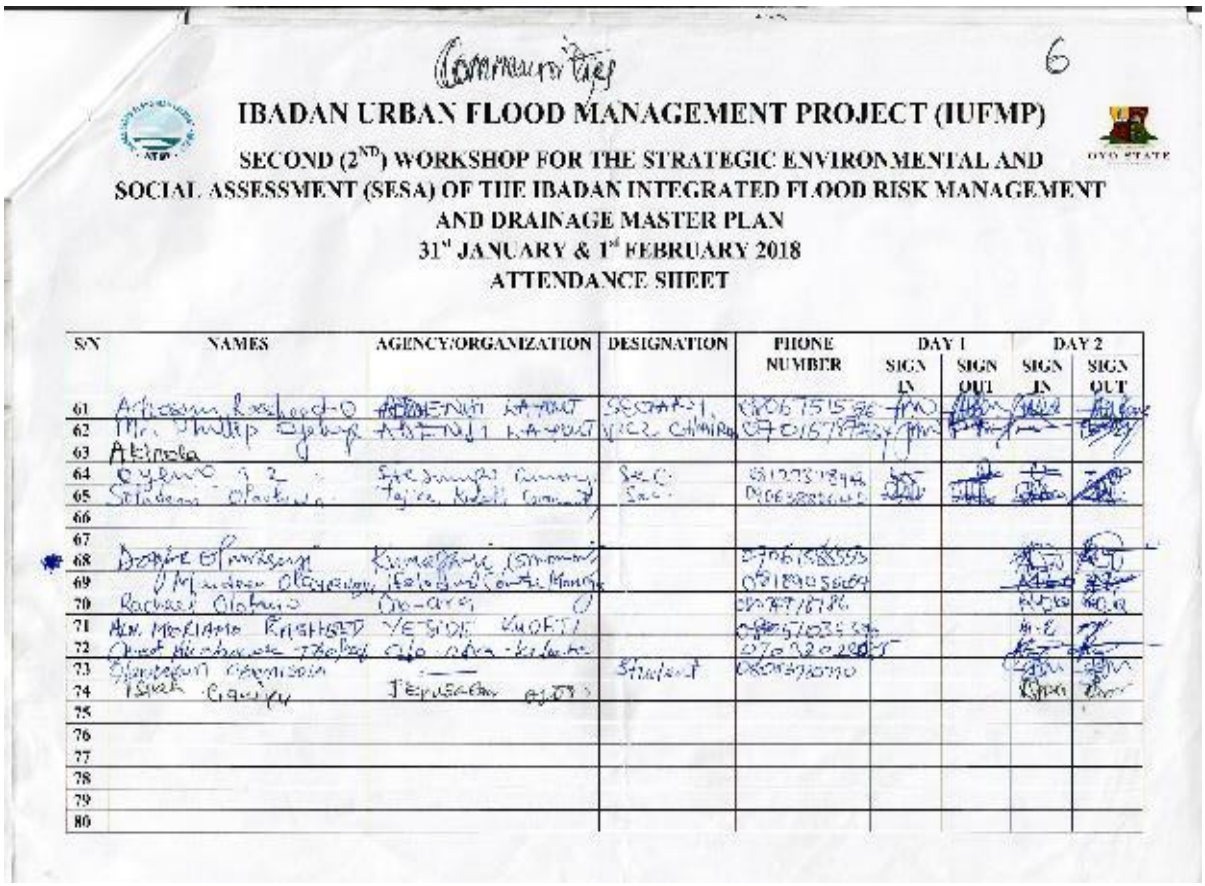

IBADAN URBAN FLOOD MANAGEMENT PROJECT (IUFMP)

SECOND (2ND) WORKSHOP FOR THE STRATEGIC ENVIRONMENTAL AND SOCIAL ASSESSMENT (SESA) OF THE IBADAN INTEGRATED FLOOD RISK MANAGEMENT AND DRAINAGE MASTER PLAN

31ST JANUARY & 1ST FEBRUARY 2018

ATTENDANCE SHEET

S/N	NAMES	AGENCY/ORGANIZATION	DESIGNATION	PHONE NUMBER	DAY 1 SIGN IN	DAY 1 SIGN OUT	DAY 2 SIGN IN	DAY 2 SIGN OUT
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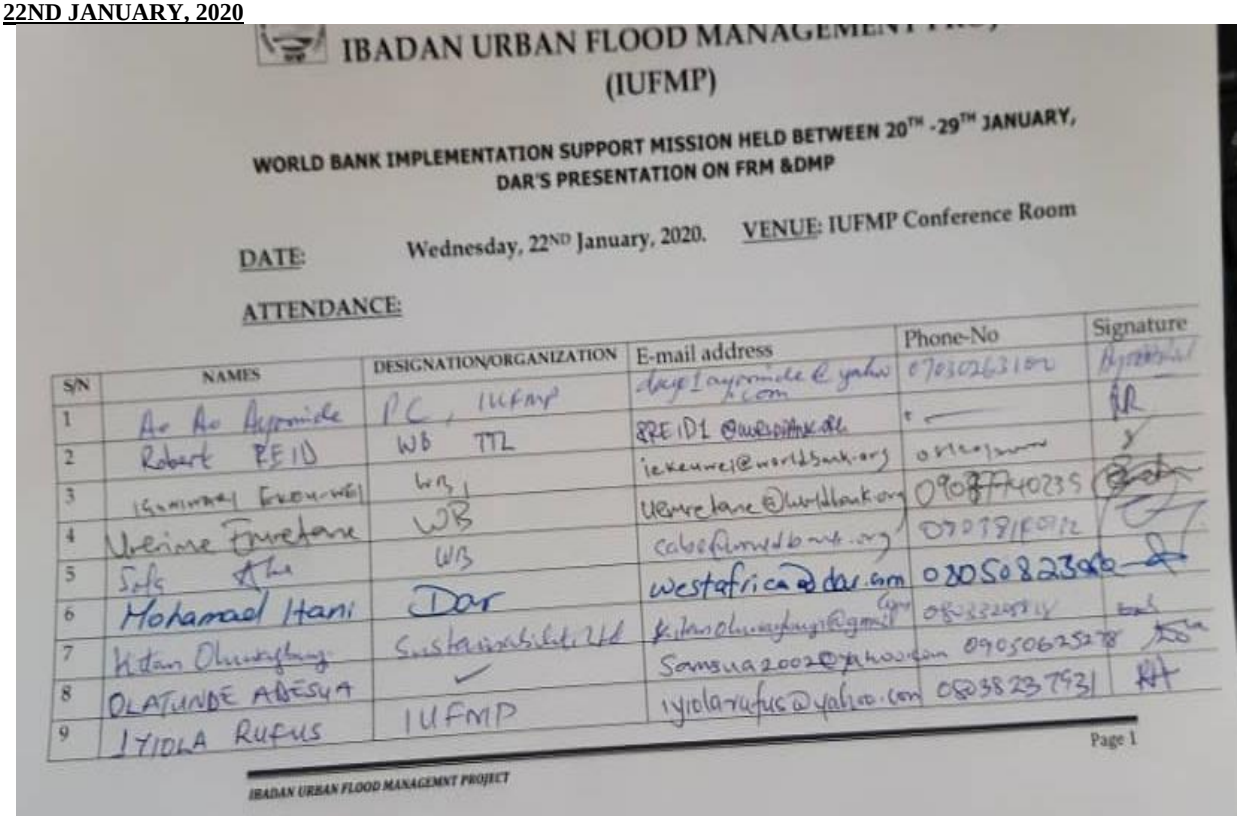
22ND JANUARY, 2020



IBADAN URBAN FLOOD MANAGEMENT [illegible]

(IUFMP)

WORLD BANK IMPLEMENTATION SUPPORT MISSION HELD BETWEEN 20TH -29TH JANUARY, DAR'S PRESENTATION ON FRM &DMP

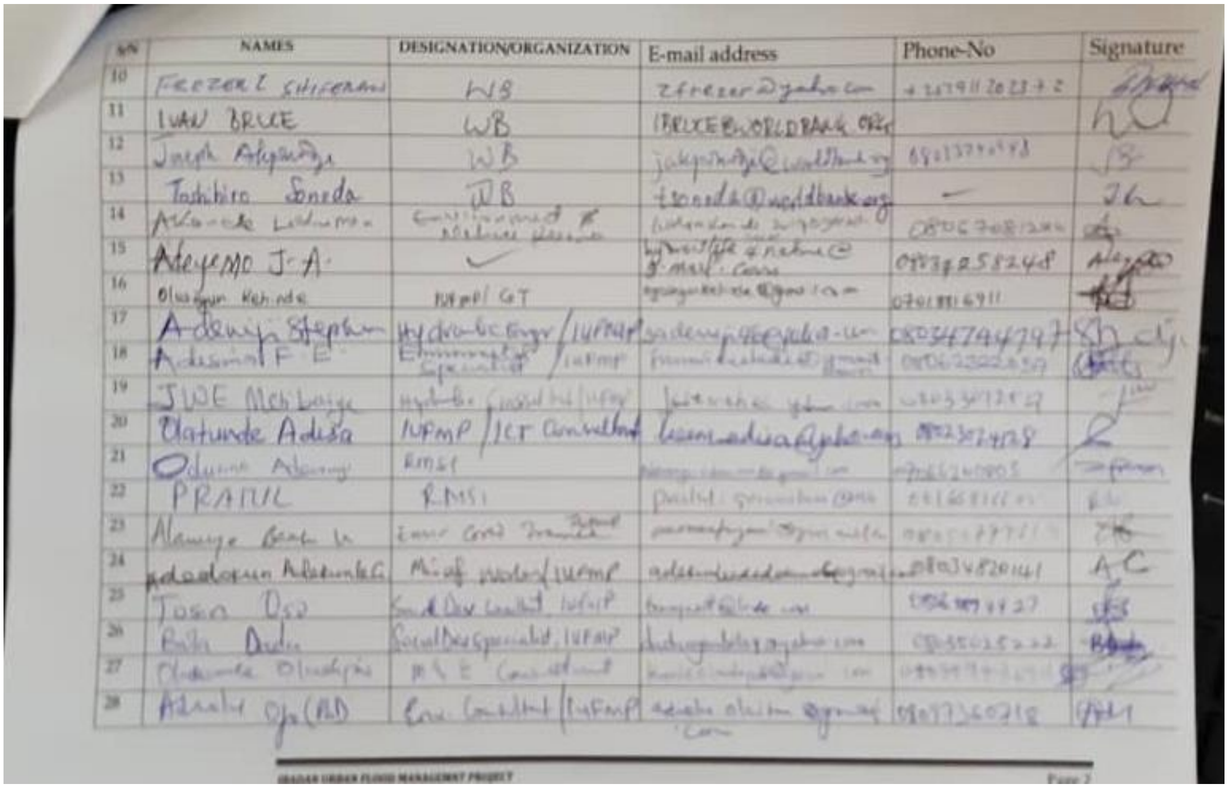
DATE: Wednesday, 22ND January, 2020. VENUE: IUFMP Conference Room

ATTENDANCE:

S/N	NAMES	DESIGNATION/ORGANIZATION	E-mail address	Phone-No	Signature
1	Ar Ao Ayomide	PC, IUFMP			
2	Robert REID	WB TTL			
3		WB			
4	Ueime Tuvetare	WB			
5		WB			
6	Mohamed Itani	Dar			
7					
8	OLATUNDE ABESUA	IUFMP			
9	IYIOLA RUFUS				

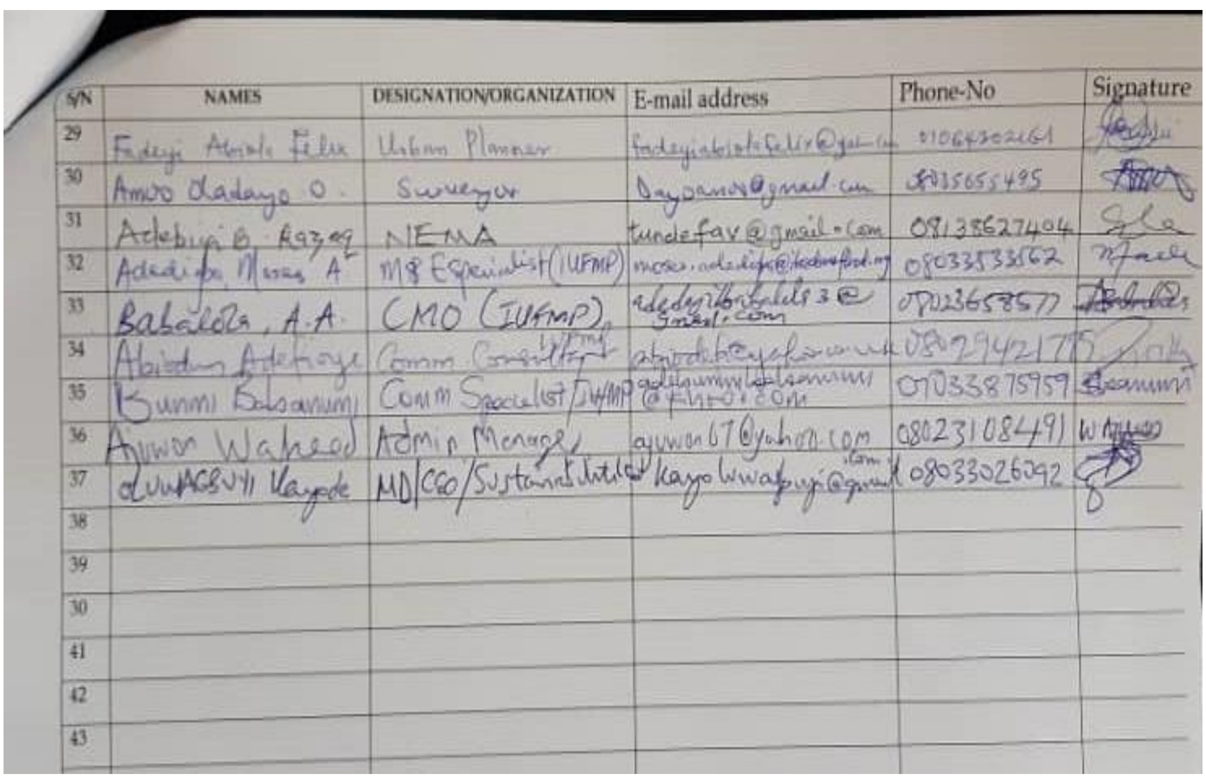
Page 1

IBADAN URBAN FLOOD MANAGEMENT PROJECT



S/N	NAMES	DESIGNATION/ORGANIZATION	E-mail address	Phone-No	Signature
10	FREZER L SHIFERAW	WB	zfrezer@yahoo.com	+251911202372	
11	IVAN BRUCE	WB	IBRUCE@WORLDBANK.ORG		
12	Joseph Akpanudje	WB	[illegible]@worldbank.org	[illegible]	
13	Toshihiro Sonoda	WB	tsonoda@worldbank.org	—	
14	[illegible]	Environment & [illegible]	[illegible]	[illegible]	
15	Aleyemo J. A.	✓	[illegible] @ g-mail.com	08034258248	
16	Olusegun Kehinde	[illegible] / GT	[illegible]@gmail.com	0701[illegible]6911	
17	Adeniji Stephen	Hydraulic Engr / IUFMP	[illegible]@yahoo.com	08034794797	
18	Adesina F. E.	Environmental Specialist / IUFMP	[illegible]@gmail.com	[illegible]	
19	JWE [illegible]	Hydrologic Consultant / IUFMP	[illegible]@yahoo.com	[illegible]	
20	Olatunde Adisa	IUFMP / ICT Consultant	[illegible]@yahoo.com	[illegible]	
21	Odunne Alawaye	RMSI	[illegible]	[illegible]	
22	PRATUL	RMSI	[illegible]	[illegible]	
23	Alawiye [illegible]	[illegible]	[illegible]	[illegible]	
24	Adedokun Adekunle G.	Min of Water / IUFMP	[illegible]	08034820141	
25	Tosin Oso	Social Dev Consultant IUFMP	[illegible]	[illegible]	
26	Bola Dudu	Social Dev Specialist, IUFMP	[illegible]@yahoo.com	[illegible]	
27	[illegible]	M & E Consultant	[illegible]	[illegible]	
28	Adeola Ojo (PhD)	Env. Consultant / IUFMP	[illegible]@gmail.com	[illegible]	

IBADAN URBAN FLOOD MANAGEMENT PROJECT Page 2



S/N	NAMES	DESIGNATION/ORGANIZATION	E-mail address	Phone-No	Signature
29	Fadeyi Abiola Felix	Urban Planner	fadeyiabiolafelix@yahoo.com	07064302161	
30	Amoo Oladayo O.	Surveyor	Dayoamoo@gmail.com	08035655495	
31	Adebayo B. Razaq	NEMA	tundefav@gmail.com	08138627404	
32	Adedigba Moses A.	M&E Specialist (IUFMP)	moses.adedigba@[illegible]	08033533562	
33	Babalola, A.A.	CMO (IUFMP)	adedayobabalola3@gmail.com	07023658577	
34	Abiodun Adefioye	Comm Consultant IUFMP	[illegible]	08029421775	
35	Bunmi Balogun	Comm Specialist IUFMP	[illegible]@yahoo.com	07033875959	
36	Ayiwon Waheed	Admin Manager	ayiwon67@yahoo.com	08023108491	
37	Oluwagbuyi Kayode	MD/CEO/Sustainable [illegible]	kayo.luwagbuyi@gmail.com	08033026092	
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ANNEX 18: SESA PICTURES

Indiscriminate waste disposal

SESA consultants close to Blocked drainage channels (as a result of poor waste disposal)

Flash flood on a rainy day

Weathering of top soil as a result of water erosion (after flood event)

Flood leading to difficulty in access

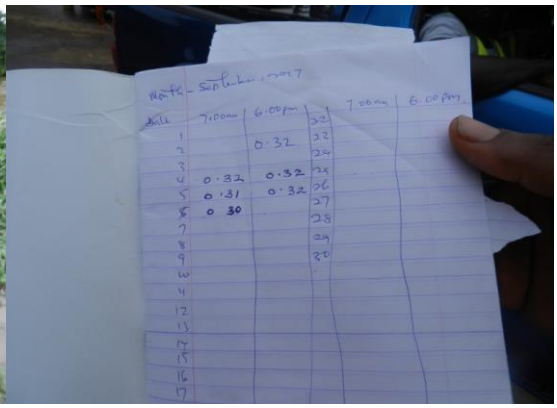
Abandoned structure as a result of flood events

Children exposed to environmental and social and health impacts of waste dumping and flood

Sand mining activities along channel


Training of Volunteers and Installation of river gauge in the river and at the river bank

River gauge reading 1.06m



Community Recording notebook

Engagement of Community on need for compliance with setbacks within the 15m distance from the river course.

Dilapidated and deserted houses

House on the setback marked in 2011 for demolition, Odo ona, orogun,

ANNEX 19: COMMUNITY CONSULTATION PHOTO SPEAK

1. **Odo-Ona St. Paul Anglican Church held at the**
   Venue: Town hall, Akako community, Odo-Ona Ibadan
   Date: 25th January, 2018

2. Ariyo community **NISER Ajibode**

Date: 28th January, 2018 Date: 26th July, 2017

3. Akinwumi (First meeting) **Akinwumi Second meeting**

Date: 1st August, 2017 Date: 25th January, 2018

ANNEX 20: QUESTIONNAIRES

IUFMP – Introductory SESA Scoping Questionnaire

The SESA for the IUFMP will cover a range of environmental and social topics, as listed below.
Please tick all boxes which relate to areas of interest or concern to you, or the organisation you represent.

Flood- related environmental issues

1. Geology, soils and land use ☐
2. Water resources ☐
3. Morphology, fluvial processes ☐
4. Air and climate ☐
5. Biodiversity, flora and fauna ☐
6. Landscape/ beautification/ parks ☐
7. Amenity, tourism and recreational use ☐
8. Population and health ☐
9. Infrastructure and material assets ☐

Flood-related social or socio-economic issues

10. Land use ☐
11. Involuntary resettlement ☐
12. The Poor Vulnerable Group ☐
13. Local economy such as employment Insurance, and livelihood ☐
14. Water Usage or Water Rights and Rights of common ☐
15. Social institutions such as Social infrastructure and local decision Making institutions ☐
16. Cultural heritage and archaeology ☐
17. Gender ☐
18. Children rights ☐
19. Labour and working conditions ☐
20. Accidents ☐
21. Global warming ☐

Further information and a map of the IUFMP/Drainage master plan project area can be found on the project website – www.-------.ie
Please continue on additional sheets if more space is required.
We are currently in the process of identifying baseline environment conditions across the Ibadan metropolis and the river basin draining it from readily available sources of information, in relation to the above environmental topics.
Are you aware of any local or site-specific issues within the Ibadan Metropolis that you feel need to be scoped into the SESA?
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The SESA and IUFMP/ Drainage Master Plan process will also provide an opportunity for consideration of environmental and social benefits and enhancements.
What opportunities would you like to see considered/investigated/implemented as part of the IUFMP/ Drainage Master Plan process?
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Do you know of any local organisations or groups that might also be able to give us useful information or that you feel should be included in our consultations as part of the SESA process, such as community groups, local interest groups, local nature groups etc? (please provide name and contact address, or website if known)
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We appreciate that some organisations may not wish to be actively involved in the SESA process for the IUFMP/ Drainage Master Plan .

Please can you therefore indicate what level of future involvement you or your organisation would like:

1. Updates provided through newsletters and website only. No attendance at workshops ☐
2. Full involvement through attendance at workshops, newsletter updates etc. ☐

3. No further involvement ☐

If you ticked boxes 2 or 3 above, please can you provide a contact email address for yourself, or additional/alternative colleague who may have an interest in being involved in the SESA for the IUFMP/ Drainage Master Plan?
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Please return along with any supporting information to: SESA on Drainage Master Plan, Sustainabiiti Limited, , , or email us at: info@sustainabiliti.com

SESA SCOPING (TYPE AND MAGNITUDES OF POSSIBLE ADVERSE IMPACTS AND MITIGATION MEASURES)

Provisional scoping was done for Flood Protection projects and drainage projects to be planned in the Drainage Master Plan.

No.	Item	Scoping Result			Rational of Assessment
		P	C	O	
Natural Environment					
1.1	Climate/ Meteorological Phenomena	D	D	D	P: No impact is expected as no engineering work is carried work at this stage. C&O: The impacts on micro-climate and micro meteorological phenomena are negligible because the project related structures will not disturb wind path.
1.2	Topography	D	B-	D	P: No impact is expected as no engineering work is carried work at this stage. C: Changes in topographic condition might occur due to excavation and filling works. Balancing the volume of excavation and filling is recommended to minimize the volume of surplus soil. O: Topographic condition will be stable after the completion of the facilities.

1.3	Geology	D	D	D	P, C&O: No impact is expected as the project does not alter the geological condition of the area.
1.4	Soil Erosion	D	B-	D	P: No impact is expected as no engineering work is carried work at this stage.
					C: Soil erosion might take place in the construction works of the facilities at rainy season.
					O: Soil erosion will not take place after the completion of the facilities.
1.5	Hydrology	D	B-	D	P: No impact is expected as no engineering work is carried work at this stage.
					C: Construction work might cause minor and temporally impact on hydrology
					O: Waste water discharge into the rivers does not cause impact on hydrology because the quantity is very small compared to the river flow rate.
1.6	Groundwater	D	D	C-	P: No impact is expected as no engineering work is carried work at this stage.
					C: Construction work of the facilities will not include groundwater abstraction.
					O: No impact is expected as groundwater abstraction will not be done in the operation of drainage system
1.7	Ecosystem, Flora, Fauna and Biodiversity	D	B-	D	P: No impact is expected. No unique/endangered species do not inhabit in the project area.
					C: Trees and bushes will be cut during the construction work of the facilities. The quantity of tree and bush trimming should be kept to the minimum.
					O: No impact is expected during the operation stage.
1.8	Protected area/Forest	D	B-	D	P: There is no protected area and forest in the project area.
					C: Construction work of the facilities will demolish some part of plantation such as sugar cane, maize.
					O: No impact is expected during the operation stage.
1.9	Coastal Zone	D	D	D	P,C&O: Project area is located inland.
1.10	Landscape	D	B-	D	P: No impact is expected as no engineering work is carried work at this stage.
					C: Construction work might cause minor and temporally impact on scenic landscape that must be considered.
					O: No impact is expected during the operation stage.
1.11	Natural Disaster	D	D	B+	P&C: flood protection and drainage project will not induce natural disaster.
					O: Drainage project will mitigate flood damage in the city.
Living Environment (Pollution Control)					
2.1	Air Pollution	D	B-	B-	P: No impact is expected as no engineering work is carried work at this stage.
					C: A certain amount of air pollutants is expected to be emitted from the use of vehicles and heavy machines during construction work of the facilities.
					O: Waste water treatment plant will not discharge air pollutant.
2-2	Offensive Odor	D	D	B-	P&C: Offensive odor will not be generated on the drainage project because any source materials of odor will not be used.
					O: drainage project (attenuation site) may emit offensive odor if waste materials take over, but its influence will be very limited because the plants will be constructed sub-urban area apart from the city.
2-3	Water Pollution	D	B-	C-	P: No impact is expected as no engineering work is carried work at this stage.

					C: Turbid water from the construction sites may pollute neighboring areas.
					O: There is some possibility of canal water pollution, if treated waste water including factory effluent will be discharge into the canal.
2-4	Bottom Sediment Contamination	D	D	D	P,C&0: drainage project will not contaminate bottom sediment in the rivers and canals.
2-5	Soil Contamination	D	D	C-	P&C: drainage project will not contaminate soil in these stages.
					O: soil contamination downstream of any drainage will be from domestic and factories discharge into the drainage rather than the drainage project
2-6	Land Subsidence	D	D	D	P: No impact is expected as no engineering work is carried work at this stage.
					C: As groundwater abstraction will not be done in construction, land subsidence will not take place.
					O: drainage project will not cause land subsidence because groundwater abstraction will not be done.
2-7	Noise/Vibration	D	B-	B-	P: No impact is expected as no engineering work is carried work at this stage.
					C: Noise and vibration will be generated from the construction sites of the facilities.
					O: Although the operation of pumps and other machines will cause some noise and vibration, there will be no significant impact since such facilities are normally located away from the congested city zone.
2-8	Sunshine Obstruction	D	D	D	P,C&0: drainage project will not cause sunshine obstruction.
2-9	Waste/Hazardous Materials	D	B-	B-	P: No impact is expected as no engineering work is carried work at this stage.
					C: Construction work of the facilities will generate surplus soil and construction debris.
					O: drainages could increase waste and hazardous materials such as heavy metals to downstream receptors.
Social Environment					
3-1	Involuntary Resettlement	C-	D	D	P: Although main drainage facilities are planned to be constructed in the areas without houses, the plans are always subject to change depending on the conditions in future and involuntary resettlement may occur. Minimizing the resettlement should be the priority for drainage design. [29]**Ticketing will be introduced and issued for structures within a distance of 0-5m, 5-10m, 10-15m to all the rivers as means of engagement in the preparation for a**

[29] See ticketing pictures in report.

					resettlement action plan.
					C: Resettlement will be completed in pre-construction stage.
					O: No resettlement will occur in operation stage.
3-2	Land Acquisition	C-	D	D	P: Land acquisition of wide area from several land owners will be needed for the construction of drainages and flood control measures. Width of the land acquisition will change depending on the scale, and other conditions.
					C: Land acquisition will be completed in pre-construction stage.
					O: No land acquisition will occur in operation stage.
3-3	Utilization of Local Resources	D	B-	D	P: No impact is expected as no engineering work is carried work at this stage.
					C: Mass scale use of local resources such as sand and quarrying for the construction of the facilities may obstruct these utilizations by the local people for other purposes.
					O: No impact will be anticipated in operation stage.
3-4	General, Regional/City Plans	D	D	B+	P: No impact is expected.
					C: No impact is expected in construction stage.
					O: Better infrastructure may cause economic development in the Project area.
3-5	Social Institutions	D	D	D	P,C&O: No impact is expected as there will be no change in social institutions.
3-6	Social Infrastructure and Services	D	B-	A+	P: No Impact is expected as no engineering work is carried work at this stage.
					C: Access to social infrastructure and services may be temporarily affected due to construction work of the facilities as well as traffic jams due to the operation of construction vehicles.
					O: drainage project will highly improve the sanitary environment of the city.
3-7	Local Economy and Livelihood	B-	B-/B+	B+	P: Loss of income source and livelihood due to involuntary resettlement are expected to negatively affect the local economy and livelihood.
					C: Temporal traffic prohibition and traffic jam accompanied with construction work may give

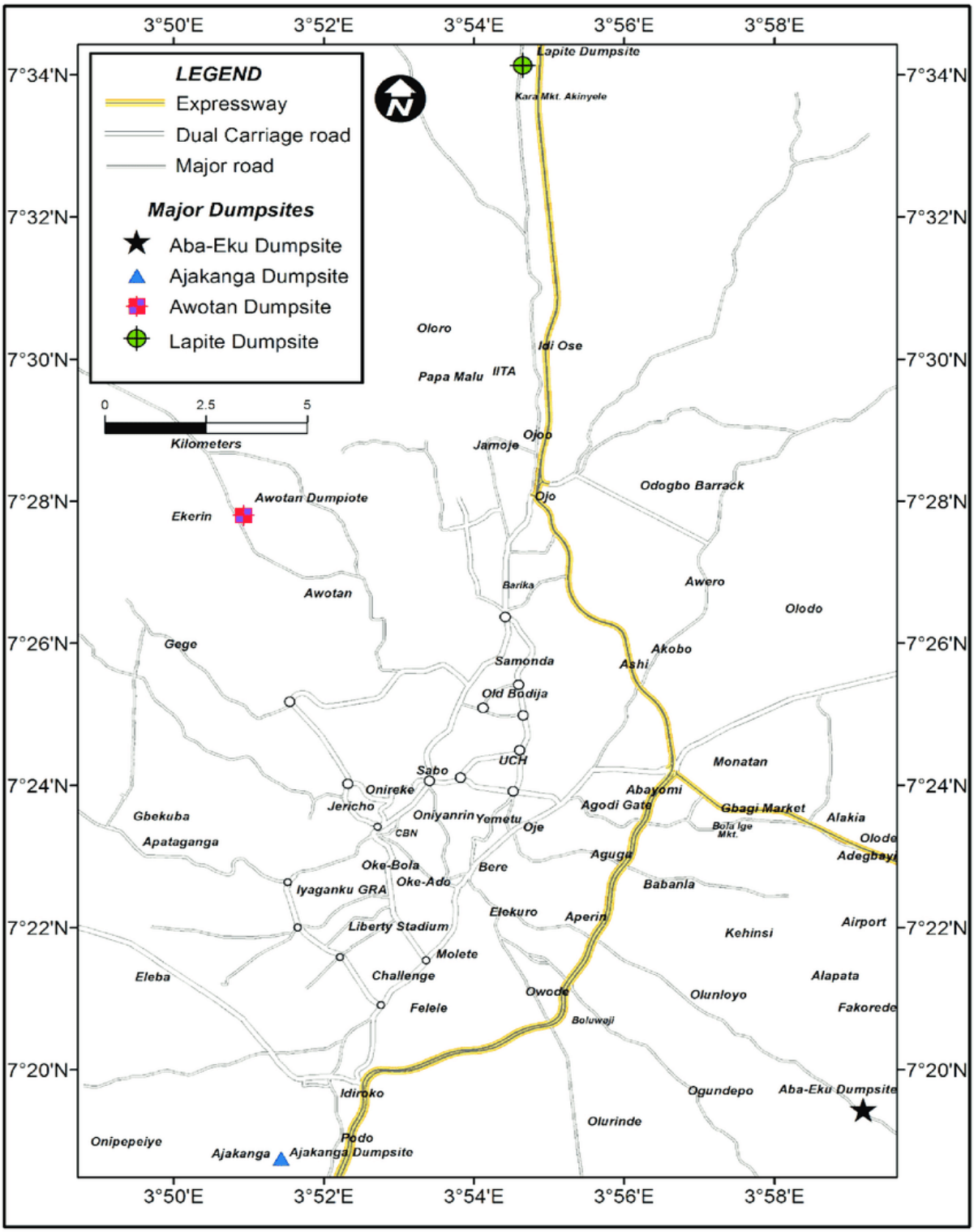
					negative impact to the local economy. On the other hand, construction works of the facilities will have positive impact on local economy by creating employment and business opportunity in the project area.
					O: drainage project will greatly improve sanitary condition of the city and conclusively lead to the improvement of the livelihood.
3-8	Unequal Distribution of Benefit and Damage	B-	B-	B-	P: Land acquisition and involuntary resettlement will lead to unequal distribution of benefit and damage between groups who are directly affected by the project and who are not.
					C: While resettling households bear much of damage, other may get benefits from new business relating the construction works, resulting in unequal distribution of benefit and damage.
					O: No impact is expected in operation stage.
3-9	Local Conflict and Inequity	D	D	B-	P: No impact is expected.
					C: No impact is anticipated in construction stage.
					O: drainage project will start from priority area and areas other than priority area cannot receive beneficence that is environmental improvement. Such unequal distribution of the services may cause complaint among the people.
3-10	Water Usage, Water Rights	D	D	D	P: No impact is expected.
					C: No impact is expected in construction stage.
					O: No impact is expected in operation stage.
3-11	Cultural and Historical Heritage	D	D	D	P: There is no cultural and historical heritage in the project area.
					C&O: No impact is expected as the project will not affect cultural and historical heritage.
3-12	Religious Facilities	B-	B-	D	P: There are many mosques, local shrines and grave yards in the city which have a very sensitive religious and cultural significance in the society. Such religious facilities must not be included in the construction sites.
					C: Roadside religious facilities may be affected by noise and vibration during construction of the facilities.
					O: No impact is expected in operation stage.
3.13	Sensitive Facilities (ex. Hospital, school, precision machine factory)	D	C-	D	P: Sensitive facilities will not be included in the construction sites in the planning.
					C: Roadside sensitive facilities may be affected by noise and vibration during

					construction of the facilities.
					O: No impact is expected in operation stage.
3,14	Poor People	D	B+	C-	P: It is necessary to assess their ability to install local drains to their personal properties and develop mitigation measures in the planning stage.
					C: They might be benefitted from employment opportunities during construction work.
					O: They may not be affordable to provide minimum drains to their properties and the mitigation measures must be needed.
3.15	Ethnic Minorities /Indigenous People	D	D	D	P,C&O: There are no designated ethnic minorities and indigenous groups in Ibadan.
3.16	Gender	D	D	D	P: No impact is expected.
					C: Equal opportunity should be sought for employment in construction work.
					O; No impact is expected in operation stage.
3.17	Children's Rights	D	D	D	P: No impact is expected.
					C&O: Child labor is unlawful and only adult is eligible for employment opportunity created by the project.
3.18	Public Health	D	D	A+/ C-	P: No impact is expected.
					C: Influx of construction workers is likely to increase the health risk, particularly HIV/AIDS.
					O: Improvement of drainage system will greatly contribute the improvement of public health in the project area. Effect of downstream receptors of all drainage systems, in case it is planned to be discharged to irrigation canal, farmer's health may be damaged by the toxic substances included in the discharge water
3.19	Occupational Health and Safety (OHS)	D	B-	B-	P: No impact is expected.
					C: Occupational Health and Safety of construction work should be properly managed through adequate labor management.
					O: Occupational Health and Safety of operation and maintenance work of the facilities should be properly managed through adequate labor management.
Others					
4.1	Accidents	D	B-	B-	P: No impact is expected.
					C: Accidents associated with construction work should be properly managed through adequate labor management.

					O: Accidents associated with operation and maintenance work of the facilities should be properly managed through adequate labor management.
4.2	Greenhouse Effect Gas (GHG) Emissions	D	D	D	P: No impact is expected.
					C: The use of construction machines and operation of vehicles will result in increase in GHG emissions. However, its affection is temporal and negligible for the global climate change.
					O: GHG will not be emitted from the facilities because commercial electric power will be used for operation of the facilities.

Note: P: Pre-Construction, C: Construction, O: Operation
A: Significant impact is expected (+: Positive impact, -: Negative impact)
B: Some impact is expected (+: Positive impact, -: Negative impact)
C: Extent of impact is unknown, further examination will be required (+: Positive impact, -: Negative impact)
D: No impact is expected

ANNEX 20: MAP SHOWING DUMPSITES IN IBADAN



ANNEX 21: WATERSHED MANAGEMENT PLAN TEMPLATE

Watershed management have shifted dramatically from early planning that was focused on flood control, to a complex range of inter-related issues including water quality and habitat protection. Some of this change is driven by sustainable development goals. However, it is also a reflection of a greater level of awareness that streams and aquatic habitats are important community resources and that development and everyday activities have an impact not only on these local resources but ultimately the health of the rivers basins and the surrounding rural or urban environment. Each watershed is unique with various mixtures of land uses, demographic communities, aquatic and wildlife habitats. Hence it's important to manage these sustainably.

The upper Ona WMP aims at guiding future city efforts (including the proposed City and Drainage Masterplan) in promoting a healthier balance between the urban environment and the natural ecosystem. The main components in a watershed plan include:

Purpose

The strategic purposes of this Watershed Management Plan is to

- establish a roadmap for restoring and maintaining a healthy, sustainable aquatic ecosystem in the upper Ona's watersheds and to provide adequate flood control and the safe management of stormwater runoff for the City's residents.
- guide watershed coordinators, resource managers, policy makers, and community organizations to restore and protect the quality of lakes, rivers, streams, and wetlands in a given watershed.
- be a practical tool with specific recommendations on practices to improve and sustain water quality.

The WMP will evolve over time as new information is gathered and analyzed, technologies advance, conditions change and regulatory requirements change. Thus, the plan must be reexamined and revised to reflect goals that have been achieved and progress on goals yet to be achieved.

Contents of a WMP include;

Section 1: Introduction
1.1 Purpose & Objectives
1.2 Development Process
1.3 Vision & Mission Statements
1.4 Stakeholders Participation

Section 2: Watershed Description
2.1 The outline of natural condition
• Geological, Meteorological, Hydrological, Geomorphologic and Environmental Wetland Mapping, Recreation, Existing Conservation Practices, Threatened/Endangered Species, Pollution
2.2 Administrative setup
• Role and responsibility of existing institutions in the basin
2.3 The outline of socio economic activities in the basin
• Demographic conditions, Land use pattern, Livelihood sources and Asset distribution, Agriculture, Tillage Systems
2.4 Beneficial aspects of floods
2.5 Negative socio economic impacts of floods
• Socio economic damage caused by past flooding
2.6 Recommendations for Watershed Conditions

Section 3: Regulatory Framework & Problem Identification
3.1 Existing Regulatory Framework
3.2 Urban Runoff Pollutants Overview
3.3 City Activities to Protect Water Quality
3.4 Planning and Regulatory Compliance
3.5 Municipal Maintenance
3.6 Industrial/Commercial Inspections
3.7 Illicit Discharge Control Activities
3.8 Public Information and Participation
3.9 Watershed Assessment
3.10 Monitoring and stakeholder responsibilities
3.11 Additional City Policies Relevant to Water Quality Protection
3.12 Recommendations for Water Quality Protection Activities

Section 4: Supporting Information
4.1 Water Quality Data
4.2 General Aquatic Life and Recreational Use Water Quality Assessments
4.3 Storm Drain Facilities Existing Conditions
4.4 Design Storm Conveyance Capacity (that incorporates the drainage master plan activities)
4.5 Benefits and Constraints of Low Impact Development (LID) & Green Infrastructure (GI)
4.6 LID/GI Siting Considerations
4.7 Recommendations for LID, Green Infrastructure, Storm Drain Facilities and water retention options.

Section 5: Goals & Solutions for;
5.1 Sewer Overflows/ Septic Systems
5.2 Aquatic life
5.3 Stream bank Erosion
5.4 Agricultural/Residential Chemical Runoff
5.5 Industrial Dischargers

Section 6: Maintenance, Monitoring and Evaluation
Maintenance Program Overview
Catchment Basin and Inlet/Outlet Servicing
Storm Drain Facility, Curb/ Gutter & Street Repairs
Wet Weather Maintenance Programs
Street Sweeping Programs
Proper waste management
6.7 Green Infrastructure Maintenance
Recommendations for Maintenance

Section 7 Funding Sources
Section 8 Annexes
8.1 Plan Evolution/Progress Reports
8.2 Contact information from stakeholder's consultation
8.3 Tentative Work plan/ Calendar of Events
8.4 Appendices

ANNEX 22: Regulations on Littering, Flooding, Land use, Channelization and Setbacks

REGULATIONS ON LITTERING, FLOODING, LAND USE, CHANNELIZATION AND SETBACKS						
CATEGORY	CODE	REGULATION & GAP	REFERENCE	RIGHTS	ROLES	RESPONSIBILITIES
FLOODING	4.4	No person shall build kiosk or shop on road median, drainage or road setback. (No information on flood plain, The law covers only kiosk or shop, not houses and focus is on road median or drainage not drainage infrastructure for the river basin)	Ministry of Environment and Habitat Law 2012: Oyo State Environmental (Sanitation and Waste Control) Regulation 2013 II Environmental Sanitation and General Cleanliness Section 4 ("litter prohibition) sub section (4) B20	Access to information on town planning. Access to affordable government shops	Oyo State Physical and Urban Planning Oyo State Ministry of Information and National Orientation	The government shall provide kiosk and shops for willing citizens. The government shall educate and provide information signs on land usage for the citizens on the set backs The government shall do a setback mapping with enforcement of no development on the setback.

Source: SESA Report April, 2020 (Kindly refer to Annex 3 of this previously submitted report for details)