

**FEDERAL REPUBLIC OF NIGERIA
FEDERAL MINISTRY OF WATER RESOURCES
(FMWR)**

**THE PROJECT FOR
REVIEW AND UPDATE OF NIGERIA
NATIONAL WATER RESOURCES
MASTER PLAN**

**VOLUME 3
PROJECT OUTLINE**

JANUARY 2014

**JAPAN INTERNATIONAL COOPERATION AGENCY
(JICA)**

**YACHIYO ENGINEERING CO., LTD.
CTI ENGINEERING INTERNATIONAL CO., LTD.
SANYU CONSULTANTS INC.**

| |
|----------|
| GE |
| JR |
| 14 - 010 |

**FEDERAL REPUBLIC OF NIGERIA
FEDERAL MINISTRY OF WATER RESOURCES
(FMWR)**

**THE PROJECT FOR
REVIEW AND UPDATE OF NIGERIA
NATIONAL WATER RESOURCES
MASTER PLAN**

**VOLUME 3
PROJECT OUTLINE**

JANUARY 2014

**JAPAN INTERNATIONAL COOPERATION AGENCY
(JICA)**

**YACHIYO ENGINEERING CO., LTD.
CTI ENGINEERING INTERNATIONAL CO., LTD.
SANYU CONSULTANTS INC.**

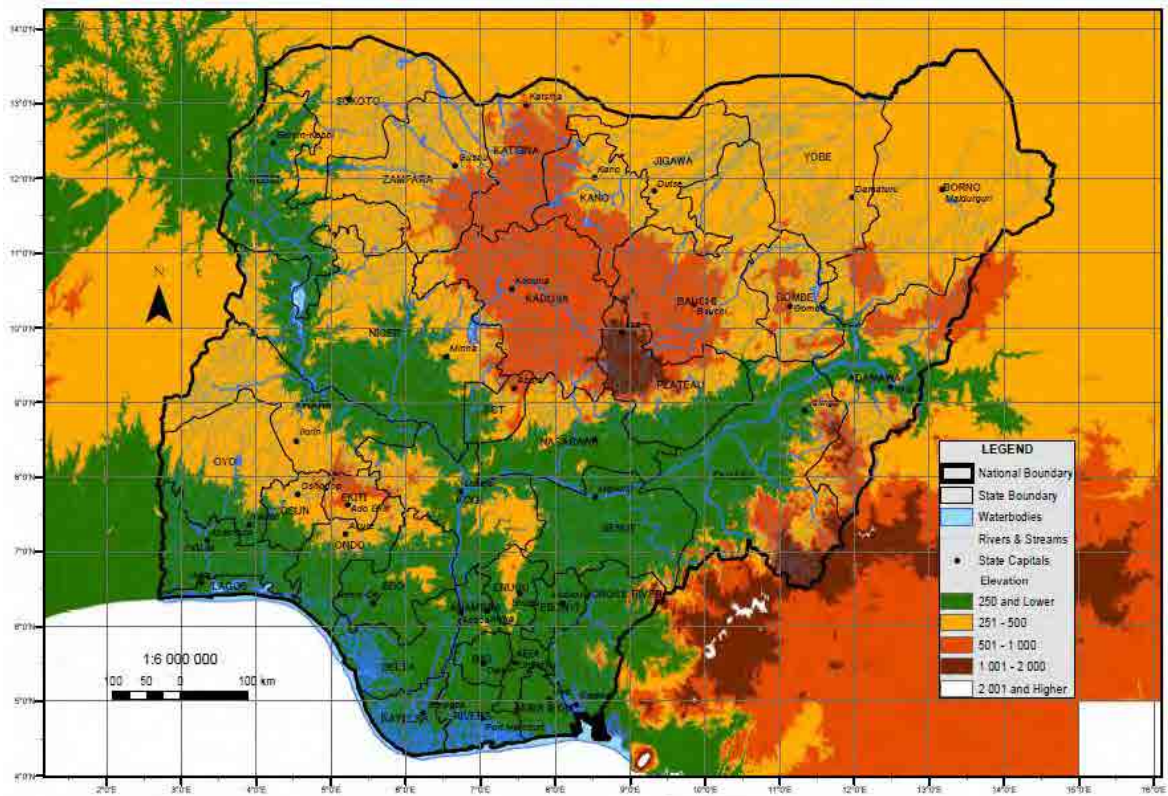
Foreign Exchange Rate

USD1.00 = NGN155.27 = JPY86.5

(31st Dec. 2012)



Location of the Federal Republic of Nigeria in Africa



Map of Project Area

Contents

| | Page |
|----------------------------|------|
| Map of Project Area | |
| Contents | (1) |
| Tables and Figures | (2) |
| List of Abbreviations..... | (3) |

VOLUME 3 PROJECT OUTLINE

CHAPTER 1 BACKGROUND AND OBJECTIVE1-1

| | |
|---------------------------------------|-----|
| 1.1 Background | 1-1 |
| 1.2 Objective of the Project | 1-1 |
| 1.3 Project Area | 1-1 |

CHAPTER 2 PROJECT MANAGEMENT2-1

| | |
|--|-----|
| 2.1 Project Operation..... | 2-1 |
| 2.2 Members of Japanese Side | 2-1 |
| 2.3 Members of Steering Committee, Technical Committee and Counterpart | 2-2 |
| 2.4 Main Meetings..... | 2-3 |
| 2.5 Workshops | 2-3 |
| 2.6 Stakeholder Meetings in period of Formulation of Catchment Management Plan..... | 2-7 |
| 2.7 Outline of Local Contracts | 2-9 |

CHAPTER 3 PROJECT OUTPUT.....3-1

| | |
|---|------|
| 3.1 National Water Resources Master Plan 2013..... | 3-1 |
| 3.2 Draft Catchment Management Plans | 3-10 |

ANNEX

Record of Main Meetings 1 - 6

Discussion Report of Stakeholder Meeting of HA-1 and Ogun-Oshun Basin for Catchment Management Plan

Attendant List of Stakeholder Meeting of HA-1 and Ogun-Oshun Basin for Catchment Management Plan

Tables and Figures

Table

| | |
|---|------|
| Table 1-1 Schedule of Project | 1-2 |
| Table 2-1 Member of Japanese Side | 2-1 |
| Table 2-2 Members of Steering Committee | 2-2 |
| Table 2-3 Member of Technical Advisory Committee | 2-2 |
| Table 2-4 Members of Counterpart | 2-3 |
| Table 2-5 Main Meetings | 2-3 |
| Table 2-6 Schedule of Workshops in Abuja | 2-4 |
| Table 2-7 Outline of Workshops in Eight Hydrological Areas | 2-4 |
| Table 2-8 Discussion in Workshops | 2-5 |
| Table 2-9 Schedule and Outline of Stakeholder Meetings and Workshops on Formulation of CMP..... | 2-7 |
| Table 2-10 Contents of Discussion on Stakeholder Meetings | 2-8 |
| Table 2-11 Contents of Local Contracts | 2-9 |
| Table 3-1 Output of M/P2013 | 3-1 |
| Table 3-2 Output of CMPs for HA-1 and Ogun-Oshun Basin | 3-10 |

Figure

| | |
|---|-----|
| Figure 1-1 Hydrological Map of Nigeria | 1-2 |
| Figure 2-1 Project Organization | 2-1 |
| Figure 2-2 The Cities where Workshops were held | 2-5 |
| Figure 2-3 Schedule of Local Contracts | 2-9 |

CHAPTER 3 Output of the Project

Output of the M/P2013 and CMPs (HA-1 and Ogun-Oshun Basin) are described in the Final Report.

3.1 National Water Resources Master Plan 2013

Output of National Water Resources Master Plan 2013 (M/P2013) is summarized in Table 3-1.

Table 3-1 Output of M/P2013

| Chapter/ section | Content | output |
|---|---|---|
| Chapter 1 Current Situation of the Project Area | | |
| 1.1 | Socio-economy | Administrative Units of Nigeria, population and economic profile are described. |
| 1.2 | Natural condition | Topography, geology, hydrogeology, soil, land use, meteorology and hydrology of the Project area are described. |
| 1.3 | Organizations and Institutions Responsibilities in Water Resources Sector | Organization and mandate of FMWR are described based on historical perspective on FMWR. Organization and mandate of RBDA and NIWRMC are also described. |
| 1.4 | Water Use and Water Resources Development | Current water use is explained on the facilities for surface water and groundwater. Water use of Niger and Benue Rive, which are international rivers, are also explained. |
| Chapter 2 Review on Exsiting National Water Resources Master Plan 1995 | | |
| 2.1 | General | Background and basic strategy of the M/P1995 are explained. Dam reservoirs, irrigation and drainage projects, water supply projects are explained as main proposed project of the M/P1995. Major indicators of the M/P1995 are explained. |
| 2.2 | Evaluation of Water Resources Potential | Catchment Delineation was newly implemented based on previous one of the M/P1995. Surface water and groundwater potential was reviewed on both its method and analyzed result. There are some problems in those method and results. How to revise the result are proposed for the revised master plan. |
| 2.3 | Projection of Water Demand | Method and result of water demand projection are explained on the M/P1995 including its issues. As a result, predicted population growth rate is considerably lower than the actual growth rate. The result of water demand projection is explained. It was concluded in the M/P1995 that there were considerable surplus in water resources compared with water demand. Water demand was projected with too big assumption of unit consumption rate (urban, rural). |
| 2.4 | Water Resources Development Plans | Surface water development plan and groundwater development plan, which were proposed in the M/P1995, were reviewed. According to the review result, most of the Programs for construction of distributed mid-small scale multi-purpose dams as long-term plan was not implemented, though rehabilitation of water source works as a short-term program were gradually implemented. It was confirmed that hardly any of the dams have established rules for operating the reservoirs. Groundwater development also has not yet been implemented as planned. It was analyzed why proposed plans of the M/P1995 were not implemented as scheduled, and methods for improvement are proposed for the revised maste plan. |
| 2.5 | Sector Development Plans and Implementation | <ul style="list-style-type: none"> • Water supply and sanitation Result of the review of rehabilitation project and new water development projects for water supply facilities was analyzed as below. <ul style="list-style-type: none"> - In aspect of rehabilitation project, it is concluded that there is little improvement in facilities for use of groundwater. On the other hand, implementation of rehabilitation projects of facilities for use of surface water was limited for urban water supply of few states, not entire Nigeria. - It is seems that almost a half of proposed projects of the M/P1995 were implemented on new water supply facilities proposed in the M/P1995 from view point of water supply coverage. <ul style="list-style-type: none"> • Irrigation and drainage Progress of proposed projects by the M/P1995 was analyzed on three main schemes. As a result, it was confirmed that the proposed projects have not progressed as a whole, though rehabilitation projects with high emergency have been implemented from time to time. <ul style="list-style-type: none"> • Measures against flood and erosion Content of the M/P1995 were analyzed on measures against flood and erosion. As a whole, the M/P1995 mentioned only the issues and problems at that time and pointed out the necessity of measures for the future. |
| 2.6 | Water Resources Management Plan | <ul style="list-style-type: none"> • Water resources management - Proposed projects in M/P1995 and its achievement in surface water and groundwater development. |

| Chapter/ section | Content | output |
|---|---|--|
| | | <ul style="list-style-type: none"> - Issue for implementation • Organization and institution - Proposed items in the M/P1995 and its achievement. |
| 2.7 | Conclusion and Feedback | <p>Implementation of the projects proposed in the M/P1995 does not proceed as scheduled after some 20 years have passed from the planning, and it is also difficult to achieve goals for the target year. Based on overall performance of the M/P1995, The revised master plan is prepared with the following consideration:</p> <ul style="list-style-type: none"> • National Policies and Basic Strategies • Evaluation of Water Resources Potential • Demand Projection and Implementation of Water Resources Development Plan • Implementation of Water Resources Management Plan |
| Chapter 3 Concept of National Water Resources Master Plan 2013 | | |
| 3.1 | Water Policy and Strategy | <p>This section describes the overview of the following important policy frameworks for the M/P2013.</p> <ul style="list-style-type: none"> • Water Resources Policy (2009 version) • Nigeria Vision 20: 2020 • The Nigeria Water Sector Roadmap • Millennium Development Goals, 2000 • The Africa Water Vision • National Water Resources Policy (Revised 2009) |
| 3.2 | Framework of M/P2013 | <p>The M/P2013 sets the goals to improve the current situation in the water sector below:</p> <ul style="list-style-type: none"> • Low rate of access to safe and clean water and sanitation facilities • Low contribution of irrigation to national food security • Insufficient utilization of hydropower for renewable energy |
| 3.2.1 | Definition | <p>This Project defines the technical terms in the M/P2013 as follows:</p> <ul style="list-style-type: none"> • National Water Resources Master Plan 2013 (M/P2013) • Integrated Water Resources Management (IWRM) • Water Sources Development Plan (WSDP) • Water Sub-sector Development Plan (WSSP) • Water Resources Management Plan (WRMP) |
| 3.2.2 | Contents of M/P2013 | <p>The M/P2013 includes main three plans: 1) Water Sources Development Plan, 2) Water Sector Development Plan and 3) Water Resources Management Plans. Constitute of the M/P2013 was explained.</p> |
| 3.2.3 | Planning Conditions | <p>Seven planning condition were explained for formulation of the M/P2013. 1) Flow and Climate Condition, 2) Climate Change Impact, 3) Trans-boundary Water, 4) Target Safety Level for Surface Water Development, 5) Priority of Water Use, 6) Minimum Stream Flow Requirement, 7) Groundwater Development.</p> |
| 3.2.4 | Strategic Socio-Environmental Consideration | <p>There will be some negative impact in social environmental aspect by implementation of the M/P2013. Main purpose of the M/P2013 is to contribute to improvement of social welfare and economy development based on national policy. Strategic consideration is performed to prevent large negative impact on related sectors such as water resources development, water supply and sanitation, irrigation and drainage.</p> |
| 3.2.5 | Usage of M/P2013 | <ul style="list-style-type: none"> • Application to CMPs as master plan for each hydrological area. • Application to sub-sector development plans except water supply, sanitation, irrigation and drainage. |
| 3.3 | Outline of National Water Resources Master Plan 2013 | |
| 3.3.1 | Strategic Issues | <ul style="list-style-type: none"> • Water resources management and development in consideration of unevenly distributed water resources and demand • Addressing increasing municipal water demand on the premise of current low operation rate of water supply facilities • Promotion of sound and self-reliant irrigation development • Effective utilization of existing water source facilities in view of contemporary needs • Enhancement of water-related data/information and its uniform management • Consideration of increasing risk on water resources • Active involvement of water resources administrator in management of important rivers and flood plains • Water quality monitoring to secure clean and safe water • Institutional development & strengthening of water resources management |
| 3.3.2 | Outline of Water Source Development Plan | <p>The water source development plan is proposed on the basis of water balance between water demand and water supply capacity, in consideration of the unevenly distributed water resources potential. The basic concept is below:</p> <p><u>Surface water development</u></p> <ul style="list-style-type: none"> • Effective utilization of existing dams • Preparation of sufficient surface water source to address increasing water demand |

| Chapter/ section | Content | output |
|--|--|--|
| | | <p>in consideration of unevenly distributed water resources in the country</p> <p><u>Groundwater development</u></p> <ul style="list-style-type: none"> • Sustainable and efficient groundwater development • Rehabilitation and repair of borehole facilities |
| 3.3.3 | Outline of Water Sub-Sector Development Plan | <ul style="list-style-type: none"> • The basic concept of sub-sector development plan related to water resources development has been prepared for the following sub-sectors which is under jurisdiction of FMWR; Water Supply and Sanitation, and Irrigation and Drainage. • On the other hand, recommendations are provided for the other sub-sectors such as hydropower generation, flood and erosion control, inland transportation, inland fishery, livestock. |
| 3.3.4 | Outline of Water Resources Management Plan | <p>Water Resources Management Plan (WRMP) shows the approach of proper delivery of water services meeting water user's needs on the basis of safety, sufficiency, efficiency, equity, and sustainability, by using facilities and operation systems to be established by WSDP and WSSP.</p> <ul style="list-style-type: none"> • Operation and maintenance for quantitative and qualitative provision of water resources • Regulation and conservation of water resources from quantitative and qualitative points of view • Coordination of organizations and mediation among users • Facilitation and improvement of water resources development / utilization / management |
| Chapter 4 Projection of Future Water Demand | | |
| 4.1 | Future Socio-Economic Framework | <ul style="list-style-type: none"> • Population (154.4 million in 2010 to 257.8 million in 2030) • Economic Growth of Industry |
| 4.2 | Municipal Water | <ul style="list-style-type: none"> • Water demand was projected for municipal water supply with three categories below: <ul style="list-style-type: none"> - Domestic water - Commercial Water - Industrial Water • The Project estimates water demand for domestic water supply according to the following basic conditions and frame. <ul style="list-style-type: none"> - Water supply coverage - Categorization of settlement and categorization on water demand projection - Population served - Per capita consumption of domestic water <p>The estimated nationwide water demand will nearly triple between 8,254MLD in 2010 and 23,876MLD in 2030. Sensitivity analyses were performed to examine whether water demand projection was appropriate or not.</p> |
| 4.3 | Irrigation Water | <p>Water demand was projected, considering 5 items to attain the goal of rice production of 100% self- sufficiency.</p> <ul style="list-style-type: none"> • Planted area and yield of rain-fed rice cultivation • Required rice production for accomplishing 100% self-sufficiency • Development area and rice production due to public irrigation scheme • Proposed cropping pattern • Projection of future water demand <p>Water demand is 2,052MCM in rainy season and 4,193MCM in dry season with 6,245MCM in total, which is equivalent to 2.2% of the total amount of water resources potential of 286,600MCM. Water demand variations were preliminary performed in case of the Climate Change.</p> |
| 4.4 | Other Sub-Sectors | <ul style="list-style-type: none"> • Livestock <p>Number of livestock and its water demand were predicted.</p> <ul style="list-style-type: none"> • Freshwater aquaculture <p>Water demand was predicted for freshwater aquaculture.</p> <ul style="list-style-type: none"> • Hydropower generation <p>Water use by hydropower generation is non-consummative, so that total water quantity is not reduced by it. The optimum utilization of water for hydropower generation was proposed on the condition that it would not inhibit other water uses such as river environment, municipal and irrigation in downstream reach.</p> <ul style="list-style-type: none"> • Flood Control <p>In the case of flood control, water intakes and consumptive uses of water are not so common, so that quantitative evaluation of water demand is not conducted.</p> <ul style="list-style-type: none"> • Inland Water Navigation <p>Inland water navigation is under the jurisdiction of NIWA in Federal Ministry of Transport. Information on this sector is so limited that the water demand and discharge in navigation route cannot be addressed adequately.</p> <ul style="list-style-type: none"> • Minimum Stream Flow Requirement <p>In the M/P2013, $Q_{97DS}90\%Y$ (90% yearly dependable 97 percentile flow for a single</p> |

| Chapter/ section | Content | output |
|--|--|---|
| | | year), which may represent the drought condition according to the flow regime in each area in Nigeria is applied. It is desirable that more appropriate minimum stream flow requirement for each of the rivers be set by discussion among stakeholders. |
| 4.5 | Water Demand Structure | <p>Water demand structure was explained based on the result of water demand projection by sector.</p> <ul style="list-style-type: none"> • Change in share of water demand by sectors • Water demand by sectors and by HAs • Estimated municipal water demand by sources • Estimated total water demand by sources • Water demand for surface water source • Water demand for groundwater source <p>Total water demand is 5.93BCM/year in 2010. It will increase 16.58BCM/year in 2030. Urban and rural water supply have 50% share both in 2010 and 2030. Irrigating and drainage sector will have 30% share in 2010 and 40% share in 2030.</p> |
| Chapter 5 Evaluation of Water Resources Potential | | |
| 5.1 | Catchment Delineation | <ul style="list-style-type: none"> • Problem and issue of the existing catchment delineation • Method of catchment delineation • Result of catchment delineation |
| 5.2 | Meteorological Condition | <ul style="list-style-type: none"> • Spatially averaged annual precipitation, annual mean air temperature and annual potential evapotranspiration are main output. |
| 5.3 | Surface Water Resources | <ul style="list-style-type: none"> • Surface water potential in quasi-natural condition was analyzed by long term rainfall - runoff analysis of 40 years data, from 1970 to 2009. |
| 5.4 | Groundwater Resources | <p>Groundwater recharge was evaluated as groundwater potential, and aquifer characteristic was analyzed. Items below were examined.</p> <ul style="list-style-type: none"> • Type of Basement rocks and hydrogeological characteristics • Groundwater recharge <p>Groundwater recharge was calculated considering the late component of Surplus (S) of the long term rainfall - runoff model.</p> |
| 5.5 | Summary of Water Resources Potential | <ul style="list-style-type: none"> • The average precipitation over the country is about 1,150mm. • Only 24% of the precipitation becomes runoff and the rest are lost as evapotranspiration and/or others. • Total internal generation of the runoff is 244BCM/year and the surface water resources potential is estimated at about 333BCM/year. • The total water resources potential can be evaluated by adding the component that is lost without becoming surface runoff among recharge. The internal generation of total water resources potential is estimated at 287BCM/year and the total water resources potential with inflow from neighboring countries is estimated at 375BCM/year. • 88BCM/year of water comes from neighboring countries, which roughly indicates that almost 24% of surface water resources in Nigeria rely on neighboring countries. • The total groundwater resources potential is estimated at 156BCM/year as a renewable source on the basis of the estimated groundwater recharge. |
| Chapter 6 Water Balance between Demand and Supply | | |
| 6.1 | Overall Water Balance between Total Water Demand and Water Resources Potential | <ul style="list-style-type: none"> • The water use rate in 2010 is just 1.6%. In 2030, the ratio will become 4.4%. • The total water demand in 2030 is still much less than the total water resources potential. • However, it should be noted that the currently usable water with stable supply for the demand is also much smaller than the surface water resources potential. • Furthermore, because the water demand and water resources are unevenly distributed, the necessity of water resources development should be examined through the water balance between supply and demand at local levels. |
| 6.2 | Procedure of Water Balance Study | <ul style="list-style-type: none"> • The current demarcation of water source in Nigeria is estimated 40% for groundwater and 60% for surface water. • As procedure for water balance analysis, the sustainability of groundwater use would be firstly examined. Then, the water balance for both groundwater and surface water would be studied. The procedure was explained for water balance study in detail. |
| 6.3 | Balance of Groundwater Recharge and Groundwater Demand | <ul style="list-style-type: none"> • Available amount of groundwater supply by the existing pumping facilities • Groundwater recharge and groundwater demand • Effect of Climate Change • Conformation of groundwater balance between demand and supply by groundwater simulation: <p>Lowering of groundwater level by implementation of proposed groundwater development of the M/P2013 was estimated less than 5m in most of the area, though it will reach 25m at some specified areas. Consequently, it was concluded that the groundwater development can be implemented as proposed by adjusting</p> |

| Chapter/ section | Content | output |
|---|---|---|
| | | depth of boreholes. In case of Climate Change, groundwater level will be lowered 5m to 20m more by the effect of Climate Change compared with in case without effect. |
| 6.4 | Balance between Demand and Supply Capacity for Surface Water Source | <ul style="list-style-type: none"> • Comparison between water demand and supply capacity at scale of entire HA • Detailed water balance study Based on the result of above two methods, items below were proposed. <ul style="list-style-type: none"> - According to the result of water balance analysis result, for all HAs the supply capacity with 90% yearly dependability is larger than the water demand. - As the results of the water balance study of above b) method, it was evaluated that some water sources could experience the deficit for supplying necessary water volume with 90% yearly. And it is also evaluated that the irrigable area in terms of stable water supply with 80% yearly dependability is less than the planned area in some schemes. Water resources development plan will be proposed for water supply and irrigation based on results above. - It was clarified that there could be excess storage volume in some significant dams, even if the demand for irrigation and municipal water supply in 2030 is considered. The excess storage volume can be utilized for several different purposes such as irrigation, municipal water supply, enhancement of firm energy of hydropower generation, reduction of peak flood discharge and enhancement of river environment. • Estimation of Risk Associated with Climate Change and Trans-boundary Water <ul style="list-style-type: none"> - As the results of the water balance study, under the Climate Change scenario, it is expected that the safety level of water supply could be lower than 90% yearly dependability in some places. - As the results of the water balance study for the existing large irrigation schemes under the Climate Change scenario of case-1, it is expected that the available irrigation area in terms of stable water supply with 80% yearly dependability could decrease in some irrigation schemes. - The hydropower generation by the significant dams as well as large hydropower dams could be reduced to 60-90% of the base climate condition. |
| Chapter 7 Water Sources Development Plan | | |
| 7.1 | Groundwater Development Plan | <ul style="list-style-type: none"> • Strategies for groundwater development • Optimum yield for borehole field / Optimum number of boreholes by borehole field / Specification of boreholes • Boreholes available for rehabilitation • Issues on groundwater development: <ul style="list-style-type: none"> - Promotion of groundwater recharge - Issues on rural water supply (borehole successful rate, groundwater contamination) - Issue on urban water supply (over-pumping, land subsidence, sea water intrusion, groundwater contamination) - Groundwater contamination by lead poisoning in the northern part of Nigeria - Lowering of groundwater level and drought - Conversion of pump type from hand pumps to motorized pumps |
| 7.2 | Surface Water Development Plan | <ul style="list-style-type: none"> • Current condition of surface water development/Problems and issues in surface water development • Strategy on surface water development • Proposed Project <ul style="list-style-type: none"> - Capacity development of dam management - Rehabilitation of equipment for proper operation of major dams - Rehabilitation of deteriorated dams - Surface water development for municipal water supply - Surface water development for irrigation development - Integrated surface water development • Possibility of hydropower generation in surface water source development projects for municipal water supply and irrigation development |
| 7.3 | Water Resources Conservation Plan | <ul style="list-style-type: none"> • Groundwater <ul style="list-style-type: none"> - Purpose and importance of groundwater conservation in quantity and quality - Method of groundwater management for conservation - Institutional issue on groundwater management • Surface water <ul style="list-style-type: none"> - Issues on conservation of surface water source <ul style="list-style-type: none"> - Point sources of pollution - Non-point sources of pollution - Soil erosion - Dams/reservoirs <p>Responsibilities of main stakeholders in proposed mechanism for conservation of</p> |

| Chapter/ section | Content | output |
|--|--|--|
| | | surface water source |
| Chapter 8 Water Resources Sub-Sector Development Plan | | |
| 8.1 | Water Supply and Sanitation Development Plan | <ul style="list-style-type: none"> • Current Status of Water Supply and Sanitation The Current operation rate of water supply facilities was analyzed on surface water and groundwater scheme • Basic Conditions of Development Planning for Water Supply and Sanitation <ul style="list-style-type: none"> - Per capita consumption - Designed capacity and yield of water sources - Rehabilitation scheme of existing facilities - Newly construction scheme of facilities - Composition of water supply facilities in development plan - Standard sanitation service level guaranteed according to settlement category - Menu of development project • Water Supply and Sanitation Development Plans <u>Water supply</u> Water supply development by both rehabilitation and newly construction projects proposed in M/P is 12,503 MLD in hydrological balance and 14,710 MLD in facility planning. <u>Sanitation</u> The M/P2013 estimates required development of domestic sanitation facilities (toilet or latrine) at 36.8 million in total in the target period of sanitation development plan from 2015 to 2030. |
| 8.2 | Irrigation and Drainage Development Plan | <ul style="list-style-type: none"> • Existing Irrigation Scheme Based on surface water potential of the existing irrigation schemes, irrigation areas were reviewed for the existing irrigation schemes. <ul style="list-style-type: none"> - Completion with no extension scheme - Ongoing scheme - Extension scheme • New Irrigation Scheme <ul style="list-style-type: none"> - Supplementary irrigation scheme - Dam irrigation scheme - Integration Development scheme • Integration scheme is to develop large scale irrigation scheme including pump operation which utilize electricity created by the hydraulic power generation in the multi-purpose medium and large scale dams constructed in the branch river of Benue River. |
| 8.3 | Recommendation to Other Sub-Sectors | |
| 8.3.1 | Hydropower Generation | <ul style="list-style-type: none"> • Evaluation of hydroelectric potential (of irrigation waterways)/Considering the installation of low-head hydroelectric stations/ Necessity of trial installation • Considering the large environmental and social impacts of constructing a large-scale hydroelectric station, as well as the lack of suitable dam sites with large enough capacities, a more practical choice for the proposed dam sites would be to install small hydropower stations that are driven by water used primarily for the other purposes such as irrigation. |
| 8.3.2 | Flood and Erosion Control | <ul style="list-style-type: none"> • Background/ issues/ current situation of sector • Proposed actions for FMWR <ul style="list-style-type: none"> - FMWR has nation-wide hydrological monitoring network and jurisdiction of a lot of dams. In this sense, FMWR should be involved in management of floodplain along the major rivers, especially for the downstream reaches of her multipurpose dams. - At the same time, the hydrological monitoring system of FMWR should be improved to monitor more short term phenomenon such as floods. |
| 8.3.3 | Inland Navigation | <ul style="list-style-type: none"> • Existing policy, strategy and plans/Existing condition/Identified issues and problems • Direction of improvement and action There is possibility that some reservoirs under management and control of FMWR affects flow regime of the rivers that are used for inland navigation in Nigeria. FMWR can contribute to i) management of irrigation area of flood plain under jurisdiction of NIWAS, and ii) provision of information against flood disaster for riverine urban areas. It is necessary that FMWR considers effect on inland navigation in flood plain management by FMWR. |
| 8.3.4 | Inland Fishery | <ul style="list-style-type: none"> • Existing policies • Recommendations Development frame of fisheries sub-sector and that of irrigation, agriculture and livestock sub-sectors are closely related each other. Hence, it is advisable to closely hold consultation among these sub-sectors for developing their activities by effectively utilizing water resources. |

| Chapter/ section | Content | output |
|--|---|--|
| 8.3.5 | Livestock | <ul style="list-style-type: none"> • Policies of livestock • Recommendations <p>The above policies do not include water resources development and management for promoting livestock industry. In practice, however, animal water at lakes, ponds, rivers, reservoirs, canals etc. is indispensable for livestock maintenance including water spots for seasonal transhumant activities. Livestock and irrigation sectors should be closely related mutually. It is necessary to produce efficient use of water resources through communication, coordination and collaboration between them.</p> |
| Chapter 9 Water Resources Management Plan | | |
| 9.1 | General | <p>Objectives and 4 strategy of water resources management was mentioned below:</p> <ul style="list-style-type: none"> • Operation and maintenance for provision of water resources quantity and quality • Regulation and conservation of water resources quantity and quality • Coordination and mediation among organizations and users • Facilitation and improvement of water resources development and management |
| 9.2 | Organization and Institution for Public Water Services | <ul style="list-style-type: none"> • Present Situation and Issues • Purpose and Basic Policies for Strengthening of Institutional Framework <ul style="list-style-type: none"> - Cooperative Institutional Arrangement - Participatory Management Administration - Fair Regulatory Framework - Decentralization and Coordination • Action plan |
| 9.3 | Operation and Maintenance for Water Resources Development Facilities | <ul style="list-style-type: none"> • Surface water <p>this Project revealed that almost all dams and reservoirs in Nigeria needed improvement toward more proper operations, maintenance, and management for items below:</p> <ul style="list-style-type: none"> - Safety management of dam structures - Safety management of reservoirs - Safety management of dam reservoir operation <ul style="list-style-type: none"> • Groundwater <p>Current situation and issues on operation and maintenance of facilities for groundwater management and development below were mentioned.</p> <ul style="list-style-type: none"> - Aquifer management - Operation and management of borehole facilities - Pumping capacity of boreholes - Borehole construction system |
| 9.4 | Hydrological Monitoring | <p><u>Surface water</u></p> <ul style="list-style-type: none"> • Problems and Issues on Hydrological Monitoring for Surface Water • Strategy on Improvement of Surface Water Monitoring • Proposed Projects <ul style="list-style-type: none"> - Improvement of surface water monitoring network - Enhancement of data management capacity in NIHSA - Establishment of hydrological modeling center within NIHSA - Enhancement of awareness on importance of hydrological monitoring <p><u>Groundwater</u></p> <ul style="list-style-type: none"> • Current groundwater monitoring • Expected groundwater monitoring system <ul style="list-style-type: none"> - Assessment for groundwater development Potential - Groundwater environmental problem • Clarification of responsibility of related organization and strengthening of institutional and technical capacity <ul style="list-style-type: none"> - Proposal on demarcation of responsibilities among NIHSA, NIWRMC and State Organizations |
| 9.5 | Data and Information Management | <ul style="list-style-type: none"> • Vision of data and information management <ul style="list-style-type: none"> - Sharing knowledge - The database maintenance and operation by NIHSA and NIWRMC • Scope of data to be managed • Policy for data acquisition • Management on data acquisition and archiving |
| 9.6 | Management of Floodplain | <ul style="list-style-type: none"> • Current situations/Issues • Strategies of FMWR <p>FMWR should start the basic investigation of floodplain of major rivers such as the Benue, the Niger, the Kaduna and the Sokoto-Rima rivers which have great potential of large scale irrigation.</p> |
| 9.7 | Consideration of Risk Associated with Climate Change and Trans-boundary Water | <ul style="list-style-type: none"> • Climate Change <p>Risk on Water Resources associated with Climate Change was identified.</p> <ul style="list-style-type: none"> • Trans-boundary Water <p>Example of issues associated with trans-boundary water.</p> |

| Chapter/ section | Content | output |
|---|--|--|
| | | <ul style="list-style-type: none"> - Lagdo Dam in Benue River - Katsina-Ala River and Kashimbilla Dam - Kandaji Dam in the Upper Niger River <p>The risk was identified on water resources associated with trans-boundary water.</p> <ul style="list-style-type: none"> • Coping Strategy on Risk associate with Climate Change and Trans-boundary Water <ul style="list-style-type: none"> - Refinement of identification of the risk by enhancement of water-related data/information - Promotion of adaptive management - Enhancement of emergency management against flood and drought - Promotion of Water Demand Management |
| 9.8 | Water Environment Management | <ul style="list-style-type: none"> • Problems and Issues on Water Environment Management • Proposed Plans for Water Environment Management Improvement <ul style="list-style-type: none"> - National Drinking Water Quality Monitoring Improvement Plan - Water Quality Monitoring Plan for Important Rivers of Nigeria |
| 9.9 | Water Allocation and Regulation | <ul style="list-style-type: none"> • Current condition and issues on water allocation and regulation • Proposed framework on water allocation and regulation • Proposed Projects <ul style="list-style-type: none"> - Formulation of catchment management plan for eight (8) hydrological areas - Enhancement of capacity on water use permitting and regulation - Promotion of catchment management for eight (8) hydrological areas - Preparation of guideline for water pricing |
| 9.10 | Public Relations for Water Sector | <ul style="list-style-type: none"> • Basic policy/ Action Plan <ul style="list-style-type: none"> - Strengthen PR, through updating FMWR's quarterly magazine - Strengthening of Web site - Strengthen and diversify the tools of Media - Strict and efficient management of document files - Participatory process |
| 9.11 | Public-Private Partnership (PPP) | <ul style="list-style-type: none"> • Basic issues • Action plan <ul style="list-style-type: none"> - Strengthening of the PPP Unit of FMWR - Capacity building for PPP projects preparation and implementation - Budget allocation for PPP projects preparation - Establishment of Projects Delivery Teams and Steering Committee - Regular Partners/Stakeholders Consultation on the PPP process - Regular updating of policies and strategies to promote private sector participation |
| 9.12 | Manpower Development and Capacity Building | <ul style="list-style-type: none"> • Basic policy for HRD • HRD plan |
| 9.13 | Monitoring and Evaluation | <ul style="list-style-type: none"> • Current monitoring and evaluation system • Recommendation to FMWR for effective use of M&E <ul style="list-style-type: none"> - To make the DAs of FMWR understand thoroughly the M&E System - To enhance the M&E System implemented by NIWRM and CMO - To develop the M&E system particularly for the preparatory stage of project |
| Chapter 10 Implementation Program | | |
| 10.1 | Implementation Schedule | <p>Proposed project were roughly classified as below:</p> <ul style="list-style-type: none"> - Water source development: Surface water and Groundwater- Sub-sector development: Water Supply and Sanitation/ Irrigation and drainage - Water resources management project: Hydrological monitoring/Water allocation and regulation/ Water environment management <p>Project implementation was divided into 3 stages, 1st to 3rd stage. Implementation schedule was proposed based on development strategies of each sector</p> |
| 10.2 | Cost Estimate | <ul style="list-style-type: none"> • Cost for surface water development projects is 375.6 billion Naira, and cost for groundwater development projects is 100.1 billion Naira with total of 475.7 billion Naira. Cost for water supply and sanitation projects is 4,117.3 billion Naira, and cost for irrigation and drainage projects is 1,531.4 billion Naira. Cost for water resources management projects is 29.3 billion Naira. |
| 10.3 | Financial Program for Project Implementation | <p>In water sources development sector (surface water and groundwater), investment for the 3rd Stage is the largest of all the stage, though investment of each stage is roughly constant. In water supply and sanitation sector, investment for the 1st Stage is the largest of all the stage. Then investment will gradually reduce afterward. In irrigation and drainage sector, investment for the 2nd Stage is the largest of all the stage.</p> |
| Chapter 11 Evaluation of National Water Resources Master Plan 2013 | | |
| 11.1 | Evaluation from Economic and Financial Aspects | <p><u>Economic Evaluation</u></p> <ul style="list-style-type: none"> • Water Supply Projects <p>The results of analysis vary from state to state. However, from the national</p> |

| Chapter/ section | Content | output |
|-----------------------------------|--|---|
| | | <p>viewpoint, the EIRR exceeds the 10 % of opportunity cost of capital or slightly below it. Accordingly, the Water Supply Projects of the M/P2013 as a whole are judged to be economically feasible.</p> <ul style="list-style-type: none"> • Irrigation and Drainage Projects Actually, the results of analysis vary from HA to HA. However, from the national viewpoint, the EIRR exceeds the 10 % of opportunity cost of capital. Accordingly, the Irrigation and Drainage Projects of the M/P 2013 as a whole are judged to be economically feasible. <p><u>Financial Consideration</u></p> <ul style="list-style-type: none"> • Water Supply Projects <ul style="list-style-type: none"> - Firstly, the allocated budget to the M/P2013 would be disbursed to the projects that could achieve the highest economical effectiveness, namely the rehabilitation projects. Secondary, the remaining budget would be spent to the new development projects. - To achieve the 100% nationwide coverage of water supply, it is strongly proposed that the government would aggressively finance with an additional budget and soft loan. - The state governments play the crucial role for the development of water supply sector. • Irrigation and Drainage Projects <ul style="list-style-type: none"> - Firstly, the allocated budget to the M/P 2013 would be disbursed to the projects that could achieve the highest economical effectiveness, namely the rehabilitation projects and the supplementary irrigation projects. Secondary, the remaining budget would be spent to the new projects. - To achieve the 100% self-supply of rice, it is strongly proposed that the government would aggressively finance with an additional budget and soft loan. |
| 11.2 | Evaluation from Social and Environmental Aspects | <ul style="list-style-type: none"> • Evaluation of IEE <ul style="list-style-type: none"> - List of projects and brief description - Categorization of projects (screening) - Identification of potential impacts and its significance - Description of mitigation measures against adverse impacts - Conclusions and recommendations <p>Some adverse impacts on the environment are also expected from the project implementation which shall be diminished through the proposed mitigation measures.</p> |
| Chapter 12 Recommendations | | |
| | | <p>In order to provide water services to suffice water users' demands, FMWR has decided to implement, with all efforts, the plans and projects proposed in the M/P 2013, in the following manners:</p> <ul style="list-style-type: none"> • Practical Use and Periodic Review of the M/P2013 • Implementation of Water Resources Development Plan <ul style="list-style-type: none"> - Water Supply Development Plan - Irrigation and Drainage Development Plan - Involvement in Other Sub-sectors • Implementation of Water Resource Management Plan • Steady and Sound Investment • Establishment of Project Promotion Function/Body |

Source: JICA Project Team

3.2 Draft Catchment Management Plan

Output of Draft Catchment Management Plans (CMPs) is summarized in Table 3-2.

Table 3-2 Output of Draft CMPs for HA-1 and Ogun-Oshun Basin

| Chapter/section | Content | Output |
|---|--|---|
| Chapter 1 Current Situation of Project Area | | |
| 1.1 | Project Area | Name of states with ratio (%) of area and population, which are included in the target area, are indicated. Moreover, list of name of LGAs, which are included in target area, are also indicated. |
| 1.2 | Socio-economy | Population, economy and financial condition, state budget were explained. |
| 1.3 | Natural Condition | Topography, geology, hydrogeology, vegetation, land use, meteorology and hydrology were explained. |
| 1.4 | Water use and Water Resources Development | Current water use of target area, surface water development facilities and groundwater development facilities were outlined. <u>HA-1</u> <ul style="list-style-type: none"> Total water use in 2010 is 799MCM/year Municipal water supply (urban and rural) is 32% of the total water use. Irrigation and drainage is 59%. The other agriculture (livestock and aqua culture) is 9%. Use of surface water is 493MCM/year (62%) and use of groundwater is 307MCM/year (38%). Number of the existing dam is 25 with total water storage of 16.92BCM, which corresponds to 45% of total water potential. <u>Ogun-Oshun Basin</u> <ul style="list-style-type: none"> Total water use is 1,111MCM/year in 2010. Municipal water supply (urban and rural) is 81% of the total water use. Irrigation and drainage is 5%. The other agriculture (livestock and aqua culture) is 14%. Use of surface water is 267MCM/year (24%), and groundwater is 844MCM/year (76%). Number of the existing dams is 37 with total water storage of 1,160MCM, which correspond to 8% of total water potential. |
| 1.5 | Organizations and Institutional Responsibilities in Water Resources Sector | Federal institutions, state institutions, LGA and the other stakeholders were summarized. |
| Chapter 2 Framework of Catchment Management Plan | | |
| 2.1 | Objective of Catchment Management Plan | Catchment management plan has two purposes, i) guideline and ii) project implementation plan, to realized water resources management in the target areas. |
| 2.2 | Basic Concept of Catchment Management Plan | <ul style="list-style-type: none"> The CMP has target year of 2030 as the same as the M/P2013. National level water policy and the following M/P2103 are superordinate to the CMP. The CMP is formulated based on the concept of Integrated Water Resources Management (IWRM). Planning condition: <ol style="list-style-type: none"> Flow and Climate Condition, Climate Change Impact, Trans-boundary Water, Target Safety Level for Surface Water Development, Priority of Water Use, Minimum Stream Flow Requirement, Groundwater |
| 2.3 | Contents of Catchment Management Plan | <ul style="list-style-type: none"> Current situation of project area Framework of the CMP Projection future water demand Water Resources potential Balance of water demand and supply Water resources management plan Water resources sub-sector development plan. Water resources management plan Implementation program Evaluation of the CMP Recommendations |
| 2.4 | Strategic issues on Water Resources Development and Management in the Project Area | The strategic issues on CMP is the same as those of the M/P2013 as shown below: <ul style="list-style-type: none"> Water resources management and development in consideration of unevenly distributed water resources and demand Addressing increasing municipal water demand on the premise of current low operation rate of water supply facilities Promotion of sound and self-reliant irrigation development Effective utilization of existing water source facilities in view of contemporary needs Enhancement of water-related data/information and its uniform management Consideration of increasing risk on water resources Active involvement of water resources administrator in management of important |

| | | |
|--|---------------------------------|---|
| | | <p>rivers and flood plains</p> <ul style="list-style-type: none"> • Water quality monitoring to secure clean and safe water • Institutional development & strengthening of water resources management |
| Chapter 3 Projection of Future Water Demand | | |
| | | <p>Water demand projection follows the M/P2013. On the other hand, water demand projection of Ogun-Oshun Basin has two (2) scenarios: Scenario A follows the M/P2013. And Scenario B reflects water demand projection by Lagos state with their development plan.</p> |
| 3.1 | Future Socio-Economic Framework | <ul style="list-style-type: none"> • Population <u>HA-1</u> Projected population will increase from 17,142 thousand in 2010 to 27, 231 thousand in 2030. <u>Ogun-Oshun Basin</u> Projected population will increase from 27,267 thousand in 2010 to 41,094 thousand (Scenario-A) and 63,803 thousand (Scenario-B) in 2030. • Economic Growth of Industry was projected. |
| 3.2 | Municipal Water | <ul style="list-style-type: none"> • Water demand of urban and rural water supply were projected with three (3) categories of i) domestic water supply, ii) commercial water supply and iii) industrial water supply. Water supply coverage, categorization of settlement, population served, and per capita consumption of domestic water were used as indicators in water demand projection. Result of the projection is as follow: <u>HA-1 / main 4 states</u> Project water demand is 2,112 MLD in 2030, which is 3.2 times as many as that in 2010, 668MLD. <u>Ogun-Oshun Basin / main 4 states</u> Scenario-A: Projected water demand is 5,140MLD in 2030, which is 2.1 times as many as that in 2010, 2,452MLD. Scenario-B: Projected water demand is 6,678MLD in 2030, which is 2.7 times as many as that in 2010, 2,452MLD. Sensitive analysis was performed to confirm appropriateness of the analysis. |
| 3.3 | Irrigation Water | <p>Considering five (5) items to attain the goal, indicators below were estimated to formulate irrigation plan for achievement of rice production of 100% self-sufficiency.</p> <ul style="list-style-type: none"> - Planted area and yield of rain-fed rice cultivation - Required rice production for accomplishing 100% self-sufficiency - Development area and rice production due to public irrigation scheme - Proposed cropping pattern - Projection of future water demand <p><u>HA-1</u> The overall water demand is 398MCM in the wet season and 377MCM in the dry season, and the total amount is 775MCM year-round. The total amount corresponds approximately to 7.2% of target region's total water abundance 10,700MCM (internal generation only). <u>Ogun-Oshun Basin</u> The overall water demand is 101MCM in the wet season and 306MCM in the dry season, and the total amount is 407MCM year-round. The total amount corresponds approximately to 3.1% of target region's total water abundance of 13.0BCM (internal generation only). Water demand variations were preliminary considered on scenarios of Climate Change.</p> |
| 3.4 | Other Sub-Sectors | <ul style="list-style-type: none"> • Livestock: Number of livestock and water demand were projected. <u>HA-1</u> The projected water demand for livestock in 2030 amounts to 77.7 MCM, as against 55.7 MCM in 2010, with 39% increase in 20 years. <u>Ogun-Oshun Basin</u> The projected water demand for livestock in 2030 amounts to 12.1 MCM, as against 8.9 MCM in 2010, with 36% increase in 20 years. • Freshwater Aquaculture: water demand for fresh water aquaculture was projected <u>HA-1</u> The water demand for freshwater aquaculture will increase from 17.9 MCM in 2010 to 28.6 MCM in 2030, with 60% increase in 20 years in 20 years. <u>Ogun-Oshun Basin</u> The water demand for freshwater aquaculture will increase from 241 MCM in 2010 to 389 MCM in 2030, with 61% increase. • Hydropower generation Water use by hydropower generation is non-consummative, so that total water quantity is not reduced by it. The optimum utilization of water for hydropower generation was proposed on the condition that it would not inhibit other water uses such as river environment, municipal and irrigation in downstream reach. |

| | | |
|--|--------------------------|--|
| | | <ul style="list-style-type: none"> • Flood Control In the case of flood control, water intakes and consumptive uses of water are not so common, so that quantitative evaluation of water demand is not conducted. • Inland Water Navigation Inland water navigation is under the jurisdiction of NIWA in Federal Ministry of Transport. Information on this sector is so limited that the water demand and discharge in navigation route cannot be addressed adequately. • Minimum Stream Flow Requirement In the CMP, Q97DS90%Y (90% yearly dependable 97 percentile flow for a single year), which may represent the drought condition according to the flow regime in each area in Nigeria, is applied. |
| 3.5 | Water Demand Structure | <ul style="list-style-type: none"> • Change in share of water demand by sectors • Water demand by sectors and by HAs • Estimated municipal water demand by sources • Estimated total water demand by sources • Water demand for surface water source • Water demand for groundwater source <p><u>HA-1</u> Total water demand of each sector is estimated 791MCM/year in 2010. This was projected to increase up to 1,625MCM in 2030. Urban and rural water supply will take 30% share of the total water demand in 2010. However, it will be 50% share in 2030.</p> <p>On the other hand, irrigation and drainage water demand will take 60% share of the total water demand in 2010. However, it will 50% share in 2030.</p> <p><u>Ogun-Oshun Basin</u> Total water demand for irrigation and drainage is 1,111MCM/year in 2010. It was projected to increase 2,589MCM/year in Scenario A and 3,193MCM/year in Scenario B in 2030.</p> <p>Water demand of for urban and rural water supply currently takes 24% share of the total water demand in 2010. It will take 59% share of total water demand in Scenario-A and 81% share in Scenario-B in 2030 with drastic increase.</p> |
| Chapter 4 Water Resources Potential | | |
| 4.1 | Catchment Delineation | <p>In the M/P2013, the review on the catchment delineation has been made by joint effort of NIHSA and JICA.</p> <p><u>HA-1</u> The number of newly delineated Sub-Hydrological Area (SHA) in HA-1 is 36, 28 of which are located inside the territory of Nigeria.</p> <p><u>HA-6 including Ogun-Oshun Basin</u> The number of newly delineated Sub-Hydrological Area (SHA) in HA-6 is 24, 22 of which are located inside the territory of Nigeria.</p> |
| 4.2 | Meteorological Condition | <ul style="list-style-type: none"> • Item below were analyzed: General spatial pattern, long-term trend, seasonal pattern <p><u>HA-1</u> The annual precipitation and annual mean air temperature in the last 40years (1970-2009) are estimated at 767mm/year and 27.4degree Celsius in average, respectively. The estimated annual PET in the last 40years is 1,419mm/year.</p> <p><u>Ogun-Oshun Basin</u> The annual precipitation and annual mean air temperature in the last 40years (1970-2009) are estimated at 1,274mm/year and 26.7degree Celsius in average, respectively. The estimated annual PET in the last 40years is 1,330mm/year.</p> |
| 4.3 | Surface Water Resources | <ul style="list-style-type: none"> • A long-term rainfall-runoff model has been introduced in order to obtain supplemental information on runoff condition. The simulated runoff from 1970 to 2009 (40years) are used for estimation of surface water resources potential in quasi-natural condition. <p><u>HA-1</u> The average runoff yield and runoff rate in HA-1 are estimated at 62mm/year and 8.1%, respectively.</p> <p><u>Ogun-Oshun Basin</u> The average runoff yield and runoff rate in Ogun-Oshun Basin are estimated at 199mm/year and 15.4%, respectively.</p> <ul style="list-style-type: none"> • Effect of Climate Change on Runoff was analyzed. • General Condition of Surface Water Quality It is expected that further deterioration of water body will take place due to future increase of population and so on. In order to preliminary discuss this; preliminary analysis on pollution load has been conducted. <p><u>HA-1</u> Sokoto-Rima River presents high levels of colloidal turbidity. It is necessary to conduct a detail study on the current situation and its causes in order to address this problem.</p> |

| | | |
|--|--|---|
| 4.4 | Groundwater Potential | <ul style="list-style-type: none"> • Aquifer of HA-1 and Ogun-Oshun Basin consists of Basement Rock and sedimentary rocks. • Groundwater recharge was analyzed as the late component of Surplus (S) of the model. <p><u>HA-1</u> Groundwater recharge is 37mm/year, with less than 50mm/year in most of HA-1 area. It is because high evapotranspiration by few rainfall and high temperature. Groundwater recharge is higher around 40mm/year in western part of HA-1 where Basement rock is distributed. However, it is smaller less than 20mm/year in the western part of HA-1 where sedimentary rock is distributed.</p> <p><u>HA-6</u> Groundwater recharge is 236mm/year, with around 100mm/year in the central and northern part of HA-6 area. Groundwater recharge is more than 200mm/year in southern part of HA-6, and it becomes lager toward south to finally reach more than 700mm/year in the coastal area of the south end of HA-6.</p> <ul style="list-style-type: none"> • Water Balance by Groundwater Monitoring: Groundwater recharge was analyzed based on the result of groundwater level monitoring in HA-1 and Ogun-Oshun Basin. • Influence of Climate Change on groundwater potential |
| 4.5 | Summary of Water Resources Potential | <p><u>HA-1</u> (including in flow from neighboring countries) Total water resources potential was 37.4BCM/year (with internal production of 10.7), including surface water potential of 35.1BCM/year (with internal production of 8.3) and groundwater potential of 5.0BCM/year.</p> <p><u>Ogun-Oshun Basin</u> (including in flow from neighboring countries) Total water resources potential is 1.1BCM/year (with internal generation of 13.0), including surface water potential is 11.5BCM/year (with internal generation of 11.4) and groundwater potential is 4.9BCM/year.</p> |
| Chapter 5 Water Balance between Demand and Supply | | |
| 5.1 | Overall Water Balance between Total Water Demand and Water Resources Potential | <ul style="list-style-type: none"> • The total water demand in 2030 is still much less than the total water resources potential. However, because the water demand and water resources are unevenly distributed, the necessity of water resources development should be examined by the water balance between supply and demand at local level. <p><u>HA-1</u> The existing total water demand in HA-1 is estimated at 0.80BCM/year. It is expected to increase to 1.65BCM/year. The water use rate in 2010 is just 2.1%. In 2030, the ratio will become 4.3%, however.</p> <p><u>Ogun-Oshun Basin</u> The existing total water demand in Ogun-Oshun Basin is estimated at 1.11BCM/year. It is expected to increase to 2.59BCM/year for Scenario-A and 3.19BCM/year for Scenario-B, respectively. The water use rate in 2010 is 8.5%. In 2030, the ratio will become 20.0% for Scenario-A and 24.6% for Scenario-B, respectively.</p> |
| 5.2 | Procedure of Water Balance Study | <p>The water usage can be categorized into two types; groundwater and surface water uses. The water resources development plan should consider the water balance for both usages so as to secure sustainable use of water resources. Procedure for analysis of water balance was explained.</p> |
| 5.3 | Balance between Demand and Supply Capacity for Groundwater Source | <ul style="list-style-type: none"> • Existing Groundwater Supply Facilities <p><u>HA-1</u> The total number of boreholes (motorized pumps and hand pumps) is 7,766. Amount of groundwater extraction is estimated about 440 thousand m³/day.</p> <p><u>Ogun-Oshun Basin</u> The total number of boreholes (motorized pumps and hand pumps) is 5,741. Amount of groundwater extraction is estimated about 190 thousand m³/day.</p> <ul style="list-style-type: none"> • Balance of Demand and Supply of Groundwater <p><u>HA-1</u> Balance between groundwater recharge and demand are shown in Table 6-2 and Figure 6-2. Ratio of groundwater demand/recharge is 20% on average of HA-1. However it is 11-47% on a state by state basis. In case of Climate Change, ratio of groundwater demand/recharge is 34% on an average of HA-1. This is small increase from 20% in the case without Climate Change. However it is 19 to 94% on a state by state basis, making the difference among states larger.</p> <p><u>Ogun-Oshun Basin</u> Ratio of groundwater demand/recharge is 29% on average of Ogun-Oshun Basin. However it is 19-60% on a state by state basis, showing large difference among the states. In case of Climate Change, ratio of groundwater demand/recharge is 40% on an average of Ogun-Oshun Basin. However it is 19 to 85% on a state by state basis, showing larger difference among states.</p> |

| | | |
|---|---|--|
| | | <ul style="list-style-type: none"> • Analysis of Groundwater Balance by Groundwater Simulation <u>HA-1</u> According to the simulation result, maximum draw-down is less than 20m. <u>Ogun-Oshun Basin</u> Maximum draw-down is less than and 15m. Consequently, proposed groundwater development can be available in both areas by adjusting borehole depth to meet future draw-down of groundwater level. |
| | Balance between Demand and Supply Capacity for Surface Water Source | <ul style="list-style-type: none"> • <u>HA-1</u> • Water Source for Municipal Water Supply As the results of the water balance study for the relatively large scale water purification plants, it is evaluated that some water sources could experience the deficit for supplying necessary water volume with 90% yearly dependability. • Water Source for Irrigation Water Supply As the results of the water balance study for the existing large irrigation schemes whose planned area is more than 500ha, it is evaluated that the irrigable area in terms of stable water supply with 80% yearly dependability is less than the planned area in some schemes. • Excess Storage Volume in Significant Dams It is clarified that there could be excess storage volume in some significant dams, even if the demand for irrigation and municipal water supply in 2030 is considered. The excess storage volume can be utilized for several different purposes such as irrigation, municipal water supply, enhancement of firm energy of hydropower generation, reduction of peak flood discharge and enhancement of river environment. <u>Ogun-Oshun Basin (Scenario-A)</u> • Water Source for Municipal Water Supply As the results of the water balance study for the relatively large scale water purification plants, it is evaluated that some water sources could experience the deficit for supplying necessary water volume with 90% yearly dependability. • Water Source for Irrigation Water Supply As the results of the water balance study for the existing large irrigation schemes whose planned area is more than 500ha, it is evaluated that the irrigable area in terms of stable water supply with 80% yearly dependability is less than the planned area in some schemes. • Excess Storage Volume in Significant Dams It is clarified that there could be excess storage volume in some significant dams, even if the demand for irrigation and municipal water supply in 2030 is considered. The excess storage volume can be utilized for several different purposes such as irrigation, municipal water supply, enhancement of firm energy of hydropower generation, reduction of peak flood discharge and enhancement of river environment. <u>Ogun-Oshun Basin (Additional Water Source for Scenario-B)</u> • One can see that the Scenario-B needs additional 910MCM/year for the entire Lagos State compared to Scenario-A. The required main surface water sources are 11MCM/year at Akute in Ogun River, 142MCM/year at Odomola in Oshun River and 676MCM/year at unspecified locations. Items blow were proposed: a) Options for Additional Water Source, b) Potential Dam Sites shown in master plan for Ogun-Oshun Basin in 1982, c) Water Balance Study, c) Tentatively Recommended Plan. |
| Chapter 6 Water Sources Development Plan | | |
| 6.1 | Groundwater Development Plan | <ul style="list-style-type: none"> • Optimum Groundwater development Groundwater development potential was analyzed by aquifer for HA-1 and Ogun-Oshun basin based on groundwater recharge and borehole field theory. Parameters on hydrogeology were set referring to hydrogeological characteristics. Available yield of borehole was estimated using formula of function of groundwater recharge, number of boreholes and distance between boreholes. • Groundwater Development Plan by Aquifer Amount of Groundwater to be developed by newly drilled borehole was estimated considering amount of boreholes to be rehabilitated) <p><u>HA-1</u> Number of newly drilled boreholes for motorized pump is 3,025 for water supply of urban/small urban/small town, 1,191 for rural water supply. On the other hand, number of hand pumps is 10,633 for rural water supply.</p> <p><u>Ogun-Oshun Basin</u> Number of newly drilled boreholes for motorized pump is 657 for water supply of urban/small urban/small town, 5,797 for rural water supply respectively. On the other hand, number of hand pumps is 1,228 for rural water supply.</p> |
| 6.2 | Surface Water Development Plan | <ul style="list-style-type: none"> • Strategy and Proposed Projects on Surface Water Development in the M/P2013 - Effective Utilization of Existing Dams - Preparation of Sufficient Surface Water Source to Address Increasing |

| | | |
|--|--|---|
| | | <ul style="list-style-type: none"> - Water Demand in Consideration of Unevenly Distributed Water Resources in the Country • Effective Utilization of Existing Dams <ul style="list-style-type: none"> - Capacity Development of Dam Management - Rehabilitation of Equipment for Proper Operation of Major Dams - Rehabilitation of Deteriorated Dams <p><u>HA-1</u> Importance of effective utilization of existing dams is discussed in detail.</p> <p><u>Ogun-Oshun Basin</u> Further increase in water demand and water resources development is expected. Coordinated operation of water resources facilities should be promoted under the condition which the owner of each facility is different among upstream and downstream area.</p> <ul style="list-style-type: none"> • Preparation of Sufficient Surface Water Source to Address Increasing Water Demand in Consideration of Unevenly Distributed Water Resources <p><u>HA-1</u></p> <ul style="list-style-type: none"> - Surface Water Development for Municipal Water Supply: akin Noma/Gusau Dam Project - Surface water development project for Irrigation:Kasanu Dam project <p><u>Ogun-Oshun Basin</u></p> <ul style="list-style-type: none"> - Surface Water Development for Municipal Water Supply (Scenario-A) Ibu dam project, Ota dam project, Araromi Ake/ Ijebu-Ode-Yemoji dam project, Odedele dam project - Surface Water Development for Municipal Water Supply (Scenario-B) Ibu dam project, Ota dam project, Araromi Ake/ Ijebu-Ode- Yemoji dam project, Odedele dam project, Aiyete dama project, Oba dam project |
| 6.3 | Water Resources Conservation Plan | <ul style="list-style-type: none"> • Groundwater Conservation <ul style="list-style-type: none"> - Purpose and Importance of Groundwater Conservation - Method of Groundwater Management for Conservation - Method of Groundwater Management for Conservation - Institutional Issue on Groundwater Management • Surface water conservation <p><u>HA-1</u></p> <ul style="list-style-type: none"> - Water quality of rivers tends to be diminished in the dry season - Sedimentation and nuisance growth of algae and aquatic vegetation in reservoirs. - Residual agricultural chemical along Sokoto River - Turbidity of Sokoto River is very high in both wet and dry seasons a - Sift of the main course of Sokoto River <p><u>Ogun-Oshun Basin</u></p> <ul style="list-style-type: none"> - The reduction of domestic pollution load. - It is recommended to implement a comprehensive research of the water quality and quantity of the lagoon - Presence of heavy metals had been detected in some rivers - There are problem of sedimentation and nuisance growth of algae and aquatic vegetation in reservoirs. |
| Chapter 7 Water Resources Sub-Sector Development Plan | | |
| 7.1 | Water Supply and Sanitation Development Plan | <ul style="list-style-type: none"> • Current situation of water supply scheme Operation rate of facilities for surface water sources (HA-1: 48.4%, Ogun-Oshun Basin: 40.3%) • Basic planning condition water supply and sanitation (per capita consumption, Designed capacity and yield of water sources, Rehabilitation scheme of existing facilities, Newly construction scheme of facilities, Composition of water supply facilities in development plan, sanitation standard by categorization of settlement, menu of sanitation development) • Water supply and sanitation development plan <p><u>HA-1 / main 4 states</u> Water supply: Amount of water to be developed is 1,139MDL in water balance, 1,321m3/day for facility planning including both rehabilitation scheme and new development scheme. Sanitation: Public toilet, final septage disposal facility/site, Sewerage system was proposed, which should be completed between 2015 and 2030. The number of domestic sanitation facilities (domestic toilet) should be 2.80 million.</p> <p><u>Ogun-Oshun Basin / main 4 states</u> Water supply: Water supply development by both rehabilitation and new construction projects proposed in the CMP is; 2,636 million liter per day (MLD) in hydrological balance and 3,167 MLD in facility planning under Scenario-A, and 5,000 MLD in hydrological balance and 6,122 MLD in facility planning under Scenario-B.</p> |

| | | |
|--|--|---|
| | | <p>Sanitation: Public toilet, Final septage disposal facility/site, Sewerage system were proposed which should be completed between 2015 and 2030. The number of domestic sanitation facilities (domestic toilet) should be 8.0 million in Scenario-A and 12.9 million in Scenario-B.</p> |
| 7.2 | Irrigation and Drainage Development Plan | <p>Public Irrigation Scheme was classified below:</p> <ul style="list-style-type: none"> • Existing Irrigation Scheme: Completion with No Extension Scheme, Ongoing Scheme, Extension Scheme • New Irrigation Scheme: Supplementary Irrigation Scheme, Dam Irrigation Scheme, Integration Scheme <p><u>HA-1</u> Completion with No Extension Scheme: System developed area of 24,941ha developed so far by FMWR is evaluated at 24,441ha due to lack of water potential against water demand for irrigation. Ongoing Scheme: According to evaluation based on surface water potential, number of irrigation scheme become 3 sites of which future irrigation area evaluated fall below planned irrigation area. Extension Scheme: It is possible to expand the system development area up to the planned irrigation areas. Dam Irrigation Scheme: The sites of new proposed irrigation schemes owing to dam are 1 site, Kasanu dam. <u>Ogun-Oshun Basin</u> Completion with No Extension Scheme: System developed area of 1,154ha developed so far by FMWR is evaluated at 474ha due to lack of water potential against water demand for irrigation. Ongoing Scheme: There are 4 sites of on-going irrigation scheme implemented by FMWR in the country, and those schemes should be completed early. Extension Scheme: The scheme for rehabilitation only have plenty amount of water, and then it is possible to expand the system development area up to the planned irrigation areas.</p> |
| 7.3 | Development Plan of Other Sub-Sectors | <p>Flood and Erosion Control and Inland Waterway Transportation <u>HA-1</u></p> <ul style="list-style-type: none"> - In the Rima and Sokoto rivers, to manage the release from dams in upstream reaches and manage the floodplain downstream - To study the causes of high turbidity of river water due to soil erosion and implement the mitigation measures by RBDA and State Government, and - To stabilize the channel around intakes in the Rima River and enhance the usage of river channels as fish pond in dry season, and enhance the usage of inland waterway transportation for local people. - Necessary Strategies: Management of Floodplain/Management of Floodplain/Improvement of River Water Intake in Rima River <p><u>Ogun-Oshun Basin</u></p> <ul style="list-style-type: none"> - Flood plain Management of Ogun River/Ibadan Urban Drainage Countermeasures/Continuous implementation of Urban Drainage Improvement in Lagos/Erosion Control in Urban Area/Study on Inland Waterway Transportation in Ogun River and Others - As necessary strategies, State Government and RBDA shall conduct topographical survey of the Ogun river floodplain and confirm the channel capacity (relation between water level and discharge) in order to study the flood hazard extent for assumed discharge. Moreover, RBDA which is in charge of upstream dam operation shall establish a framework to inform the dam release information to States (SEMA), LGA and relevant disaster prevention organizations located in downstream. <ul style="list-style-type: none"> • Inland fishery Inland fishery basically competes with irrigation sector in terms of water use. However, it is recommendable to apply fish farming in the field of irrigation in such ways as fish farming in dams and reservoirs for agricultural purpose. Development frame of fisheries sub-sector and that of irrigation, agriculture and livestock sub-sectors are closely related each other, and it is advisable to closely hold consultation among these sub-sectors for developing their activities by effectively utilizing water resources. • Livestock Animal water at lakes, ponds, rivers, reservoirs, canals etc is indispensable for livestock. Livestock and irrigation sectors should closely be related mutually, it is necessary to produce efficient use of water resources through communication, coordination and collaboration between them. |
| Chapter 8 Water Resources Management Plan | | |

| | | |
|-----|---|--|
| 8.1 | General | <p>Water Resources Management is implemented based on the following Strategies:</p> <ul style="list-style-type: none"> • Operation & Maintenance for Provision of Water Resources Quantity and Quality • Regulation & Conservation of Water Resources Quantity and Quality • Coordination & Mediation among Organizations and Users • Facilitation & Improvement of Water Resources Development and Management |
| 8.2 | Institutional Framework of Water Resources Management | <p>It is important to focus on the Participatory Approach of Management in the basin. It implies that of particular importance is to create a basin-wide comprehensive institutional arrangement involving all stakeholders in the basin for implementation of adequate catchment management plan. It will be composed of CMCC, CMCC, and State IWRM Committee. Based on above strategies, items below were proposed,</p> <ul style="list-style-type: none"> • Summary of Proposals by Issue • Basic Approach for Strengthening of Institutional Framework • Proposals for Institutional Framework in Water Resources Management • Plan for Future Stakeholder Meetings |
| 8.3 | Operation and Management of Water Resources Development Facilities | <ul style="list-style-type: none"> • Operation and management of facilities <p>Target of the management is as below:</p> <ul style="list-style-type: none"> - The management of the facility of the dam body - Management of dam reservoir - Controlling and operation of the dam reservoir <p><u>HA-1</u> Bakorori, Goronyo, Zobe, Jibiya dam in Sokoto-Rima river, and Gusau dam.</p> <p><u>Ogun-Oshun Basin</u> New dam construction is planned in Ogun and Oshun rivers, so that it is important for development of limited water resources to operate those dam groups efficiently. Items below was proposed for operation and maintenance of surface water facilities:</p> <ul style="list-style-type: none"> - Issue to realize high level dam management - Expected integrated management of dam - Arrangement for integrated water resources management (soft and hard) <ul style="list-style-type: none"> • Operation and maintenance of facilities for groundwater use <p>Twelve (12) items below were mentioned on current situation, issues and strategies for improvement, on operation and maintenance of facilities for groundwater use:</p> <p>Operation and management of aquifer/ Operation and management of borehole facilities/ Capacity of borehole/ Borehole construction/ system/ Lowering of groundwater level by over-pumping/ Groundwater contamination/ Groundwater contamination by mining activities (only inn HA-1)/ improvement of successful rate borehole drilling/ Promotion of groundwater recharge (only HA-1)/ Monitoring of groundwater level and measures against drought/ Sea-water intrusion (Ogun-Oshun basin)/ Land subsidence (Ogun-Oshun basin)</p> |
| 8.4 | Hydrological Monitoring | <ul style="list-style-type: none"> • Hydrological Monitoring for Surface Water <p>Improvement of Surface Water Monitoring Network and recommendation on surface water monitoring by RBDA and State Government</p> <ul style="list-style-type: none"> • Groundwater monitoring <ul style="list-style-type: none"> - Current groundwater monitoring - Direction of groundwater monitoring system expected for the future - Clarification of Purpose and method of monitoring - Groundwater environmental problem in urban area - Assessment for groundwater development Potential - Evaluation of Water quality |
| 8.5 | Data and Information Management | <ul style="list-style-type: none"> • Objective and strategies (information sharing, operation and maintenance of data-base with RBDA and NIHSA) • Vision of Data and Information Management • Scope of Data • Policy for Data Acquisition • Management on Data Acquisition and Archiving |
| 8.6 | Consideration of Risk Associated with Climate Change and Trans-boundary Water | <ul style="list-style-type: none"> • Identification of Risk on Water Resources associated with Climate Change <p><u>HA-1</u> Kandaji dam which is planned in upstream of Niger river, transboundary groundwater.</p> <p><u>Ogun-Oshun Basin</u> Tranboundary groundwater</p> <ul style="list-style-type: none"> • Coping Strategy <ul style="list-style-type: none"> - Refinement of identification of the risk by enhancement of water-related data/information - Promotion of adaptive management - Enhancement of emergency management against flood and drought - Promotion of Water Demand Management |
| 8.7 | Water Environment Management | <p>Two Sectors namely Water Environment Conservation and Water Quality Management are considered as fundamental for proper Water Environment</p> |

| | | |
|---|---|---|
| | | <p>Management. As for Water Environment Conservation, the well management of forest plays an important role to protect the water resources of a basin. As for Water Quality Management, the control of pollution of sources and the monitoring of water quality are subcomponents on which relies the water quality of the water sources. Important problems/issues are listed below:</p> <ul style="list-style-type: none"> - Drinking Water Quality Monitoring - Water Pollution Control - Water Environment Conservation |
| 8.8 | Water Allocation and Regulation | <ul style="list-style-type: none"> • Proposed Framework on Water Allocation and Regulation in the M/P2013 The Catchment Management Office (CMO), which is local office of NIWRMC for each hydrological area, acts major role on water resources management in hydrological area. The headquarters of NIWRMC in Abuja oversees the activities of CMO. FMWR further oversees all activities by NIWRMC. Their activities are classified I to two categories below: <ul style="list-style-type: none"> - Coordination of stakeholders for macro management as macro management - Daily work as regulator of water use for micro management as micro management. • Promotion of the Framework on Water Allocation and Regulation Formulation of the CMP is a first step for improving the water allocation and regulation. Stakeholder forum should be established based on the stakeholder meetings hold on the process of formulating the draft CMP. The stakeholder forum should be the basis for CMCC. In future, CMCC should be officially established. • Allocation and Regulation of Groundwater <ul style="list-style-type: none"> - Current condition of groundwater development and usage - Groundwater development and use out of order - Control of groundwater development and use - Priority of groundwater usage - Groundwater management organization - Control method of groundwater use |
| 8.9 | Communication Strategies for Water Resources Management | <p>Communication in water sector is undertaken mainly by the Press and Public Relations Unit of FMWR (PR Unit). In line with the above action plans, we suggest the proposals for improving the communication in terms of catchment management of water resource as follows.</p> <ul style="list-style-type: none"> - Strengthen PR, through updating FMWR's quarterly magazine (WATER) - Strengthening of Web site of FMWR - Strengthen and diversify the tools of PR - Strict and efficient management of document files within FMWR - Participatory process |
| 8.10 | Public-Private Partnership | <p>It is recommendable to apply the same action plans which were suggested in the M/P 2013.</p> <ul style="list-style-type: none"> - Strengthening of the PPP Unit of FMWR - Capacity building for PPP projects preparation and implementation - Budget allocation for PPP projects preparation - Establishment of Projects Delivery Teams and Steering Committee - Regular Partners/Stakeholders Consultation on the PPP process - Regular updating of policies and strategies to promote private sector participation |
| 8.11 | Manpower Development and Institutional Capacity Development | <p>In view of the basic policies for Human Resources Development (HRD) in the M/P 2013, we believe that it is extremely significant to emphasize the needs for HRD focusing on IWRM at basin and catchment status.</p> |
| 8.12 | Monitoring and Evaluation | <p>In order to implement steadily planned projects, a development of M&E system particularly for the preparatory stage of project is strongly recommended.</p> <ul style="list-style-type: none"> - To prepare Project Proposal - To carry out the F/S - To prepare the Project Explanatory Note |
| Chapter 9 Implementation Program | | |
| 9.1 | Implementation Schedule | <p>Proposed project was categorized as below:</p> <ul style="list-style-type: none"> • Water Source Development : 1) surface water, 2) groundwater • Sub-sector Development : 1) water supply and sanitation, 2) irrigation and drainage • Water Resources Management : 1) hydrological monitoring, 2) Water Allocation and Regulation, 3) Water Environment Management <p>Implementation schedule was divided into three (3) stages, 1st to 3rd stages. Project implementation schedule was proposed based on development strategies of each sector (water sources development, water supply and sanitation, irrigation and drainage, water resources management).</p> |
| 9.2 | Cost Estimate | <p><u>HA-1</u> Total amount of the Project cost is 8.7 billion Naira for surface water development, 15.2 billion Naira for groundwater development, and 23.8 billion Naira in total. On the other hand, it is 256.3 billion Naira for water supply and sanitation, and 51.6 billion Naira for irrigation and drainage. Also it is 3.5 billion Naira for water resources management.</p> |

| | | |
|---|--|---|
| | | <p><u>Ogun-Oshun (Scenario-A)</u> Total amount of the Project cost is 24.6 billion Naira for surface water development, 5.3 billion Naira for groundwater development, and 29.9 billion Naira in total. On the other hand, it is 1,299.5 billion Naira for water supply and sanitation and 106.9 billion Naira for irrigation and drainage. Also it is 3.2 billion Naira for water resources management.</p> <p><u>Ogun-Osun (Scenario-B)</u> Total amount of the Project cost is 67.9 billion Naira for surface water development, 5 billion Naira for groundwater development with 72.9 billion Naira in total. On the other hand, it is 2,669.3 billion Naira for water supply and sanitation and 106.9 billion Naira for irrigation and drainage. Also it is 3.2 billion Naira for water resources management.</p> |
| 9.3 | Financial Program for Project Implementation | <p><u>HA-1</u> In water sources development sector (surface water and groundwater), investment for the 2nd Stage is the largest of all the stage. In water supply and sanitation sector, investment for the 1st Stage is the largest of all the stage. Then investment will gradually reduce afterward. In irrigation and drainage sector, investment for the 1st Stage is the largest of all the stage.</p> <p><u>Ogun-Oshun (Scenario-A)</u> In water sources development sector (surface water and groundwater), investment for the 2nd Stage is the largest of all the stage. In water supply and sanitation sector, investment for the 1st Stage is the largest of all the stage. Then investment will gradually reduce afterward. In irrigation and drainage sector, investment for the 1st Stage is the largest of all the stage.</p> <p><u>Ogun-Oshun (Scenario-B)</u> In water sources development sector (surface water and groundwater), investment for the 2nd Stage is the largest of all the stage. In water supply and sanitation sector, investment for the 2nd Stage is the largest of all the stages, and then it will reduce afterward. In irrigation and drainage sector, investment for the 3rd Stage is the largest of all the stages.</p> |
| Chapter 10 Evaluation of Catchment Management Plan | | |
| 10.1 | Evaluation from Economic and Financial Aspects | <p><u>HA-1</u> - In rehabilitation schemes, the EIRR of urban and semi-urban water supply as a whole shows quite high rate of 41%. The EIRR of rural water supply as a whole shows also quite high; 24%. - In New Development Schemes, the EIRR of urban and semi-urban presents 8%, below 10% of OCC. The EIRR of rural water supply as a whole presents 9.2%, slightly below 10% of OCC. However, it could be judged rather economically feasible if taking into account the low level of ability-to pay of rural areas. - In Rehabilitation Schemes, the EIRR presents quite high rate of 30.5%. In Irrigation Extension Projects of ongoing Scheme, the EIRR is 9.7%. In Irrigation Extension Projects of coming Scheme, and Dam Irrigation Schemes, both schemes present the EIRRs lower than 10% of OCC.</p> <p><u>Ogun-Oshun Basin</u> - In rehabilitation schemes, the EIRR of both Scenario A and Scenario B of urban and semi-urban water supply shows quite high rate of EIRR. The EIRR shows also quite high; 37% of rural water supply - In New Development Schemes, the EIRR of urban and semi-urban water supply of both Scenario A and Scenario B exceed 10% of OCC. The EIRR of rural water supply presents 13.9% that exceeds 10% of OCC. - In rehabilitation schemes, the EIRR presents quite high rate of 45.5%. In irrigation extension projects of ongoing scheme, the EIRR of both scenario A and scenario B shows exceed 10% of OCC. In irrigation extension projects of coming scheme, and dam irrigation schemes, the EIRR of the irrigation extension projects presents economically feasible, 14.3%. On the other hand, the EIRR of the dam irrigation schemes shows lower than 10% of OCC.</p> |
| 10.2 | Evaluation from Social and Environmental Aspects | Implementation of the proposed projects for HA-1 and Ogun-Oshun Basin will give considerable benefits to three sectors, namely i) urban and rural water supply, ii) irrigation and drainage and iii) sanitation. There will be some negative impacts in social and environmental aspects by implementation of the proposed projects. However, the impact will be reduced by implementation of mitigation measures proposed in the CMP. |
| Chapter 11 Recommendation | | |
| | | <ul style="list-style-type: none"> • Development of Catchment Management System and Establishment of CMP <ul style="list-style-type: none"> - Development of Catchment Management System - Establishment of the CMP • Practical Use and Periodic Review of CMP <ul style="list-style-type: none"> - Practical Use of CMP - Periodic Review of CMP |

| | | |
|--|--|---|
| | | <ul style="list-style-type: none">• Implementation of Water Resources Development<ul style="list-style-type: none">- Water Supply Development Plan- Irrigation and Drainage Development Plan- Involvement in Other Sub-sectors• Implementation of Water Resource Management• Steady and Sound Investment<ul style="list-style-type: none">- Direct Capital Investment of Federal Government of Nigeria (FGN)- Other Sources of Financing |
|--|--|---|

Source: JICA Project Team

ANNEX


- **Record of Main Meetings 1 - 6**
- **Discussion Report of Stakeholder Meeting of HA-1 and Ogun-Oshun Basin for Catchment Management Plan**
- **Attendant List of Stakeholder Meeting of HA-1 and Ogun-Oshun Basin for Catchment Management Plan**

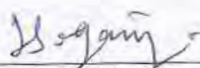
ANNEX-1: Minute of Meeting of Inception Report

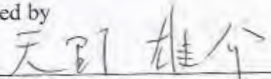
Minutes of Meetings
on
The Inception Report
for
the Project for Review and Update of
Nigeria National Water Resources Master Plan

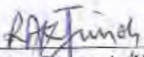
Agreed on between
The Federal Ministry of Water Resources
and
The Japan International Cooperation Agency


Abuja, August 12th, 2011


Mr. Masatomo Watanabe
Team Leader
Japan International Cooperation Agency
(JICA), Japan


Mrs. L.D. Bagaiya
Project Director
Director
Department of Planning, Research and Statistics
Federal Ministry of Water Resources,
Federal Republic of Nigeria

Witnessed by

Mr. Yusuke Amano
Senior Advisor to the Director General
Water Resources and Disaster Management
Group, Global Environment Department
Japan International Cooperation Agency
(JICA), Japan


Engr. Razaq A. K. Jimoh
Project Manager
Coordinating Director
Nigeria Integrated Water Resource Management
Commission (NIWRMC)
Federal Ministry of Water Resources,
Federal Republic of Nigeria

Witnessed by

Mr. B. O. Akpanyung
Director
Department of International Cooperation
National Planning Commission
Federal Republic of Nigeria

In accordance with Scope of the Work for the Project for Review and Update of Nigeria National Water Resources Master Plan (hereinafter referred to as "the Project"), the Japan International Cooperation Agency (hereinafter referred to as "JICA") sent to the Federal Republic of Nigeria (hereinafter referred to as "Nigeria") the Team for the Project (hereinafter referred to the Project Team), from August 8th, 2011.

The Project Team held a series of meetings with the Federal Ministry of Water Resources (herein after referred to as "FMWR") after submission of 20 hard copies with one soft copy in CD-rom of the Inception Report (IC/R) to FMWR in accordance with the Scope of Work agreed on March 8th, 2011. The Steering Committee Meeting was held on August 9th, 2011. List of those who attended the meetings is shown in the Attachment-1.

The Project Team explained the content of IC/R including implementation policy, methodology, time schedule and so on. As a result of discussion on IC/R, FMWR accepted and agreed upon IC/R. Finally FMWR and the Project Team confirmed the matters below.

- 1) Nigerian side and the Project Team agreed that Draft Catchment Management Plan will be formulated in Niger North and Ogun-Osun River Basin area of West Littoral Catchment areas. Nigerian side assured that Catchment Management Office for the latter catchment will be established by the end of Phase-1 of the Project.
- 2) FMWR submitted the list of Steering Committee members as attached to Attachment-2, and the tentative list of Counterpart Team members for the Project as attached to Attachment-3. Full time Deputy Project Manager was newly assigned.
- 3) Nigerian side proposed an office for the Project Team in the Headquarters of FMWR.
- 4) In accordance with the Article "15. Provision of Necessary Information" of the Minute of Meeting agreed on March 8th, 2011, both side re-confirmed that the Nigerian side shall provide the Project Team with the necessary and available information for the Project free of charge or at its own expense.
- 5) Nigerian side requested that Master Plan will be formulated in consistence with the policy of Vision 20:2020 and Water Sector Road Map, considering the latest institutional change in water resources sector.

In the course of discussion, Nigerian side highlighted the water issues related to Water Resources Management and Development as described in the Attachment-4.

(end)

The image shows four handwritten signatures in black ink. From left to right: a large, stylized signature; a signature that appears to be 'A'; a signature that appears to be 'RPR'; and a signature that appears to be 'EAO'.

Attachment-1

List of Attendant

**MEETING OF THE STEERING COMMITTEE ON THE PROJECT FOR THE REVIEW
AND UPDATE OF NATIONAL WATER RESOURCES MASTER PLAN**

ATTENDANCE LIST

9TH AUGUST, 2011

| S/N | NAME | DESIGNATION | DEPT/ORGANISATION | E-MAIL ADDRESS | PHONE NO. | SIGN |
|-----|-----------------------------|--------------------------------|-----------------------|---------------------------|--------------|------|
| 1 | Amb. (Dr.) Gonkwon Igali | Permanent Secretary | FMWR | | | |
| 2 | Mrs. LD. Bagayya | Director | PRS | lthbagayya@yahoo.com | 08014507930 | |
| 3 | Olufemi Oluatosin | Director | Office of Dam Con. | olufeminduroso@yahoo.com | 08011243845 | |
| 4 | Engr. E.A.K. Jimoh | Coordinating Director | NIWBM | javajjim@yahoo.com | 08033212548 | |
| 5 | S.O. Omo | Director | DRD | lansp4006@yahoo.com | 08065292254 | |
| 6 | P.A. Niekwa | Director | NHSA | patnikwa@yahoo.com | 08016915786 | |
| 7 | Dr. Martins Edinwe | Coordinator, RWSSC | NWRP | martinedinwe@yahoo.com | 08016400061 | |
| 8 | Engr. R.A. Oyewole | Rep. Dir (RW) | FMWR (RD) | oyewole@yahoo.com | 08013208450 | |
| 9 | R.O. Ikeawun | Representing Director (DRD) | FMWR | Regyike2003@yahoo.com | 08011138557 | |
| 10 | Engr. W.K. Datta | Ag.D (WS) | NIWBM | wdatta@yahoo.com | 08065394058 | |
| 11 | Engr. I.C. Oye- Ansil | DD(RW) R/P, DWS | WS(FMWR) | rufusonoyeansil@yahoo.com | 08074155927 | |
| 12 | Anthony A. Ekpa (RD) | DD(M&E) | FMWR | antthoaaekpa@gmail | 08054583477 | |
| 13 | Adrota C. Bawa | DD PRS | FMWR | antolajee@yahoo.co.uk | 08013127787 | |
| 14 | I.L. Odudu | AD (P) | FMWR | ilalufuture@yahoo.com | 08065400333 | |
| 15 | Faizul B.H. | AD (POLICY) | FMWR | fhfadim@yahoo.com | 08062728047 | |
| 16 | Shettina Abba (RD) | AD (Research) | PRS/FMWR | shettinettina@yahoo.com | 0803140831 | |
| 17 | Shetima M.C. | AD(M&E) | FMWR | firstshetima@yahoo.com | 08065599043 | |
| 18 | Pam Odama Dawoh | AD(R&S) | FMWR | | 08036114018 | |
| 19 | Adetomi Adewun | AD(WS) | FMWR | antunijetawun@yahoo.com | | |
| 20 | Dr. Akpanife A. Wahed | Head of Land/Water | NWRP | wahedakpanife@unfccc.com | | |
| 21 | Balarinde S.M. | Head, Climate Change Unit | FMWR | balarindesm@yahoo.com | | |
| 22 | Elizabeth Ugeh | CSO | DWQ&S | ugehe@yahoo.com | 08059692643 | |
| 23 | Basssey E.A. | (C/P) | FMWR | efybassey@yahoo.com | 08036145478 | |
| 24 | Engr. N.O. Madu | ECF | FMWR | madueng@yahoo.co.uk | 08044065991 | |
| 25 | James Innomofun | ETSS | GWMA | timiyasun@james@yahoo.com | 08068924557 | |
| 26 | Dgundoro M.I. | ECF | FMWR | themig48@yahoo.com | | |
| 27 | Amata A.Y. | ACTO | NIWBM | amataalata@yahoo.com | 08035066562 | |
| 28 | M.B.A Adekola | ACTO | RDCI | mwaadekola@yahoo.com | 08039174961 | |
| 29 | Stephen Juffe | ACTO | FMWR | Stephenjuffe68@yahoo.com | 070312133731 | |
| 30 | Musat B. Tafida | FAO (Res) | FMWR | musatafida@yahoo.com | 08017861390 | |
| 31 | Illiamz Anthony | SD(PRS) | FMWR | anthonywilliams@yahoo.com | 08036011669 | |

Eko

[Handwritten signature]

[Handwritten signature]
(2)

| | | | | | | |
|-------------------------------------|----------------------|--------------------|-----------------------------|--|-------------|--|
| 32 | Akor Onoja Victor | STAT L | FMWR | oojoakor@yahoo.com | 08062091039 | |
| 33 | Agwuma, E.A | SSCI | FMWR | agwuma@yahoo.com | 08059692451 | |
| | Nwata Lynda Ndidi | | Press | | | |
| NATIONAL PLANNING COMMISSION | | | | | | |
| 34 | Faminan S.O. | Desk- (Asia) | Officer NPI | depofaminan@yahoo.com | 08034264007 | |
| JICA TEAM | | | | | | |
| 35 | Aniano Yusuke | | JICA HQ | | | |
| 36 | Kiyo Takashima | Deputy Director | JICA HQ | | | |
| 37 | Yoshiro MASUMI | Representative | JICA, Nigeria | www.yoshiro@jica.go.jp | 07059835350 | |
| 38 | Biola Olatunji | Staff | JICA, Nigeria | Olatunjiwoahmed.ngjica.go.jp | 08037871140 | |
| 39 | Masatomo WATANABE | Team Leader | JICA Project Team | | | |
| 40 | Toshinori Kitamura | Groundwater | JICA Project Team Leader | kitamura@viii.co.jp | | |
| 41 | Hiroshi Naka MURA | Ground Water | JICA Study Team | hi-naka@eku.allite.jp | | |

Geo

[Handwritten signature]

[Handwritten signature]

[Handwritten signature]
(3)

Attachment-2

List of Steering Committee Members

1. Chairman: Permanent Secretary – Federal Ministry of Water Resources(FMWR) ✓
2. Director, Planning, Research & Statistics (PRS) ✗
3. Director, Dams and Reservoir Operation ✓
4. Director, Irrigation and Drainage ✓
5. Director, Water Supply ✓
6. Director, Water Quality and Sanitation ✗
7. Ag. Director, River basin Operation and Inspectorate ✓
8. Executive Director, Nigeria Integrated Water Resources Management Commission (NIWRMC) ✗
9. Director – General, Nigeria Hydrological Service Agency ✓
10. Executive Director – National Water Resources Institute ✗
11. Coordinating Director – Guarara Water Management Authority (GWMA)
12. Managing Director, Sokoto Rima River Basin Development Authority ✓
13. Managing Director, Ogun-Oshun River Basin Development Authority ✓
14. National Planning Commission
15. Japan International Cooperation Agency (JICA)

to do

[Handwritten signature]

RAK
(4)

[Handwritten signature]

Attachment-3

Tentative List of Counterpart Team Members

**THE PROJECT FOR THE REVIEW AND UPDATE OF THE NATIONAL WATER
RESOURCES MASTERPLAN**

Tentative List of Counterpart staff from Departments/Agencies

| S/N | NAMES | DEPARTMENT/AGENCY | RANK/ POSITION | AREA OF SPECIALISATION | TELEPHONE No./ e-mail |
|-----|---------------------------|--|---|--|-----------------------------|
| 1. | N. C. NWOSU | River Basin Operation & Inspectorate | GL.16 | | |
| 2 | Rev. M.I Nwabufo | Nig. Hydrological Service Agency (NIHSA) | GL .16 | | |
| 3 | Engr. (Mrs.)G.C NWosah | Gurara Water Management Authority | GL.16 | | |
| 4 | O .A Idowu | Water Supply | GL15 | | |
| 5 | Engr. A.O Mebude | Irrigation & Drainage | GL15 | Irrigation & Drainage | |
| 6 | Engr K. S. Sunmonu | Integrated Water Res Management Commission | Deputy Project Manager GL . 14 | Surface Water Management and Development | |
| 7 | Mr. C. O. Ikediashi | Planning Research & Statistics | CSO(M&E) - GL14 | Socio-economic Analysis | |
| 8 | Engr. M. D. Madu | Dams & Reservoir Operations | GL. 14 | Hydropower Generation | |
| 9 | E. A. Bassey | Planning Research & Statistics | Chief Statistician GL- 14 | Socio-economic Analysis | |
| 10 | Mrs. Elizabeth Ugoh | Water Quality & Sanitation | GL. 14 | Water supply & Sanitation | |
| 11 | Mr. Oton E. O | Integrated Water Res Management Commission | Chief Scientific Officer GL. 14 | Water Environment and Environmental and Social consideration | |
| 12 | Mr. A.A. Olayinka | Planning Research & Statistics | Chief Statistician GL. 14 | Information Management on Water Resources | |
| 13 | Mr. Abdulyekeen S.O. | Integrated Water Res Management Commission | GL.10 | Ground Water Management and Development | |
| 14 | Ihuoma Anthony | Planning Research & Statistics | Senior Statistical Officer GL. 09 | Information Management on Water Resources | |
| 15 | G. A. Agwuma | Planning Research & Statistics | Senior Statistical Officer GL. 09 | Water Environment and Environmental and Social consideration | |

Eno

[Signature]

[Signature]
(5)

[Signature]

Attachment-4

Water Issues Highlighted by Nigerian side

Nigerian side highlighted that the following water issues are to be considered in the course of the Project.

- 1) Concept of Integrated Water Resources Management (IWRM)
IWRM concept is fundamental for the Project, and it should be properly reflected in the Project.
- 2) Climate Change Adaptation
Adaptation strategies against climate change should be integrated in the Master Plan. For example, effective operation and utilization of the existing storage dams should be taken into consideration as one of adaptation measures.
- 3) Stakeholder Involvement
It is crucial to involve stakeholders such as state governments in addition to relevant MDAs (Ministries, Departments and Agencies) at Federal level in the course of the Project.
- 4) Sustainable Monitoring System of Water Resources
Current monitoring system and information for surface and groundwater are not sufficient. Sustainable monitoring system is a key for integrated water resources management (IWRM) in order to assess water resources potential all the time.
- 5) Necessity of Sustainable Agriculture
Agriculture should be sustainable, since it is a main industry of Nigeria. Therefore, efficient and affordable irrigation system should be pursued.

Tejo

[Signature]

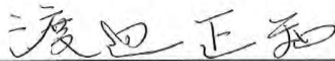
RAK
(6)

[Signature]

ANNEX-2: Minute of Meeting of Progress Report-2

Minutes of Meeting of the Steering Committee
on
Progress Report-2
on
The Project for Review and Update of
Nigeria National Water Resources Master Plan

Agreed between
The Federal Ministry of Water Resources
and
The Japan International Cooperation Agency (JICA)
Project Team
Held in Abuja, on 10th July, 2012

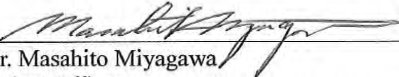


Mr. Masatomo Watanabe
Team Leader,
JICA Project Team

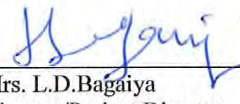


Amb.(Dr) Godknows Boladei Igali, OON
Permanent Secretary/Chairman
Federal Ministry of Water Resources
Federal Republic of Nigeria

Witness:



Mr. Masahito Miyagawa
Project Officer,
Water Resources Management Division 2,
Water Resources and Disaster Management
Group, Global Environment Department
Japan International Cooperation Agency
(JICA), Japan



Mrs. L.D. Bagaiya
Director/Project Director
Department of Planning, Research and
Statistics
Federal Ministry of Water Resources,
Federal Republic of Nigeria



Engr. Razaq A. K. Jimoh
Coordinating Director/Project Manager
Nigeria Integrated Water Resources
Management Commission (NIWRMC)
Federal Ministry of Water Resources,
Federal Republic of Nigeria

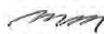
Preamble: The Steering Committee (SC) meeting started with opening remarks by the Permanent Secretary/Chairman, Federal Ministry of Water Resources (FMWR), Amb.(Dr.) GodKnows B. Igali OON. He commended the JICA Project Team for their cooperation and promised the Ministry's continuous support on the project.

In accordance with Scope of work for the Project for Review and Update of Nigeria National Water Resources Master Plan (hereinafter referred to as "the Project"), the JICA Project Team carried out series of data collection and analysis on water resources management and development. As a result of these activities, the JICA Project Team completed Progress Report-2 (P/R(2)) and submitted 20 hard copies with one soft copy in CD of P/R(2) to FMWR. The SC meeting was held for explanation and discussion of P/R(2) on July 10th, 2012. List of those who attended the meeting is shown in the Attachment-1.

As a result of discussions on the P/R(2), SC accepted and agreed upon the P/R(2). The main discussion points between SC and the JICA Project Team were as follows.

- 1) The presented contents of the revised Master Plan were accepted by the SC Members. Further clarifications and opinions if any will be submitted to the JICA Project Team at the end of the 12th July, 2012 Stakeholders meeting/workshop.
- 2) SC suggested that flood and erosion control and environment should be part of water resources development and management issues. The JICA Project Team basically agreed.
- 3) The JICA Project Team explained that the issue of trans-boundary water and climate change will be handled at the formulation stage of the Master Plan (Phase-2).
- 4) SC emphasized the importance of sanitation sub-sector. Both sides agreed that the issue of sanitation sub-sector in the revised Master Plan will be adequately reflected in the course of Phase-2 of the Project.
- 5) SC appreciated the On the Job Training, of counterpart staff and the training of three (3) of them in Japan and requested for capacity development for more counterpart staff and Management staff in Japan. The JICA Project Team noted the request.
- 6) FMWR mentioned effort made on the purchase of necessary data for the Project. The SC members emphasized the importance of adequate and quality data and the need to make adequate budgetary provision for its acquisition.
- 7) SC suggested amendment of some terms used in the document. Both sides agreed to review the important terms which will be used in the revised Master Plan.

(end)



Attachment-1

List of Attendance

| S/N | NAME | POSITION | DEPT/ORGANISATION |
|-----|--------------------------|---|------------------------------|
| 1 | Amb. (Dr) Godknows Igali | Permanent Secretary | FMWR |
| 2 | Mrs. L.D Bagaiya | Director | PRS |
| 3 | Masatomo Watanabe | Project Manager | JICA PROJECT TEAM |
| 4 | Engr R.A.K Jimoh | Coordinating Director | NIWRMC |
| 5 | Engr. Halidu Yusuf | Managing Director | SRRBDA |
| 6 | Engr. B.A Tunau | Director | Water Supply |
| 7 | Engr. Tahir | Director | Water Supply |
| 8 | Dr.E.Adanu | Director | Dams and Reservoir |
| 9 | Dr.A.O.Agada | Director | Water Quality and Sanitation |
| 10 | Godwin O. Usifoh | Director | NIHSA |
| 11 | Prince N.C Nwosu | Director | RBO&I - FMWR |
| 12 | Engr. A.T Aduragba | Managing Director | LNRBDA |
| 13 | Engr k. Sunmonu | Assistant Director | NIWRMC |
| 14 | Engr. Nwosah Gladys | Acting Director | GURARA |
| 15 | Zakari Sabiu | Deputy Director | PRS |
| 16 | R.I Idialu | Assistant Director | PRS |
| 17 | Rev. M.I Nwabufo | Deputy Director | NIHSA |
| 18 | Engr. W. Bukar | Consultant PRS | PRS |
| 19 | Ogbonna Kenneth | Senior Hydrogeologist | WS |
| 20 | Femi Oguntona | Chief planning Officer | PRS/OORBDA |
| 21 | Bintu Ali | Senior Hydrologist | GWMA |
| 22 | S.B .Lawal | Assistant Chief Administration Officer | PRS |
| 23 | Agwuma G.A | Senior Statistical Officer | PRS |
| 24 | Ihuoma Anthony | Principal Statistical Officer | PRS |
| 25 | Engr. N.D Madu | Assistant Director | FMWR |
| 26 | Masahito Miyagawa | Project Officer | JICA |
| 27 | Masato Mikamo | Representative | JICA |
| 28 | Bamidele Olatunji | In House Consultant | JICA |
| 29 | Akinori Miyoshi | JICA Project Member | JICA PROJECT TEAM |
| 30 | Tadanori Kitamura | JICA Project Member | JICA PROJECT TEAM |
| 31 | Noboru Osakabe | JICA Project Member | JICA PROJECT TEAM |
| 32 | Hiroshi Nakamura | JICA Project Member | JICA PROJECT TEAM |
| 33 | Ayibadi Asegbe | Secretary JICA Project Team | JICA PROJECT TEAM |
| 34 | Beatrice Kieriana | Secretary JICA Project Team | JICA PROJECT TEAM |

Jio

JLS

mm

APP Jmichy
(2)

M

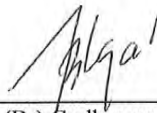
ANNEX-3: Minute of Meeting of Outline of Draft Master Plan

Minutes of Meeting of the Steering Committee
on
Outline of Draft Master Plan
on
The Project for Review and Update of
Nigeria National Water Resources Master Plan

Agreed between
The Federal Ministry of Water Resources
and
The Japan International Cooperation Agency (JICA)
Project Team
Held in Abuja, on 6th March, 2013

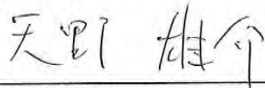


Mr. Masatomo Watanabe
Team Leader,
JICA Project Team

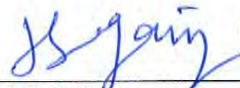


Amb.(Dr) Godknows Boladei Igali, OON
Permanent Secretary/Chairman
Federal Ministry of Water Resources
Federal Republic of Nigeria

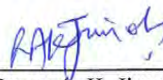
Witnesses:



Mr. Yusuke AMANO
Senior Advisor to the Director General
Global Environment Department
Japan International Cooperation Agency
(JICA), Japan



Mrs. L.D. Bagaiya
Director/Project Director
Department of Planning, Research and
Statistics
Federal Ministry of Water Resources,
Federal Republic of Nigeria



Engr. Razaq A. K. Jimoh
Coordinating Director/Project Manager
Nigeria Integrated Water Resources
Management Commission (NIWRMC)
Federal Ministry of Water Resources,
Federal Republic of Nigeria

Preamble: The Steering Committee meeting started with opening remarks by the Permanent Secretary/Chairman, Federal Ministry of Water Resources (FMWR), Amb.(Dr.) GodKnows B. Igali OON. He commended the JICA Project Team for their cooperation and hard work. He promised the Ministry's continuous support for the Project. Mr. Tetsuo Seki, the Representative of JICA Nigeria Office, in his remarks, appreciated the efforts and the close collaboration between Nigeria and the JICA Project Team. He believed that the outcome of the Project will be of immense benefit to Nigeria. The attendance list is attached.

- (1) Mr. Amano, a senior advisor in JICA headquarter, made a presentation on Integrated Water Resources Management in Japan. The participants at the meeting were inspired by his presentation and showed keen interest on the presentation especially on the administrative structure for water resources management. They also expressed interest for training in Japan in order to learn more from the Japanese experience.
- (2) Mr. Watanabe made a presentation on the outline of the draft master plan and exhaustive discussion was made on the contents. The main points of the discussion were as follows:
 - Clarification on the water resources potential estimated in the Project was requested by the Nigerian side. The JICA Project Team explained the methodology used and its estimation was understood by the Nigerian side.
 - Details on groundwater development methodology especially for rural water supply were explained by the JICA Project Team. The Nigerian side was satisfied with the explanation.
 - Based on the explanation made, both sides were satisfied that drainage component is implied in the proposed irrigation projects.
 - The criteria for selection of the dam sites for irrigation development were explained by the JICA Project Team and were accepted by the Nigerian side. Both sides also agreed that the possibility to include the hydropower component for the proposed dams would be examined.
 - The JICA Project Team explained that the hydropower generation by run-of-river type is under investigation and some recommendations would be included in the draft master plan report.
 - The Nigerian side requested that a recommendation be made on the schedule for completion of the on-going public irrigation schemes in the draft master plan report. The JICA Project Team agreed.
 - Both sides agreed that as part of the planning conditions, optimum use of the water for hydropower generation would be mentioned in the draft master plan report.
 - Both sides noted the importance of the human resources development aspect to implement the master plan. The Nigerian side desired to include the strategy on human resources development in the draft master plan. The JICA Project Team agreed.
- (3) Mrs. Bagaiya explained the methodology of disseminating the new Official National Water Resources Master Plan Document.

(1)







- (4) Draft Catchment Management Plans would be formulated for Niger North (HA-1) and Ogun-Osun River Basin (a part of HA-6) during the phase-3 of the Project. Mrs. Bagaiya explained that due to security reasons, FMWR will invite stakeholders from HA-1 to Abuja at its expense to participate in series of workshops which are necessary for the formulation of the draft Catchment Management Plans. In case the planned stakeholder workshops for HA-1 are not held on time in Abuja, the JICA Project Team would be forced to only conduct water balance study as well as examine alternative options for water resources development and management in this hydrological area without any field survey and any stakeholder consultation.

(end)

Geo

(2)

M

AAK Jwidy

Attachment-1

List of Attendance

| S/N | NAME | POSITION | DEPT/ORGANISATION |
|-----|------------------------------|-------------------------------|------------------------------|
| 1 | Amb. (Dr) Godknows Igali | Permanent Secretary | FMWR |
| 2 | Mrs. L.D Bagaiya | Director | PRS |
| 3 | Masatomo Watanabe | Project Manager | JICA PROJECT TEAM |
| 4 | Engr R.A.K Jimoh | Coordinating Director | NIWRMC (FMWR) |
| 5 | Salisu G. Dandume | Executive Director (ENGR) | SRRBDA |
| 6 | Engr. I.Babbaji | Coordinating Director | GWMA (FMWR) |
| 7 | Engr. J.A. Ezie | Director, Engr. Services | DRO |
| 8 | Dr.E.Adanu | Director | Dams and Reservoir |
| 9 | S.O. Ome | Director | Water Quality and Sanitation |
| 10 | Engr. J.Kwanashie | Director | Irrigation & Drainage |
| 11 | Prince N.C Nwosu | Director | RBO&I - FMWR |
| 12 | Engr. G.O. Osuagwu | Deputy Director | Water Supply (FMWR) |
| 13 | Engr K.S. Sunmonu | Assistant Director / DPM | NIWRMC |
| 14 | Engr. U.B. Magashi | Deputy Director | NIHSA |
| 15 | Zakari Sabiu | Deputy Director (P) | PRS |
| 16 | R.I Idialu | Assistant Director (P) | PRS |
| 17 | E.A. Adeoye | Director | HRD (FMWR) |
| 18 | Engr. W. Bukar | Consultant PRS | PRS |
| 19 | K.M. Ngelale | DR(RBOI) | FMWR |
| 20 | F. Odumosu | DOPS | FMWR |
| 21 | Bintu Ali | Senior Hydrologist | GWMA |
| 22 | Engr (Mrs) E.O. Oluniyi | Assistant Director | I&D(FMWR) |
| 23 | Engr.Osse. F. Obiwu | AD(RBOI) | RBOI(FMWR) |
| 24 | Ihuoma Anthony | Principal Statistical Officer | PRS |
| 25 | Engr. N.D Madu | Assistant Director | FMWR |
| 26 | Engr. C.L. Yerima | Water Engineer | NIWRMC |
| 27 | Bassey Efiang.A. | Assistant Director | FMWR |
| 28 | Engr.R.A. Iyiola | Deputy Director | OORBDA |
| 29 | Engr. (Mrs) Anthea Ochedikwu | ACTO | I&D (FMWR) |
| 30 | Agwuma G.A | SSO | PRS |
| 31 | Ihuoma Anthony | PSO | PRS |
| 32 | Ike Joshua Chuka | Research Analyst | EOJ |
| 33 | Tetsuo Seki | Chief representative | JICA |
| 34 | Chie Shimodaira | Representative | JICA |
| 35 | Yusuke Amano | Senior Adviser | JICA |
| 36 | Masahito Miyagawa | Project Officer | JICA |
| 37 | Bamidele Olatunji | In House Consultant | JICA |
| 38 | Tadanori Kitamura | JICA Project Member | JICA PROJECT TEAM |
| 39 | Hiroshi Nakamura | JICA Project Member | JICA PROJECT TEAM |
| 40 | Kazunori Inoue | JICA Project Member | JICA PROJECT TEAM |
| 41 | Sebastian G. Jara | JICA Project Member | JICA PROJECT TEAM |

Ezo

(R)

[Handwritten signature]

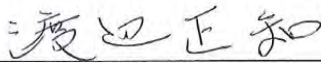
[Handwritten signature]

ANNEX-4: Minute of Meeting of Interim Report

Minutes of Meetings of the Steering Committee Meeting (SCM)
on
Interim Report
on
The Project for Review and Update of
Nigeria National Water Resources Master Plan (Project)

Agreed between
The Federal Ministry of Water Resources (FMWR)
and
The Japan International Cooperation Agency (JICA)
Project Team

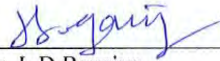
Held in Abuja, on 16th May, 2013



Mr. Masatomo Watanabe
Team Leader
JICA Project Team



Mr. Baba Umar Farouk OON
Chairman of SCM and Permanent Secretary
FMWR
Federal Republic of Nigeria



Mrs. L.D. Bagaiya
Project Director and Director
Department of Planning, Research and
Statistics, FMWR
Federal Republic of Nigeria



Engr. Razaq A. K. Jimoh
Project Manager and Coordinating Director
Nigeria Integrated Water Resources
Management Commission (NIWRMC), FMWR
Federal Republic of Nigeria

Mr. Watanabe, Leader of JICA Project Team, made a presentation on the Interim Report which contains the draft national water master plan (Draft Master Plan). The Interim Report was accepted by the Nigerian side. Both sides agreed that the Draft Master Plan would be further reviewed until the draft final report would be submitted on November, 2013. The main comments on the Interim Report were as follows:

- The Nigerian side understood the necessary investment to achieve the target in the water sector.
- The Nigerian side understood the importance of water-related data and information, and showed an interest in introduction of good examples to manage data and information on water resources.
- Clarification on the recommendation on the flood management of major rivers and flood plain was requested by the Nigerian side. The JICA Project Team explained the recommendation in detail and it was understood by the Nigerian side.
- Clarification on the selection criteria on the hydrological areas for formulation of catchment management plan in the phase-3 of this project was requested by the Nigerian side. The JICA Project Team explained that the selection was made in the scope of work of this project. Furthermore, during phase-1 and 2 of this project, it was clarified that the selected hydrological areas are water-scarce areas.
- Clarification on the high evaluation on rehabilitation projects was requested by the Nigerian side. The JICA Project Team explained why the B/C is high for the rehabilitation project and it was understood by the Nigerian side.
- The Nigerian side emphasized the importance of water quality monitoring for both assessing ecological condition of river systems and securing quality of drinking water.
- The Nigerian side pointed out that the sanitation project is implemented by state government. The federal government would give policy for the implementation.
- The Nigerian side emphasized that importance of not only flood management but also drought management as the risk management against climate change.
- Nigerian side emphasized importance of the demarcation of hand pumps and motorized pumps for boreholes for rural water supply. Moreover, Nigerian side pointed out efficient groundwater development considering efficient drilling method.

(end)

Attachment-1

List of Attendance

| NAME | POSITION | DEPT/ORGANISATION |
|------|---------------------------|---|
| 1 | Mr. Baba Umaru Farouk OON | Chairman of Steering Committee, Permanent Secretary |
| 2 | Mrs. L.D. Bagaiya | Project Director, Director, Planning, Research & statistics |
| 3 | Engr. R.A.K Jimoh | Project Manager & Coordinating Director, NIWRMC |
| 4 | Engr. J. Kwanashie | Director |
| 5 | Faramade T. Oyenyi | Director |
| 6 | Daudu D.M | Director |
| 7 | S.O. Ome | Director |
| 8 | Olufemi Odumosu | Director |
| 9 | Dr E. A Adanu | Director |
| 10 | Engr. I. Babaji | Coordinating Director, Gurara |
| 11 | Dr. O.A Bamgboye | Executive Director, NWRI |
| 12 | Zakari Sabiu | Deputy Director, Planning |
| 13 | Engr. K.A Afolabi | Deputy Director, Irrigation & Drainage |
| 14 | Engr. W. Bukar | Consultant(Planning, Research & Statistics) |
| 15 | Kingsley M. Nge | Deputy Director, River Basin Operations & Inspectorate |
| 16 | R.I. Idialu | Assistant Director, Planning |
| 17 | R. A Bako | Assistant Director, Water Supply |
| 18 | Bassey E.A | Assistant Director, Technical Support Services |
| 19 | Engr. Caleb .T. | Assistant Director, Civil |
| 20 | Engr. K.S. Sunmonu | Assistant Director |
| 21 | Osse F. Obiwe | Assistant Director, River Basin Operations & Inspectorate |
| 22 | Bintu Ali | Senior Hydrologist |
| 23 | Enyi Hycinth | Assistant Chief Technical Officer |
| 24 | A.Y. Anda | Chief Technical Officer |
| 25 | Ogbonna K.E | Senior Hydrologist I |
| 26 | S.I Ojo | Chief Planning Officer, National Planning Commission |
| 27 | Agwuma G.A | Senior Statistical Officer, Planning |
| 28 | Okpara S.O | Assistant Chief Hydrology |
| 29 | Engr. A.H Mu'azu | Executive Director, Engineering |
| 30 | Tetsuo Seki | Chief Representative of JICA Nigeria |
| 31 | Chie Shimodaira | Representative of JICA Nigeria |
| 32 | Dele Olatunji | JICA Nigeria Office |
| 33 | Masatomo Watanabe | Team leader, JICA Project Team |
| 34 | Tadanori Kitamura | JICA Project Team |
| 35 | Inoue Kazunori | JICA Project Team |
| 36 | Hiroshi Nakamura | JICA Project Team |
| 37 | Junkichi. Yamazaki | JICA Project Team |

ANNEX-5: Minute of Meeting of DraftFinal Report

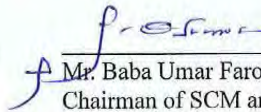
Minutes of Meetings of the Fifth Steering Committee Meeting
(SCM)
on
Draft Final Report
on
The Project for Review and Update of
Nigeria National Water Resources Master Plan (Project)

Agreed between
The Federal Ministry of Water Resources (FMWR)
and
The Japan International Cooperation Agency (JICA)
Project Team

Held in Abuja on 27th November, 2013

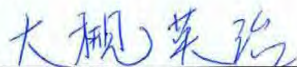


Mr. Masatomo Watanabe
Team Leader
JICA Project Team



Mr. Baba Umar Farouk OON
Chairman of SCM and Permanent Secretary
Federal Ministry of Water Resources
Federal Republic of Nigeria

Witnesses:



Mr. Eiji OTSUKI
Senior Advisor to the Director General
Global Environment Department
Japan International Cooperation Agency
Japan



Mr. J.D. Birdling
Deputy Project Director
Department of Planning, Research and
Statistics
Federal Ministry of Water Resources
Federal Republic of Nigeria



Engr. R. A. Habu
Project Manager and Coordinating Director
Nigeria Integrated Water Resources
Management Commission (NIWRMC)
Federal Ministry of Water Resources
Federal Republic of Nigeria

Preamble: The Fifth Steering Committee Meeting started with opening remarks by Director Special Duties, Mr. Olufemi Odumosu, representing the Permanent Secretary/Chairman, Federal Ministry of Water Resources (FMWR). He commended the JICA Project Team for their cooperation and hard work. Mr. Eiji Otsuki, Head of Mission, JICA Headquarter, in his remarks, expressed his delight for the Steering Committee Meeting. He mentioned the importance of the following two points; i) a driving body for promotion of the National Water Resources Mater Plan 2013 (M/P2013) to wider stakeholders, ii) allocation of appropriate budget for the implementation of the recommendations highlighted for development in the M/P2013. The attendance list is attached.

The Draft Final Report was submitted to the Nigerian side on 25th November 2013, and was accepted by them. Both sides agreed that comments if any on the Draft Final Report would be submitted to the JICA Project Team before 25th December 2013. The comments would be incorporated in the Final Report.

(1) Mr. Watanabe, JICA Project Team Leader and Mr. K. S. Sunmonu, Deputy Project Manager made presentations on the Draft Final Report which contains the M/P2013 and the First Draft of Catchment Management Plans (CMPs) for HA-1/Niger North and part of HA-6/Ogun-Oshun Basin, respectively.

(2) Regarding the recommendations described in the Draft Final Report, on behalf of the Project Director, Deputy Project Director stated the following points:

- Nigerian side appreciated the activities of the JICA Project Team from the beginning of the Project up to the submission of the Draft Final Report.
- Nigerian side assured that the M/P2013 will be submitted to the National Council on Water Resources which will be held from 9th December 2013, the Federal Executive Council (FEC) and the National Economic Council (NEC), in order to approve the M/P2013 as a national official document.
- Nigerian side promised that FMWR will initiate Project Promotion Mission Unit (PMU) that will coordinate and monitor the implementation of the M/P2013.

(3) The main comments on the Draft Final Report were as follows:

- On Implementation of the M/P2013

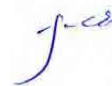
The Nigerian side emphasized the importance of institutional and legislative framework for the implementation of the M/P2013. The JICA Project Team responded that the PMU can be a fundamental institutional arrangement for the implementation of the M/P2013.

The Nigerian side fully supported for the establishment of the proposed PMU. One participant also suggested that the PMU should be established and maintained not only for 5 years but for the entire period up to 2030.

- On Implementation of the CMPs

The Nigerian side proposed to utilize the existing institutional structure along the Advisory Councils of the River Basin Development Authority for implementation of the CMPs. The JICA Project Team further stated that this can be a basis for setting the proposed new institutional arrangement for proper implementation of the CMPs.

(1)



● Other Comments

Other major observations made by the participants are as follows.

- Consideration of climate change and trans-boundary issues in the CMPs
- Importance of water quality and waste water management and related capacity development
- Importance of monitoring of sedimentation, especially in dam reservoirs
- Issues of capacity building
- Contributions of stakeholders during formulation of the CMPs

The JICA Project Team as well as Deputy Project Manager informed the meeting that all the issues raised above have been contained in the Draft Final Report.

(end)

Geo



(2)



Attachment-1

List of Attendance

| S/N | Name | Position | Organization |
|-----|------------------------|---|---------------------|
| 1 | Olufemi Odumosu | Director Special Duties, Representing Permanent Secretary | FMWR |
| 2 | R. A. Habu | Project Manager, Coordinating Director | NIWRMC |
| 3 | Engr. Halidu Yusuf | Managing Director | Sokoto-Rima RBDA |
| 4 | S. O. Ome | Director, Water Quality Control and Sanitation | FMWR |
| 5 | Daudu D. M. | Director, Dam and Reservoir Operation | FMWR |
| 6 | Kingsley M. Ngelale | Deputy Director, River Basin Operation & Inspectorate | FMWR |
| 7 | Birdling J. D. | Deputy Project Director, Deputy Director, Planning, Research and Statistics | FMWR |
| 8 | Engr. Moyi Kabir | Deputy Director, Dam and Reservoir Operation | FMWR |
| 9 | Adetunji Idowu | Deputy Director, Water Supply | FMWR |
| 10 | Okeku Vincent | Deputy Director, Dam and Reservoir Operation | FMWR |
| 11 | Engr. K. A. Afolabi | Deputy Director, Irrigation and Drainage | FMWR |
| 12 | Dr. Alayande A. Waheed | Head of Department, Land & Water | NWRI |
| 13 | Engr. K. S. Sunmonu | Deputy Project Manager, Assistant Director | NIWRMC |
| 14 | R. I. Idialu | Assistant Director, Planning, Research and Statistics | FMWR |
| 15 | Babarinde S. M. | Assistant Director, Climate Change Unit | FMWR |
| 16 | U. B. Magashi | Special Advisor to Director General | NIHSA |
| 17 | S.I. Ojo | Chief Planning Officer | NPC |
| 18 | Joshua Bitrus | Assistant Chief Technical Officer | NIWRMC |
| 19 | Akinola B.A. | Head Hydrologist | Ogun-Oshun RBDA |
| 20 | Attari M. Hope | Press | FMWR |
| 21 | Agwuma Tony | Principal Statistical Officer | FMWR |
| 22 | Eiji Otsuki | Senior Adviser to Director General | JICA Headquarter |
| 23 | Masanori Yamazaki | Project Formulation | JICA Headquarter |
| 24 | Chie Shimodaira | Representative | JICA Nigeria Office |
| 25 | Dele Olatunji | Consultant | JICA Nigeria Office |
| 26 | Masatomo Watanabe | Team Leader | JICA Project Team |
| 27 | Hiroshi Nakamura | Team member (Groundwater) | JICA Project Team |
| 28 | Tadanori Kitamura | Team member (Surface Water) | JICA Project Team |
| 29 | Akinori Miyoshi | Team member (Water Supply & Sanitation) | JICA Project Team |

Remarks:

FMWR: Federal Ministry of Water Resources
JICA: Japan International Cooperation Agency
NIHSA: Nigeria Hydrological Services Agency
NIWRMC: Nigeria Integrated Water Resources Management Commission
NPC: National Planning Commission
NWRI: Nigeria Water Resources Institute
RBDA: River Basin Development Authority

ECO

(3)

ANNEX-6 : Minute of Meeting on the Planning Condition

**Minutes of Discussion
on
Meeting of The Planning Condition for The Project for Review and
Update of Nigeria National Water Resources Master Plan**

On 23rd January, 2013, as a part of the activities in The Project for Review and Update of Nigeria National Water Resources Master Plan, the meeting of the planning condition applied for the project was held at the conference room of Federal Ministry of Water Resources, under chaired by Engr. Jimoh, Project Manager of the project. The attendance list is shown in the attachment-1.

Mr. Kitamura, expert in JICA Project Team, explained the proposed planning condition. The proposed condition was discussed among the participants in the meeting, and the followings were concluded.

(1) Flow and Climate Condition

- 1) As a basic condition of the climate, the existing climate condition (40years: 1970-2009) is applied. Based on the existing runoff condition as well as the existing climate condition, the alternative options for water uses and water resources development will be examined.
- 2) Future climate condition is still uncertain. Therefore, the planning will be based on the existing climate and runoff conditions.

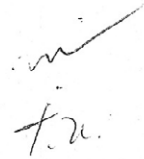
(2) Climate Change Impact

- 1) The possible climate change impact on water resources and water demand will be treated as a risk factor which we cannot control as is the case of uncertainty associated with trans-boundary water. The sensitivity of the risk factor may be analyzed.
- 2) For the climate change scenario, the scenario applied in Progress Report-2 of the project will be basically applied. However, the possibility to use same information from the Climate Change Risk Analysis in Nigeria from the project supported by World Bank will also be explored and discussed among JICA Project Team and the Nigerian side.

(3) Trans-boundary Water

- 1) There are large amount of inflow through the Niger River, Benue Rivers and its

RAK



tributaries, and Cross River. These inflows may be affected by the water resources development and use in the neighboring countries, which is a risk factor that is not basically controlled. The risk factor may be examined by sensitivity analysis, if necessary.

- 2) Especially, i) Operation of Lagdo dam in the Benue River, ii) Operation of Kandaji dam (under construction) in the upper Niger River will be carefully treated. The regulated water by these dams is not considered as a usable water source unless the minimum flow is set, by the assumption that the regulated water is basically utilized in the upstream countries.

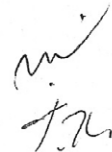
(4) Target Safety Level for Surface Water Development

- 1) The following target safety level for surface water development will be basically applied.
 - Municipal Water Supply = 90% year (1/10 years safety level)
(Lack of water at once in 10years can be accepted.)
 - Irrigation Water Supply = 80% year (1/5 years safety level)
(Lack of water at once in 5years can be accepted.)
 - Other Water Supply = 80% year (1/5 years safety level)
(Lack of water at once in 5years can be accepted.)(It is noted that municipal water supply includes domestic, industrial and commercial through water supply system.)
- 2) It is noted that the target safety level in the other developing countries, especially in Africa, should be clarified.

(5) Priority of Water Use

- 1) The following priority order of consumptive water use will be basically applied, when the surface water resources development is planned.
 - 1st priority: Minimum stream flow requirement
 - 2nd priority: Municipal water supply
 - 3rd priority: Irrigation water supply
 - 4th priority: Other water supply, if any (Hydropower generation)When the hydropower component that is non-consumptive water use is included in the water resources development, the optimum use of hydropower will be considered, under the above-mentioned priority order.
- 2) It is noted that the basic strategy for the priority should be shown.
- 3) For actual operation during extreme event such as drought and flood conditions,

FAK




the priority should be discussed among stakeholders case by case. This is a part of risk management of water resources. To do so, the master plan may recommend the establishment of the committee of water use in each HA.

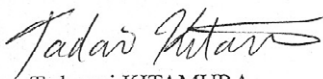
(6) Minimum Stream Flow Requirement

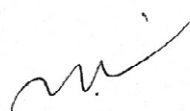
- 1) $Q_{97DS90\%Y}$ (90% year dependable 97percentaile daily flow for a single year), which has been estimated in the present project and may represent the drought condition according to the flow regime in each area in Nigeria, will be applied as the minimum stream flow requirement, when the surface water resources development is planned in the present project.
- 2) In the future, when more data for river discharge and as well as river conditions will be accumulated, more details to set appropriate minimum stream flow requirement should be discussed among stakeholders.

23rd January 2013

Abuja


Engr. R.A.K. Jimoh
Coordinating Director
NIWRMC


Tadanori KITAMURA
JICA Project Team


Zakari Sabiu
Deputy Director
Department of Planning, Research
and Statistics
FMWR

**Attachment-1: ATTENDANCE LIST ON THE MEETING OF THE CONSIDERATION OF THE
PLANNING CONDITION AND ENVIRONMENTAL FLOW FOR NWRMP.**

| S/N | NAME | ORGANIZATION | POSITION | TEL | E-MAIL |
|-----|---------------------------|---|---------------------------|-------------|--------------------------------|
| 1 | Babarinde Segun Mukaila | FMWR | AD, CCU | 08037034604 | babarindesm@yahoo.com |
| 2 | Zakari Sabiu | FMWR | DD (Planning) | 08030720640 | sabiuzakari@yahoo.co.uk |
| 3 | Engr. N.D. Madu | FMWR | AD (DHP) | 08034065991 | maduengr@yahoo.co.uk |
| 4 | Dr. Nwosah G.C | Gurara | Ag.D (CTSS) | 08036190471 | gladysnwosah@yahoo.com |
| 5 | Engr. Amodu D.A | NIHSA | ACHY | 08033498574 | danamodu@yahoo.com |
| 6 | Mr Ogbonna K.E | FMWR | SHG (DWS) | 08055546664 | ogbonnkn@yahoo.com |
| 7 | Engr. Okon Ekpenyong | Energy Commission of Nigeria | DD | 08032920873 | ekpenyongokon@yahoo.com |
| 8 | Engr. James A. Gana | NEMA | Senior Scientific Officer | 08035952043 | gJames_audu@hotmail.com |
| 9 | Mr John Onovbiona | Federal Ministry of Agric and Rural Development | Chief Fish Officer | 08067416627 | jonovwiona@yahoo.com |
| 10 | Mrs. R.A Bako | FMWR | AD (WS) | 08037861107 | rukayyatub@yahoo.com |
| 11 | Engr. R.A.K Jimoh | NIWRMC | C.D | 07055071728 | raziqjim@yahoo.com |
| 12 | Rev. M.I Nwabufo | NIHSA | Director (HYDROGEOLOGY) | 08037861797 | mnwabufo@yahoo.com |
| 13 | Mr. Bassey Effiong Asukwo | FMWR | AD (P/TSS) | 08036145428 | efybassey@yahoo.com |
| 14 | Engr. K.S Sunmonu | NIWRMC | AD | 08054045395 | kensulad@yahoo.com |
| 15 | Yuichi MATSUMOTO | JICA TEAM | Irrigation & Drainage | 07055130378 | yu-matsumoto@sanyu-con.co.jp |
| 16 | Toshihide SHIBATA | JICA TEAM | Agronomist | | toshi_shibata@sanyu-con.co.jp |
| 17 | Noboru OSAKABE | JICA TEAM | Financial | | osakabe@intl.yachiyo-eng.co.jp |
| 18 | Sebastian JARA | JICA TEAM | Environment | 07057621434 | jara@ctil.co.jp |
| 19 | Tadanori Kitamura | JICA TEAM | Water Resources | | |
| 20 | Beatrice Klerlama | JICA TEAM | Secretary | 08152349276 | informprestige@yahoo.ca |

AKK

[Handwritten signature]

**ANNEX-7: Discussion Report of Stakeholder Meeting of A-1 and HA-6 for Catchment
management Plan**

**Discussion Report
of
Stakeholder Meeting
of
HA-1 and Ogun-Oshun Basin
for
Catchment Management Plan**

Summary of Discussion of Stakeholder Meeting and Workshop of HA-1 and HA-6

| Date | Meetings/Workshop | Highlight of Discussion | Identified Issues, Constraints, Problems and Challenges | Proffered Solution by affected States |
|------------|---|---|--|---|
| 15/05/2013 | Steering Committee Meeting | Team Leader presented the Interim Report to Steering Committee Members | | |
| 23/05/2013 | Stakeholders meeting. | Brief opening presentation by Project Director, the Counterparts staff made presentation on the behalf of JICA project Team Members on the Interim Report. | Needs for Water Law, and FMWR should identify water supply gap and invest in regional water supply schemes. | Need for Synergy and cooperation among Stakeholders |
| 24/05/2013 | Kick-off Meeting in HA-1 and HA-6 | Stakeholders Analysis done by participants | | |
| 12/6/2013 | Stakeholders Meeting, HA-1 (Zamfara) | There was presentations on surface and ground water resources potentials and demands, Erosion and flood, Water Environment by JICA Project Team Members. This was followed by comments and clarifications by Participants. | Needs for more government investment in water supply. High raw water turbidity in Zamfara state intake point. Water is free in the state as government policy. | |
| 24/6/13 | Project Team arrive Lagos Visited the State Ministry of Environment and met with senior Officers of Department of Water Resources and the Courtesy visit the Team Proceeded to venue of workshop. | There were presentations on surface and ground water resources potentials and demands by JICA Team Experts. This was followed by comments and clarifications by Participants. | | |
| 25/6/14 | Project Team arrive Abeokuta with the intention to visit the Honourable commissioner of rural development before the Stakeholders meeting at OORBDA. Project Team visited small treatment works within RBDA Estate. | There was a big Stakeholders meeting in Abeokuta (NCA Conference) most invited participant could not attend the called meeting. A short meeting was held with Top Management of OORBDA and Two Participant from State Ministry of Rural Development .JICA project Team also made similar presentation on Surface and Groundwater potentials of Ogun-Oshun Basin this was followed by comments and questions from Participants. | | |
| 26/6/15 | Project Team paid courtesy visit to Permanent secretary State Ministry of Environment. Stakeholders workshop at Leisure Spring hotel, Osogbo with participants from Lagos, Ogun, Oyo and Osun States and | The Project Team Presented Surface and Groundwater potentials and demands. This was followed by comments and questions from Participants. Thereafter participants were asked to raise issues and challenges on water resources development and | Groundwater pollution, sea water intrusion | |

| Date | Meetings/Workshop | Highlight of Discussion | Identified Issues, Constraints, Problems and Challenges | Proffered Solution by affected States |
|------------|---|---|---|---|
| | Participants from FMWR, NIWRMC, CMO. | management. | | |
| 27/6/13 | Project Team paid courtesy visit to Permanent Secretary State Ministry of Water Resources. Stakeholders workshop at RUWASSA Training Hall, Ibadan, Oyo State. The Honourable Commissioner for State Ministry of Water Resources joined the Meeting. | The Project Team Presented Surface and Groundwater potentials and demands. This was followed by comments and questions from Participants. Thereafter participants were asked to raise issues and challenges on water resources development and management. | | |
| 28/6/13 | Project Team paid courtesy visit to Group Managing Director, Lagos Water Corporation. LASEPA and Lagos State Ministry of Agriculture. | Project Team explained that they are aware of Water demand projection which is different from the projection in the Master Plan because Lagos State have population projection different from the National estimate. | The group Managing Director appeal to the Team Member that the Study should accommodate their population projection. | |
| 3/7/2013 | Stakeholders Workshop for HA 1 (4 States) | The Project Team Presented Surface and Groundwater potentials and demands for HA 1. This was followed by comments and questions from Participants. Thereafter participants were asked to raise issues and challenges on water resources development and management. | Inadequate or lack of data base and collection framework, obsolete equipment, absence of Policy and legislation in some states, inadequate funding, lack of coordination among Stakeholders, Lack of spare parts, Problem of Turbidity with raw water, lack of skill personnels, absence of active public participation, lack of capacity building, non-remittance of water tariff by government institutions | |
| 24/07/2013 | Stakeholders Workshop for HA 1 (4 States) | The Project Team members made presentations Surface and Groundwater potentials and demands for HA 1 Floods and Water Environment. This was followed by comments and questions from Participants. Thereafter participants were asked to raise issues and challenges on water resources development and management. In addition | Participants from Sokoto appeal for JICA support to solve the problem of Water Turbidity affecting the State. | The Project Manager requested the participating State that the proposal by JICA project Team on water demand projections shall be |

| Date | Meetings/Workshop | Highlight of Discussion | Identified Issues, Constraints, Problems and Challenges | Proffered Solution by affected States |
|------|-------------------|---|---|--|
| | | each State was given opportunity to propose/provide the water demand projection if different from what was proposed under the JICA Master Plan 2013 | | adopted in preparing the catchment Management the draft plan for HA1 |

Table NO OF REGISTERED PARTICIPANTS

| DATE | NO OF REGISTERED PARTICIPANTS | DATE | NO OF REGISTERED PARTICIPANTS |
|------------|-------------------------------|------------|------------------------------------|
| 15/05/2013 | 36 | 26/6/15 | 65 |
| 23/05/2013 | 138 | 27/6/13 | 21 |
| 24/05/2013 | | 28/6/13 | A follow up Meeting - by two Teams |
| 12/6/2013 | 45 | 3/7/2013 | 40 |
| 24/6/13 | 35 | 24/07/2013 | 42 |
| 25/6/14 | 27 | - | - |

REPORT OF THE NATIONAL STAKEHOLDERS' WORKSHOP FOR FEDERAL MINISTRY OF WATER RESOURCES/JAPAN INTERNATIONAL COOPERATION (JICA) ON THE PROJECT FOR REVIEW AND UPDATE OF NATIONAL WATER RESOURCES MASTERPLAN, HELD AT IMMACULATE SUITES AND APPARTMENT FROM 23rd MAY, 2013

1.0 Introduction

The Federal Ministry of Water Resources/Japan International Cooperation Agency (JICA) on the Project for Review and Update of National Water Resources Master plan held a National Stakeholders Workshop on the 2013 draft Water Resources Master Plan at Immaculate Suites and Apartments from 23rd May, 2013.

The programme commenced at 10. 45am with an Islamic and Christian prayers offered by Alhaji Dalhatu Musa and S. Eno respectively.

2.0 Attendance

The workshop was attended by the Honourable Minister of Water Resources, Mrs. Sarah Reng Ochekepe and the Permanent Secretary, Baba Umar Faruk who were ably represented by Mrs L. D. Bagaiya, the Project Director and the Project Manager Engr. R. A. K. Jimoh, JICA Nigeria representative Mr. Tetsuo Seki, States Commissioners responsible for Water Resources Kano, Plateau, Yobe and special Adviser on Technical Matters to the Governor of Delta State.

In attendance were representatives drawn from the two hydrological areas, HA1 and HA 6 comprising Sokoto, Kebbi, Katsina, Zamfara and Lagos, Ogun, Oyo, Osun, Cross River, Delta and.

Others include Nigeria Integrated Water Resources Management Commission, Nigeria Hydrological Services Agency, State Ministries of Water Resources, Environment, Agriculture, State Water Board, River Basin Development Authorities (RBDAs), National Water Resources Institute, Rural Water (RUWASSA), Rural Water Sanitation Initiative (RUWASI), National Planning Commission, National Environmental Standards Regulation and Enforcement Agency (NESREA).

3.0 Opening Ceremony

3.1 Welcome Address by the Permanent Secretary

The Permanent Secretary, Federal Ministry of Water Resources Baba Umar Faruk was represented by the Project Manager, Nigeria Integrated Water Resources Management Commission, Engr. R. A. K. Jimoh, due to other official engagements. In his address, he welcomed participants and informed them that the project team had submitted two progress reports (1&2) on the review and update of the National Water Resources Master plan to the Steering Committee and other Stakeholders' through meeting and workshop.

However, he commended the efforts of the JICA Project team for working within the project schedule despite constraints.

Finally, he expressed gratitude to the JICA project and government of Japan for the continuing support on the project and implored stakeholders' to contribute meaningfully to enrich the content of the revised Master plan for the Water sector. He wished stakeholders' fruitful deliberations.

3.2 Key Note Address by the Honorable Minister of Water Resources, Mrs Sarah Reng Ocheke

The Project Director Mrs L. D Bagaiya recognizes the members of the High table and thank God for giving all the Stakeholders the opportunity to be at this Stakeholders Workshop which is very crucial to the progress of the Review of the 2013 Master plan. She apologized on behalf of the Honorable Minister of Water Resources Mrs. Sarah Reng Ocheke as is unavoidable absent and she presented her key note address as follows:

The Honorable Minister informed participants on the presentation of the 2013 draft Water Resources Master Plan by the Japan International Cooperation Agency (JICA), Review and Update of the 1995 National Water Resources Master Plan commenced in August 2011 by JICA with its policy thrust aimed at ensuring adequate supply and utilization of water to meet the desired quality and standard by means of hydrological and hydro-meteorological information could be obtained to mitigate the effects of climate change resulting from flooding, drought and desertification.

Furthermore, she stressed the need to ensure a coordinated and sustainable Management of the Nations Water Resources which could be harnessed for hydropower generation to improve electricity, develop irrigated Agriculture for increasing output towards attaining the Nation target for food security.

She pointed out that imbalance in the water infrastructural development; increasing population growth and urbanization have created a deficiency with its attendant effects on Nigerians. However, she stated that the gaps created sought the need for the Review and Update of the National Water Resources Master Plan of 1995.

At this juncture, she recalled that the Ministry has keyed into the Transformation Agenda of the present administration, in which the development of a robust Master Plan in the water sector could lead to the Nation attaining vision 20:2020 and millennium Development Goal Target and Africa vision for water.

She expressed her appreciation to the JICA for the continued support they have been providing to Nigeria and indeed to the Federal Ministry of Water Resources in particular. She promised to support the efforts of JICA and vigorously pursue and sustain all the key deliverables outlined in the 2013 master plan especially in the area of development of policy and strategy for Water Management, water supply development and action plan, Water Demand Management, Operation and Maintenance Plan, Cost Estimation and implementation schedule with the milestones and attached timelines in a coordinated manner. She added that as we deliberate on the issues before us today, it is my belief that in no distant future, adequate water supply and sanitation to our cities will attain the expected level.

She informed Stakeholders on the Project deliverables in which three counterpart staff of the project drawn from the Department of Irrigation and Drainage, Planning Research and Statistics and Nigeria Integrated Water Resources Management Commission were trained in Japan and presentation of Progress Report 1 and 2 to the Steering Committee and other Stakeholders via series of workshops and discussions by the JICA Project Team and today's event is a continuation of the project deliverables and represents an important milestone in the development of the Nation's Water Resources Potentials.

In conclusion, she enjoined the core professionals in the sector to make concrete and constructive contributions which would enrich the draft Interim Report for a Sustainable Water Resources development and Management

3.3 Welcome Remarks by the Project Manager Engr. R. A. K Jimoh

The Project Manager informed Stakeholders on the overall objective of the Project which is to Review and Update the National Water Resources Master Plan formulated in 1995 and the target was to set a principle and strategy of Water Resources Management and Development in the Country in line with the global principles of Integrated Water Resources Management.

Furthermore he informed Stakeholders that there are some distinct features in the 2013 Master Plan which was not in the 1995 Master Plan such as incorporation of Integrated Water Resources Management, Catchment Management Plan proposed for Hydrological Area 1 and Hydrological Area 6 due to time and funding constraints for the project and that studies will be replicated in other Hydrological Areas with improved funding, emphasis on Private Partnership Participation (PPP), as a viable alternative source of funding of Government Projects, Inclusion of climate change, Mechanisms for user pay principles and he informed that all the processes started by the involvement of the Stakeholders and the Steering Committee members at every stages and presentations of Interim Draft Reports for Stakeholders inputs.

In conclusion, he told the participants that the 1995 National Water Resources Master Plan could not be properly implemented due to wider Stakeholders inputs.

3.4 Goodwill Messages

The Honourable Commission of Water Resources Kano State

The goodwill messages were delivered by the Honourable Commissioner of Water, Resources, Kano State on behalf of other Commissioners present. In his message, he commended the effort of the Federal Ministry of Water Resources and JICA for the robust discussion. He stressed the significance of Water supply and its management to our lives and other socio - economic uses in the Country. He therefore appeal for collaboration of JICA with the States for the Development of Water Resources in the Country as water is not only for drinking but for other uses such as irrigation and industrial uses. On this, it is my hope that the lesson learnt will translate in no distance future to a sustainable water development and management in the Country.

4.0 Paper Presentations

The under listed papers were presented by the Project Director, Project Manager and Counterpart staffs to the Project as follows:

1. Introduction - Mrs. L. D. Bagaiya (Director PRS)
 - Overall Schedule
 - Concept of Water Master Plan
 - Strategies for Water Master Plan
2. Evaluation of W. Res. Potential - Engr. Amodu (NIHSA)
3. Projection of Water Demand - Engr. Sumonu (NIWRMC)
4. Water Resources Development (Incl. O&M)
 - Ground water - Mr. K. Ogbonna (Water Supply Dept.)
 - Surface Water - Engr. Madu (Dam Dept.)
5. Water Supply & Sanitation
 - Water Supply - Engr. Bello (Water Supply Dept.)
 - Sanitation - Ms. Yemisi (Water Quality & Sanitation Dept.)
6. Irrigation & Drainage - Engr. Anthea Ochedikwu Udo (Irrigation & Drainage Dept.)
8. Water Resources Management Plan Part-1 - Engr. Sumonu (NIWRMC)
 - Introduction
 - Organization and Institution
- Part-2
 - Hydrological Monitoring/Flood Management - Engr. J. Gbadegesin (NIHSA)

- | | |
|--|---|
| - Water Environment Management Dept.) Part-3 | - Ms. Bako (Water Quality & Sanitation) |
| - Data & Information Management | - Mr. A. A. Olayinka |
| - Water Allocation and Regulation | - Engr. Sumonu |
| - Risk Associated with Climate Change and Trans-boundary water | - Mr. S. M. Babarinde |
| - Public Relations for Water Resources | - Mrs. N. T. Ogundoro |
| - Public-Private Partnership (PPP) | - Engr. B. Ajisegiri |
| - Human Resources Development | - Mr. Jameel |
| - Monitoring & Evaluation | - Mr. S. Eno |
| 9. Implementation Plan and Evaluation | - Mr. E.A. Bassey (PRS Dept.) |
| 10. Recommendations/Conclusion | - Engr. R. A. K. Jimoh |

5.0 Comments/Observation

After the paper Presentations by the Counterpart Staff, comments/observations were raised as follows:

Engr (Mrs) C. B Olajide – Director - Ogun State Ministry of Rural Development

Suggested that internally delegated Management contract (IDMC) should be identified so as to reposition the entire Urban Water Sector work force to ensure sustainability and that Monitoring and Evaluation in terms of Urban Water Supply Management should be enforce to measure performance in line with sustainability and target setting for operation, she also suggested that ground water recharge should involve urbanization, maintenance of dams and staff training should be taking seriously instead of construction of more dams.

Engr. C. L Yerima (NIWRMC)

He informed that slide 88 bullet 1 has a component of Watershed Management; he recommended that the Nigerian Integrated Water Resources Management Commission should be included among the MDAs, because the Integrated Water Resources Management Committees at the State level could be of tremendous support, he also wants to know why in slide 18 reference was made of data obtained from UN and no reference was made to National Population Commission data.

Dr. Alayande A. Waheed – Head land and Water Dept – National Water Resources Institute.

He informed that the 2013 Masterplan had carefully identify the need to build the capacities of the sector personnel's, partner agencies and some of the sector gaps unfortunately, the implementation plan of the Masterplan has nothing to implement in this direction. Secondly he recommended that more investments are needed on regional water schemes and empowering the state water boards to meet the need of Nigerians instead of the recommendation of drilling of 100,000 more boreholes in 2030 by the 2013 Master plan.

Rev. M. I Nwabufo – NIHSA

He suggested that NIHSA should be incorporated in the priority Agencies to be involved in the Private Partnership Participation arrangement and that JICA should make clear to OSGOF topographic and cross sectional map of Nigeria. He informed that in the paper presented by Mr. Adelabu IWRMC should come before RBDAs.

Adama Alache – Head Gender and Human Rights – FMWR

She observed that gender was only mentioned under Public Relation Unit, while gender issues cut across board in all the departments, agencies and the River Basin Development Authorities under the Ministry and should stand alone, she appealed that gender submissions should be allowed to be sent to the Project Team for proper inclusion in the Masterplan.

Mrs. Emeka Aneke – Ad Gender and Human Rights

She observed that gender as a stand-alone was not recognized, she also informed that the issues of climate change and gender responsiveness in the disaster risk management should be properly incorporated under climate change strategic risk and promotion of adaptive and mainstreaming management, she also emphasized the need for proper strengthen of the Federal Ministry of Water

Resources Gender Unit Capacity building and the need to incorporate gender counterpart officers in the JICA 2013 Master Plan Project.

Dr. Martins O. Eduvie – Corrdinator- RWSSC- NWRI Kaduna

He suggested that the code of practice for borehole construction should be included in the Master plan, that will assist in the reduction of non – functional boreholes and that capacity building should be for all personnel, he commends the effort of the Project Team in carrying the younger generation in the overall plan of the Mater Plan as demonstrated in the presentations by the counterpart staff for the sustainability of the Master Plan.

Mr. Sonde. O. O. Project Manager – Ogun State - RUWATSAN

He suggested the need for synergy and collaboration amongst the Stakeholders in the water sectors and that enabling law is necessary for people to know that water is not a social economic value. He also wants to know the areas that his organization can collaborate with JICA.

Mr. Nasiru Muazu- Sokoto State Water Board

He informed that his organization has recorded a draw – down of more than 25meters along lime stone zone and over 47 Nos boreholes has dried up completely between April and May some of which were drilled since 1981(within a radius of 3km so the estimation 20 meter draw-down is very correct in view of the above he wants to know more about the application of the formula.

Lady E. C Ezeka – Deputy Director - National Environmental Standard Regulations and Regulation Enforcement Agency

She comments the Project Team for the incorporation of water quality which was initially omitted in the Master Plan; she also informed that there is a National Environmental (surface and Ground water Quality Control) Regulations 2011 being implemented by National Environmental Standard Regulations and Regulation Enforcement Agency, she wants her organization to partner with the water quality unit of the Ministry to ensure that the water supplied to consumers are free from pollutants.

Oyeniya Olarele– Ogun State.

Wants to know how soon the promotion of user’s pay principle will commence and also if uniform meter will be introduced to all consumers.

Mr. Agbeja Olawuyi . J. Deputy Director Ogun State Water Supply- RUWESA

He wants to know the exact modalities of Private Partnership Participation (PPP), if they are going to be responsible for project construction if yes how are they going to recuperate their investment.

Engr. P. L. Mumuah Deputy Director - Ministry of Water Resources Yola Adamawa State.

He requested for more clarification on the figures given on target as regards safety of Water Resources Development.

Mr. Subuloye D. A Federal Ministry of Environment

He wants to know why special authorities (task force) should be created for National Projects for the integration of Sub-sectors and jurisdiction, he suggested that Nigeria Hydrological Services Agency (NIHSA) and Nigeria Integrated Water Resources Management Commission could play the role of this special agencies.

Mr. Okafor Akachukwu- Head of Programmes-Rural Water and Sanitation Initiative.

He observed that the Master plan lacks adequate sustainability model/ frame work to other Development Projects.ensure that these projects are largely meets its objectives.

Mr. Kayode Ayodele - Representative of the Honorable Commissioner of Water Resources Kogi State.

He informs that the Master Plan is recommending the drilling of more bore holes, he wants to know if there are plan in the Master Plan to carry out researches to know the effects of having so many boreholes drilled to reduce the incidence of land subsidence.

Hon. Sidi Yakubu Karasuida Hon. Commissioner Ministry of Water Resources Yobe State

He wants NIHSA to encourage States and Local Government Areas to establish rainfall data collection center by the State Ministry of Water Resources, Agriculture and State NEMA for adequate water data collection and information dissemination to the rural people. He also suggested the need for the Federal Ministry of Water Resources to know exactly the existing water supply gap so that the design can be in line with the 2013 Master Plan implementation strategies.

Mr. Oru Sylvester - Delta State.

He wants to know if Delta State belong to HA5 and HA 6 and where the Benin River fall into and has the question of acidity and saline water in Delta area been considered in the consideration of local level operation and maintenance, did the Master Plan consider alternative water sources like rain water harvest collection which are free from salt and excess iron and construction of artificial aquifers, was there consideration for water transfer from areas with water requiring lesser treatment to areas with salt and excess ion in the coastal areas to multiple communities in a chain, was there consideration for sub regional supply from centrally treated headwork's and can Delta State submit her technical inputs formally to JICA after this inception report to address her peculiar problems?

Engr. Segun A. Director – Design and construction- Osun State Water Cooperation

He wants to know if the Federal Government will assist states in desilting state owned Dams.

Mr. ALA. J. C – Director PRS Ministry of Water Supply – Bayelsa State-----

He suggested that salt water intrusion in coastal areas aquifer should be considered, that no depth of boreholes should be prescribed for the HAs and that water supply source and means should not be imposed on the HAs, he also observed that the activities to implement the Master Plan is only concentrated in the Federal Ministry of Water Resources and that States should also be assisted in the area of capacity building.

Mr, Dalhatu Musa. M. MBEP Zamfara State

He wants to know if the State can replicate the population growth variables when making water demand projection.

Mr. Ezekwo Victor . C – PM/PIA – Anambra State RUWASSA/SPIA

He recommended that Integrated Development of Irrigation and Hydropower generation should also accommodate the supply of portable water to municipal areas and constructions of treatment plants/distribution networks, that the Master Plan should proffer more strategy for adequate sustainability plan and that the usage of cubic meter symbol with CM instead of m³ should be corrected in the report of the Master Plan.

Engr. Bamidele. O Water Cooperation Oyo State

He wants to know from the presentation on water supply and sanitation the strategies in the Master Plan to control underground water pollution through the application of fertilizer and agro- chemical herbicides in irrigation and mechanized farming.

Mr. Ademu Labbo – Director- INFRAS – Zamfara ADP

He wants to know the standard spacing for tubewells and wash bores in irrigation land.

6.0 Recommendations

- Code of practice for borehole construction should be included in the Master plan
- Capacity building should be proposed for all personnel's of the Ministry and its agencies.
- The need for more investments are needed on regional water schemes and empowering the state water boards to meet the need of Nigerians instead of the recommendation of drilling of 100,000 more boreholes in 2030 by the 2013 Master plan
- Gender submissions should be allowed to be sent to the Project Team for proper inclusion and stand alone as it cut across board to be sent to the in the Master plan.
- Proper strengthening of Monitoring and Evaluation.
- The need for synergy and collaboration amongst the Stakeholders in the water sectors.
- Integrated Development of Irrigation and Hydropower generation should also accommodate the supply of portable water to municipal areas and constructions of treatment plants/distribution networks.

-
- The need for water law and water charges.
- NIHSA to encourage States and Local Government Areas to establish rainfall data collection centre by the State Ministry of Water Resources, Agriculture and State NEMA for adequate water data collection and information dissemination to the rural people.
- The need for the Federal Ministry of Water Resources to know exactly the existing water supply gap so that the design can be in line with the 2013 Mater Plan implementation strategies.
- Climate change and gender responsiveness in the disaster risk management should be properly incorporated under climate change strategic risk.
- The need to strengthen the Federal Ministry of Water Resources Gender Unit and Capacity building and to incorporate gender counterpart officers in the JICA 2013 Master Plan Project.
- The need to incorporated NIHSA in the priority Agencies in the Private Partnership Participation arrangement.

7.0 Closing Remarks by the JICA Nigeria Representative Mr. Tetsuo Seki

The JICA Nigeria Representatives commended the Federal Ministry of Water Resources for the successful hosting of the Stakeholders Workshop and the demonstration of the Counterpart personnel in their presentations.

Furthermore he recalled the support of JICA in 1980 to Lower Anambra Irrigation Project as well as the formulation of the 1995 National Water Resources Master Plan, which is also presently been Reviewed with the Support of JICA. He further informed that JICA has equally assisted Ten (10) states in Nigeria in Rural Water Supply and Sanitation.

In conclusion he expressed hope that involvement of the Stakeholders will assist in timely implementation of the Master Plan and Nigeria will soon be self-sufficient in water supply, hydropower generation and in food production.

8.0 Closing

In the absences of more comments/observations the workshop came to an end at 4.00p.m.

REPORT ON COURTESY CALL TO KEY STAKEHOLDERS ON WATER RESOURCES IN 4 NOS. STATES OF WESTERN LITTORAL (LAGOS, OGUN, OYO & OSUN STATES) AND WORKSHOP FOR FORMULATION OF CATCHMENT MANAGEMENT PLAN IN THE 4 STATES from 24th to 27th June .

- i) Attendance-The list of attendance in each States are attached as annex A, B, C and D.
- ii) Venue- The courtesy call to Stakeholders were made at their respective State Ministry of Environment and Water Resources except Lagos and Ogun States that was held in Ogun-Osun River Bsin Development Authority Guest House and Its Conference Room at Abeokuta respectively.
- iii) Time- The meeting started at about 10 am in each of the states.

Opening Remarks the Coordinating Director (NIWRMC)

After a short welcome speech by the representatives of the states Commissioner and self introduction of the participants in each of the states, the Coordinating Director briefly gave the background of the project and the purpose of visit. In his remarks, he highlighted that the National Water Resources Master Plan (NWRMP) was conducted in 1995 with a review period of ten years. According to Engr. R.A.K Jimoh and with a view to having a comprehensive and updated NWRMP, the Nigeria Government signed another MoU with the Government of Japan in 2011. The Project for the Review and Update of NWRMP which commenced in 2011 is with a completion period of three years and is in 3 phases namely: i) Collection of data and clarification of issues among others, ii) Development of NWRMP and iii) Formulation of Catchment Management Plan in two Hydrological Areas (HAs) of the Country i.e Niger North (HA₁) and Western Littoral (HA₆). The phases i & ii are already completed.

In furtherance to his remarks, the formulation of the Catchment Management Plan, which is the purpose of the visit, is for the period of 9 months. In conclusion, he informed the participants of the two presentations on both surface and groundwater, to be made by the JICA Project Team.

PRESENTATIONS

The presentations were made by two of the JICA Project team on;

- Water Audit Study (Water Balance Study) for Ogun-Osun Basin in HA6.
- Groundwater potential and development.

HIGHLIGHTS OF PRESENTATIONS

Water Audit Study (Water Balance Study) for Ogun-Osun Basin in HA₆.

The scope of the presentation is based on the findings in the 2013 NWRMP and it includes;

- i) Catchment delineation
- ii) Meteorological condition
- iii) Water Resources Potential
- iv) Water Demand
- v) Water Demand-Supply Balance (mainly for surface water).

Groundwater potential and development.

The scope is also based on the findings in the 2013 NWRMP and it includes;

- i) Geology of the Basin (Ogun-Osun Basin)
- ii) Groundwater recharge distribution
- iii) Groundwater Potentials and demand (H6 has GW potential of 22,304 MCM/year). On states basis, the groundwater potentials in MCM/year are 734, 1152,1066 and 1399 in Lagos, Ogun, Osun and Oyo respectively.
- iv) Current number and yield of boreholes
- v) Aquifer classifications.

Comments and Contributions

Following the presentation made in each of the state, comments and contributions were made by the participants and the highlights are as detailed.

a) LAGOS STATE

| Contributions/Comments | Remarks |
|--|--|
| <ul style="list-style-type: none"> • Nationwide Policy Guide to be developed to guide against over exploitation of groundwater. • Awareness campaign to be organised by NIWRMC on the danger of drilling borehole on the refuse dump site to prevent underground water pollution. • JICA to assist more on capacity building for the Catchment Management Plan especially for the Hydrologist to avoid inaccurate data readings. Yelwa River should be “Yewa River”. • Research institute such as the Universities, to be incorporated into the formulation of the Catchment Management Plan for their inputs. • Water Laboratories are to be carried along for both Surface and Groundwater Analysis. • Lagos State population should be considered in the NWRMP as all developmental plans is based on its figure. Also, the 30% water loss given in the presentation is low. • None-operational boreholes in Lagos State are too high compare to operational boreholes, as these needs to be recomputed. | <ul style="list-style-type: none"> • Engr. Alade, MA • Adewuyi S.F.A, Water Front Inf. • Eduku .P LSWC • Fadunsin. E, LMRD • Erinoso. K, FMWR • Akiwowo. T.A. LSWC |

Response

In response to the comments and contributions made by the participants, the JICA Project Team made it known that the 30% value for water lost and the none operational boreholes are as presented in the

Draft in 2013 NWRMP. Other comments were noted and to be effected.

Closing Remarks

The Chairman thanked the participants for their useful contributions and request them to send more of their comments and other issues to the JICA Team in Abuja for inclusion to the final report.

b) OGUN STATE

The Ogun State Stakeholders Workshop was poorly attended. The Coordinating Director also itemized the 3-stages of the Project and requested the JICA Project Team to briefly summarised their presentations.

After the presentation, due lack of time, the Coordinating Director asked the few participants to send their comments and contributions to an e-mail given to them.

Observations by JICA

In addition to the presentation made, JICA made the following observation known to the participants.

- i. Data are not available in OORB but visit to OORBDA's office has added more to thire data.
- ii. Hydrological data are not available for Oyan and Ikeregorge Dams
- iii. Population data is no available in the state,
- iv. From their water demand projection, excess water storage are available in Oyan dam based on 2013 MP.

General Response in Ogun State

The Ag. Managing Director of OORBDA generally comment on the motorized boreholes in Ogun State. In his response, motorized boreholes in the state have been replaced with renewable pressurized one due to its high level of technicality that is involved. A sensitization workshop was held on how to make it friendly to common people though this has been taken over by the Ogun Sate Ministry of Rural Development.

According to Kitamora of JICA Project Team, the idea will also reduce the cost of Operation & Maintenance for sustainability and Engr. RAK Jimoh concluded by informing the few participants of the workshop to be held in Osogbo.

OYO STATE

After the usual briefing on the Project by the Coordinating Director of the NIWRMC, the Honorable Commissioner of Oyo State Ministry of Water Resources, expressed his happiness on the entire project as it will form the basis of water resources planning in the country. While promising hid cooperation on the project till completion, he thanked the Japan Government for their contribution to water resources development in Nigeria.

Comments and Contributions

| Contributions/Comments | Remarks |
|---|--|
| <ul style="list-style-type: none"> • Mechanism for implementing the MP should be incorporated into the final report. • Politicians (National Assembly) should be sensitized for effectiveness in the implementation of the MP. • Capacity building for the Catchment Management Plan especially for the Hydrologist for accurate data readings. • Reason for high water demand in the urban areas and how can it be sustained • Integration of Gender to the Water Resources Master Plan • Global population growth rate compare to that in the MP • How does the MP address climate change? | <ul style="list-style-type: none"> • Akinwale, MPP&UD • Adetokun Oyo State ADP. • “ • No name • Yekinni K, ME |

Generally, The JICA Team responded that there is no operational Rules for dams in Oyo Sate such as Eleyele dam and other issues raised were noted. In a comment by the Permanent Secretary of the Oyo State Ministry of Water Resources, mode of implementing the Master Plan should be incorporated into the recommendations at the final report. The General Manager of Oyo State Rural Water Supply and

Sanitation Agency, in his opinion, thanked the Japan Government for their assistance to the Oyo State Government and request for more especially in the area of drilling equipment.

**REPORT ON STAKEHOLDERS ON WORKSHOP FOR FORMULATION OF
CATCHMENT MANAGEMENT PLAN IN THE 4 STATES WESTERN LITTORAL on 26th
June**

Preamble

Prior to the commencement of the Stakeholders workshop in Osogbo, a team headed by Engr. R.A.K Jimoh made a courtesy call to the Honorable Commissioner of Osun State Ministry of Environment. The Permanent Secretary, who represented the Honourable Commissioner welcomed the team and promised his support to the Project.

Brief Remark by Coordinating Director/Project Manager

After the introduction of the team members, he thanked the Permanent Secretary for his promise and shortly explained the purpose of the visit and highlighted the background of the project as follows.

- The first National Water Resources Master Plan (NWRMP) was conducted in 1995 with a review period of ten years.
- With a view to having a comprehensive and updated NWRMP, the Nigeria Government signed another MoU with the Government of Japan in 2011.
- The Project for the Review and Update of NWRMP which commenced in 2011 is with a completion period of three years.
- The Project is in 3 phases namely: i) Collection of data and clarification of issues among others, ii) Development of NWRMP and iii) Formulation of Catchment Management Plan in two Hydrological Areas (HAs) of the Country i.e Niger North (HA₁) and Western Littoral (HA₆).
- The phases i & ii are already completed to the Draft Stage.
- The Formulation of Catchment Management Plan in two Hydrological Areas (HAs) of the Country i.e Niger North (HA₁) and Western Littoral (HA₆) is on-going.

After the PS expressed his appreciations to the Team and promised cooperation and support for data provision from Osun State Ministry of Environment, the Coordinating Director request for his full participation in the Workshop and the meeting closed.

Introduction

The stakeholders workshop took place at Leisure Spring Hotels in Osogbo and started by 10 am. After the introduction of the participants of 57 in numbers, Engr. R.A.K Jimoh who chaired the meeting gave a brief remarks about the project as it has be highlighted during the courtesy visit to the Honorable Commissioner of Osun State Ministry of Environment.

PRESENTATIONS

The presentations were made by two of the JICA Project team on;

- Water Audit Study (Water Balance Study) for Ogun-Osun Basin in HA₆.
- Groundwater potential and development.

Highlights of Presentations

Water Audit Study (Water Balance Study) for Ogun-Osun Basin in HA₆.

The scope of the presentation is based on the findings in the 2013 NWRMP and it includes;

- vi) Catchment delineation
- vii) Meteorological condition
- viii) Water Resources Potential

- ix) Water Demand
- x) Water Demand-Supply Balance (mainly for surface water).
- **Groundwater potential and development.**
 - The scope is also based on the findings in the 2013 NWRMP and it includes;
 - vi) Geology of the Basin (Ogun-Osun Basin)
 - vii) Groundwater recharge distribution
 - viii) Groundwater Potentials and demand (H6 has GW potential of 22,304 MCM/year). On States basis, the groundwater potentials in MCM/year are Lagos (734), Ogun(1152),Osun(1066) and Oyo(1399) respectively.
 - ix) Current number and yield of boreholes
 - x) Aquifer classifications.

After the presentations, the chair man iterated that participants from the respective state Ministries and Agencies were requested to forward tne number of existing boreholes (proposed rural and urban boreholes) to the Commission in Abuja among other information. This is to be within two weeks from the day of the Workshop.

Contributions and Comments

| Contributions/Comments | Remarks |
|---|---|
| <ul style="list-style-type: none"> • Relevant NGOs, CBOs should be invited to all subsequent workshops for a wider contributions • Owiwi Dam should be included among dams that are for Irrigation. • Lagos State already develop drainage Master Plan which can be forwarded for inclusion into the Catchment Management Plan. • Shallow groundwater (Washbore) used for Agricultural and Domestic purpose is to be captured in the report. • Monitoring of the implementation is necessary after the MP. • Lagos State population should be considered in the NWRMP as all developmental plans is based on its figure. • Federal Government to establish a central body to avoid uncoordinated and scattered water resources data • O & M to be included in the Mp. • Abstractions in the coastal Areas to be regulated • Mr. President to ascent to the Bill of the NIWRMC | <ul style="list-style-type: none"> • Engr. Dimeji, EU • Sonde O, RUWATSA Ogun • Adepegba, LSME • Adenuga Fatai, OME • Akiwowo. T.A. LSWC • Engr. Okedara, OWC • Engr. Okedara, OWC |

Responses

The chairman inform the meeting that, in addition to the coordination at the federal level, coordination is also required at the Catchment level as it has been established in Hydrological Area viii (HA8). Other challenges, according to the Coordinating Director are the absence of State Water Resources Policy, Laws poor data management and capacity development. The JICA Project Team requested for Lagos State Drainage Plan for it to be included in the Plan.

Closing Remarks

After thanking the participants for their immerse contributions, the Coordinating Director remarks as follows.

- Other comments to be sent to Engr. Sunmonu's e-mail address
- Data on boreholes to be sent within 2 weeks to update the report
- Informed the participants of the next 2 meetings which will be communicated to them, and the meeting closed by 4.30 pm.

REPORT ON STAKEHOLDERS WORKSHOP FOR THE FORMULATION OF CATCHMENT MANAGEMENT PLAN IN THE 4 STATES (OGUN, OYO,OSUN AND LAGOS STATES) OF WESTERN WESTERN LITTORAL on 18th July

| | |
|------------|---|
| Venue | - Ogun-Osun River Basin Development Authority Training Hall |
| Date | - 18 th July ,2013 |
| Attendance | - Attached as annexure I |

Preamble

The meeting commenced with an opening prayer by Engr. Sokunle T.O who represented the acting Managing Director of the Ogun-Osun River Basin Development Authority.

Prior to the Workshop on 18th July, 2013, the JICA Team visited the States Ministry of Environment, Agriculture, Water Corporation and Rural Water Supply & Sanitation Agencies of the four states. The purpose of the visit is to clarify issues and more information needed to complete the report. In this regards, various water infrastructure projects in the states were visited for identification.

Remarks By Coordinating Director

As usual, he iterated the background of the project again and added that the purpose of the Workshop is to collect enough information and data for the formulation of the Catchment Management Plan. In conclusion, he requested the stakeholders to fully participated through enough interactions in order to have a robust data base for the Catchment Management Plan.

Presentations by JICA Team

Presentations were made in the following areas:

- i. Issues in Ground Water Management of HA6- Three items namely: Groundwater pollution, Sea water intrusion and Land subsidence were examined on this issue.
- ii. Surface water resources development under dual scenarios in CMP- On this, two scenarios were proposed under the basic concept, water demand (including demarcation of Surface water and Groundwater), Water supply Plan and Water Resources Development Plan. In addition to this, the presentation confirmed that;
 - Lagos State has its own water supply master plan
 - Lagos State uses its own population data and projection
 - Methodology and parameter for existing municipal water demand is different from that used in MP2013.
- iii Recommendation from flood subsector- The scope of this presentation is Rivers and Nigerian Settlement, Flood issues in HA-6, Erosion issues in HA-6 and recommendations.
- iv Irrigation and Drainage- This consist of:
 - Current status of Irrigation & Drainage
 - Irrigation Development Plan
 - Projection of Water Demand

Comments and Contributions

Following the presentation made by JICA Team, comments and contributions were made by the participants and the highlights are as detailed.

| Contributions/Comments | Remarks |
|---|---|
| <ul style="list-style-type: none"> • Aquatic weeds in Nigeria's natural water bodies should be eliminated for effective fishing • Only Large & Medium scales Irrigation were considered in the presentation, inspite of the low concept of irrigation in the west compare to that of North. Small scale should be encouraged. • JICA to assist more on capacity building for the Catchment Management Plan especially for the Hydrologist to avoid inaccurate data readings. Yelwa River | <ul style="list-style-type: none"> • Awoyemi, A OMA • Engr. RAK Jimoh NIWRMC • Eduku .P LSWC |

| Contributions/Comments | Remarks |
|--|--|
| <p>should be “Yewa River”.</p> <ul style="list-style-type: none"> • Lower Ogun Irrigation scheme is at Ogun State and not Oyo State. Also Asa Irrigation scheme is at Oyo, not in Osun State. “Ilero” not “Irelo” These are to be effected accordingly. • Water Laboratories are to be carried along for both Surface and Groundwater Analysis and needed to be equiped • Lagos State population should be considered in the NWRMP • How does desalination of lagoon water becomes an option for water use and why is nitrate level in semi-protected well highest? • What is the best scientific option for groundwater aquifer location? And how good is the electrical method in the exploration of groundwater. | <ul style="list-style-type: none"> • Engr. Braimoh, OORBDA • Lawal S B OGSEPA • Abiola A LSMA • Olaniyan.L ASEPA |

Close remarks

In a closing remark by the Coordinating Director, Engr. RAK Jimoh, he requested each state to provide its own projected water demand up to 2030 and make it available to the Commission by 26th July, 2013. This will be incorporated into the Catchment Management Plan. The projection should be both rural and urban water demand. The meeting was closed by 4.30pm.

REPORT OF ONE DAY WORKSHOP BETWEEN THE FEDERAL MINISTRY OF WATER RESOURCES AND REPRESENTATIVE OF JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) ON THE PROJECT, REVIEW AND UPDATE OF NATIONAL WATER RESOURCES MASTER PLAN PHASE 3 – CATCHMENT MANAGEMENT PLAN FOR SOKOTO- RIMA BASIN (HA-1) HELD AT IMMACULATE HOTEL, ABUJA ON 3RD JULY, 2013

1. INTRODUCTION

The Federal Ministry of Water Resources and Japan International Cooperation Agency (JICA) held a one day Workshop at Immaculate Hotel, Abuja on 3rd July, 2013 on the Project, Review and Update of National Water Resources Master Plan for Sokoto-Rima Basin (Hydrological Area -1). The Workshop was essentially for the participants from Hydrological Area HA-1 to identify challenges/constraints of Water Resources Development and Management in the Catchment Areas.

2. The Workshop was attended by the Coordinating Director, NIWRMC, Director (Authorization), the representatives of Hydrological Area HA-1 comprising of Kastina, Kebbi, Sokoto, and Zamfara, as well as States Ministries of Water Resources and State Water Corporation. Also in attendance were Staff of Federal Ministry of Water Resources, Nigeria Water Resources Management Commission (NIWRMC), Nigeria Hydrological Services Agency and Gurara Water Management Authority.

3. Opening remarks by Project Director, Mrs. L. D. Bagaiya

The Project Director, Mrs. L. D. Bagaiya was represented by the Project Manager, Engr. R. A. K. Jimoh, Coordinating Director, Nigeria Integrated Water Resources Management Commission. In his remarks welcomed participants and briefed them on the Project background, and also informed them that the Workshop was to provide the necessary information/data gaps required from the Hydrological Areas.

On this note, he advised the participants to use the opportunity provided so as to fill the missing information that would enrich the Master Plan document.

Concluding, he wished participants a fruitful discussion

4. Brief Presentation by JICA Experts Team on Surface and Ground Water Resources Potentials

The JICA Experts Team did a brief presentation on the above topic.

-Surface water by Kitamura Tadanori while Ground water was by Nakamura Hiroshi

5. Comments and Observations on Water Resources Development and Management

After the Presentation by the Japan International Cooperation Agency (JICA) expert Team, Comments were raised by representatives of Hydrological Area (HA- 1) comprising Kastina, Kebbi, Sokoto and Zamfara as well as other participants as follows:

6. Challenges/Constraints

- i. Lack of adequate data base and collection framework;
- ii. Obsolete equipment;
- iii. Lack/absence of Policy and Legislation in the Water Sector;
- iv. Inadequate funding;
- v. Lack of coordination by different Ministries, Departments and Agencies of Government;
- vi. Lack of Spare Parts;
- vii. Absence of quality Personnel;
- viii. Problem of Raw Water quality;
- ix. Absence of active public participation;
- x. Lack of capacity of building, Training and Research development;
- xi. Non-remittance of water rates by Institution of Government;

7. Contributions/Suggestions

- i. There is need to improve Agricultural practices within the Hydrological Areas;
- ii. Institutions within the HA should embrace Catchment Management approach;
- iii. Afforestation should be undertaken to prevent incessant siltation/ sedimentation in the areas;
- iv. There is need for public participation in order to proffer solution;
- v. Policy framework and Legislation should be institutionalized;
- vi. Political will is necessary at all levels of Government for the States to see the need to pay for water rates.

8. Closing Remarks_

The Coordinating Director, Engr. R. A. K. Jimoh of the Nigeria Integrated Water Resources Management Commission (NIWRMC) thanked participants for their useful contributions and active participation at the Workshop. Therefore, he expressed hope that Comments raised would be noted and incorporated in the Review and Update of the Water Resources Master Plan. On this note, he wished participants safe journey to their respective destination. The Workshop was closed at 4:45 p.m.

**REPORT OF THE SECOND ROUND OF THE TECHNICAL CONSULATIVE WORKSHOP
FOR HA1 STAKEHOLDERS FOR THE PROJECT FOR REVIEW AND UPDATE OF
NATIONAL WATER RESOURCES MASTERPLAN/JICA, HELD AT HAMONIA HOTEL
ON THE 23TH JULY, 2013**

1. Introduction

The Federal Ministry of Water Resources/Japan International Cooperation Agency (JICA) on the Project for Review and Update of National Water Resources Master plan held a second round of technical consultative National Stakeholders Workshop for Hydrological Area 1 (HA1) for draft Water Resources Master Plan at Hamonia Hotel 23th July, 2013.

The programme commenced at 10. 40am with an opening prayers.

2. Attendance

The workshop was attended by the project Director, Mrs. L. D Bagaiya, who was ably represented by

Mr. Deputy Dir Jeosph O Birdling, Deputy Dector Planning and the Project Manager Engr. R. A. K. Jimoh, JICA Team and stakeholders from HA1 which includes Sokoto, Zamafara, Kebbi and Katsina.

Others include Nigeria Integrated Water Resources Management Commission, State and counterpart staff.

3. Opening Ceremony

3.1 Welcome Address by the Project Director

The Representative of the Project Director Mr. Jeosph O Birdling, apologized for starting the meeting late and for the project Director's inability to be at the workshop as she was away for an official assignment he presented her welcome address, in her remarks she mentioned that this is the second round of technical consultative workshop. She reminded participants from Hydrological Area 1, that today's workshop is to enable participants provide available information and data on the water demand projections to the JICA Team if it differs from what was earlier proposed in Master Plan of 2013 and the need for modification of existing data.

Furthermore she employed the stakeholders to make positive contributions and make available to the JICA Team relevant data that would facilitate the formulation of the Catchment Management Plan; she wished all the participants fruitful deliberations.

3.2 Welcome Remarks by the Project Manager Engr. R. A. K Jimoh

The Project Manager briefed The Stakeholders from HA1 on the summary of the stakeholders workshop held in HA6, he informed that it was mainly field visits and curtsey calls in each of the four states which includes Lagos, Ogun, Oyo and -----and a workshop in Ogun state on the 18th July, 2013 which was attended with 72 registered participants. The workshop was the second in the series of three such meetings, it was earlier mentoned that the JICA Study Team will be holding technical consultative workshops for HA1 and HA6 to enable the team collect more information and data and validate the work done and presentations were made similar to the ones been organized today. The presentations were exhaustively discussed gross scenarios in Catchment Management Plan.

Furthermore he informed stakeholders in HA1 that Lagos State has a water supply masterplan with a projection up to 2020, it was agreed that the projection should be extended to 2030 to align with the projection of 2013 master, copies were made available to JICA Study Team and the Federal Ministry of Water Resources.

It was observed from the workshop for HA6 that there were variations in the compositions of Ministry's dealing with water resources and management in that catchment; it is only Oyo state that has Ministry of Water Resources.

It was agreed that any state that has water supply master plan should submit to the JICA Study Team on or before 28th July, 2013.

4. Paper Presentations

The under listed papers were presented by the Project Director, Project Manager and Counterpart staffs to the Project as follows:

- Municipal Water Supply Plan in CMP – Water Demand Projection
- Sanitation Plan and Water Demand proposed Plan in the draft MP 2013 and possible modification in CMP.
- Irrigation and Drainage Plan and Water Demand – Proposed Plan in the draft MP2013 and possible modification in CMP.
- Surface Sources Development – Proposed Plan in the draft MP2013 and possible modification in CMP.
- Ground Water Sources Development Proposed Plan in the draft MP2013 and possible modification in CMP.
- Flood Management in Nigeria and Discussion on Problems and issues I HA1
- Water Environmental Management in Nigeria and Discussions on Problems and issues in HA1.

5. Comments/Observation

After the paper Presentations by the Counterpart Staff, comments/observations were raised as follows:

6. Reports on Water Supply Master Plan in HA1 States

The Project Manager asked the stakeholders of HA1 states that have water supply master plan with projection to be submitted to the JICA Study Team, but it was discovered from the discussion's that non of the states in HA 1 has the water supply masterplan and if the states are doing anything as regards water supply master plan.

He further asked to know if the states in HA1 have water resources management ministries and what the states are doing.

RUWASSA Katsina

The participant from

7. Conclusion

The four states in HA1 have no water supply master plan, because of this the JICA Study Team will use scenario 1 (Water Resources Masterplan of 3013 with base year 2010) for the preparation of Catchment Management Plan. The Project Manager asked the present to inform the HA1 states that are not present about the decisions taking. Further more the states that were not present were asked to send their water supply masterplan to the JICA Study Team if any on or before 25th July, 2013, he concluded by seeking further cooperation from the stakeholders in HA1 and that the attendance was poor.

Closing Remarks

8. Closing

In the absences of more comments/observations the workshop came to an end at 4.00p.m.

MINUTES OF FGN/JICA WORKSHOP ON THE PRESENTATION OF THE FRAMEWORK FOR THE DEVELOPMENT OF CATCHMENT MANAGEMENT PLAN FOR HYDROLOGICAL AREA 1 HELD AT IMMACULATE SUITES & APARTMENTS EXTENSION, NO 24 LOBITO CRESCENT, OFF ADEMOLA ADETOKUMBO CRESCENT, WUSE II, ABUJA ON 26TH SEPTEMBER, 2012

A. PROCEEDINGS

| S/NO | Issues |
|------|---|
| 1 | <p><u>Opening</u></p> <p>The meeting commenced at 10:10 am with Engr. R. A. Aliyu representing the Coordinating Director of NIWRMC as Chairman. In his welcome remarks, Mr. R.I. Idialu who also represented the Project Director-Mrs. L.D. Bagaya officially welcomed the participants to this very important workshop which is aimed at streamlining the framework for catchment management plan for Sokoto-Rima Basin. He noted that this event represents an important milestone in the development of the Nation's water resources potentials. He expressed his confidence on the timbre and caliber of core professionals in the water sector and enjoined them to make robust contributions after the presentation of the Framework of the Catchment Management Plan by the JICA Project Team. He expressed his appreciation to JICA for their immense support they have been providing to Nigeria and indeed to Federal Ministry of Water Resources. Finally, he opined that as we deliberate today, adequate water supply and sustainable sanitation will attain appreciable level throughout the country in no distant future. He later thanked the participants and wished them fruitful deliberations. In a related development. Engr. R. Aliyu conveyed the goodwill message of the CD-NIWRMC stressing on the importance of the assignment today. He observed that this is a forerunner to the planning and management of the water resources of the basin. On behalf of the Coordinating Director, he wished the stakeholders fruitful deliberations.</p> |

| S/NO | Issues |
|------|---|
| 2 | <p><u>Presentation of the Framework of Catchment Management Plan for Hydrological Area 1 by Mr. Watanabe</u></p> <p>Prior to the commencement of the presentation, the Team Leader-Mr. Watanabe informed the stakeholders that this workshop is the second in the series of planned workshops for this Hydrological Area. He noted that today's meeting signals the last participation by the JICA Project Team and hoped that the meetings will continue subsequently.</p> <p>Thereafter, he gave a vivid outline of the presentations which focused on the following:</p> <ul style="list-style-type: none"> ▪ The target area and composition of HA 1 ▪ Purpose of the Catchment Management Plan which according to him should be to act as a guideline and implementation plan to realize the water resources potentials of the area based on 2E and 3S Principles (2E: Efficiency and Equitability, 3S: Sufficiency, Sustainability and Safety) ▪ Water Policies & Strategies and Concept of IWRM ▪ Projection of Future Water Demand ▪ Water Balance between Demand and Supply ▪ Water Resources Development Plan including dams and wells ▪ Water sub-sector development plan including water supply, irrigation etc. ▪ Water resources management plan (Institution, O&M, Water Allocation & Regulation, Monitoring & Data Management) ▪ Implementation Programme and Evaluation of CMP |
| 3 | <p><u>Clarification of Current Institutions for Water Resources in HA 1 and Proposal for Institutional Improvement by Engr. K. S. Sunmonu.</u></p> <p>As a prelude to his presentation, Engr. K.S. Sunmonu thanked the participants from HA1. He informed the stakeholders that on this project, there are a number of experts working on different aspects and that Mr. Yamazaki who is the institution expert prepared this institutional framework based on the discussions held at the Ministry level. He recalled that similar workshop was held in the past where institutional issues such as the actual stakeholders in HA1 were articulated. He later outlined the institutional framework for water resources development and management at both Federal and State Levels. He went further to define the specific roles and responsibilities of all key stakeholders involved in the water resources management of HA 1. He further identified the key issues/ problems in WRM of HA1 to include:</p> <ul style="list-style-type: none"> ▪ Lack of Water Resources Policy and Strategies especially in Sokoto State ▪ Decentralized Water Resources Management ▪ Multiplicity of Agencies at all tiers of government pursuing uncoordinated water agenda ▪ Lack of decentralization at CMOs Level ▪ Weak legal and policy framework for the basin ▪ Uncertainty of Water Regulation ▪ Absence of a statutory basin-wide organization to coordinate the implementation of catchment strategies and to harmonize state policies ▪ Lack of inter-sectorial coordination ▪ Stand-alone nature of Agencies in the execution of water resources agenda ▪ Overlapping of responsibilities in the existing laws across the different institutions ▪ Unclear mandates/ fragmented institutional arrangements ▪ Lack of data/ data management ▪ Poor public/ women participation in WRM ▪ Weakness of RWSS Departments at LGA level ▪ Insufficient Manpower and Lack of capacity development for new employees ▪ Low capacity for maintenance of water facilities ▪ Lack of IWRM capacity at catchment level etc. |

| S/NO | Issues |
|------|--|
| | <p>Having identified these problems, he went further to state that the CMP will propose series of measures aimed at resolving these challenges. Some of these proposals are :</p> <ol style="list-style-type: none"> 1. The need to create comprehensive institutional frameworks (Systems) responsible for the implementation of CMP 2. Strengthening the institutional capacity of NIWRMC and CMOs for integrated basin management system 3. Decentralization and Integration of state and federal level institutions 4. Promotion of Joint Management practices for inter-state water issues 5. Enforcement of Regulatory system of the river basin 6. Creation of CBOs 7. Strengthening of RUWASSAs 8. Institutional reform for the public irrigation management authorities 9. Creation of new unit or department within FMWR for WRM at State Level 10. Development of data sharing protocols amongst states 11. Dissemination of national water policy, Water Resources Master Plan, CMP and other Legislation in consultation with the PR Unit of FMWR 12. Organize programmes, workshops and seminars on the role of water in the society 13. Develop cost effective water services using the private sector 14. Creation of PPP Unit at State Level 15. Project for Capacity Development at Catchment Level |
| 4.0 | <p><u>Comments, Questions and Suggestions Arising from the Presentation by Participants</u></p> <p>4.1 Name: Engr. Ibraahim Gado Designation: Deputy Director Water, Ministry of Rural Development, Sokoto State Comments: There is a lot of Duplication of responsibilities in Sokoto State concerning the supply of water through Ministry of Rural Development, Ministry of Agriculture, IFAD, Ministry for Local Government and other donor agencies. An advocacy should be carried out to harmonize the operation of water management in the state.</p> <p>Name: Dr. Ibrahim Natatu Designation: Director, Irrigation Engineering Services, Ministry of Agriculture, Sokoto State Comments: There is need to extend the data sharing platform amongst the states to the neighboring countries such as the case being currently practiced between Sokoto state and Niger Republic</p> <p>4.2 Name: Engr. N.D. Madu Designation: AD (Dams & Hydropower, FMWR) Comments: Cautioned that on the area of information sharing, utmost care should be exercised as there are bi-lateral and multi-lateral agreements signed by Federal Government and other neighboring countries.</p> <p>Name: Engr. R. A. Aliyu Designation: NIWRMC Comments: There is need to expand the scope of stakeholders inventory to include the water users, civil society organizations, private sector and the legislators (the senate, House of Reprs, State houses of Assemblies and their respective committees on water resources.</p> <p>4.3 Equally, the CMP should take into account water issues in HA1 which includes flooding, pollution of water courses, underutilization of dams/ reservoirs spread across the catchment and desertification</p> <p>He finally opined that NIWRMC is solely responsible for coordination and regulation of water resources in all the catchments across the federation and as such, creation of a</p> |

| S/NO | Issues |
|------|---|
| 4.4 | <p>new unit in the Ministry may not be necessary.</p> <p>Name: Nasiru Muazu Designation: Director Water, Sokoto State water Board Suggested that FMWR should try and sensitize the legislators towards the speedy passage of the water law so as to minimize or eliminate conflicts and overlapping of responsibilities by sector stakeholders/ agencies. This according to him will curtail taking over of some of the functions of FMWR by the some newly created agencies.</p> <p>Name: Engr. Ekanem Nyanaso Gabriel Designation: Institutional and Policy Expert, EU-WSSSRP Comments: Legislators should be involved in discussions on water resources management to ensure that all laws are consistent There is need for M& E Framework that links all monitoring data to one repository. Planning, Research and Statistics Unit should be empowered to manage data related to WRM. Data management protocol should include emergency data management for trans-boundary communications.</p> |
| 5.0 | <p><u>Plan on Stakeholder Meetings for Water Resources management for HA 1 by Engr. K. S. Sunmonu</u></p> <p>The last aspect of the presentation focused on the plan for future stakeholders meetings in HA 1. According to him, the methodology is to develop a three phased approach which encompasses information sharing spanning from January 2014- July 2014, followed by stakeholders meetings and workshops which will run between August 2014-April 2015. Afterwards, the actual implementation of CMP and monitoring /revision of the plan will follow suit as from May 2015. This will involve paying of courtesy calls to commissioners, permanent secretaries and heads of government institutions to introduce and distribute draft CMP and the new National Water Resources Master Plan. Equally, technical consultative meetings and stakeholders workshops will be organized to finalize the final CMP for HA 1. Instructive at this stage is the proposal for the formation of state IWRM committee and CMCC in HA 1.</p> |
| 6.0 | <p><u>Discussion/ Clarification on the Proposal for Institutional Development in HA 1:</u></p> <p>At this juncture, participants focused discussions on the institutional development in the basin. Topical amongst issues discussed is the high turbidity of Sokoto-Rima River System which was highlighted in the previous meeting. As a matter of serious concern, Engr. Sani Mustapha Gusau of Zamfara State Water Board presented a raw water sample to the participants to drive home this point. According to him, this problem was brought to the fore in the previous meeting but nobody has proffered solution to it. This elicited several reactions on the floor with Engr. Ibrahim Gado of Sokoto State Ministry of Rural Development suggesting that the problem can be remedied with the aid of Jar Test and use of appropriate coagulant/ flocculants after determination of the PH. Mr. Adetunji Idowu of FMWR was of the opinion that the problem could be referred to either NWRI or the National Water Quality Laboratories for further research on the matter. According to him, these agencies of Government possess the requisite technical skills and expert knowledge on water quality problems across the country.</p> <p>In a related development, Mr. Ekanem Nyananso Gabriel (Institutional and Policy Expert, WSSSRP) observed that data on water quality, water level (ground water) and stream flows should be gathered at rural, small towns and regional levels to a central portal to guide policy, research and statistics. Also, Mr. Mohammed Dikko who is an environmental specialist at Katsina State Fadama III Project noted that Katsina State experienced a lot of flooding in the recent past. This according to him might be due to siltation of water bodies and high amount of rainfall in recent times. He recalled an incident where 25 people lost their lives when a bridge collapsed due to heavy rainfall in Charanchi LGA. He suggested that FMWR and the relevant agencies concerned should</p> |

| S/NO | Issues |
|------|--|
| | <p>carry out a comprehensive study in order to finding a lasting solution to this menace.</p> <p>Equally, Dr. Abubakar Natatu of Sokoto State Ministry of Agriculture informed the participants that he was the Chairman of the committee set up by SRRBDA to determine the problems of Rima River flows from Goronyo Dam down to the confluence of River Rima and Niger River at Yuna. He promised to make a copy of the report to JICA and advocated for the promotion of programmes to normalize the flows of river systems within the catchment. Finally, Nasiru Muazu of Sokoto State Water Board suggested that future advocacy visit should include visit to state governors and speakers of house of assemblies.</p> |
| 7 | <p><u>Remarks by EU-WSSSRP</u></p> <p>The representative of EU-WSSSRP in Nigeria informed the participants that EU is working with Enplan Group on a World Bank Project at Sokoto –Rima River System and Bakalori Irrigation System and hoped to partner closely with JICA or anybody who is interested in the project.</p> |
| 8 | <p><u>Contribution from JICA-Nigeria Office</u></p> <p>Speaking on behalf of JICA Nigeria Office, Mr. Dele Olatunji emphasized on the need for wider stakeholder participation in subsequent workshops. He stressed that the much needed goal of achieving ownership of the proposed CMP can only be actualized if sector stakeholders are involved at conception stage and are adequately represented.</p> |
| 9 | <p><u>Closing Remarks</u></p> <p>In his closing remarks, Engr. R. A. Aliyu noted that there is need to carry out more stakeholder education as part and component of capacity building where the political leadership will be enlightened in issues of IWRM. He welcomed the partnership extended by EU to JICA and advocated for more stakeholder participation especially the water users, the civil societies and the private sector that according to him constitute the major driving force in WRM in any catchment.</p> |
| 10 | <p><u>Closing Prayer</u></p> <p>The meeting came to an end at 2.38pm</p> |

REPORT ON STAKEHOLDERS ON WATER RESOURCES IN 4 NOS. STATES OF WESTERN LITTORAL (LAGOS, OGUN, OYO & OSUN STATES) AND WORKSHOP FOR FORMULATION OF CATCHMENT MANAGEMENT PLAN IN THE 4 STATES.

- i) **Attendance-** The list of attendance in each state is attached as annex A.
- ii) **Venue-** Ogun-Osun River Basin Development Authority Training Room, Abeokuta.
- iii) **Time-** The meeting started at about 10 am.

Welcome Remarks by the Managing Director OORBDA

Engr. Bayo Alayande, who is the Managing Director of OORBDA appreciate the JICA Project Team for their contribution to National Development and informed the meeting on the importance of the Catchment Management Plan. He also made it known that the JICA report should be given consideration for any Water Resources Planning and Development, after completion. In his remarks, reference was made to the similar job carried out Tahal Consultant in 1992 and this has formed the basis for any Water Resources Planning and Development in Ogun-Osun Basin. Remarks were concluded by imploring the meeting to give maximum support and cooperation.

Opening Remarks the Coordinating Director (NIWRMC)

Short Address by the JICA Representative from Abuja

The JICA Representative, Mr. Dele Olatunji commended the participants for their immerse contributions from the inception of the project in 2011 and despite the project is going to an end, he solicited for continuous support of the stakeholders when the needs arise. Further to this, he sought for full implementation of the report which can be achieved through a continuous stakeholders meeting in the Basin.

PRESENTATIONS

The following papers were presented at the Stakeholders meeting;

- Framework of Catchment Management Plan for Hydrological Area VI (HA6), by JICA Project Team.
- Development Plan for Demand Scenario-B, by JICA Project Team.
- Current Institutions for Water Resources Management in HA6 West and proposal for improvement, by NIWRMC.
- Plan on Stakeholder meeting for Water Resources Management in HA6, by NIWRMC.

HIGHLIGHTS OF PRESENTATIONS

Framework of Catchment Management Plan for Hydrological Area VI (HA6), by JICA Project Team.

The scope of the presentation it includes;

- iv) Purpose of Catchment Management Plan for HA6
- v) Water Policies & Strategies and Concept of IWRM
- vi) Contents of Catchment Management Plan for HA6

Development Plan for Demand Scenario-B, by JICA Project Team

The scope includes;

- vii) Dual Scenarios in CMP
- viii) Demand Projection of Municipal Water Supply (Scenario A&B)
- ix) Water Demand Structure for each scenario in Lagos, Ogun, Osun and Oyo.
- x) Water Demand Structure for scenario B
- xi) Options for additional water sources.
- xii) Available Water volume (90% year dependable)
- xiii) Potential significant Dan sites identified in Master Plan in 1982 for Ogun-Osun Basin.
- xiv) Priority water supply scheme to be considered.
- xv) Recommended Project for Scenario B.
- xvi) Necessity of Coordinated Operation of facilities for effective use of water in the Basin (Ogun & Osun Rivers)

Current Institutions for Water Resources Management in HA6 West and proposal for improvement, by NIWRMC.

The institutions are;

- i) Federal Level Institutions
- ii) State Level Institutions
- iii) LGA Level Institutions
- iv) Others are; Academic and Research Institutions, Private Sectors, Community Based Organizations and External Support Agencies.

Comments and Contributions

Following the presentation made, comments and contributions were made by the participants and the highlights are as detailed.

LAGOSSTATE

| Contributions/Comments | Remarks |
|---|---|
| <ul style="list-style-type: none"> Pollutant source in the Catchment should be identified in addition to comprehensive inventories of all industries and manufacturing companies for effective monitoring of the effluents and pollution control. Needs to strengthen collaboration within Federal, States and Local Governments. | <p>Olanigan K. U, MRD, Lagos</p> <p>Rufai D. A MP&UD, Lagos</p> |

Response

In response to the comments and contributions made by the participants, collaboration among Federal, States and Local Governments has been strengthened and has yielded good result especially on flood control.

OGUN STATE

| Contributions/Comments | Remarks |
|--|--|
| <ul style="list-style-type: none"> Regulation of groundwater abstraction was excluded from the presentation and which organization is responsible. Gauging stations was not highlighted in the presentation as tools necessary for collection of water resources data. | <p>Engr. Tomi. O OSWC</p> <p>Sonde. O.O, RUWATSA, Ogun</p> |

Response

JICA Team responded that issues raised above has been mentioned and recommended during the 2nd phase of the project (Review and Update of National Water Resources Master Plan).

OYO STATE

| Contributions/Comments | Remarks |
|---|--|
| <ul style="list-style-type: none"> Final Report on the CMP should be made available to the National Planning Commission in Abuja. JICA to recommend Eleyele Dam for provision of portable water supply in Oyo State | <p>Akindele A.O, Planning & Budgeting, Oyo State</p> <p>Akinde N.P, Economic Planning Oyo State.</p> |

Responses

In response, Engr. K.S Sunmonu said that National Planning Commission has always on the invitation list for Stakeholders meeting and Final Report will be made available to all the Stakeholders.

OSUN STATE

| Contributions/Comments | Remarks |
|--|---|
| <ul style="list-style-type: none"> Institutional support has not been mentioned in the presentation and what extent can they support in terms of equipment provision and infrastructural development. Osun State Environmental Protection Agency was omitted from the presentation. Also the quality control and Monitoring & Evaluation was not captured. | <p>Agbeja O.J RUWESA, Osun State</p> <p>Ibrahim F.A, RUWESA, Osun State</p> |

Response

JICA Team responded that issues raised above has also been mentioned and recommended during the 2nd phase of the project (Review and Update of National Water Resources Master Plan).

Closing Remarks by CD, NIWRMC

After thanking the participants for their immense contributions, the Coordinating Director promised the distribution of the soft copies to all participants and solicit for more cooperation and the meeting closed.

REPORT OF THE JICA NATIONAL STAKEHOLDERS MEETING AND SEMINAR ON PRESENTATION OF DRAFT FINAL REPORT OF THE PROJECT FOR THE REVIEW AND UPDATE OF NATIONAL WATER RESOURCES MASTER PLAN, HELD IN ABUJA ON 3RD DECEMBER, 2013

- i) **Attendance-** The lists of attendance in each state are attached.
- ii) **Venue-** Chelsea Hotel, Abuja.
- iii) **Time-** The meeting started at about 10.00 am.

Preamble

The workshop/seminar was the 4th and the last in series of the National Stakeholders workshops in Abuja to conclude the three year duration of the Master Plan Project. Participants from relevant Ministries Department and Agencies were invited from all the 36 States of the Federation and FCT.

Opening Remark

Shortly after the members of the high table took their sit, the opening prayers was said and followed by the opening remarks by the representative of the Permanent Secretary, Federal Ministry of Water Resources, Director Special Duties FMWR, Mr. Femi Odumosun, this was followed by Good will messages from Ambassador of Japan in Nigeria, JICA Chief Representatives in Nigeria and the Key note address by the Representative of the Honourable Minister ,Director Human Resources gave the Key note address by the Honourable Minister.

Highlights of the Opening Remark

The Permanent Secretary remarks that:

- i) The meeting is to consider report for the Review and Update of National Water Resources Master Plan, 2013 for developmental plans, utilization plans and management plans of the Nation's water resources.
- ii) JICA support for the project was solicited by FMWR to reposition the water sector in line with the Nation's vision 20-2020 and MDG goals.
- iii) The Project commenced in August and was executed in phases namely: a) Collection of data and clarification of issues among others, b) Development of new NWRMP and c) Development of Catchment Management Plan in two Hydrological Areas (HAs) of the Country i.e Niger North (HA1) and Western Littoral (HA6).
- iv) Result of the 3rd phase (CMP for HA1 and HA6) will also presented for scrutiny to enable JICA Team produce final NWRMP 2013.
- v) The CMP for HA1 and HA6 are still at draft stage and Stakeholders from the basins are to continue the process till the final agreement is reached.
- vi) The Permanent Secretary appreciate the Government of Japan and JICA Team for their support and commitment to the Project and promised to make reference to the developed plan for any water resources development.

Highlights of the Keynote Address

In the key note address, the Minister representatives highlighted the following about the Master Plan Project to;

- i Ensure standardization in water resources development
- ii Harness the hydropower generation potentials for improved electricity generation and to mitigate the effects of climate, flooding, erosion, draught and desertification.
- iii Ensure coordinated and sustainable management of Nation's water resources for national development.
- iv Develop irrigated agriculture for increased food production for the attainment of food

- security.
- v Avert the indiscriminate water infrastructure development in Nigeria.
- vi Implement the transformation agenda of the present administration for the attainment of vision 20-2020, MDG and Africa Water Vision in 2025 through an integrated plan of water resources.

Additionally, participants were requested to fully contribute to the document after presentation. The Honourable Minister also appreciated the support of Japan Government and JICA Team towards having a comprehensive policy document that will guide the country in water resources development. Finally, in the address the Ministry promised to establish a Unit to promote and monitor the implementation of the Master Plan for effectiveness.

Goodwill Messages

In his goodwill message, the JICA Chief Representative on the Project, Mr. Seki Tetsuo congratulated the Honorable Minister and the Permanent Secretary of Water Resources, and all relevant Stakeholders from both Federal and States Agencies for the success of the project. In general he stated that;

- JICA support in water sector of Nigeria was since 1980s with Lower Anambra Irrigation Project under the JICA grant Aid scheme. This is followed by Development of NWRMP in 1995 and now the Review and Update Project.
- JICA assistance in water sector has been extended to ten States of the country with amount valued at over 2 Billion Naira under Grant Aid scheme.
- National Water Resources Institute has also benefited through capacity building for rural water supply and sanitation. Other assistance are in Lagos and FCT.
- Water is essential for the development of MDGs
- The Master Plan 2013 document is reliable for National Development, considering the data collected and critically analyzed.
- Ministry of Water Resources to strictly follow the plan as scheduled for any water resources development by playing a central role among relevant MDAs
- Promote meaningful dialogue among various levels of stakeholders from states to Local Governments and also encourage Development Partners to incorporate the Master Plan in their Projects.

PRESENTATIONS of Water Resources Management in Japan and Nigeria

The presentations were made on the following

- i ***Integrated Water Resources Management and Development in Japan***- This was presented by Mr. Masanori Yamazaki of JAICA and it cover the following areas;
- The history of increased water use and the countermeasures.
 - Water Resources policies for rapid increased of water demand which consist of basic policies for integrated development and use of eater resources (Designation of regions under policy and National government's basic plan for water right of rivers nationwide).
 - Water Resources promotion law (1961).
 - Prioritizing projects in designated river systems (Plan for Water Resources Development stipulates demand forecast and supply targets for 7 designated river systems on the basis of W/E Development Promotion Law, following a cabinet decision.
 - Process for achieving the consensus among stakeholders (All related MDA).
 - Related issues of WRM (Adverse effects of economic growth i.e Ground subsidence and water pollution).
 - Related Laws (Land improvement, Waterworks, Industrial water, National development and Multipurpose Dam Laws).
 - Integrated Water Resources Management (IWRM).
 - Organisation and roles of Japanese government in Water Resources.

- Coordination between Central and Local Government.
- ii) The Water Resources Development and Mangement of Nigeria was presented by Director Dams and Reservoir Operation. Dr.E.A Adanu
- iii) There after Counterpart Staff on the Project made presentation in form of seminar on the work done to date on the *National Water Resources Master Plan project as scheduled on the agenda of the workshop in the following order*
- Introduction
 - Evaluation of Water Resources potentials
 - Projection of Water Demand
 - Water Resources Development (Groundwater & Surface water)
 - Water supply
 - Sanitation
 - Irrigation & Drainage
 - Water Resources Management Plan
 - Implementation and Evaluation of M/P 2013
- iv) ***Catchment Management Plan of HA-1 & HA-6***

The Catchment Management Plan aiming at realizing the water management guidelines and approach of proper delivery of water services to meet the water user's needs on the basis of 3Ss and 2Es by using the facilities and operation systems prepared by governments and private sector.

Strategic Issues of Water Resources Management and Development in the HA-1 and HA-6

- Water Resources Management Development
- Operation Rate of Water Supply Facilities
- Promotion of Irrigation Development
- Effective Utilization of Existing Water source facilities
- Enhancement of Water-related Data/Information anf its uniform management
- Consideration of increasing risk on water resources
- Management of important rivers and flood plains
- Water quality monitoring
- Institutional development & Strengthening of water resources management

Summary of Findings in HA-1

| State | Summary |
|----------------|---|
| Katsina | No enough irrigation water source as municipal water is prioritized |
| Zamfara | Existing Gusau Dam cannot supply enough water. New Dam is proposed for Gusau |
| Sokoto & Kebbi | The existing Goronyo and Bakolori dams can supply enough water for the expected demand for 2030. There is excess volume of water in these dams. The optimum use of the excess water should be considered as below: <ul style="list-style-type: none"> • Controlled flood for enhancing the river environment • Recharge to groundwater |

Summary of Findings in HA-6

| State | Summary |
|-------|--|
| Lagos | Scenario-A: Water can be supplied by the existing dams. Scenario-B: Additional water source should be developed as below: |

| State | Summary |
|-------|--|
| | <ul style="list-style-type: none"> • Construction of two new dams is proposed tentatively. • Study on water quality of the lagoon is recommended for desalination |
| Ogun | Some local water sources in Ogun State cannot supply water stably. It is recommended to construct new dams. |
| Oyo | <p>Scenario-A: the construction of the proposed Odedele dam is necessary to meet the future water demand in Ibadan.</p> <p>Scenario-B: construct a new dam in Oyo State is recommended to meet the future water demand in Lagos.</p> |
| Osun | <p>Scenario-A: main water sources for municipal water supply can meet the future water demand in 2030.</p> <p>Scenario-B: construction of a new dam in Osun State is recommended to meet the future water demand in Lagos.</p> |

Recommendations for CMP in the target Has 1 & 6

The following recommendations were made on the Development of the Catchment Management Plan;

- Development of Catchment Management System and Establishment of CMP
- Practical Use and Periodic Review of CMP
- Implementation of Water Resources Development
- Implementation of Water Resources Management
- Steady Sound Investment

COMENTS/CONTRIBUTIONS

| | |
|--|---|
| <ul style="list-style-type: none"> • Number of boreholes (existing or newly drilled) may not meet the population projection of 2030. • Consideration to be given to scaling-up of the sanitation profile especially in rural and semi urban | RUWESA, Osun State |
| <ul style="list-style-type: none"> • What are the criteria used in selecting the states under consideration? • What is the plan to avert the mal-functioned boreholes to meet the set goals of FMWR? | Dir(Mini. Info & State Orientation) |
| <ul style="list-style-type: none"> • Due to submerged and settlement of infrastructure in the South-South region of the country as a result of oil exploitation, Report should encourage regional water scheme as it is less expensive and sustainable. • Report to encourage that every water provider such as NDDC, RBDAs EU etc to base their developmental plan on the NWRMP 2013. This is to avoid duplication, and to promote ownership and maintenance among other. • Report to recommend O & M cost at the design stage for improved project life span. • Report to recommend practice of rain water harvesting for agriculture. | HOD Planning (River State MWR&RD) |
| <ul style="list-style-type: none"> • Use of Biological toilets in urban cities should be recommended in the report to maintain zero waste environmental sustainability and for sanitation purpose. | Aba P.D (FMA&RD) |
| <ul style="list-style-type: none"> • Regional Water Scheme to be promoted instead of additional boreholes. • River State sanitation coverage figure to be checked again. • Submission from River State during the first stage of the project implementation (Data collection and clarification of issues) was not effected in the Final Draft MP. | SMWR&RD(Tech. Asst. to Hon. Comm.) Mrs. Judith) |
| <ul style="list-style-type: none"> • Since the existing boreholes presuppose the functioning ones therefore should be added together. (slide 30) | Engr. RAK Jimoh (Consultant RAKIM |

| | | |
|--|---|-----------------------------------|
| | <ul style="list-style-type: none"> • In 1995 MP, the 252 Dam sites identified presupposed developed. Hence is there anyone identified in the current exercise for construction?. (Slide 444) • There should be update of the 2007 and 2008 survey carried out (slide 56). • Report to emphasized on Optimum utilization and operation of Dam in an integrated manner. | Engineering Ltd |
| | <ul style="list-style-type: none"> • Report to encourage human capacity development for its implementation. • Encourage a wider Stakeholders participation for its acceptability and implementation. • Encourage forestry development to control flood. • Adopt 1991 population rather than that of 2006 that has been generating controversies. • Look at the effects of the three dams (Sheri, Ibafo and Mowe) to be constructed by the Ogun State Government. | D(MU& Phy. Planning), Ogun State. |
| | <ul style="list-style-type: none"> • More than one model to be considered in data analysis for reliability purpose. | Scientific officer NESREA |
| | <ul style="list-style-type: none"> • Stakeholders in Water Resources to pay more emphasis on data generation for future water resources development. | |
| | <ul style="list-style-type: none"> • Extension services to educate famers for irrigation to be recommended in the report. This will avoid under utilization of dams and generates job and wealth. | Nasarawa Agric Dev. Programm |
| | <ul style="list-style-type: none"> • Dam construction in Osun State is to meet the water need of Osun State not that of Lagos State. | Osun State WC |

Responses

Seminar presenter responded to question raised by participants and assured the participants that more information are contained in the soft copy of the report given to them during registration, the JICA Project Team told the participant that further comment should reach them before 25 December 2013 to enable them captured it in the Final Report .

Closing Remarks

The Project Manager who is also Coordinating Director of the Nigeria Integrated Water Resources Management Commission gave the vote of thanks. He congratulated the JICA Project Team for their Contributions and hard work to deliver the project as scheduled and thanked the participants for their useful contributions to the Project and requests them to contribute more when required

**ANNEX-8: Attendant List of Stakeholder Meeting of HA-1 and Ogun-Oshun Basin for
Catchment Management Plan**

**Attendant List
of
Stakeholder Meeting
of
HA-1 and Ogun-Oshun Basin
for
Catchment Management Plan**

Stakeholder Meeting on 23rd May, 2013

| S/NO | NAME | POSITION | ORGANIZATION | STATE |
|------|------------------------------|--------------------|-----------------------------------|-------------|
| 1 | Mrs L.D. Bagaiya | Director | FMWR | |
| 2 | Engr. R.A.K Jimoh | C.D/Project Manger | FMWR | |
| 3 | Engr. B.A Tunau | Director (WS) | FMWR | |
| 4 | Rev. M.I Nwabufo | Director | NIHSA | |
| 5 | Engr. Mahmud A. Gwandu | General Manager | Water board | Kebbi State |
| 6 | Sidi Yakubu | Commissioner | Min of Water | Yobe State |
| 7 | Akinde Ngozi P. | Director | Min of Economic Planning & Budget | Oyo |
| 8 | Engr. Markus L. Anga | Director | Min of Water | Kaduna |
| 9 | Engr. Adeyemi S.A | Director | Min of Environment | Lagos |
| 10 | Engr. Ibilola O.O | Director | Min of Environment | Lagos |
| 11 | Ala James C. | Director | Min of Water Res. | |
| 12 | Engr. Mrs Cecilia B. Olajide | Director | MRD | Ogun state |
| 13 | Engr. M.A . Ayanwale | Director | Min of Water | Oyo state |
| 14 | Dalhatu Musa .M. | Director | MBED | Zamfara |
| 15 | Engr. Segun | Director | | Osun |
| 16 | Engr. Osundina F.O | Director | | Osun |
| 17 | Adamu Labbo .K. | Director | ADP | Zamfara |
| 18 | Dr. Y.A. Dangwani | Commissioner | Min of Water | Kano |
| 19 | Sambo Umar Jumberi | P.S | Min of Water | Bauchi |
| 20 | Engr. Ibrahim .I. Daho | Director | Min of Water | Kano |
| 21 | Dahiru Mati | Director | Water Board | Katsina |
| 22 | Nasiru Muazu | Director | Water Board | Sokoto |
| 23 | Dubagari Abisabo | Director | Min of Water | Nasarawa |
| 24 | Engr. Jonathan Malami | Director | MWRRD | Plateau |
| 25 | Engr. Adesukami T.A. | Director | ADP | Oyo |
| 26 | Kayode Ayodele | Director | Min of Water | Kogi |
| 27 | Tolulope Akiwowo | Director | Lagos Water Corporation | Lagos |
| 28 | Ogunlana .S. Olatunji | Director | Lagos Water Corporation | Lagos |
| 29 | Engr. P.L. Mumueh | Director | Min of Water | Adamawa |
| 30 | Dr. Martin .O.Eduvie | Coordinator | NWRI | Kaduna |
| 31 | Engr. Rufai .A. Aliyu | Director | NIWRMC | |
| 32 | R.A Habu | Director | NIWRMC | |
| 33 | Bello Sani | GM(OPs) | Water Board | Zamfara |
| 34 | Muhammad Suleiman | GM(P&P) | Water Board | Zamfara |
| 35 | Ezekwo Victor | PM | RUWASSA | Anambra |
| 36 | B.J. Ajayi | Director | Water Corporation | Ekiti state |
| 37 | Oyenyi Olalere | Director | Min of Finance | Osun |
| 38 | Adegboyega S.G | D/M&E | WCOS | Oyo |
| 39 | Engr. Bamidele .O. | DOM | WCOS Ibadan | Oyo |
| 40 | Sabiu Zakari | DD | FMWR | |
| 41 | Dr. Sam Eno | DD | FMWR | |
| 42 | Adama A.P. (Mrs) | DD(Gender) | FMWR | |
| 43 | Biola Bawa | DD | FMWR | |
| 44 | S.U.D. Maigama | DD (R&S) | FMWR | |
| 45 | Engr. K. Dalha | D,CSS | FMWR/NWRMC | |
| 46 | Idowu Adetunji | DD (WS) | FMWR | |
| 47 | Engr. E.C . Eze | DD (WQ&S) | FMWR | |
| 48 | Lady E.C Ezekaka | DD | NESREA | |
| 49 | Agbeja Olawuyi | DD | RUWESA | Osun |
| 50 | I.E Bashir | DM | RUWASSA | Taraba |
| 51 | Shialsuk J.L | DD | NIHSA | |
| 52 | Adamu .I. | DD | NIHSA | |

| S/NO | NAME | POSITION | ORGANIZATION | STATE |
|------|------------------------|-----------------------|--------------------------------|---------|
| 53 | Adamu Icwami | DD | UBRBDA | Adamawa |
| 54 | R.I. Idialu | AD | FMWR | |
| 55 | Engr. K.S. Sunmonu | AD | NIWRMC | |
| 56 | Buba B.T | AD | FMWR | |
| 57 | Bassey Effiong Asukwo | AD | FMWR | |
| 58 | Charles Ikediashi | AD(M&E) | FMWR | |
| 59 | Salih A.A. | AD(Evaluation) | FMWR | |
| 60 | A.J. Alakuro | AD(P) | FMWR | |
| 61 | Susan T. Chuku | AD | FMWR | |
| 62 | Elegeale A.E. (Mrs) | AD(IPPIS) | FMWR | |
| 63 | R.A. Bako | AD | FMWR | |
| 64 | Shehu M.L | AD | FMWR | |
| 65 | Ugwu .C.E. | AD | FMWR | |
| 66 | Babarinde S.M | AD(CCU) | FMWR | |
| 67 | Engr. I.G. Ifeora | AD(CM&U) | NIWRMC | |
| 68 | E.U Oton | AD | NIWRMC | |
| 69 | Olayinka A.A | AD(Stat) | FMWR | |
| 70 | Emeka Aneke .V. (MRS) | AD | FMWR | |
| 71 | Sojину Olasunkanmi | AD | Lagos state Min of Environment | Lagos |
| 72 | Subuloye D.A. | AD(FFMC) | Fed.Min of Environment | |
| 73 | Ibrahim Dasuki .A. | AD | Katsina State Water Board | Katsina |
| 74 | Mafayeyomi .E. Olabode | Ag ED (P/D) | Benin-Owena RBDA | |
| 75 | Engr. Dr. Nwosah G.C | Ag D(CTSS) | FMWR/GWMA | |
| 76 | O. Aboyade M.A. | Engineer | NIWRMC | |
| 77 | Enyi Hycinth | ACTO | FMWR | |
| 78 | Peniel C.S (Mrs) | SEO | FMWR | |
| 79 | Ojerumu Williams | PEO 1 | FMWR | |
| 80 | Bintu Ali | Snr. Hydrologist | GWMA | |
| 81 | Ihuoma Anthony | PSO | FMWR | |
| 82 | Abdulyekeen S.O. | | NIWRMC | |
| 83 | Engr. Victor Ojiako | Asst. Engr | NIWRMC | |
| 84 | Akinnimi Felix | PAD | FMWR | |
| 85 | Jamil S. Nakwarai | ACAO (SW) | FMWR | |
| 86 | Pam J.D. | AO II | FMWR | |
| 87 | Stephen Jude | CAO (M) | FMWR | |
| 88 | Hussaini Y.A. | SSO(P) | FMWR | |
| 89 | Birma M. Usman | AO II | FMWR | |
| 90 | Popoola Maruf L. | AEO | FMWR | |
| 91 | Engr. Amodu D.A. | ACHY | NIHSA | |
| 92 | Akpa O.E. | PSO | FMWR | |
| 93 | Engr. Bello K. | PTO 1 | FMWR | |
| 94 | Waha Musliyu A. | HEO (P) | FMWR | |
| 95 | Akor O. Victor | Snr. Stat | FMWR | |
| 96 | Akinyanju Tokunbo | HEO | FMWR | |
| 97 | Engr. John Gbadegesin | Principal Hydrologist | NIHSA | |
| 98 | Engr. Wakil Bukar | Consultant | FMWR | |
| 99 | Ogunro Yewande | Geologist | FMWR | |
| 100 | Engr. Anthea O.U | Irrigation Engr. | FMWR | |
| 101 | Ogbonna K.E. | SHG | FMWR | |
| 102 | Engr. N.D. Madu | DRO | FMWR | |
| 103 | S.S Lawal | CAO(P) | FMWR | |
| 104 | Engr. L.C Yarima | P.E | FMWR | |
| 105 | Kelani A.W. | SAO | FMWR | |
| 106 | Odu Mercy | ACSO | FMWR | |
| 107 | Galadima A.L. | CHG | FMWR | |

| S/NO | NAME | POSITION | ORGANIZATION | STATE |
|------|-------------------------|---------------------------|-----------------------------------|-------|
| 108 | Dr. Alayande .A. Waheed | Head L&W, R&D | NWRI | |
| 109 | Dr. Ben Aneke | HOD (Hydrology) | Anambra-Imo River Basin | |
| 110 | Ipinlaye .O. | | NIWRMC | |
| 111 | Engr. Ogunnubi Adekunle | CE | Ogun-Osun River Basin | |
| 112 | Engr. Lawal K.M. | Ag. Cat. Mgt | NCWO | |
| 113 | Olu Ashiru | Consultant | NIAF | |
| 114 | J. Bitrus | ACTO(CSS) | NIWRMC | |
| 115 | Gold K.K. | EDPD | UNRBDA | |
| 116 | A.Y. Anda | CTO | NIWRMC | |
| 117 | Zeinab Ibrahim | Principal Hydrologist | NIHSA | |
| 118 | Enr. Sonde4 O.O. | Prog. Man | RUWATSAN | Ogun |
| 119 | Ibrahim Fatai .A. | Procurement Officer | RUWESA | Osun |
| 120 | Kehinde Michael Engr. | AGM(C) | Ogun State Water Corporation | Ogun |
| 121 | Engr. T.K. Okedara | AGM(M&E) | Ogun State Water Corporation | Ogun |
| 122 | Raheem .A. Kayode | Engr | Oyo State ADP | Oyo |
| 123 | Oru Sylvester | Special Asst. Tech | Delta State MWRD | Delta |
| 124 | Aluku Ilias .T. | Admin Officer | Min of Economic Planning & Budget | |
| 125 | Tomi Ikotun | Consultant | NIAF | |
| 126 | Abubakar .A. Ladan | Fisheries Officer | F.M. ASRD | |
| 127 | John .A. Onovbiona | Chief Fisheries Officer | F.M. Agric & RD | |
| 128 | Engr. Olabatoke Aka | M.D | Kadeg g Ng Ltd | |
| 129 | Kussa Emmanuel .O. | CASO | Lower Benue River Basin | |
| 130 | Ibrahim Ayedi S.B | Admin Officer | | Oyo |
| 131 | Okafor Akachukwu | Head of Programmes | RWASI | |
| 132 | Ibrahim Fatai .A. | Procurement Officer | RUWESA | Osun |
| 133 | S.I Ojo | CPO(NPC) | NPC | |
| 134 | Engr. M. Amodu | Infrastructure Specialist | NPFS | |
| 135 | Chie Shimodaira | Programme Officer | JICA | |
| 136 | Seki Tetsuo | CR | JICA | |
| 137 | Dele Olatunji | Consultant | JICA | |
| 138 | Ike Joshua Chuka | Research Analyst | Embassy of Japan | |

Stakeholder Meeting on H-A 1 and on 24th May, 2013

| S/N | NAME | POSITION | ORGANIZATION | STATE |
|-----|-------------------------|-----------------|---------------------------|---------|
| 1 | Mrs L.D. Bagaiya | Director (PRS) | FMWR | |
| 2 | Engr. R.A.K Jimoh | Project Manager | FMWR | |
| 3 | Engr. Muhammad Sulaiman | GM(P&P) | Zamfara State Water Board | Zamfara |
| 4 | Engr. Bello Sani | GM(OM) | Zamfara State Water Board | Zamfara |
| 5 | Engr. Sammani G. Kaure | ED(S) | SRRBDA | Sokoto |
| 6 | Engr. Lawal K.M | Ag. CD | NWCO | Zamfara |
| 7 | Engr. Mahmud .A. Gwandu | GM | Kebbi State Water Board | Kebbi |
| 8 | Rev. M.I Nwabufo | Director | NIHSA | |
| 9 | Dr. Engr. Nwosah G.C | AgD(CTSS0 | FMWR | |
| 10 | Engr. I.K. Ifeora | Ag.D(CMU) | NIWRMC | |
| 11 | Engr. Y.K. Dalka | Director | NIWRMC | |
| 12 | Lere Oyeniya | DFPM | Min of Finance | |
| 13 | Dauda D.M. | D(OPS) | MWR | Kebbi |

| S/N | NAME | POSITION | ORGANIZATION | STATE |
|-----|------------------------|----------------------------|-------------------------------|----------|
| 14 | Engr. Segun Ajara | Director | Osun State Water Corporation | Osun |
| 15 | Engr. M.A. Ayanwale | Director, Dam & Hydrology | Min of Water Res. | Oyo |
| 16 | Dalhatu Musa .M. | Director EC. Plan | Min of Budget | Zamfara |
| 17 | Agbeja Olawuyi .J. | DPIR(Water Supply) | RUWESA | Osun |
| 18 | Engr. Mrs C.B. Olajide | Director | Min of Rural Dev. | Ogun |
| 19 | T.A. Akiwowo (Mrs) | Director (Hydrology) | Lagos Water Corporation | Lagos |
| 20 | Engr. Adeyemi S.A | Director | Min of Environment | Lagos |
| 21 | Engr. Ibilola .O. | Director | Min of Environment | Lagos |
| 22 | Engr. Adegboyega | Director | Water Corporation | Oyo |
| 23 | Engr. Bamidele O.O | Director | Water Corporation | Oyo |
| 24 | S.O Ogunlana | Director | Lagos Water Corporation | Lagos |
| 25 | Nasir Muazu | Director, Water | SSWB | Sokoto |
| 26 | B.J. Ajayi | Director, PRS | Ekiti State Water Corporation | Ekiti |
| 27 | Dahiru Mati | Director | Katsina State Water Board | Katsina |
| 28 | R.A. Habu | Director | NIWRMC | |
| 29 | Adamu Labbo | Director | ZADP | Gusau |
| 30 | Akinde N.P. (Mrs) | Director | MEP&B | Oyo |
| 31 | Sonde O.O. | Program Manager | RUWATSAN | Ogun |
| 32 | Engr. Kehinde Michael | AGM | Ogun State Water Corporation | Ogun |
| 33 | Engr. T.K Okedara | AGM(M/G) | OGSWC | Ogun |
| 34 | S. Zakari | DD | FMWR | |
| 35 | A.C . Bawa | DD | FMWR | |
| 36 | Dr. Sam Eno | DD(M&E) | FMWR | |
| 37 | Engr. Adesokan T.A | DD,ES | Oyo ADA | Oyo |
| 38 | Engr. F.O. Osundina | DGM(WSM) | Osun State Water Corporation | Osun |
| 39 | Engr. Sunmonu K.S | AD | NIWRMC | |
| 40 | Charles Ikediashi | AD(I/A)M&E | FMWR | |
| 41 | Ugwu C.E. | AD(Prog) | FMWR | |
| 42 | Ibrahim Dasuki A. | AD | Katsina Water Board | Katsina |
| 43 | Alakuro Ayo | AD | FMWR | |
| 44 | E.U Oton | AD | NIWRMC | |
| 45 | Ibrahim Ayede | Admin Officer | Min of EP & B | Oyo |
| 46 | Engr. Victor Ojiako | Asst. Chief water Engineer | NIWRMC | |
| 47 | Zeinab Ibrahim | Gender | NIHSA | |
| 48 | Joshua Bitrus | ACTO | NIWRMC | |
| 49 | Engr. M. Amodu | Infrastructure Specialist | NPFS | |
| 50 | Birma M. Usman | AO II | FMWR | |
| 51 | Aluku Ilias | AO II | MEP & B | Oyo |
| 52 | Kussa Emmanuel .O. | CASO | Lower Benue River Basin | |
| 53 | Abdulyekeen S.O. | | NIWRMC | |
| 54 | Engr. Wakil Bukar | Consultant | FMWR | |
| 55 | Odunsi B.I | Asst. Chief Plan Officer | MEPB | Lagos |
| 56 | Omolarin D.O | Principal Planning Officer | MEPB | Lagos |
| 57 | Kims Rhoda | PEO II | FMWR | |
| 58 | Dubagari Abisabo | | MWRRD | Nasarawa |
| 59 | Ibrahim Fatai .A. | Procurement Officer | RUWESA | Osun |
| 60 | Ipinlaye Olajja | Desk Officer, WLCO | NIWRMC | Osun |

| S/N | NAME | POSITION | ORGANIZATION | STATE |
|-----|---------------------|-------------------------------------|---------------------|-------|
| 61 | Sojinu Olasunkanmi | Head, Assessment Unit | Min of Environment | Lagos |
| 62 | G.A. Agwuma | SSO(P) | FMWR | |
| 63 | Engr. S.O. Oru | SA(Tech), Hon. Comm, Delta State | MWR | Delta |
| 64 | Engr. A.A. Ogunnubi | CE | Ogun-Osun RBDA | Ogun |
| 65 | Hussain Yusuf | SSO(P) | FMWR | |
| 66 | Engr. C.L Yarima | PE | NIWRMC | |
| 67 | Ihuoma Anthony | PSO | FMWR | |
| 68 | Anda Yalaks | CTO | NIWRMC | |
| 69 | Raheem .A. Kayode | Engr. | Oyo State ADP | Oyo |
| 70 | Dele Olatunji | Consultant | JICA | |
| 71 | Ifiok Ekon | Export Manager | System Group, Italy | |

Stakeholder Meeting On HA-1, on 12th June, 2013

| S/N | NAME | POSITION | ORGANIZATION | STATE |
|-----|----------------------|-----------------------|---------------|---------|
| 1 | Engr. R.A.K. Jimoh | CD | NIWRMC | |
| 2 | Mrs L.D. Bagaiya | Director | FMWR | |
| 3 | Engr. Sani M.G. | MD | ZSWB | Zamfara |
| 4 | Engr. Muh'd Suleiman | GM | ZSWB | Zamfara |
| 5 | Engr. A. Aliyu | Director | NIWRMC | |
| 6 | Oton E.U. | Director | NIWRMC | |
| 7 | Engr. I.G. Ifeora | Ag. Director | NIWRMC | |
| 8 | Engr. Y.k. Dalha | Director | NIWRMC | |
| 9 | Adamu Labbo | Director | Zamfara ADP | Zamfara |
| 10 | Sabiu Zakari | DD | FMWR | |
| 11 | Engr. Wakil B. | Consultant | FMWR | |
| 12 | S.U.D. Maigana | DD(R&S) | FMWR | |
| 13 | R.I. Idialu | AD | FMWR | |
| 14 | Bassey Effiong .A. | AD | FMWR | |
| 15 | Engr. K.S. Sunmonu | AD | NIWRMC | |
| 16 | Charles Ikediashi | AD | FMWR | |
| 17 | Usman Alkali | DA | ZS MBEP | Zamfara |
| 18 | Bello Muh'd Gusau | DIS | MANR | Zamfara |
| 19 | Dalhatu Musa | DEP | Min of Budget | Zamfara |
| 20 | Nasiru Galadima | RFLO | FADAMA III | Zamfara |
| 21 | Ogbonna K.E. | SHG | FMWR | |
| 22 | Abdulyekeen S.O. | Principal Hydrologist | NIWRMC | |
| 23 | Joshua Bitrus | ACTO | NIWRMC | |
| 24 | Bintu Ali | Snr Hydrologist | GWMA | |
| 25 | B.C. Ojo | P HGL | NIHSA | |
| 26 | Mrs. Adedeji G.O | CTO HGL | NIHSA | |
| 27 | Enyi Hycinth | ACTO | FMWR | |
| 28 | Engr. Anthea O. | ACTO | FMWR | |
| 29 | Engr. Victor Ojiako | ACWE | NIWRMC | |
| 30 | R.A. Habu | Director | NIWRMC | |
| 31 | Engr. M.A. Aboyade | CTO | NIWRMC | |
| 32 | Engr. C. Yarima | PWE | NIWRMC | |
| 33 | Ihuoma Anthony | PSO | FMWR | |
| 34 | G.A. Agwuma | SSO(P) | FMWR | |
| 35 | Simon Ekpong | Geologist I | FMWR | |
| 36 | Ogunro Yewande | Geologist I | FMWR | |

Meeting with Lagos State Ministry of Environment on 24th June, 2013

| S/N | NAME | POSITION |
|-----|--------------------------|---------------------------|
| 1 | Akinori Miyoshi | Water supply & sanitation |
| 2 | Taizo Hashiguchi | Dam & Hydropower |
| 3 | Sebastian Jara | Environment |
| 4 | Noboru Osakabe | Fin/Economic |
| 5 | Yuichi Matsumoto | Irrigation & Drainage |
| 6 | Tadanori Kitamura | Surface water |
| 7 | Hiroshi Nakamura | Ground water |
| 8 | Tiamiyu Sikiru Olubusola | |
| 9 | Engr. K.S. Sunmonu | |
| 10 | Engr. R.A.K. Jimoh | |
| 11 | Ipinlaye .O. | |
| 12 | Ibilolu O.O. | |
| 13 | Engr. Adeyemi A.O. | |
| 14 | Adepgbe .A. | |

Workshop in Lagos OORBDA Guest House on 24th June, 2013

| S/N | NAME | POSITION | ORGANIZATION |
|-----|---------------------|----------------------|--------------------------------|
| 1 | Akiwowo T.A. | Director | Lagos Water Corp |
| 2 | Engr. Alade A.A. | Asst. Director | Lagos State Min of Agric |
| 3 | Engr. K.S. Sunmonu | DPM | NIWRMC |
| 4 | Olopade S.F. | SSO | FMWR |
| 5 | Oshin B.O. | SSO | FMWR |
| 6 | Alayo A.A. | HTO | FMWR |
| 7 | Babalola E.A. | SO 1 | FMWR |
| 8 | Erinosa K.S. | TO | FMWR |
| 9 | Fadunsin E.B | Asst Chief Geologist | Lagos State Min of Rural Dev |
| 10 | Olanigan U.K. | AC(W.S) | Lagos State Min of Rural Dev |
| 11 | Enduku Priye | Hydrologist | Lagos Water Corp |
| 12 | Engr(Mrs) Idris R.B | AC | Lagos State Min of Agric |
| 13 | Adepegba A. | ACSO | Lagos State Min of Environment |
| 14 | Adewuyi S.F.A | CTO(Civil) | Lagos State Min of Waterfront |
| 15 | Taizo Hashiguchi | | JICA |
| 16 | N. Osakabe | Financial/Economic | JICA |
| 17 | Yuichi Matsumoto | | JICA |
| 18 | Sebastian Jara | Environment | JICA |
| 19 | Adedoyin I.M | PEPO | Lagos State Physical Planning |
| 20 | Shonibare F.S. | STPO | Lagos state Physical Planning |
| 21 | Adewuyi S.F.A | CTO(Civil) | Lagos State Min of Waterfront |
| 22 | Alayo Adijat | HTO | FMWR |
| 24 | Oshir .B.O. | SSO | FMWR |
| 25 | Adepegba .A. | ACSO | Lagos state Min of Environment |
| 26 | Tiamiyu S.O. | Mech. Eng | NIWRMC |
| 27 | Ipinlaye O. | PIE | NIWRMC |
| 28 | Tadanori Kitamura | Hydrologist | JICA Team |
| 29 | Akinori Miyoshi | | JICA Team |

Workshop in OORBDA OGUN STATE on 25th June, 2013

| S/N | NAME | POSITION | ORGANIZATION |
|-----|----------------------|---------------------------|-------------------|
| 1 | Engr. R.A.K. Jimoh | CD | NIWRMC |
| 2 | Engr. Bayo Alayande | Ag. MD | OORBDA |
| 3 | Soyemi Akin | ED(P&D) | OORBDA |
| 4 | Sokunle T.O. | DD(O&M) | OORBDA |
| 5 | Iyiola Rufus | DD(Cons) | OORBDA |
| 6 | Engr. K.S. Sunmonu | AD | NIWRMC |
| 7 | Odesanya M.O. | AD(Elect) | OORBDA |
| 8 | Femi Dokunmu | AD(Information) | OORBDA |
| 9 | Mrs Ojulari O.O | Snr Admin Officer | Min of Rural Dev. |
| 10 | Lucas Omotayo .O. | Admin Officer II | Min of Rural Dev. |
| 11 | Tiamiyu Sikuru | Mech Eng | NIWRMC |
| 12 | Ogunnubi A.A. | ACE(C) | OORBDA |
| 13 | Ipinlaye O. | PE | NIWRMC |
| 14 | Adu B.M. | Chief Accountant | OORBDA |
| 15 | Olatunji B.O. | ACE(Hydro) | OORBDA |
| 16 | Ojo Olumayowa | Hydrologist II | OORBDA |
| 17 | Owosho Shogo | Civil Eng II | OORBDA |
| 18 | Makanjuola Oluwaseun | Civil eng II | OORBDA |
| 19 | Balogun A.G. | Design | OORBDA |
| 20 | Yuich Matsumoto | Irrigation & Drainage | JICA Team |
| 21 | N. Osakabe | Economic/ Financial | JICA Team |
| 22 | Tadanori Kitamura | Hydrologist | JICA Team |
| 23 | Taizo Hashiguchi | Dam & Hydropower | JICA Team |
| 24 | Akinori Miyoshi | Water Supply & Sanitation | JICA Team |
| 25 | Sebastian Jara | Environment | JICA Team |
| 26 | Hiroshi Nakamura | Hydrogeologist | JICA Team |

Meeting in Commissioner Office of Environment, OSUN STATE on 26th June, 2013

| S/N | NAME | POSITION | ORGANIZATION |
|-----|-------------------------|----------------------------------|--------------|
| 1 | Noburu Osakabe | Economic/Finance | JICA TEeam |
| 2 | Akinori Miyoshi | Water supply & Sanitation | JICA Team |
| 3 | Tadanori Kitamura | Hydrologist | JICA Team |
| 4 | Sebastian Jara | Environment | JICA Team |
| 5 | Yuichi Matsumoto | Irrigation & Drainage | JICA Team |
| 6 | Taizo Hashiguchi | Dam/Hydropower | JICA Team |
| 7 | Hiroshi Nakamura | Hydrogeology | JICA Team |
| 8 | Prof. Olubukola Oyawoye | Hon. Commissioner of Environment | Min of Env |
| 9 | Segun Olorunsogo | PS | Minof Env |
| 10 | Engr. R.A.K. Jimoh | CD | NIWRMC |
| 11 | Mrs A.O. Oni | Director(Finance & Admin) | Min of Env |
| 12 | Zakari Sabiu | DD | FMWR |
| 13 | Engr. K.S. Sunmonu | AD | FWWR |
| 14 | R.I. Idialu | AD | FMWR |
| 15 | Ipinlaye Olaiya | | NIWRMC |
| 16 | Tiamiyu S.O. | | NIWRMC |

Stakeholder Meeting in HA-6 on 26th June, 2013

| S/N | NAME | POSITION | ORGANISATION | STATE |
|-----|-----------------------|------------------------|--|-------------------|
| 1 | Engr. R.A.K. Jimoh | CD | NIWRMC | |
| 2 | Sonde O.O | P.M | RUWATSAN | Ogun |
| 3 | Asamu Samuel .O. | PM | Min of Physical Planning & Urban Dev | Oyo |
| 4 | Engr. Kaeem | PM | Basket Entrepot | Ogun-Osun RBDA |
| 5 | Engr. T.K Okedara | AGM | OGSWC | Ogun |
| 6 | Engr. F.O. Osundina | DGM | OSWC | Osun |
| 7 | Engr. M.A. Ayanwale | Director | Min of Water Res. | Oyo |
| 8 | Akiwowo T.A (Ms) | Director | Lagos Water Corp | Lagos |
| 9 | Engr. Olagoke R.O | Director | Min. of Environment & Sanitation | Osun |
| 10 | D.G. Iyanda | Director(Intl Coop) | State Planning Commission | Osun |
| 11 | Surv. A.R. Adejumbi | DSG | Office of the Surveyor General | Osun |
| 12 | Mr. A.A. Ojo | Director | Min of Agric | Osun |
| 13 | Zakari Sabiu | DD | FMWR | |
| 14 | Opaleye T.I. | DD | Min of Budget & Planning | Ogun |
| 15 | Engr. T.A. Adesokan | DD | Oyo state ADP | Oyo |
| 16 | Adeboye F.S. | | | |
| 17 | Engr. K.S. Sunmonu | AD | NIWRMC | |
| 18 | R.I. Idialu | AD | FMWR | |
| 19 | Engr. Alade A.A. | AD | Min of Agric | Lagos |
| 20 | TPL. E.A. Oladejo | AD | Min of Land, Phy Planning & URBAN Dev | Osun |
| 21 | Tiamiyu S.O | Mech. Eng | NIWRMC | |
| 22 | Akinyemi Taiwo | E.O | NIWRMC | |
| 23 | Engr. Ipinlaye Olaiya | PE | NIWRMC | |
| 24 | Ihuoma Anthony | PSO | FMWR | |
| 25 | Afolarin O.M. | HEO | FMWR | |
| 26 | Olanigan U.K | AC | Min of Rural Dev. | Lagos |
| 27 | Engr. Mrs Idris R.B. | AC | Min of Agric | Lagos |
| 28 | Adepegba .A. | ACSO | Min of Environment | Lagos |
| 29 | Azeez Kazeem A. | Project Engineer | Summer time Engr. Services | Lagos |
| 30 | Engr. Niyi Oyewole | Civil Engineer | Water Corporation of Oyo State | Oyo |
| 31 | Oloyede S.M | Scientific Officer | Ministry of Environment | Oyo |
| 32 | Engr. Ogunnubi A.A. | CE | OOBDA | Ogun-Osun |
| 33 | Akinori Miyoshi | | JICA Team | |
| 34 | Tadanori Kitamura | | JICA Team | |

Stakeholder Meeting of HA-1 on 3rd July, 2013

| S/N | NAME | POSITION | ORGANIZATION | STATE |
|-----|-------------------------|-----------------------|------------------------------|---------|
| 1 | Engr. R.A.K Jimoh | Coordinating Director | NIWRMC | |
| 2 | Engr. Sani Mustapha | MD | Water Board | Zamfara |
| 3 | Engr. Muhammad Sulaiman | GM(P&P) | Zamfara State Water Board | Zamfara |
| 4 | Engr. Y.K. Dalha | Director CSS | NIWRMC | |
| 5 | R.A. Habu | Director | NIWRMC | |
| 6 | Oton E.U. | Ag. Director | NIWRMC | |
| 7 | Engr. R.A.Aliyu | Director | NIWRMC | |
| 8 | Engr. I.G | Ag. Director (CMU) | | |
| 9 | Nasiru Muazu | Director Water | Water Board | Sokoto |
| 10 | Muntari Kado | Director waste | Min of Environment | Katsina |
| 11 | Engr. K.M. Musa | DGM(P/P) | Water Board | Kebbi |
| 12 | Dalha Isa Ladan | Director | Min of Water Res. | Katsina |

| S/N | NAME | POSITION | ORGANIZATION | STATE |
|-----|------------------------|------------------|---------------------|---------|
| 13 | Dahiru Mati | Director | Water Board | Katsina |
| 14 | S. Zakari | D.D | FMWR | |
| 15 | Engr. K.S. Sunmonu | AD | NIWRMC | |
| 16 | Bassey Effiong | AD | FMWR | |
| 17 | R.I. Idialu | AD | FMWR | |
| 18 | Garba Yahaya Ahmad | Secretary | Water Board | Kebbi |
| 19 | Moh'd Dikko Abdulaziz | Envt. Specialist | Fadama Dev. Project | Katsina |
| 20 | Engr. Lawal K.M | CIE | NIWRMC Gusau | |
| 21 | Simon Ekpong | Geo 1 | | |
| 22 | Engr. M.A. Aboyade | CTO | NIWRMC | |
| 23 | Kubrali A. Olaniyi | CPO | NIWRMC | |
| 24 | Adegbite Godwin | CRUE | | |
| 25 | Engr. Anthea | Counterpart | FMWR | |
| 26 | Engr. C.L Yarima | PWE | | |
| 27 | Engr. Victor Ojiake | ACE(CMU) | NIWRMC | |
| 28 | Jane Asukwo | H.E.O | FMWR | |
| 29 | Popoola Lawrenta Funke | Geologist 1 | FMWR | |
| 30 | Engr. Ipinlaye .O. | PIE | NIWRMC | |
| 31 | Ogbonna Kenneth .E. | SHG | FMWR | |
| 32 | Ihuoma Anthony | PSO | FMWR | |
| 33 | A.Y. Anda | CTO | NIWRMC | |
| 34 | Engr Peter Sule | CTO | NIWRMC | |
| 35 | Abdulyekeen | PHG | NIWRMC | |
| 36 | Bintu Ali | Snr Hydrologist | GWMA | |
| 37 | Agwuma G.A | SSO(P) | FMWR | |
| 38 | Ogumo Yewande | Geogist | FMWR | |
| 39 | Dibia Pamela | Geologist | FMWR | |
| 40 | Abiodun Ezekiel | S.O | FMWR | |

Meeting with OYO STATE Water Corporation on 17th July, 2013

| S/N | NAME | DESIGNATION |
|-----|-----------------------|--------------|
| 1 | G.O. Oguntola | GM |
| 2 | Folarunmi Elisha | PRO |
| 3 | Akintayo Tairu | O/M |
| 4 | Okunbayo Bukola | Director(QC) |
| 5 | Engr. Bamidele O.O. | OOM |
| 6 | Deacon R.O. Adeniyi | Secretary |
| 7 | Engr. Oyewole Adeniyi | CEI |

Stakeholder Meeting of HA-1 on 26th September, 2013

| S/N | NAME | POSITION | ORGANIZATION | STATE |
|-----|--------------------------|----------------------|-----------------------|---------|
| 1 | Habu R.A | CD | Integrated | |
| 2 | Engr. K.M. Lawal | Ag. CD | NNCO | Zamfara |
| 3 | Engr. Sani Mustapha | MD | ZSWB | Zamfara |
| 4 | Engr. Muhammadu Suleiman | GM(P&P) | ZSWB | Zamfara |
| 5 | Dr. Abubakar Nalatu | Director, Irrigation | Min of Agric, | Sokoto |
| 6 | Abdusalam Saidu | Director, Admin | MRD Dept, FRW | Sokoto |
| 7 | Nasiru Muazu | Director, W | State Water Board, So | Sokoto |
| 8 | Habibu Habibu | | ZSWB | Zamfara |
| 9 | Adamu Labbo | Director | ZADP | Zamfara |
| 10 | Idowu Adetunji | DD(WS) | FMWR | |
| 11 | Engr. B. Muh'd Gusau | DD(IS) | MANR | Zamfara |
| 12 | Enge. Ibrahim Gado | DD(W) | Min R.D | Sokoto |
| 13 | R.I. Idialu | AD(P) | FMWR | |
| 14 | C.D. Ikediashi | AD(M&E) | FMWR | |
| 15 | Engr. K.S. Sunmonu | AD | NIWRMC | |
| 16 | Onoja Peter .O. | AD | NIWRMC | |

| S/N | NAME | POSITION | ORGANIZATION | STATE |
|-----|------------------------|--------------------|--------------------|---------|
| 17 | Engr. N.D. Madu | AD | FMWR | |
| 18 | Abdulyekeen S. Olutade | Prin. Hydrologist | NIWRMC | |
| 19 | Bintu Ali | Snr. Hydrologist | GWMA | |
| 20 | Tunde Akingbale | Consultant | FMWR | |
| 21 | Ogbonna Kenneth | SHG | FMWR | |
| 22 | Enyi Hycinth | ACTO | FMWR | |
| 23 | Moh's Dikko Alaziz | Environmentalist | FADAMA III | Katsina |
| 24 | Nasiru Galadima | RFLO | FADAMA III | Zamfara |
| 25 | Dele Olatunji | Consultant | JICA | |
| 26 | Aboyade M.A | CTO | NIWRMC | |
| 27 | A. Y. Anda | CTO | NIWRMC | |
| S/N | NAME | POSITION | ORGANIZATION | STATE |
| 28 | Engr. Victor Ojiako | Chief Water Engr. | NIWRMC | |
| 29 | Ipinlaye Olaiya | ACE | NIWRMC | |
| 30 | Ogunlaja S.I. | Chief Sec Asst | NIWRMC | |
| 31 | Azi Chioma Ozioma | Scientific Officer | NIWRMC | |
| 32 | Simon Ekpong | Geologist I | FMWR | |
| 33 | Dibia Pamela | Geologist | FMWR | |
| 34 | Ekanem Gabriel | IPE | ATKINS-WSSRP | |
| 35 | Kendall Tom | | ATKINS-Sokoto-Rima | |

Stakeholder Meeting of Ogun-Oshun Basin on 3rd October on 3rd, 2013

| | NAME | POSITION | ORGANIZATION | STATE |
|----|-----------------------|---------------------|--------------------------------------|-------|
| 1 | R.A. Habu | CD | NIWRMC | |
| 2 | Jirai Istifanus Crown | Ag DFA | NIWRMC | |
| 3 | Engr. M.A.A. Adekunle | D(RW) | Min of Rural Dev | Ogun |
| 4 | TPL. G.A. Badejo | D(RP) | Min of Urban & Planning | Ogun |
| 5 | Engr. Tomi Onafowokan | D, Engr Distib | OGSWC | Ogun |
| 6 | Mr. Oyesanwen A.A. | DPRS | Min of Rural Dev | Ogun |
| 7 | Sonde O.O. | Prog. Manager | RUWATSAN | Ogun |
| 8 | Engr. Bayo Alayande | MD | OOBDA | |
| 9 | Engr. Akin Soyemu | ED(P&D) | OOBDA | |
| 10 | Engr. Jimi Sokunle | Ag. ED | OOBDA | |
| 11 | Akinde N.P | Director(M&E) | Economic Planning & I | Oyo |
| 12 | Dr. Tairu T.T. | GM | RUWASSA | Oyo |
| 13 | M.O. Makinde | Director(WS) | RUWASSA | Oyo |
| 14 | Engr. Ayanwale M.A. | Director | Min of Water Res. | Oyo |
| 15 | Engr. Olagoke R.O. | Director | Min of Env & Sanitatio | Osun |
| 16 | Isaac Babalola | Director | Min of Water Res, Rural Comm Arrairs | Osun |
| 17 | Engr. Akpan | Director | OSWC | Osun |
| 18 | Engr. F.O. Osundina | Director | OSWC | Osun |
| 19 | Akindele A.O. | DD(Planning) | Economic Planning & I | Oyo |
| 20 | Engr. R.A. Iyiola | DD(Construction0 | OOBDA | |
| 21 | Engr. Adesokan T.A. | DD | Oyo State ADP | Oyo |
| 22 | Agbeja O.J. | DD | RUWESA | Osun |
| 23 | R.I. Idialu | AD(Planning) | FMWR | |
| 24 | Engr. K.S Sunmonu | AD | NIWRMC | |
| 25 | J.O. Adekunle | AD(Design) | OOBDA | |
| 26 | Bintu Ali | Snr. Hydrologist | GWMA | |
| 27 | Ogbonna K.E. | Snr. Hydrologist | FMWR | |
| 28 | Ipinlaye O. | CMO | NIWRMC | |
| 29 | Saliu A.J. | Public Relations | OOBDA | Ogun |
| 30 | Mr. Adewale S. Taiwo | TPO I | Min of Urban & Planning | Ogun |
| 31 | Musa Ganiyu | Planning Officer II | OOBDA | |

| | NAME | POSITION | ORGANIZATION | STATE |
|----|-----------------------|----------------------|---------------------------------------|-------|
| 32 | Olatoke Kehinde | ACPO | OORBDA | |
| 33 | Balogun A.G. | PTO I(Design) | OORBDA | |
| 34 | Engr. Jide Braimoh | PE9Design) | OORBDA | |
| 35 | Medu-Oye Pius | AEO(PRO) | OORBDA | |
| 36 | Engr. E.A. Falola | CE(Irrigation) | OORBDA | |
| 37 | Engr. Titi Adeyemo | PE(Mech) | OORBDA | |
| 38 | Akinola B.A. | CTO(WR) | OORBDA | |
| 39 | Saliu A.J. | PEO II(Info) | OORBDA | |
| 40 | Ogunira A.U | PO II | OORBDA | |
| 41 | Adewale A.A. | PTO(Civil) | OORBDA | |
| 42 | Adeboye Satin Tunde | Snr F.(Elect0 | OORBDA | |
| 43 | Ajewole Oluwatosin I. | ME II | OORBDA | |
| 44 | Oyebamiji O. Samuel | P&D, HTO | OORBDA | |
| 45 | Engr. Oyewole Adeniyi | Civil Engineer | Water Corporation | |
| 46 | Ibrahim Fatai A. | Procurement Officer | RUWESA | Osun |
| 47 | Engr. A. Akinhanmi | WATSAN Consultant | EU-WSSSRP II | Osun |
| 48 | Omisare O.J | Senior Lands Officer | Min of Lands, Planning & Urban Dev | Osun |
| 49 | Oluwadare O.A, Mrs | Senior Town Planning | Min of Lands, Planning & Urban Dev | Osun |
| 50 | Enduku Priye | Hydrologist | Water Corporation | Lagos |
| 51 | Olanigan U.K | Hydrologist | MRD | Lagos |
| 52 | Engr. Aileru T.K. | | MRD | Lagos |
| 53 | Oguntoyinbo O.O | Agric Officer | Lagos State Min of Coop | Lagos |
| 54 | Engr. Agbolade M.O. | Engineer | Lagos State Min of Coop | Lagos |
| 55 | Mrs Said | BLDR | MPPSUD | Lagos |
| 56 | Rufai D.A. | Town Planner | MPP&UD | Lagos |
| 57 | Adepegba A. | Hydrologist | MOE | Lagos |

Seminar on 3rd December, 2013

| S/N | NAME | POSITION | ORGANIZATION | STATE |
|-----------|--------------------------------|------------------------------------|---------------------------------------|--------|
| 1 | Boye Adeoye(rep Hon. Minister) | Director,HR | FMWR | |
| 2 | Odumosu Olufemi(rep PS) | Director, Special Duties | FMWR | |
| 3 | Dr. E.A. Adanu | Directors, Dams | FMWR | |
| 4 | R.A. Habu | CD | NIWRMC | |
| 5 | Engr. Joe Kwanashie | Director, Irrigation & Drainage | FMWR | |
| 6 | Oton E.U | Director | NIWRMC | |
| 7 | Lawal K.M | Director | NIWRMC | |
| 8 | Engr. R.A. Aliyu | Director | NIWRMC | Minna |
| 9 | Engr. Y.K. Dalha | Director | NIWRMC | |
| 10 | Engr. I. Babaji | Director | GWMA | |
| 11 | Engr. I.G. Ifeora | Director(CM&U) | NIWRMC | |
| 12 | E.I.C. Olumese | Executive Director | Benin-Owena River Basin | Edo |
| 13 | Engr. Sammani G.K. | Executive Director(S) | SRRBDA | Sokoto |
| 14 | Hassan Liman Kambaza | Executive Director(P&D) | SRRBDA | Sokoto |
| 15 | Ebenezer O. Mafayeyomi | MD | Benin Owena River Basin | Edo |
| 16 | Mrs. Ann Nworie | Executive Director (F&A) | AIRBDA | |
| 17 | Engr. Prof. S.Z. Abubakar | Executive Director | NAERLS, FMARD | Kaduna |
| 18 | Jirai I. Crown | Ag. DFA | NIWRMC | |
| 19 | TPH G.A. Badejo | Director | Min. of Urban & Physical Planning | Ogun |
| 20 | Engr. J. Olu Kehinde | Director | Oyo State,ADP | Oyo |
| 21 | Akinde N.P(Mrs) | Director | Min. of Economic Planning & Budget | Oyo |

| S/N | NAME | POSITION | ORGANIZATION | STATE |
|-----|------------------------------|-------------------------------|----------------------------------|--------------|
| 22 | Engr. Sani Mustapha | MD | Water Board | Zamfara |
| 23 | Engr. Muh'd Suleiman | GM(P&P) | Water Board | Zamfara |
| 24 | Nayaya Water | MD/Chairman | Driver Asst | Zamfara |
| 25 | Hybris Solution | MD | Driver Asst. | Zamfara |
| 26 | Dahiru Mati | Director, Admin | Katsina State Water Board | Katsina |
| 27 | Engr. Amatemeso O. Emmanuel | Director, PRS | Rivers State MWRRD | Rivers |
| 28 | Prof. Nicholas A. Ada | Deputy Chancellor(Admin) Vice | Benue State University | Benue |
| 29 | Hussain A. Kabawo | D(PRS) | Min of Water Res. | Yobe |
| 30 | Idris F. | D(D&R) | Min of Water Res. | Yobe |
| 31 | Tolulope Akiwowo | Director | Lagos Water Corp | Lagos |
| 32 | Abdusalam Saidi | Director(Admin) | Dept, FRWS | Sokoto |
| 33 | Nasiru Muazu | D(PP&D) | SSW Board | Sokoto |
| 34 | Hon. Dein Benadomne | Hon. Commissioner | Min of Water Resources | Bayelsa |
| 35 | Mrs. Mary Chukwu | Rep . Hon Commissioner | Min of Inter & State Orientation | Ebonyi |
| 36 | Ogandu Thankgod .E. | Director/Env, Health & Sani | Min of Petroleum & Env. | Imo |
| 37 | Engr. Elemi B. Etowa | Commissioner | Min of Water Res. Calabar | Cross- River |
| 38 | Engr. C. Ukam .O. | Director(PRS) | CRSWBL | Cross River |
| 39 | Engr. Ernest Usoro | MD/CEO | Akwa Ibom Water Company | Akwa Ibom |
| 40 | Dr. Nestor Udoh | PS | Min of Special Duties | Akwa Ibom |
| 41 | Birdling J.D | DD(P) | FMWR | |
| 42 | Awe Emmanuel | DD | FMWR | |
| 43 | Onoja Peter O. | DD | NIWRMC | |
| 44 | Olamide Ogungbe | DD | NIHSA | |
| 45 | Idowu Adetunji | DD | FMWR | |
| 46 | Okeke V.I | DD | FMWR | |
| 47 | Adenuga Adesoji O. | Dam Manager | FCT Water Board | Abuja |
| 48 | Ezekwo Victor .C. | IA/PM | SPIA/RUWASSA | Anambra |
| 49 | Prof. A.C. Eziashi | Dean, FAC of Env.Sc | University of Jos | Plateau |
| 50 | Simon D. | Project Manager | PSWB | Plateau |
| 51 | Engr. Mohammed Galadima | Ag. Catchment Director | NIWRMC – LCCD. Dutse | Jigawa |
| 52 | Engr. Tomi Omafowolam | Ag. Director Dist. | OGSWC | Ogun |
| 53 | Engr. K.A. Kareem | Ag. AGM(M/E) | OGSWC | Ogun |
| 54 | Engr. T.A. Adesokan | DD | Oyo State ADP | Oyo |
| 55 | Adamu Labbo | Ag. Director | Zamfara ADP | Zamfara |
| 56 | Engr. B.M. Gusau | DD | Min of Agric | Zamfara |
| 57 | Agbeja O.J | DD(Water Supply) | RUWESA | Osun |
| 58 | Osundina F.O. | DGM(WSR) | OSWC | Osun |
| 59 | Apara Segun | DGM(D&C) | OSWC | Osun |
| 60 | Ibrahim Gado | DD(W) | Dept.FRWS | Sokoto |
| 61 | Dr. Sylvester Obono | Ag. PS | Min of Water Res. Calabar | Cross River |
| 62 | Andrew E. Odu | HOD(PRS) | | |
| 63 | Engr. Danlami Akpoko Osagede | DD | Min of Agric & Water Res. | Nasarawa |
| 64 | Adamu Umar | DD | NADP | Nasarawa |
| 65 | Dr. Ben Aneke | DD | AIRBDA | |
| 66 | Ameh G. Okwari | L.O | LBRBDA | Benue |
| 67 | Oyedeki R.O. | L.O | OORBDA | Abeokuta |
| 68 | Rasaq Oyebode | L.O | LNRBDA | Ilorin |
| 69 | Kekemeke I. Stanley | L.O | BORBDA | Ondo |
| 70 | Engr. R.A. Sam | DD(Soil water Eng) | FMA&RD | |
| 71 | R.I. Idialu | AD(P) | FMWR | |
| 72 | K.S. Sunmonu | AD | NIWRMC | |
| 73 | Charles Ikediashi | AD(M&E) | FMWR | |

| S/N | NAME | POSITION | ORGANIZATION | STATE |
|-----|-----------------------|-------------------------|---------------------------|----------|
| 74 | Olayinka A.A. | AD(Stat) | FMWR | |
| 75 | Engr. N.D. Madu | AD | FMWR | |
| 76 | Onovbiona John | AD | FMA | |
| 77 | R.A. Bako | AD | FMWR | |
| 78 | Bassey Effiong | AD(TSS) | FMWR | |
| 79 | Festus Ademehin | AD | BORBDA | Edo |
| 80 | Alaya T.N. | AD(PRS) | AEPB | Abuja |
| 81 | James Akinjobi | AD | NEMA | Abuja |
| 82 | Matthew Aghomishe | AD | NGSA | Abuja |
| 83 | Zainab Umar | AD | AEPB | Abuja |
| 84 | Engr. O. Anthony | HOD, Water dept | RUWASSA | Delta |
| 85 | Ibrahim Dasuki A. | AD(Operation) | Katsina State Water Board | Katsina |
| 86 | Umar F. Danikawu | AD(P/G) | URPB | Katsina |
| 87 | Engr. E.I. Eyimina | HOD, Water & Sanitation | Min of Water Res. | Bayelsa |
| 88 | Engr. Anthea O.U | PIE | FMWR | |
| 89 | Engr. Bello k. | ACTO | FMWR | |
| 90 | Engr. John Gbadegesin | ACHY | NIHSA | |
| 91 | R.A.K. Jimoh | Consultant | FMWR | |
| 92 | Dibia Pamela | Geologist | FMWR | |
| 93 | Okolo Chinyere | SSO | FMWR | |
| 94 | Bintu Ali | Snr. Hydrologist | FMWR/GWMA | |
| 95 | Engr. Ipinlaye O. | NIWRMC | NIWRMC | |
| 96 | Abdulmumunin Ibrahim | SAO | NIWRMC | Nasarawa |
| 97 | Yaro D.U | PEO II | FMWR | |
| 98 | Kadola Mabel | PTO I | NIWRMC | |
| 99 | Abdulyekeen S. | PHG | NIWRMC | |
| 100 | Dr Alayande A.W. | HOD(Land & Water) | NWRI | Kaduna |
| 101 | Nelson Nwosu A. | Admin Officer | NIWRMC | |
| 102 | Azi Chioma .O. | Scientific Officer | NIWRMC | |
| 103 | Ibiale James | I.T | NIWRMC | |
| 104 | Simon Ekpong | Geologist I | FMWR | |
| 105 | Okolo Felicia | PEO 1 | NIWRMC | Delta |
| 106 | Enyi Hycinth | ACTO | FMWR | |
| 107 | Engr. Amodu D.A. | ACHY | NIHSA | |
| 108 | Engr. C.L. Yarima | ACE | NIWRMC | |
| 109 | Engr. Victor Ojiako | CWE | NIWRMC | |
| 110 | Ani C.E. | PTO II | NIWRMC | |
| 111 | Ukaegbu B.U(Mrs) | SSO | FMWR | |
| 112 | Joe Ukairo | ACHG I | NIHSA | |
| 113 | Tunde Akingbala | Consultant | FMWR | |
| 114 | Popoola L.F | Geologist I | FMWR | |
| 115 | Aboyade M.A. | WE | NIWRMC | |
| 116 | Adeyinka O.T | PEO | NIWRMC | |
| 117 | Jane Asukwo | HEO | FMWR | |
| 118 | A.Y. Anda | CTO | NIWRMC | |
| 119 | Ijasan Oluwatoyin | Snr Hydrologist | BORBDA | Edo |
| 120 | Daniel Ameh | CSO(Soil) | LBRBDA | Benue |
| 121 | Engr. D.A. Hendricks | CIE/SA(Tech) to MD | LBRBDA | Benue |

