ナイジェリア連邦共和国

連邦水資源省（FMWR）

ナイジェリア国
全国水資源管理開発基本計画策定
プロジェクト報告書

第３編

プロジェクトのアウトライン

平成 26 年 1 月
(2014)

独立行政法人
国際協力機構（JICA）

八千代エンジニヤリング株式会社
株式会社建設技研インターナショナル
株式会社三祐コンサルタンツ

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外国為替レート

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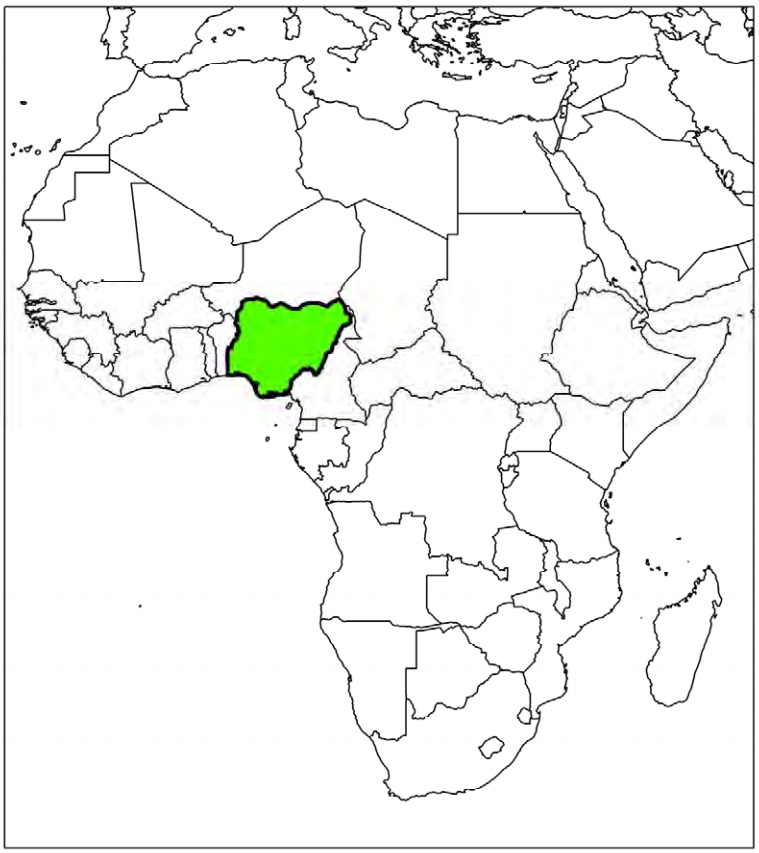
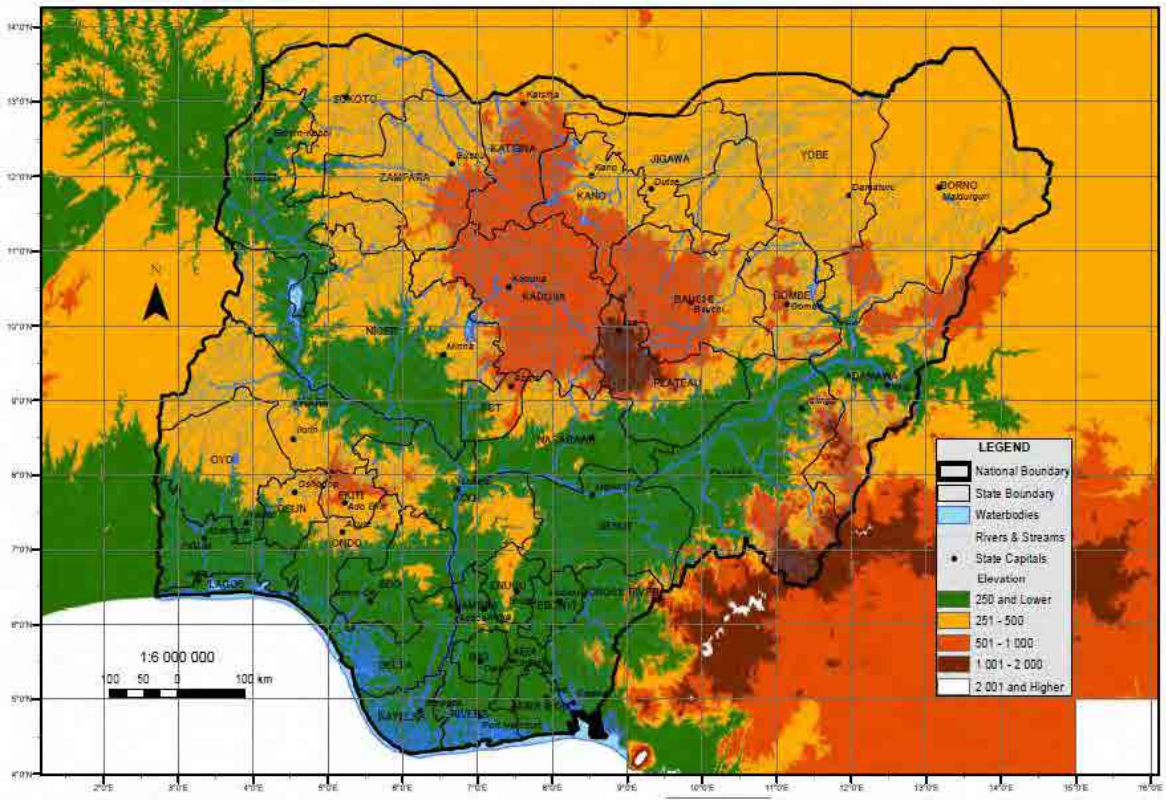
（2012 年 12 月 31 日）



ナイジェリア連邦共和国の位置図



プロジェクトエリア（ナイジェリア全国）

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略語表

略　語	説　明
ACGSF	Agricultural Credit Guarantee Scheme Fund
ADP	Agricultural Development Project
AEPB	Abuja Environmental Protection Board
AfDB	African Development Bank
BADC	British Atmospheric Data Centre
BCM	Billion Cubicmeter
BOD	Biochemical Oxygen Demand
BOT	Build-Operate-Transfer
CCU	Climate Change Unit
CD	Capacity Development
CITES	Convention on International Trade in Endangered Species
CMCC	Catchment Management Coordinating Committee
CMO	Catchment Management Office
CMP	Catchment Management Plan
CPI	Consumer Price Index
CWIQS	Core Welfare Indicators Questionnaire Survey
DDRO	Department of Dam and Reservoir Operations
DEM	Digital Elevation Model
DFID	Department for International Development in UK (UKAID)
DID	Department of Irrigation and Drainage
DO	Disolved Oxygen
DPRS	Department of Planning and Research and Statistics
DRBOI	Department of River Basin Operation and Inspectorate
DWQ&S	Department of Water Quality Control and Sanitation
DWS	Department of Water Supply
EA	Environmental Assessment
EC	European Commission
ECN	Energy Commission of Nigeria
EIA	Environment Impact Assessment
EL	Elevation
EMSS	Environmental Management Support System
ERICA	European Rivers and Catchment
ET	Evapotranspiration
EU	European Union
FAO	Food and Agriculture Organization
FCA	Fadama Association Committee
FCT	Federal Capital Territory
FEPA	Federal Environmental Protection Agency
FEWS	Flood Early Warning System
FGN	Federal Government of Nigeria
FIWD	Federal Inland Waterways Department
FMANR	Federal Ministry of Agriculture and Natural Resources
FMARD	Federal Ministry of Agriculture and Rural Development
FME(d)	Federal Ministry of Education
FME(n)	Federal Ministry of Environment
FMH	Federal Ministry of Health
FMP	Federal Ministry of Power
FMT	Federal Ministry of Transport
FMWA	Federal Ministry of Women’s Affairs
FMWR	Federal Ministry of Water Resources

略　語	説　明
FMWRRD	Federal Ministry of Water Resources and Rural Development
GCM	Global Climate Models
GDMA	Gurara Dam Management Authority
GDP	Gross Domestic Product
GIS	Geographical Information System
GWMA	Gurara Water Management Authority
HA	Hydrological Area
HYCOS	Hydrological Cycle Observation System
ICT	Information and Communication Technology
IEE	Initial Environmental Evaluation
IPCC	Intergovernmental Panel on Climate Change
IUCN	International Union for Conservation of Nature
IWRM	Integrated Water Resources Management
JAXA	Japan Aerospace Exploration Agency
JICA	Japan International Cooperation Agency
JMP	Joint Monitoring Programme
kW	Kilowatt
kWh	Kilowatt-Hour
LCBC	Lake Chad Basin Commission
LGA	Local Government Authority
M&E	Monitoring and Evaluation
M/P	Master Plan
MANR	Ministry of Agriculture and Natural Resources
MCM	Million Cubicmeter
MDG	Millennium Development Goals
MICS	Multiple Indicator Cluster Survey
MLIT	Ministry of Land, Infrastructure and Transport of Japan
MW	Megawatt
MWh	Megawatt-Hour
NACRDB	Nigeria Agricultural Cooperative and Rural Development Bank
NAFDAC	Nigeria Food Drag Administration and Control
NAFSS	National Agriculture and Food Security Strategy
NASRADA	Nigeria Space Research and Development Agency
NBA	Niger Basin Authority
NBN	National Bank of Nigeria
NBS	National Bureau of Statistics
NCC	Nigeria Cameroon Commission
NCWR	National Council on Water Resources
NDHS	National Demographic and Health Survey
NEED	National Economic Empowerment and Development Strategy
NEMA	National Emergency Management Agency
NERA	National Emergency Relief Agency
NESREA	National Environmental Standards and Regulations Enforcement Agency
NEWMAP	Nigerian Erosion and Watershed Management Project
NFDP	National Fadama Development Project
NFSSP	National Food Security Support Project
NGO	Non Governmental Organization
NGSA	Nigeria Geological Survey Agency
NIHSA	Nigeria Hydrological Services Agency
NIMET	Nigerian Meteorological Agency
NIS	Nigerian Industrial Standard
NIWA	National Inland Waterways Authority

略　語	説　明
NIWRMC	Nigeria Integrated Water Resources Management Commission
NNJC	Niger-Nigeria Joint Commission
NPC	National Population Commission
NPC	Nigeria Planning Commission
NRDS	National Rice Development Strategy
NRW	Non Revenue Water
NTN	National Training Network
NWRI	National Water Resources Institute
NWSSBS	National Water Supply and Sanitation Baseline Survey
OORBDA	Ogun-Osun River Basin Development Authority
PET	Potential Evapotranspiration
PHCH	Power Holding Company of Nigeria
PPP	Public-Private Partnership
PSP	Private Sector Participation
RBDA	River Basin Development Authority
RBMC	River Bain Management Commission
RCM	Regional Climate Models
ROPSIN	Review of the Public Irrigation Sector of Nigeria
RUWASSA	Rural Water Supply and Sanitation Agency
SEA	Strategic Environmental Assessment
SHA	Sub Hydrological Area
SON	Standards Organisation of Nigeria
SRRBDA	Sokoto-Rima River Basin Development Authority
SRTM	Shuttle Radar Topography Mission
SSHA	Small Sub Hydrological Area
STWSS	Small Town Water Supply and Sanitation
STWSSA	Small Town Water Supply and Sanitation Project
STWSSP	Small Town Water Supply and Sanitation Agency
SWA	State Water Agencies
TOR	Terms of Reference
UAC	Users Association Committee
UFW	Unaccounted for Water
UNDP	United Nations Development Programme
UNEP	UN Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children's Fund
UNISDR	United Nations International Strategy for Disaster Reduction
VAB	Visual Basic Application
WASHCOM	Water, Sanitation and Hygiene Committee
WATSAN	Water and Sanitation
WB	World Bank
WCA	Water Consumers Association
WHO	World Health Organization
WRDP	Water Resources Development Plan
WRMP	Water Resources Management Plan
WRUP	Water Resources Utilization Plan
WSSSRP	Water Supply Sanitation Sector Reform Programme
WTP or WTW	Water Treatment Plant or Works
WUA	Water Users Association

第１章　　プロジェクトの背景と目的

1.1　　プロジェクトの背景

近年、ナイジェリア（「ナ」国）では、人口増や経済発展に伴い灌漑、飲料水、エネルギー開発などに必要な水資源開発のニーズが高まっている。また、北部を中心とした渇水は深刻化しており、乱開発を防ぎつつ希少な水資源の適切な開発・管理は喫緊の課題となっている。

「ナ」国政府の要請の下、国際協力機構（JICA）は 1995 年に開発調査「全国水資源総合開発計画」を実施し、「全国水資源マスタープラン」（以下、M/P1995）の策定を支援した。M/P1995 の提言を受け、2008 年には連邦水資源省（FMWR）下に、水資源管理全般や利害関係者の調整、水資源開発にかかる許認可制度の改善などを包括的に行うナイジェリア総合水資源管理庁（Nigeria Integrated Water Resources Management Commission: NIWRMC）が設立された。しかし、M/P1995 策定から 15 年が経過し、以下のような問題点・課題が生じてきている。

① 人口増加や経済発展により、水需要が拡大している。

② 乾季には河川流量が減るのが通例であるが、特に近年では 12 月から 1 月にかけて完全に干上がる河川が以前と較べ多く出現し、また、北部を中心に乾季に完全に枯渇する地下水源も以前と較べ増加するなど、M/P1995 が前提とする水資源状況と現状に乖離が生じている。

③ 気候変動等の影響により、極端な気象状況の頻度が増加し、渇水、豪雨等による被害が増加しており、適切な水資源の管理・利用に向けて予報/予防といった新しい観点を計画に組み込む必要性が生じている。

④ 水資源管理行政を国家レベルで司る NIWRMC の設置に加えて、全 8 流域に NIWRMC の下部組織である流域管理事務所を設置し、水資源の配分等に関するステークホルダーとの調整・合意のもとで「流域管理計画」を策定し実施することが制度化されるなど、水資源管理・開発行政の制度的な変更が生じている。

かかる状況の下、「ナ」国政府は我が国に対して、適切な水資源管理行政の推進に向けて、M/P1995 を改訂するため、開発計画調査型技術協力を日本に対して要請した。これを受け、JICA は 2011 年 2 月に詳細計画策定調査団を派遣し、要請経緯、要請内容、組織体制、他ドナーによる協力、現況、本格調査で実施される調査内容等について説明・協議を行い、2011 年 3 月に先方実施機関の連邦水資源省（FMWR）と実施細則（S/W）を署名・交換した。JICA はコンサルタントからなるプロジェクトチームを結成し、2011 年 8 月に現地調査が開始された。

1.2　　プロジェクトの目的

本プロジェクトの目的は、以下のとおりである。

1）M/P1995 を見直し、改訂した、2030 年を目標年とする「全国水資源マスタープラン 2013」の策定
2）HA-1（Niger North）及び HA-6 西部 Ogun-Oshun 流域を対象とした各「流域管理計画（案）」の策定

流域管理計画（案）を先行的に策定することにより、以後行われる他流域での同計画の策定に資することが期待される。

1.3　　プロジェクト区域

全国水資源マスタープラン 2013 の対象地域は「ナ」国を構成する全 8 流域（Niger North:HA-1、Niger Central:HA-2、Upper Benue HA-3、Lower Benue HA-4、Niger South:HA-5、Western Littoral:HA-6、Eastern Littoral:HA-7、Lake Chad:HA-8、総面積：923,700km2、総人口：1 億 4043 万人）とする。図 1-1 参照。

本プロジェクトでは、①基礎調査、②マスタープランの策定、③流域管理計画（案）の策定の 3

つのフェーズに分割され、①及び②は全国（全 8 流域）を対象とし、③については、HA-1:Niger North 及び HA-6:Western Littoral 西部/Ogun-Oshun 流域の 2 流域を対象とする。表 1-1 参照。

図 1-1　「ナ」国の水文地域図

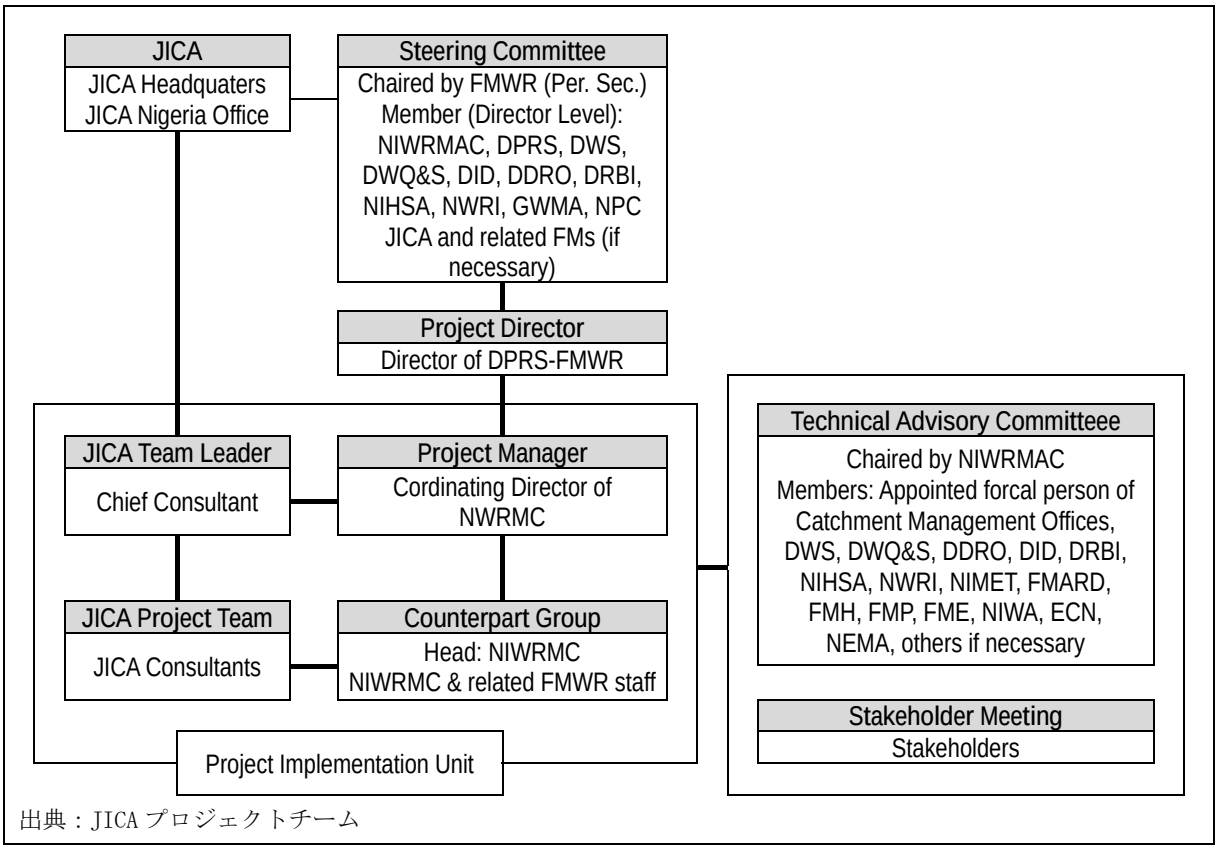
表 1-1　プロジェクトの全体工程

フェーズ-1 （2011 年 8 月～2012 年 8 月、13 ケ月）	フェーズ-2 （2012 年 9 月～2013 年 4 月、8 ケ月）	フェーズ-3 （2013 年 5 月～2014 年 1 月、9 ケ月）
基礎調査 ◆ データ収集 ◆ 水資源量評価 ◆ 水需要量評価 ◆ 課題の抽出 ◆ 水資源管理の方向性の確認	**マスタープランの策定** ◆ 全国水資源マスタープラン 2013 の策定	**流域管理計画（案）の策定** ◆ 対象 2 水文地域の流域管理計画（案）の策定 - HA-1:Niger North - HA-6:Western Littoral 西部の Ogun-Oshun 流域

第２章　　プロジェクトの運営

2.1　　プロジェクトの運営組織

本プロジェクトの運営組織は、図 2-1 に示すとおりである。



出典：JICA プロジェクトチーム

図 2-1　プロジェクト運営組織

2.2　　日本側メンバー

日本側メンバーを表 2-1 に示す。

表 2-1　日本側メンバー

氏　名		役　職
JICA 本部		
天野 雄介	JICA 本部	地球環境部水資源・防災グループ参事役
大槻 英治	JICA 本部	地球環境部水資源・防災グループ参事役
涌井 純二	JICA 本部	地球環境部水資源・防災グループ課長
今井 達也	JICA 本部	地球環境部水資源・防災グループ課長
高嶋 清史	JICA 本部	地球環境部水資源・防災グループ職員
渡辺 利一	JICA 本部	地球環境部水資源・防災グループ職員
宮川 聖史	JICA 本部	地球環境部水資源・防災グループ職員
山崎 正則	JICA 本部	地球環境部水資源・防災グループ職員
JICA ナイジェリア事務所		
鷲見 佳高	JICA ナイジェリア事務所	所長
関　 徹男	JICA ナイジェリア事務所	所長
増田 吉朗	JICA ナイジェリア事務所	所員
美甘 政門	JICA ナイジェリア事務所	所員
下平 千恵	JICA ナイジェリア事務所	所員
JICA プロジェクトチーム		
渡辺 正知	八千代エンジニヤリング㈱	総括/水資源管理・開発計画
北村 忠紀	㈱建設技研インターナショナル	表流水管理・開発/水文
中村 浩	八千代エンジニヤリング㈱	地下水管理・開発/水理地質

氏　名		役　職
三好 聡憲	八千代エンジニヤリング㈱	給水・衛生
松本 裕一	㈱三祐コンサルタンツ	灌漑・排水
柴田 秀英	㈱三祐コンサルタンツ	営農
橋口 泰三	八千代エンジニヤリング㈱	ダム・水力発電 1
原　成市	八千代エンジニヤリング㈱	ダム・水力発電 2
井上 和則	㈱建設技研インターナショナル	治水計画
山崎 順吉	八千代エンジニヤリング㈱	組織制度・人材育成
長下部 昇	八千代エンジニヤリング㈱	社会経済分析
セバスチャン・ハラ	㈱建設技研インターナショナル	水環境・環境社会配慮
田中 宇祐	八千代エンジニヤリング㈱	水資源情報管理
大浦 寿	八千代エンジニヤリング㈱	業務調整・水資源情報管理補佐

出典：JICA プロジェクトチーム

2.3　「ナ」国側メンバー

運営委員会メンバーを表 2-2 に、技術諮問委員会メンバーを表 2-3 に、カウンターパート・チームメンバーを表 2-4 に示す。

表 2-2　運営委員会メンバー

氏　名	所　属	役　職
Mr. Baba Umar Farouk	FMWR	Chairman of Steering Committee, Perm. Secretary
Amb.(Dr) Godknows B. Igali	FMWR	Chairman of Steering Committee, Perm. Secretary
Mrs. LD Bagaiya	FMWR	Director PRS
Dr. E.A .Adanu	FMWR	Director Dams & reservoir Operation
Engr. J Kwanashie	FMWR	Director Irrigation & Drainage
Engr. Bello Tunau	FMWR	Director Water Supply
Engr. S.O Ome	FMWR	Director Water Quality Control & Sanitation
Mr. Nelson Nwosu	FMWR	Dir. River Basin Operations & Inspectorate
Mr. Reuben A. Habu	NIWRMC	Coordinating Director of NIWRMC
Engr. R.A.K Jimoh	NIWRMC	Coordinating Director of NIWRMC
Engr. Halidu Yusuf	SRRBDA	Managing Director
Engr. Jimi Omobki	OORBDA	Managing Director
Mr. J.A. Shamonda	NIHSA	Director General
Dr. Olusanjo A. Bamgboye	NWRI	Executive Director
Engr. Babaji I.	FMWR	Director Gurara
Mr. Ojo Sunday	NPC	Director, International Cooperation Dept.

出典：JICA プロジェクトチーム

表 2-3　技術諮問委員会メンバー

氏　名	所　属	役　職
Engr. (Mr.) Okon Ekpenyong	ECN	Deputy Director
Engr. (Mr.) James Akinjobi	NEMA	Senior Scientific Officer
Mr. John A. Onov Biona	FMARD	Chief Fish Officer
Mr. Temitope R. Omotola	NPC	Deputy Director
Engr. (Mr.) N. D. Madu	FMWR	Assistant .Director
Mr. Adetunji Idowu	FMWR	Deputy Director
Engr. (Mr.) Peter Y. Manjuk	FMWR	Deputy Director
Engr. (Mr.) R. A. K. Jimoh	NIWRMC	Coordinating Director
Baryr (Mrs.) Von Emeka-Aneke	FMWR	Deputy Director
Engr. (Mr.) Mohammed U. Galadima	NIWRMC	Deputy Director
Mr. Philip D. Abah	FMARD	Deputy Director
Mrs. R. A. Bako	FMWR	Assistant Director
Rev. Engr. Dr. (Mrs.) Nwosah G. C.	FMWR	Assistant Director
Rev. (Mr.) M. I. Nwabufo	NIHSA	Director
Mr. Lawal Kola Maroof	NIWRMC	Deputy Director
Mr. S. Zakari	FMWR	Deputy Director

出典：JICA プロジェクトチーム

表 2-4　カウンターパート・チームメンバー

氏　名	所　属	役　職
Mrs. L.D. Bagaiya	FMWR	Project Director
Mr. Reuben A. Habu	NIWRMC	Project Manager
Engr. R. A. H. Jimoh	NIWRMC	Project Manager
Engr. K. S. Sunmonu	NIWRMC	Deputy Project Manager
Mr. Ogbonna Kenneth E.	FMWR	Hydrogeologist., DWS
Mr. Bitrus Joshua	NIWRMC	Principal Technical Officer
Mr. Oyakhirome Florence	FMWR	Chief Scientific Officer, DDRO
Engr. Enyi Hycinth	FMWR	Principal Technical Officer, DWQC
Engr. A. O. Mebude	FMWR	Assistant Director, DID
Mr. Ihuoma Anthony	FMWR	Senior Statistical Officer, DPRS
Mr. G. A. Agwuma	FMWR	Senior Statistician, DPRS
Mr. S. O. Abdulyekeen	NIWRMC	Senior Hydrogeologist
Mr. S. O. Okpara	NIHSA	Assistant Chief Hydrogeologist
Mr. B. C. Ojo	NIHSA	Principle Hydrogeologist
Engr. J. A. Gbadegesi	NIHSA	Principle Engineer
Mr. E. O. Oton	NIWRMC	Assistant Director
Engr. Kassim Bello	FMWR	Civil Engineer, DWS
Ms. Yemisi	FMWR	Senior Scientific Officer, DWQC
Engr. Anthea Ochedikwu	FMWR	Assistant Chief Irrigation Engineer, DID
Mr. Ikpeamaeze Joseph	FMWR	Assistant Chief, Administration Office
Engr N. D. Madu	FMWR	Assistant Director, DDRO
Mr. D. A. Amodu	NIHSA	Principle Engineer
Ms. Alice O. Ojowu	FMWR	Assistant Director, DPRS
Mr. A. Olayinka	FMWR	Assistant Statistician, DPRS
Mr. Charles Ikediashi	FMWR	Chief Scientific Officer
Mr. E. A. Bassey	FMWR	Chief Statistician, DPRS
Ms Biritu Ali	GWMA	Hydrogeolgist

出典: JICA プロジェクトチーム

2.4　主要な会議

調査開始（2011 年 8 月）から現在（2013 年 11 月）までに開催された主要会議は、表 2-5 のとおりである。

表 2-5　主要会議

開催日	会議名	内　容
2011 年 8 月 9 日	第 1 回運営委員会	インセプションレポートの説明と協議
2011 年 8 月 12 日	第 1 回ステークホルダー会議	インセプションレポートの説明と協議
2012 年 2 月 14 日	第 2 回運営委員会	プログレスレポート（1）の説明と協議
2012 年 7 月 10 日	第 3 回運営委員会	プログレスレポート（2）の説明と協議
2012 年 7 月 12 日	第 2 回ステークホルダー会議	プログレスレポート（2）の説明と協議
2013 年 3 月 6 日	第 4 回運営委員会	インテリムレポート(案)の説明と協議
2013 年 5 月 16 日	第 5 回運営委員会	インテリムレポートの説明と協議
2013 年 5 月 23 日	第 3 回会ステークホルダー会議	インテリムレポートの説明と協議
2013 年 11 月 27 日	第 6 回運営委員会	ドラフトファバルレポートの説明と協議
2013 年 12 月 3 日	セミナー	ドラフトファイナルレポートの説明と協議

出典：JICA プロジェクトチーム

また、上記会議に加え 2013 年 1 月に技術諮問委員会会議が開催され全国水資源マスタープラン 2013 の計画条件が議論され、基本的合意が得られた。

2.5　全国水資源マスタープラン 2013 の作成に係るワークショップ

JICA プロジェクトチームは、全国ワークショップと水文地域ワークショップの 2 段階のワークショップを実施した。その目的と成果を以下のとおりである。

(1) 全国ワークショップ

全国ワークショップは連邦首都 Abuja で実施され、関連機関の本プロジェクトへの参加を依頼するとともに、水資源管理・開発に関する情報・事業計画・課題に関する情報交換を行った。本プロジェクトのフェーズ-1 の期間に、合計 3 回の全国ワークショップを実施した(表 2-6 参照)。

表 2-6　全国ワークショップの開催

No.	協議内容	開催日	参加者数
第 1 回	水問題と水需要	2011 年 10 月 20 日	71
第 2 回	水問題と水資源開発ポテンシャル	2012 年 3 月 19 日	75
第 3 回	マスタープランの策定方針	2013 年 5 月 16 日	75

出典：JICA プロジェクトチーム

(2) 水文地域ワークショップ

水文地域ワークショップは、各水文地域における水資源管理・開発にかかわる問題を明らかにするとともに、関係各機関に対して情報提供の依頼を行うこと目的として実施した。ワークショップでは各州からの参加者が水問題に関し広範な議論と情報交換を行った。ワークショップの実施行程を表 2-7、開催地を図 2-2 に示す。

表 2-7　水文地域ワークショップの実施行程

開催順序	水文地域		都市[注)]	開催日	参加者		
	No.	名称			参加者数	RBDA	州
第 1 回	2	Niger Central	Minna	10月6日	73	Upper Niger	Niger, Kaduna, Kwara, Kogi, FCT
第 2 回	8	Chad Basin	Kano	11月1日	58	Hadejia Jama' are	Kano, Boruno, Jigawa
第 3 回	2	Niger North	Sokoto	11月3日	54	Sokoto Rima	Sokoto, Katsina, Kebbi, Zamfara
第 4 回	5	Niger South	Benin	11月17日	67	Bennin Owena	Delta, Edo, Ekiti, Ondo, River
第 5 回	7	Eastern Littorl	Owerri	11月22日	79	Anambra Imo, Cross River and Niger Delta	Anambra, Abia, Imo, Ebonyi, Enugu, Cross River, River
第 6 回	4	Lower Benue	Makurdi	11月24日	36	Lower Benue	Benue, Nassarawa, Plateau
第 7 回	3	Upper Benue	Yola	11月29日	103	Upper Benue	Adamawa, Taraba, Yobe, Bauchi, Gombe
第 8 回	6	Western Littoral	Abeokuta	12月7日	60	Ogun Oshun	Ogun, Osun, Ooyo, Lagos

注) 開催都市と水文地域が必ずしも一致していない理由は、会場の所在地や治安を考慮したため
出典：JICA プロジェクトチーム

(3) ワークショップにおける討議内容

ワークショップでは、以下の 3 つテーマに沿って JICA プロジェクトチームと参加者との間で協議がなされた。

- プロジェクトの内容紹介
- プロジェクトの実施に必要なデータ・情報の提供依頼
- 現地再委託業務の内容紹介と協力依頼

各ワークショップにおける協議内容の要約を表 2-8 に示す。また、各ワークショップに共通して以下の意見が提出された。

- M/P1995 や連邦レベルの政策・計画の内容が州政府レベルまで伝わっておらず、改善が必要である。
- M/P1995 のソフトコピーを各州のステークホルダーに配布してもらいたい。
- ダムの運用・管理規則の見直しと同時にダムの堆砂問題が検討されるべきである。
- 改訂されるマスタープランでは気候変動問題を検討してもらいたい。

一連のワークショップの議事録と参加者リストを添付資料に示す。

出典：
JICA プロジェクトチーム

図 2-2　ワークショップ開催都市

表 2-8　ワークショップの協議内容

地区	「ナ」国側からの意見・提案
全国ワークショップ	
Abuja	第 1 回 • マスタープランでは水資源量だけでなく水質に関しても十分に検討すべきである。 • データを所有する機関がプロジェクトのために積極的にデータを提供すべきである。 • 地下水モニタンリグ調査は流域管理計画策定が予定されている 2 水文地域で行う計画であるが、他の流域にも拡大すべきである。
	第 2 回 • 水資源モニタリングに関するステークホルダー間の役割分担が明確でない。 • 幾つかの地域で水問題による対立が続いている。また、対立がない地域でも水利用者間の調整不足が顕在化している。 • 連邦政府、州政府、地方政府間の連絡・調整が不足している。 • 現行法律の不備や公共財としての水資源の性質が水料金の徴収を難しくしている。 • 関係技術者の能力向上のための訓練が不足している。 • 高濃度浮遊土砂やダムの堆砂による使用可能水量の減少が問題となっている。
水文地域ワークショップ	
Niger Central	• マスタープランは、各州の開発計画や優先事業を取り込むべきである。特に、州政府のマスタープランや水需要予測など、マスタープランの結果との整合性が求められる。その一方でマスタープランは全国を対象とすることにも留意すべきである。 • 利用されていない大規模ダムがあり、マスタープランで有効利用に関し検討してもらいたい。 • 各関連機関はデータバンク設立の努力を行い、データ提供を推進すべきである。 • JICA プロジェクトチームは Kainji PHCN からデータ・情報収集をすべきである。 • 各機関の連携体制を確立することがマスタープラン成功の鍵である。
Chad Basin	• マスタープランの見直しと同時にその実施に向けたアクションプランを作成すべきである。 • JICA プロジェクトチームは民間会社等の草の根レベル的な水資源関連組織からも情報収集すべきである。 • 連邦政府は適切な手続きによって各州政府に対して現地再委託業者を紹介すべきである。 • 社会経済調査実施のために、関連機関は適切なデータバンクを設立すべきである。 • ダム調査では、ダムによる負の影響を保障するための政策に関して調査・検討されるべきである。 • マスタープランが対象とするダムは今回の再委託の対象となっている大規模ダムに限定すべきではない。多くの中・小規模ダムが同様の問題を抱えており、運用・維持管理方法の見直しが必要である。
Niger North	• プロジェクト開始時点におけるステークホルダーの参加は評価できる。 • JICA プロジェクトチーム、現地再委託コンサルタントは柔軟性と忍耐力を持ってデータ収集をすべきである。 • マスタープランの中で、適切で効率的なダム利用方法に関して提案してもらいたい。

地区	「ナ」国側からの意見・提案
	• ダムの存在が上・下流域に与える利益・不利益を総合的に評価すべきである。 • 井戸台帳調査を担当する再委託業者はすべての関連機関を対象に調査すべき。 • 全てのダムを対象として堆砂問題を検討すべきである。 • 各州政府は独自に立案した水政策を連邦水資源省に提示すべきである。
Niger South	• Ondo 州、Edo 州、Ekiti 州および Delta 州の一部は Benin-Owena RBDA (HA-6) にも含まれることに JICA プロジェクトチームは留意すべきである。 • 果樹栽培のための水資源開発を改訂されるマスタープランに含むべきである。また、LGA レベルのステークホルダーのプロジェクトへの参加を期待する。 • M/P1995 に示された村落給水の目標値 42%は現時点において達成されていない。 • データを適切にモニタリングし評価するとともに、収集されたデータの質に注目し、必要に応じて補正・修正ことが必要である。 • 適切な技術によるマスタープランの見直しが必要である。
Eastern Littoral	• M/P1995 の提案事業が実施されていない理由を検討し、今後の有効活用を図るべきである。 • 改訂されるマスタープランでは、関連機関・組織の役割分担を適切に定め重複を避けることによって資源の無駄遣いを防ぐ必要がある。 • 大規模ダムの問題だけが指摘されているが、小規模ダムに問題はないのか。 • 連邦政府、州政府機関、LGA 間の定期的な情報交換が必要である。 • 改訂されるマスタープランの最終報告書は、ソフト・ハードコピーの両方を関係機関に配布願いたい。 • マスタープラン実施に向けた関連資源の利用可能性に関して、各資源へのアクセス方法と利用法を具体的に検討・発表してもらいたい。 • 北部 Owerri の Ubowalla や Emekula 地域は洪水と浸食により分断された。緊急対策の立案に供するデータ・情報収集が必要である。
Lower Benue	• 越境水の活用方法提案と表流水の賦存量調査に期待する。 • 関連機関がデータ収集のための資金配賦を待つのではなく、自身で積極的にデータ収集する姿勢が大切である。 • 若手技師の育成が必要である。 • 各レベルにおける政策の実施や、各機関がデータバンクを持ちデータ・情報を集積するのが望ましい。 • 井戸台帳調査やその他の再委託調査における収集データ提出方法は政府の方式に従うべきである。再委託契約金額の最終支払いは収集データ提出後とすべきである。
Upper Benue	• マスタープランの目的達成のためには、担当職員の訓練・能力強化とともに、3 つの政府(連邦、州、地方)の連携におけるシナジー効果を期待すべきである。 • データ収集の初期段階は単純なデータ収集、編集であるが、次の段階では専門機関によるデータ編集と解析が実施されるべきである。 • 社会条件調査の質問表の内容は単純で平易であるが、色々な方法を駆使して、社会条件調査の目的を達成すべきである。
Western Littoral	• 根菜類（キャッサバ・ヤム）ではなく野菜を対象とした灌漑計画の立案を期待する。 • 本プロジェクトで水資源管理が強調されている点を重く受け止める必要がある。 • 養殖分野を独立した水セクターとしてマスタープランの見直しに含めてもらいたい。 • M/P1995 を関連機関に配布してほしい。 • 小規模アースダムの運営・維持管理にも注目すべきである。

出典：JICA プロジェクトチーム

2.6 流域管理計画（案）の作成に係るステークホルダー会議

調査団は流域管理計画（案）の作成に関連し、対象地域である HA-1 及び HA-6 西部 Ogun-Oshun 流域のステークホルダーと一連の会議を実施した。その内容を以下に述べる。

(1) ステークホルダー会議の運営

ナイジェリア総合水資源管理庁（NIWRMC）と流域管理事務所（CMO）がすべてのステークホルダー会議、ワークショップにおいてリーダーシップを発揮し会議を運営した。

(2) ステークホルダー会議の内容

ステークホルダー会議の日程と概要を表 2-9 に示す。ステークホルダー会議では流域管理計画（案）の対象地域である HA-1 および Ogun-Oshun 流域の水資源開発ポテンシャル、水需要、水需給バランス、水資源開発計画等に関し全国水資源マスタープラン 2013 の内容を説明し協議を行った。それに対して、参加者から以下に示す水問題と課題が提出された（表 2-10 参照）。

一連のステークホルダー会議の議事録と参加者リストを添付資料に示す。

表 2-9　流域管理計画（案）に係るステークホルダー会議の日程と概要

日程	活動	内容
5 月 23 日	• 全体ステークホルダー会議	• M/P2013 の説明と質疑応答を行った。
5 月 24 日	• HA-1 および Ogun-Oshun 流域ステークホルダー会議	• ステークホルダーのリストアップ、役割分担の確認を行った。
6 月 12 日	• HA-1（Zamfara 州）ステークホルダー会議	• M/P2013 実施上の課題の抽出と協議を行った。
6 月 24 日 ～ 6 月 28 日	• Ogun-Oshun 流域（主要 4 州）ステークホルダーとの協議 • ステークホルダー会議（6 月 26 日）	• 調査団が Ogun-Oshun 流域の主要 4 州政府機関を訪問し情報収集を行い、M/P2013 の内容を説明し協議した。 • ステークホルダー協議では、M/P2013 実施上の課題を抽出し協議した。
7 月 3 日	• HA-1（主要 3 州）ステークホルダー会議	• HA-1 の 3 州の M/P2013 実施上の課題抽出と協議を行った。
7 月 15 日 ～ 7 月 19 日	• Ogun-Oshun 流域（主要 4 州）ステークホルダーと協議 • Ogun-Oshun 流域ステークホルダー会議（7 月 18 日）	• 調査団が Ogun-Oshun 流域主要 4 州政府機関を訪問し情報収集を行い、M/P2013 の内容を説明し協議した。 • ステークホルダー会議では課題解決のための方策を議論した。 • 主要 4 州独自の水需要量予測結果の提出を依頼した。
7 月 24 日	• HA-1（主要 4 州）スタークホルダー会議	• M/P2013 提案事業の内容を説明した。 • 課題解決のための対策を提案した。 • 主要 4 州独自の将来水需要量予測結果の有無に関す確認を行った。
9 月 26 日	• HA-1（主要 4 州）スタークホルダー会議	• 流域管理計画の進捗状況説明しまた組織制度に関し提案した。
10 月 2 日 10 月 3 日	• Ogun-Oshun 流域スタークホルダー会議	• 流域管理計画の進捗状況を説明し、組織制度に関し提案した。更に Lagos 州独自の水需要に対する開発計画を説明した。

備考：M/P2013:全国水資源マスタープラン 2013
出典：JICA プロジェクトチーム

表 2-10　ステークホルダー会議における協議内容

HA-1 における「ナ」国側からの意見・提案	
水需要予測	• HA-1 の主要 4 州は州独自のマスタープラン又は長期需要予測は行っていない。従って M/P2013 に示された水需要予測を基礎に将来の水資源管理・開発計画を検討する。
表流水	• Sokoto 地域における給水のための Rima 川取水箇所における河川水の濁度が非常に高く浄水処理における薬品使用のコストが大きい。Sokoto 川沿いに粘土質の地層が分布しており、河川沿いの採掘場の存在と土地の荒廃と浸食の増大が濁水発生の原因の一つと指摘されている。 • Sokoto の灌漑地域で地下水汚染が発生している。また水草の繁茂が著しい。 • 河道における堆砂が著しい。
地下水	• M/P2013 調査結果の井戸本数は公的な給水井戸に限定されており民間井戸（家庭、工場、自事務所）が含まれていない。民間井戸の掘削記録が公的機関によって収集・管理されていないのが問題である。
水質汚染	• Zamfara 州の地下水汚染は深刻な問題であり地下水汚染地域の特定が必要である。またゴミ処理場などの地下水汚染源の分布を明らかにし、対策を立案すべきである。 • 地下水中の鉄の濃度が高くまた浅井戸の地下水汚染が進行している。 • 地下水質の悪化を防ぐための過剰揚水や過剰な井戸掘削を規制すべであり、また水質汚染を避けるためにより深部の地下水開発を期待する。 • 工業廃水の処理のレベルが低い。
施設の運営・管理	• 観測機材の不足や故障によって水文データの集積が不足している。 • 水資源の開発・管理計画が不十分である。 • 流域の水質悪化が進行しているが、水質分析機材が不足し水質汚染の実態が把握されていない。 • 水道局の退職職員数に補充がなくまた職員の能力が不足している。 • ステークホルダー間の調整が不足している。 • 料金回収が不十分であり水道事業の運営・維持管理費が十分に回収されていない。 • 長期間にわたって水道料金が据え置きされ水道事業の経営を圧迫している。
Ogun-Oshun 流域における「ナ」国側からの意見・提案	
水需要予測	• Lagos 州は独自の水需要予測を持っており、この予測値は M/P2013 における予測値と大きく異なるものである。流域管理計画においては Lagos 州の独自の水需要に対する計画を別シナリオとして採用し、この水需要に対応する水資源管理・開発計画を策定する必要がある。
水源保全	• 森林伐採にあたっては州政府の許可が必要であるが実効性に乏しく、水資源保全のため対策が必要である。また森林再生・浸食対策が必要である。 • 表流水・地下水の水質を分析評価する水質分析試験施設・機器が不足している。
地下水	• 井戸登録・井戸建設規制が必要である。海岸地域では海水侵入対策の必要性が高い。過剰揚水の

	規制対策、井戸掘削位置の分布を指導・規制する計画・法律・ガイドラインが必要であり、特に公的な給水用井戸の水量・水質を保護するための揚水規制が必要である。処理場付近での地下水開発の規制が必要である。 • 近年多くのハンドポンプ井戸が太陽光発電を含む動力ポンプ井戸に変わるなど技術的変化が進んでいる。また、地下水利用のいける灌漑井戸・家庭用浅井戸などの私的な地下水利用が進行しているがその実態が十分には把握されていない。
能力向上	• 気象・水文関連の担当職員の能力向上と水文データを正しく評価する能力が必要である。 • 州政府レベルの水資源開発政策、データ管理、能力開発が必要である。
組織・運営管理	• M/P2013 策定後に、提案された事業の実施状況に係わるモニタリングが必要である。 • 連邦レベルだけでなく、対象の Ogun-Oshun 流域を含む HA-6 で既に設立されている水文地域レベルでの調整機関の存在が必要である。また水資源の開発・管理に関する調整とデータ収集を一元的に行う組織の設立が必要である。

備考：M/P2013:全国水資源マスタープラン 2013
出典：JICA プロジェクトチーム

2.7 再委託業務の概要

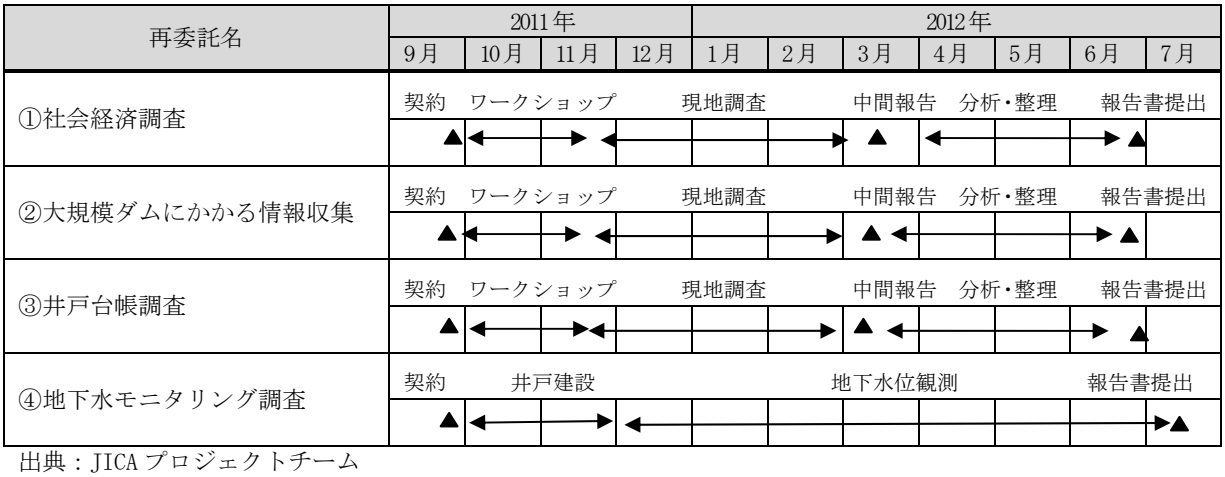
本プロジェクトでは、表 2-8 に示す 4 件の現地再委託調査を実施した。

表 2-11 再委託業務の内容

再委託名	内 容	成果品
①社会経済調査	全国 37 州の水資源管理･開発に係る社会経済情報を収集する。	給水事業内容、農業活動内容、洪水・浸食対策、環境問題、観光事業に関するデータ。
②大規模ダムにかかる情報収集	全国 26 箇所の大ダムの流量やダム仕様その他の基本情報を収集する。	ダム設計仕様、ダム水位、ダム流入出量、ダム運用規則等。
③井戸台帳調査	全国 37 州の井戸情報を収取・整理する。	各 LGA の深井戸本数、揚水量、稼働率等。
④地下水モニタリング調査	流域管理計画策定の対象となる HA-1 および Ogun-Oshun 流域において、合計 30 箇所の浅井戸を建設し地下水位を継続観測する。	全 30 箇所のモニタリング浅井戸の地下水位変化。期間は 2011 年 12 月～2012 年 6 月。

出典：JICA プロジェクトチーム

再委託委業務の実施期間中（図 2-3 参照）は、JICA プロジェクトチームと各再委託業者が再委託業務の内容と作業方法に関して綿密な打ち合わせを重ねた。また、再委託業者は連邦政府および各州政府機関から情報を収集する必要があったため、各ワークショップに参加し各機関の代表者にデータ提出依頼を行い、業務の円滑な進捗に努めた。



出典：JICA プロジェクトチーム

図 2-3 再委託業務の工程

第３章　　プロジェクトのアウトプット

プロジェクトでは、アウトプットとして全国水資源マスタープラン 2013 と、HA-1 および Ogun-Oshun 流域のそれぞれの流域管理計画（案)を策定しファイナルレポートにとりまとめた。

3.1　全国水資源マスタープラン 2013

全国水資源マスタープラン 2013 のアウトプットを表 3-1 に示す。

表 3-1　全国水資源マスタープラン 2013 報告書のアウトプット

章・項	目次	アウトプット
第１章　プロジェクト区域の現状		
1.1	社会・経済条件	「ナ」国の行政執行体制（国家と地方)、人口、経済状況、財政に関して記述した。
1.2	自然条件	地形、地質、水理地質、土壌、植生、土地利用、気象、水文に関して記述した。
1.3	水資源セクターにおける組織と責任	水資源関連組織とその役割を、歴史的背景を踏まえ組織と役割を記述した。とくに、連邦水資源省（FMWR)、流域開発公社（RBDAs）とナイジェリア統合水資源管理庁（NIWRMC）の組織と役割を詳述した。
1.4	水資源の開発と利用	水利用の現況を表流水施設と地下水施設を区分して記述した。また、国際河川である Niger 川、Benue 川の水利用を説明した。
第２章　既存の全国水資源マスタープラン 1995 の見直し		
2.1	概説	調査の経緯とまた基本方針を記述し、提案された主要事業である貯留ダム、灌漑配水事業、上水道事業に関して説明した。また、計画指標を示した。
2.2	水資源ポテンシャルの評価	流域分割に基づき新たに流域分割を行った。表流水ポテンシャルと地下水ポテンシャルの評価方法と結果に関し解説した。問題・課題とマスタープラン改訂における見直し方法を記述した。
2.3	水需要の予測	水需要予測の手法と結果を記述し、またその問題点を解説した。人口予測は結果としてかなり低めであり、全体的に水資源量に余裕があると結論された。また、結果的に過大な単位給水量（都市、農村）で予測されたと判断された。
2.4	水資源開発計画	提案された表流水開発計画および地下水開発計画に関してレビューを行った。その結果、短期計画として提案された水源工リハビリ事業は徐々に進められてきているものの、長期計画として提案された分散型中小規模多目的貯水池開発事業については、そのほとんどが実施されていない。また貯水池運用ルールの欠如などの課題が現時点での改善されていないことが確認された。地下水開発も提案通りに開発が進んでいるとは言い難い。計画に沿って進行していない理由を分析しマスタープラン改訂における改善点を提案した。
2.5	サブセクター別プログラムとその実施	給水・衛生：提案された給水施設のリハビリ事業と新規開発事業に関して実施状況を分析した。給水リハビリ事業に関して、既存の地下水利用施設の大きな改善はなく、地表水利用施設（主に都市給水）も一部の州に限られており全国的な改善はないものと推定された。新規開発給水事業に関しては給水普及率からみた M/P1995 開発計画の進捗は半分程度の達成率にあると推定された。 灌漑配水：計画事業の進捗状況を 3 つの主要スキームに関して分析し、結果として緊急性の高いリハビリ事業は少しずつ進められているが、全体的に停滞していることが確認された。 洪水エロージョン対策：侵食対策と洪水対策に関して、現状の問題点と課題の指摘、将来の対策の必要性を述べるに留まっていることが確認された。
2.6	水資源管理計画	表流水、地下水に関する水資源管理計画に関して、提案事項と実施状況、実施に係わる課題を記述した。また、組織制度に関して提案内容と実施状況を記述した。
2.7	結論とフィードバック	M/P1955 策定から 20 年近く経た現在、提案された事業の目標達成は困難であり、改訂されるマスタープランの策定において検討すべき以下の 4 項目を示した。 • 国家政策とマスタープラン基本方針・戦略 • 水資源ポテンシャルの評価 • 水需要の予測および水源開発事業・セクター開発事業の実施 • 水資源管理計画の実施
第３章　全国水資源マスタープラン 2013 のコンセプト		
3.1	水資源開発・管理の政策・戦略	以下の上位計画を説明した。 • ナイジェリア・ビジョン 20:2020 • 水セクターロードマップ • ミレニアム開発目標 • アフリカ水ビジョン

章・項	目次	アウトプット
		• 国家水資源政策（2009 年改訂）
3.2	全国水資源マスタープラン 2013 のフレームワーク	以下の課題を解決する手法を具体的に進めていく計画であるとした。 • 安全な飲料水や衛生施設への低いアクセス率 • 灌漑農業の食糧自給率への低い貢献度 • 再生可能エネルギーの包蔵水力の不十分な活用等
3.2.1	計画の定義	• 全国水資源マスタープラン 2013 • 統合水資源管理（IWRM） • 水源開発計画 • 水サブセクター開発計画 • 水資源管理計画
3.2.2	全国水資源マスタープラン 2013 の内容	全国水資源マスタープラン 2013 は、主要な 3 計画（水源開発計画、水サブセクター開発計画および水資源管理計画）を中心にして取りまとめることとし、その構成を説明した。
3.2.3	全国水資源マスタープラン 2013 の計画条件	流況・気象条件、気候変動の影響、越境水、利水安全度、利水優先度、河川維持流量、地下水開発
3.2.4	環境社会面への戦略的配慮	全国水資源マスタープラン 2013 の実施によりいくつかの環境社会面の負のインパクトが生じるかもしれないものの、主たる目的はビジョン 20:2020 といった国家計画に基づく社会福祉の向上と経済成長への貢献である。環境社会面での大きな負のインパクトを防ぐため、水源開発、給水・衛生、灌漑・排水の各セクターで戦略的に考慮する。
3.2.5	全国水資源マスタープラン 2013 の活用	• 水文地域ごとのマスタープランとしての流域管理計画への展開に活用 • 給水・衛生および灌漑・排水以外の水サブセクター開発計画へ展開に活用
3.3	全国水資源マスタープラン 2013 の計画概要	
3.3.1	「ナ」国の水資源開発・管理に関わる主要な課題と戦略	• 偏在する水資源量、水需要量を考慮した水資源の管理開発 • 現況の低い施設運転率を踏まえた将来の給水水需要量増加への対応 • 堅実な自立性のある灌漑開発の促進 • 既存水源施設の今日的観点からの有効活用 • 水関連基礎情報の充実と一元管理 • 増加する水資源に関わるリスクの考慮 • 水資源管理者による重要河川・氾濫原管理への積極的関与 • 清浄かつ安全な水の確保のための水質モニタリング • 流域単位-水資源管理のための協力的・参加型の組織・制度の開発・強化
3.3.2	水資源開発計画の概要	水源開発計画は、水需要量と水資源ポテンシャルの地域分布を考慮し水需要量と水源供給可能量のバランスを検討し提案した。以下は、水源開発の基本コンセプト。 表流水開発： • 既存ダムの機能回復、向上 • 偏在する水資源量を考慮しつつ増加する水需要量に対応する表流水水源の準備 地下水開発： • 持続的および効率的地下水開発 • 井戸施設のリハビリ・改良
3.3.3	水サブセクターの開発計画の概要	• 水資源開発に関係する各サブセクターの計画の基本構想は、FMWR が管轄する給水・衛生および灌漑・排水の 2 セクターを対象と提案した。 • 他省庁が管轄するその他セクター（水力発電、洪水・侵食対策、内陸水運、内水漁業、畜産、水質保全およびレクリエーション）については提言を行った。
3.3.4	水資源管理計画の概要	水資源管理計画は、水資源開発計画に基づいて設置された施設と運用システムを使って、充足性・効率性・公平性・安全性・持続性を基本に水ユーザーにサービスを適切に提供する手法を示した。また水資源管理の 4 つの戦略を示した。 • 水資源の量と質の提供のための運転と維持管理 • 水資源の量と質の規制・保全 • 組織間の調整とユーザー間の調停 • 水資源開発・利用・管理の促進と改善
第４章　将来水需要の予測		
4.1	将来の社会・経済のフレームワーク	• 人口（2010 年の 158.4 百万人から 2030 年の 257.8 百万人に増加） • 産業別経済成長
4.2	都市・村落給水（生活用水、業務・商業用水、	都市・村落給水は、生活用水、業務・商業用水、工業用水の 3 つの分類で水需要予測を行った。水需要予測に当たり、給水普及率、居住地分類、給水人口、給水原単位等の指標を設定した。

章・項	目次	アウトプット
	工業用水）	水需要予測の結果として、2010 年の 8,254MLD から 2030 年の 23,876MLD に全国の水需要予測が約 3 倍に増加する。また水需要予測に関する感度分析を行い、水需要予測の妥当性を検証した。
4.3	灌漑用水	「ナ」国の農業及び灌漑政策の目標（米自給率 100%）を示し、それを達成するために取り組むべき 5 項目に着目し、水需要予測を行った。 • 天水稲作の作付面積、単位収量の推移 • 自給率 100%を達成するために必要なコメ生産量 • 公的灌漑スキームの開発面積とコメ生産量 • 計画作付パターン • 計画水需要量 水需要量は、雨季 2,052MCM、乾季 4,193MCM、総量で 6,245MCM。総量は「ナ」国の水資源ポテンシャル（内部生産分のみ）286,600MCM の 2.2%に相当 また、気候変動を考慮した計画水需要量変化の予備的考察を行った。
4.4	その他サブセクター	畜産：家畜頭数予測と水需要を推計した。 淡水養殖：淡水養殖の水需要を推計した。 水力発電：水力発電は非消費型の水利用であり、基本的には水量の総量を減少させることはない。下流河道での河川環境、上水・灌漑のための水利用を阻害しない範囲で、水力発電の最適化された活用を提言した。 洪水防御：洪水防御においては、消費的な水利用の形態を取らないため、水需要量の定量的な算定は行わない。 内陸水運：内陸水運は運輸省の NIWA の管轄であるため情報が非常に限られ、必要な流量の評価は出来無いと判断された。 河川維持流量：各地域における流況特性を反映した渇水状況を代表する指標である Q_{97DS}90%Y（90%年の信頼度を有する単独年の 97%日流量）を河川維持流量として適用した。将来的に、ステークホルダー間の協議により、個別河川ごとによりふさわしい河川維持流量が設定されるのが望ましい。
4.5	水需要量の構造	• セクターによる水需要量シェアの変化 • HA 及びセクターごとの水需要量 • 推定された水源別都市・村落給水需要量 • 推定された水源別総水需要量 • 表流水源の水需要量 • 地下水源の水需要量 全水需要量は 2010 年時点で 5.93BCM/年であり、2030 年には 16.58BCM/年に増加するものと推定される。都市・村落給水水需要量のシェアは、現在（2010）、将来（2030）ともに約 50%である。灌漑水需要量のシェアは、2010 年の約 30%から 2030 年には約 40%になる。
第５章　水資源ポテンシャルの評価		
5.1	流域分割	• 既往流域分割の問題と課題 • 流域分割の方法 • 流域分割結果
5.2	気象状況	• HA ごとに空間平均された年降水量、年平均気温、年可能蒸発散量
5.3	表流水	• 長期降雨-流出解析による 1970～2009 年までの 40 年間分の結果をもとに、疑似自然状態の水資源量の推定を行った。
5.4	地下水	地下水ポテンシャルとして地下水涵養量を推計し、また帯水層特性を検討した。 • 帯水層のタイプと水理地質特性 • 地下水涵養量 地下水涵養量は長期降雨-流出解析モデルの浸透余剰成分のうち遅い流出成分を参考に求めた。
5.5	水資源ポテンシャルのまとめ	• 全国の平均降雨量は 1,150mm である。 • 降雨量の約 24%が流出し、残りは蒸発散その他で消失する。 • 国土内での内部総流出量は 244BCM/年であり、表流水のポテンシャルは 333BCM/年である。 • 総水資源ポテンシャルは、表流水ポテンシャルに地下水涵養量のうち基底流出として出現しない分を加えたものとして評価され、国土内での内部生産によるものは 287BCM/年であり、国外からの流入水を含めると合計 375BCM/年と評価される。 • 88BCM/年は国外起源のものであり、総水資源ポテンシャルの約 24%は隣接国からの貢献によるものであるといえる。 • 地下水涵養量の推定から、更新可能の資源としての地下水ポテンシャルは 156BCM/年であると推定される。
第６章　需要と供給の水バランス		

章・項	目次	アウトプット
6.1	全体的な水需要と水資源ポテンシャルのバランス	• 水利用率は 2010 年ではわずか 1.6%に過ぎないが 2030 年には 4.4%となる。 • 2030 年における国全体でみた総水需要量は依然として総水資源ポテンシャルと比較してはるかに小さい。 • 水資源ポテンシャル＝安定して供給可能な水量ではなく、現時点で安定して供給可能な水量もまた総水資源量よりもはるかに小さい。 • 水資源量と水需要量の地域差が大きいことから、地域内での水バランスの検討から水源開発を検討する必要がある。
6.2	水バランスの検討手順	• 現在（2010）の表流水と地下水の利用割合は 40%、60%と推定されている。 • 地下水利用の持続性の確認を行ったうえで、表流水、地下水利用それぞれの水バランスの検討を行うこととし、水バランスの検討手順を示した。
6.3	地下水の需要・供給バランス	• 既存施設による地下水供給可能量 • 地下水涵養量と地下水需要量 • 気候変動の影響 • 地下水シミュレーショによる地下水需給の検証 地下水シミュレーション結果から提案する地下水開発を実施した場合の地下水位の低下量は、大部分の地域で 5m 以下である。北部の限られた地域で地下水低下量が 25m に達するが井戸深度を確保することにより十分に対応可能であると結論された。気候変動の影響は、影響がない場合と比べ更に 5～20m 程度の追加的な地下水位低下が予想された。
6.4	表流水の需要・供給バランス	• 水文地域全体のスケールからみた水需要量と水源供給可能量の比較 • 詳細水バランス これらの解析から以下の結果が得られ、提案を行った、 • 全 HA において 90%年信頼供給可能量が将来（2030）の水需要量を上回っている。 • 都市用水水需要量について 1/10 安全度で供給できる水量がいくつかの水源で不足し、また 1/5 安全度で水源水を供給しうる灌漑面積が計画面積の 65%程度となると評価された。水源開発計画、灌漑開発計画はこれらの評価結果を参照して策定する。 • 2030 年に必要とされる都市用水、灌漑用水を考慮しても、貯水に余裕が生じる大規模ダムが存在する。こうした余剰貯留容量は、灌漑用水供給、都市用水供給その他様々な用途への活用が考えられる。 気候変動、越境水に起因する水需給面のリスクの推定について、 • 比較的大規模な都市用水取水地点について約 30%のいくつかの取水地点において給水安全度が 1/10 を下回ると予想された。 • 大規模灌漑スキームは、1/5 安全度で灌漑可能な面積は縮小するケースが出る。 • 上流国から流入する越境水の流入量の減少率と国内の発電力量の減少率はほぼ等しくなる。
第７章　水源開発計画		
7.1	地下水開発	• 地下水開発基本方針 • 井戸群当たりの揚水量、井戸本数、井戸の仕様 • リハビリ可能井戸 • 地下水開発に係わる課題（地下水涵養量の促進、村落給水における課題、都市給水における課題、北部鉱山地帯の地下水鉛汚染、地下水位低下と旱魃、ハンドポンプから動力ポンプへの転換）
7.2	表流水開発	• 表流水開発の現状、問題点と課題 • 表流水開発の戦略 • 提案事業（ダム管理能力強化事業、ダムの適正運用管理のための機材リハビリテーション事業、ダムリハビリテーション事業、都市用水水源開発事業、灌漑用水水源開発事業、総合開発事業） • 都市用水、灌漑用水水源開発事業における水力発電の可能性
7.3	水源保全	<地下水>地下水保全の目的と意義、保全の方針、地下水開発・管理の手法、管理における制度的課題が提案された。 <表流水>表流水保全の課題（汚濁物のポイントソース、汚濁物のノンポイントソース、土壌侵食、ダム貯水池）、保全の枠組みが提案された。
第８章　水資源サブセクター開発計画		
8.1	給水・衛生	• 給水スキームの現況把握 表流水（浄水）施設の全国稼働率 45.2% • 給水・衛生開発計画の基本計画条件（原単位水量、水源の設計生産水量、既存施設の改修事業、新規施設の開発事業、給水スキーム施設構成、居住地分類別による衛生施設基準、衛生開発事業のメニュー） • 給水・衛生開発計画

章・項	目次	アウトプット
		給水：2015～2030 年に、改修事業と新規事業を併せて、水資源収支上では 12,620MLD（1MLD=1,000m3/日）、施設計画上は 14,880m3/日 衛生：2015～2030 年に開発すべき公衆便所、最終処分場、下水道建設等を提案。必要な各世帯の衛生施設（家庭用便所）の数は 36.8 百万に達する。
8.2	灌漑・排水	• 既往灌漑事業（整備終了事業、整備実施中事業、整備拡張予定事業）について、各事業の表流水ポテンシャルに基づき評価面積を算出した • 新規灌漑事業（補給灌漑事業、ダム掛り灌漑事業、総合開発事業） • 総合開発事業は Benue 川の支流に多目的の中・大規模ダムを建設し、水力発電で得た電気を新規灌漑地のポンプ運転に使用し、大規模灌漑スキームを開発する計画である。
8.3	その他サブセクターへの勧告	
8.3.1	水力発電	• 水力発電賦存量（ダムの従属発電)の評価、低落差水力発電設備の導入検討、試験施工の必要性 • 大型の水力発電所の建設は環境・社会面に与える影響が大きいこと、容量を確保できるダム適地が乏しいこともあり、現実的には提案するダムサイトにおいて利水従属発電による水力発電所を設置することが現実的と考える。
8.3.2	洪水・土壌侵食対策	• 背景、課題、セクターの現況 • FMWR の今後の役割のあり方、アクション FMWR は、全国レベルの水文モニタリングネットワークを有し、主要な河川流域において多数のダムを管理しており、ダム運用を通じた洪水対策に関与すべきである。水文モニタリングは、短期的な洪水現象の把握にも対応できるものに改善していくべきである。
8.3.3	内陸水運	• 既存の政策、戦略、計画、現状、問題、課題 • 改善の方向性、FMWR の今後の役割のあり方 FMWR が所有・管理するダムは、可航区間の流況に影響を与える場合がある。また、FMWR は NIWA が管轄する氾濫原における大規模灌漑地の管理や沿川市街地への防災情報の提供において貢献できる。FMWR が今後行なっていく氾濫原の管理において、内陸水運への影響を考慮することが必要である。
8.3.4	内陸漁業	• 漁業セクターの政策 • 提言 漁業セクターの開発構想と灌漑・農畜産諸部門の開発構想は密接に関連するため、これらの関連部門間で協議し、水資源の有効利用を図りながら開発を進めるべきである。
8.3.5	家畜	• 畜産セクターの政策 • 提言 畜産業の振興に関して水資源開発は含まれていない。しかし移牧による家畜は湖沼、河川、農業用貯水池、用水路等の水を飲用している。従って、畜産セクターの開発構想と灌漑セクターの開発構想は密接に関連することから、両セクターで協議して、水資源の有効利用を図りながら開発を進めるべきである。
第９章　水資源管理計画		
9.1	概説	水資源管理の 4 つの戦略を設定し、対策を検討した。 • 水資源の量と質の提供 • 水資源の量と質の規制・保全 • 組織間の調整とユーザー間の調停 • 水資源開発・利用・管理の促進と改善
9.2	公共水サービスに係る組織制度	• 組織制度の現状と課題 • 組織制度強化の目的と基本方針（協力的な組織制度の構築、参加型組織制度の強化、公正な規制・監視組織制度の確立、機能・権限の委譲及び調整の推進） • アクションプラン
9.3	水資源開発施設の運営・維持管理	〈表流水〉 殆ど全てのダム・貯水池で「適切な運転」と「適切な維持管理」の改善の必要性が明らかになり、今後は適切な施設の運営・維持管理を行うことが極めて重要である。 • ダム管理の熟度向上、ダム・貯水池の運転・操作、安全管理 〈地下水〉 地下水利用施設の運営・維持管理の現況と課題、その改善策を提案した。 • 帯水層の運営・維持管理、深井戸利用施設の運営・維持管理、深井戸の揚水能力、深井戸の建設体制
9.4	水文モニタリング	〈表流水〉 • 表流水に関わる水文モニタリングの問題点と課題抽出 • 表流水に関わる水文モニタリング改善の戦略

章・項	目次	アウトプット
		• 提案事業（表流水モニタリングネットワーク整備事業、水文データ管理能力強化・利活用促進事業、水文モデリングセンター事業、水文情報啓蒙促進事業） 〈地下水〉 • 現況の地下水モニタリング • 今後期待される地下水モニタリングの方向性（地下水開発可能量の評価、地下水環境問題） • モニタリング担当機関の役割分担の明確化と組織・能力強化（NIHSA、NIWRMC、州政府機関の役割分担の提案）
9.5	水資源データ・情報管理	• 戦略目標（知見の共有、NIHSA と NIWRMC によるデータベースの運用及び保守） • 管理対象のデータについて • 観測データ取得方針 • データ収集及び蓄積に係る管理
9.6	氾濫原の管理	• 問題点の抽出、課題の整理 • FMWR としての戦略（大規模河川の氾濫原、とりわけ Benue 川とその主要支川区間を対象として氾濫原の基礎的な調査を戦略的に開始する）
9.7	気候変動、越境水に起因するリスクの考慮	• 気候変動（政策、気候変動に起因する水資源に関するリスク） • 越境水（政策、越境水に関する問題の事例：Benue 川における Lagdo ダム、Katsina-Ala 川および Kashimbilla ダム、Niger 川上流に計画される Kandaji ダム、越境地下水、越境水に起因する水資源に関するリスク） • リスクへの対応（水関連情報の精度向上によるリスク特定の精緻化、順応的管理の推進、洪水・渇水に対する危機管理体制の強化、水需要管理の推進）
9.8	水環境管理	• 水環境管理に関する問題と課題の抽出 • 水環境管理改善計画の提案（全国飲料水水質観測改善計画、重要河川水質モニタリング計画）
9.9	水の配分と規制	• 水の配分と規制に関わる現状と課題の抽出 • 水の配分と規制に関わるフレームワークの提案 • 提案事業（流域管理計画策定事業、水利用許認可・規制能力強化事業、流域管理促進事業、水料金ガイドライン策定事業）
9.10	水セクターにおける広報活動	• 基本方針、具体的取組み（季刊誌の充実化、Website の充実化、メディア活用、効率的な公文書管理、参加型プロセス等）
9.11	官民連携（PPP）	• 基本課題、具体的取組み（PPP Unit の強化、能力開発、予算配分、Project Delivery Team およびステアリングコミッティの設置、プロセスに関わる定期的利害関係者協議、民間セクター参入の促進のための政策・戦略の定期的更新）
9.12	人材開発・能力開発	• 基本方針、人材資源開発計画
9.13	モニタリング・評価	• モニタリングと評価の制度 • 現行の M&E への提言（FMWR の内局、外局レベルでの M&E の徹底、NIWRMC および CMO に関する M&E システム改善、プロジェクト準備段階の M&E システムの検討）
第１０章　事業実施プログラム		
10.1	事業実施工程	提案事業を以下のよう大分類した。 • 水源開発事業：表流水開発、地下水開発 • サブセクター開発事業：給水・衛生事業、灌漑・排水事業 • 水資源管理関連事業：水文モニタリング、水の配分と統制、水環境管理 事業の実施実施を第 1～3 ステージに区分し、各事業の実施工程はそれぞれの開発方針に基づき提案した。
10.2	事業費の積算	表流水開発事業費は 3,756 億ナイラ、地下水開発事業費は 1,001 億ナイラで両者の合計額は 4,757 億ナイラである。給水・衛生事業費は 4 兆 1,173 億ナイラ、灌漑・排水事業費は 1 兆 5,314 億ナイラである。また、水資源管理関連事業費は 293 億ナイラである。
10.3	事業実施の財務プログラム	水源開発事業費（表流水と地下水）のステージごとの投資比率は、各期において均衡しているが第 3 ステージの投資比率が他ステージより高い。給水・衛生事業の投資比率は第 1 ステージにおける投資比率が最も高くその後に漸減する。灌漑・排水事業の投資比率は第 2 ステージにおける投資比率が高い。
第１１章　全国水資源マスタープラン 2013 の評価		
11.1	経済・財務面の評価	〈経済評価〉 給水事業：各事業とも州によりばらつきがあるが、資本の機会費用である 10%を上回るあるいはそれに近い数値を示す州が多く、概ね経済的に妥当である。 灌漑・排水事業：各事業とも HA 別にばらつきがあるが、資本の機会費用である 10%を上回るあるいはそれに近い数値を示す HA が多く、概ね経済的に妥当である。 〈財務考察〉

章・項	目次	アウトプット
		給水事業：政府予算は、投下資本効率の高い改修事業に第一義的に配分し、残余分を新規事業に配分するものとする。給水率 100%目標達成のためには政府追加予算及びソフトローン調達は避けて通れないところである。給水事業分野では州政府の果たすべき役割は大きい。 灌漑・排水事業：政府予算は、投下資本効率の高いリハビリ事業及び補給事業に第一義的に配分し、残余分を新規事業に配分する。2030 年における米自給率 100%目標達成のためには政府追加予算及びソフトローン調達といった政府による積極財政支出が望まれる。
11.2	社会・環境面の評価	• IEE による評価結果（事業リストと概略事業内容、事業の分類・スクリーニング、潜在的社会・環境インパクトの特定とその大きさ、負の社会・環境影響に対する緩和策、社会・環境面の評価の結論と勧告） 事業実施によるいくつかの社会・環境面での負のインパクトが想定されるが、提案される緩和策の実施によりそれらのインパクトは緩和される。
第１２章　勧告		
		• 全国水資源マスタープラン 2013 の活用と定期的なレビュー • 水資源開発計画の実施 - 給水開発計画 - 灌漑・排水開発計画 - その他サブセクターへの関与 • 水資源管理計画の実施 • 着実な投資 • プロジェクト実施推進機能・母体の確立

出典：JICA プロジェクトチーム

3.2 流域管理計画（案）

HA-1 および Ogun-Oshun 流域の流域管理計画（案）のそれぞれのアウトプットを表 3-2 に示す。

表 3-2 HA-1 および Ogun-Oshun 流域の流域管理計画（案）のアウトプット

章・項	目次	アウトプット
第１章 計画対象地域の概要		
1.1	計画対象地域	流域に含まれる州とその面積割合、人口割合を示した。また、計画対象地域に含まれる LGA のリストを示した。
1.2	社会経済状況	人口、経済・財務状況、州政府予算を記述した。
1.3	自然状況	地形、地質、水理地質、植生、土地利用、気象、水文を説明した。
1.4	現状の水利用と水資源開発	地域の水利用の現状、表流水開発施設、地下水開発施設について既述した。 <HA-1> • 2010 年時点での総水利用量は 799MCM/年 • 都市・村落給水、灌漑、その他農業（畜産、淡水養殖）の利用割合は、それぞれ 32%、59%、9% • 表流水、地下水の利用はぞれぞれ 493MCM/年（62%）、307MCM/年（38%） • 既存ダムは総数 25、総貯水容量 16.92BCM。総水資源ポテンシャルの約 45%に相当 <Ogun-Oshun 流域> • 2010 年時点での総水利用量は 1,111MCM/年 • 都市・村落給水、灌漑、その他農業（畜産、淡水養殖）の利用割合は、それぞれ 81%、5%、14% • 表流水、地下水の利用はぞれぞれ 267MCM/年（24%）、844MCM/年（76%） • 既存ダムは総数 37、総貯水容量 1,160MCM、総水資源ポテンシャルの約 8%に相当
1.5	水資源管理体制に係る現状の組織及びその役割と責任	連邦組織、州政府組織、地方政府（LGAs）、その他の利害関係者のそれぞれで記述した。
第２章 流域管理計画のフレームワーク		
2.1	流域管理計画の目的	流域管理計画の目的は、対象流域の中で「水資源管理」を実現するための、一つのガイドラインであり事業実施計画書である。
2.2	流域管理計画の基本コンセプト	計画目標年次を、「全国水資源スタープラン 2013」と同様に 2030 年とする。上位計画は、「国家レベルの水政策」およびこの戦略に基づいて作成された「全国水資源マスタープラン 2013」であり、統合水資源管理（IWRM）のコンセプトに基づいて作成される。 計画条件：流況・気象条件、気候変動の影響、越境水、利水安全度、利水優先度、河川維持流量、地下水開発
2.3	流域管理計画の構成	• 計画対象地域の概況 • 流域管理計画のフレームワーク • 水需要の予測 • 水資源ポテンシャルの評価 • 水需要・水供給のバランス • 水源開発計画 • 水サブセクターの開発計画. • 水資源管理計画 • 事業実施計画 • 流域管理計画の評価 • 勧告
2.4	流域の水資源開発・管理に関わる戦略的課題	全国水資源マスタープラン 2013 と同じとする。 • 偏在する水資源量、水需要量を考慮した水資源の管理開発 • 現況の低い施設運転率を踏まえた将来の給水水需要量増加への対応 • 堅実な自立性のある灌漑開発の促進 • 既存水源施設の今日的観点からの有効活用 • 水関連基礎情報の充実と一元管理 • 増加する水資源に関わるリスクの考慮 • 水資源管理者による重要河川・氾濫原管理への積極的関与 • 清浄かつ安全な水の確保のための水質モニタリング • 流域単位 - 水資源管理のための協力的・参加型の組織・制度の開発・強化
第３章 将来水需要の予測		
		HA-1 における水需要予測は全国水資源マスタープラン 2013 に準ずる。 一方、Ogun-Oshun 流域における水需要予測は、全国水資源マスタープラン 2013 に準

		ずるシナリオAと、州独自（Lagos州）の予測および開発計画を反映したシナリオBのそれぞれ
3.1	将来の社会経済のフレームワーク	• 人口 <HA-1>2010年の17,142千人から2030年の27,231千人に増加 <Ogun-Oshun流域>2010年25,267千人から、2030年の41,094千人（シナリオA）および63,803千人（シナリオB）に増加 • 製造業経済成長予測
3.2	都市・村落給水	都市・村落給水は、生活用水、業務・商業用水、工業用水の3つの分類で水需要予測を行った。水需要予測に当たり、給水普及率、居住地分類、給水人口、給水原単位等の指標を設定した。水需要予測の結果として、 <HA-1/主要4州> 2010年の668MLDから2030年の2,112MLDと3.2倍に増加する。 <Ogun-Oshun流域/主要4州> シナリオA：2010年の2,432MLDから2030年の5,140MLDと2.1倍に増加する。 シナリオB：2010年の2,452MLDから2030年の6,678MLDと2.7倍に増加する。 また水需要予測に関する感度分析を行い、水需要予測の妥当性を検証した。
3.3	灌漑用水	「ナ」国の農業及び灌漑政策の目標（米自給率100%）を示し、それを達成するために取り組むべき5項目に着目し、水需要予測を行った。 • 天水稲作の作付面積、単位収量の推移 • 自給率100%を達成するために必要なコメ生産量 • 公的灌漑スキームの開発面積とコメ生産量 • 計画作付パターン • 計画水需要量 <HA-1> 水需要量は、雨季398MCM、乾季377MCM、総量で775MCM。総量はHA-1地域の水資源ポテンシャル（内部生産分のみ）10,700MCMの7.2%に相当 <Ogun-Oshun流域> 水需要量は、雨季101MCM、乾季306MCM、総量で407MCM。総量はOgun-Oshun流域の水資源ポテンシャル（内部生産分のみ）13.0BCMの3.1%に相当 また、気候変動を考慮した計画水需要量変化の予備的考察を行った。
3.4	その他サブセクターの水利用	畜産：家畜頭数予測と水需要を推計した。 <HA-1>2010年で55.7MCM、2030年で77.7MCMであり、20年間で約39%増 <Ogun-Oshun流域>2010年で8.9MCM、2030年で12.1MCMであり、20年間で約36%増 淡水養殖：淡水養殖の水需要を推計した。 <HA-1>2010年で17.9MCM、2030年で28.6MCMであり、20年間で約60%増 <Ogun-Oshun流域>2010年で241MCM、2030年で約61%増 水力発電：水力発電は非消費型の水利用であり、基本的には水量の総量を減少させることはない。下流河道での河川環境、上水・灌漑のための水利用を阻害しない範囲で、水力発電の最適化された活用を提言した。 洪水防御：洪水防御においては、消費的な水利用の形態を取らないため、水需要量の定量的な算定は行わない。 内陸水運：内陸水運は運輸省のNIWAの管轄であるため情報が非常に限られ、必要な流量の評価は出来無いと判断された。 河川維持流量：各地域における流況特性を反映した渇水状況を代表する指標であるQ_{97DS}90%Y（90%年の信頼度を有する単独年の97%日流量）を河川維持流量として適用した。将来的に、ステークホルダー間の協議により、個別河川ごとによりふさわしい河川維持流量が設定されるのが望ましい。
3.5	水需要の構造	• セクターによる水需要量シェアの変化 • HA及びセクターごとの水需要量 • 推定された水源別都市・村落給水需要量 • 推定された水源別総水需要量 • 表流水源の水需要量 • 地下水源の水需要量 <HA-1>全水需要量は2010年時点で791MCM/年であり、2030年には1,625MCM/年に増加するものと推定される。都市・村落給水水需要量のシェアは、現在（2010）では約30%であるが、将来（2030）には約50%に増加する。逆に、灌漑水需要量のシェアは、2010年の約60%から2030年には約50%に減少する。 <Ogun-Oshun流域>全水需要量は2010年時点で1,111MCM/年であり、2030年にはシナリオAの場合2,589MCM/年、シナリオBの場合3,193MCM/年にそれぞれ増加するものと推定される。都市・村落給水水需要量に対する表流水源の占める割合は、現在（2010）では約24%であり、将来（2030）にはシナリオAで約59%、シナリオBで

		約 81%と大幅に増加する。
第４章	**水資源ポテンシャルの評価**	
4.1	流域分割	NIHSA と JICA プロジェクトチームの協働努力による流域分割の見直しが行われた。 <HA-1>SHA の数は 36 であり、うち 28 は国内に位置 <HA-6（Ogun-Oshun 流域含む）>SHA の数は 24 であり、うち 22 は国内に位置
4.2	気象状況	気象状況に関して、一般的空間分布、長期的傾向、季節パターンを分析 <HA-1>過去40年間（1970～2009）における年間降水量と年平均気温は、それぞれ平均767mm/年、27.4度、同様に年可能蒸発散量は1,419mm/年と推定 <Ogun-Oshun流域>過去40年間（1970～2009）における年間降水量と年平均気温は、それぞれ平均1,274mm/年、26.7度、同様に年可能蒸発散量は1,330mm/年と推定
4.3	表流水	• 疑似自然状態における表流水ポテンシャル（長期降雨-流出解析モデルの導入等） 1970～2009 年の 40 年間分の流出量を用いて疑似自然状態の表流水ポテンシャルうを推定 <HA-1>平均流出高、流出率は、それぞれ 62mm/年、8.1%と推定 <Ogun-Oshun 流域>平均流出高、流出率は、それぞれ 199mm/年、15.4%と推定 • 気候変動が流出量に及ぼす影響 • 表流水水質の概況 将来の人口増加、産業活動等の進展により、水域の水質に影響が出る可能性がある。この点を予備的に考察するために、現時点で入手可能なデータと情報に基づき、汚濁負荷量の予備的分析を行った。 <HA-1>Sokotoo-Rima 川においてはコロイド状の高濁度水が問題となっており、詳細調査を実施し代替解決策を検討する必要がある。
4.4	地下水	• 帯水層のタイプ(HA-1 および Ogun-Oshun 流域の帯水層は基盤岩と堆積岩からなる) • 地下水涵養量（長期降雨－流出解析における浸透余剰成分のうち遅い流出成分(LSR)を参考に計算) <HA-1>地下水涵養量は 37mm/年、大部分の地域で 50mm/年以下。東部高原地帯に分布する基盤岩地帯では 40mm/年、西部低地帯に分布する堆積岩地帯では 20mm/年以下 <HA-6>地下水涵養量は 236mm/年、中央～北部を示す基盤岩地域で 100mm/程度。南部の堆積岩地帯では地下水涵養量が増大し 200mm/年を超え、最南端の海岸平野部では 700mm/年以上 • 地下水モニタリングによる水収支（両地域の各 15 箇所で地下水モニタリングを実施し、その結果から地下水涵養量の評価を行った） • 気候変動の影響
4.5	水資源ポテンシャルのまとめ	<HA-1>（国外からの流入水含む） 総水資源ポテンシャル 37.4BCM/年（うち内部生産 10.7)、表流水ポテンシャル 35.1BCM/年（うち内部生産 8.3)、地下水ポテンシャル 5.0BCM/年 <Ogun-Oshun 流域>（国外からの流入水含む） 総水資源ポテンシャル 13.1BCM/年（うち内部生産 13.0)、表流水ポテンシャル 11.5BCM/年（うち内部生産 11.4)、地下水ポテンシャル 4.9BCM/年
第５章	**需要と供給の水バランス**	
5.1	全体的な水需要量と水資源ポテンシャルのバランス	2030 年における総水需要量は依然として総水資源ポテンシャルに対して小さい。しかしながら、水資源量と水需要量の地域差が大きいことから、地域内での水バランスの検討から水源開発を検討する必要がある。 <HA-1>総水需要量は 0.80BCM/年と推定され、2030 年には 1.65BCM/年に増加。水利用率は、2010 年では 2.1%に過ぎないが 2030 年には 4.3%となる。 <Ogun-Oshun 流域>総水需要量は 1.11BCM/年と推定され、2030 年には、シナリオ A で 2.59MCM/年、シナリオ B で 3.19MCM/年にそれぞれ増加。水利用率は、2010 年では 8.5%であるが、2030 年にはシナリオ A で 20.0%、シナリオ B で 24.6%となる。
5.2	水バランスの検討手順	水資源の利用形態は、地下水利用と表流水利用に大別される。地下水と表流水それぞれについて持続的かつ効率的に利用可能となるよう、それぞれの水バランスに配慮して水資源開発を計画するための水バランス検討の手順を示した。
5.3	地下水の需要・供給バランス	• 既存施設による地下水供給可能量（公的給水用の深井戸） <HA-1>7,766 本、地下水使用量は約 44 万 m3/日 <Ogun-Oshun 流域> 5,741 本、地下水使用量は約 190 万 m^3/日 • 地下水の水需給 <HA-1>地下水涵養量に対する地下水需要は平均 20%。州ごとに見ると 11～47%と大きなバラツキを示す。気候変動の影響の場合、全体の地下水涵養量に対する地下水需要は平均 34%であり、気候変動の影響のない場合の 20%程度の増加であるが、州ごとに見ると 19～94%と差は一段と大きい。 <Ogun-Oshun 流域>地下水涵養量に対する地下水需要は平均 29%。州ごとに見ると 19～60%と大きなバラツキを示す。気候変動の影響の場合、全体の地下水涵養量に対

		する地下水需要は平均 40%であり、州ごとに見ると 19～85%と差は一段と大きい。 • 地下水シミュレーションによる地下水需給の検証 提案する地下水開発を実施した場合の現時点の地下水位からの水位低下量は、 <HA-1>大部分の地域で-5m より小さい。 <Ogun-Oshun 流域>大部分の地域で-5m より小さい。 井戸の深度を確保することによって十分に対応が可能である。
5.4	表流水の需要・供給バランス	<HA-1> 都市用水水源：比較的大規模な浄水場（群）に対する水バランス計算の結果、2030 年に必要とされる都市用水水需要量について 1/10 安全度で供給できる水量がいくつかの水源で不足すると評価された。 灌漑用水水源：計画面積 500ha 以上の大規模灌漑スキームに対する水バランス計算の結果、いくつかの既存灌漑スキームにおいて、第 3 章で示した標準的クロッピングパタンに対して 1/5 安全度で水源水を供給しうる灌漑面積が計画面積よりも小さくなると評価された。 大規模ダムにおける余剰貯留容量：水バランス計算の結果、2030 年に必要とされる都市用水、灌漑用水を考慮しても、貯水に余裕が生じる大規模ダムが存在することが明らかとなった。こうした余剰貯留容量は、灌漑用水供給、都市用水供給、ファーム発電量の増強、下流の洪水ピーク流量の低減、環境保全のための放流など、様々な用途への活用が考えられる。 <Ogun-Oshun 流域（シナリオ A）> 都市用水水源：比較的大規模な浄水場（群）に対する水バランス計算の結果、2030 年に必要とされる都市用水水需要量について 1/10 安全度で供給できる水量がいくつかの水源で不足すると評価された。 灌漑用水水源：計画面積 500ha 以上の大規模灌漑スキームに対する水バランス計算の結果、いくつかの既存灌漑スキームにおいて標準的クロッピングパターンに対して 1/5 安全度で水源水を供給しうる灌漑面積が計画面積よりも小さくなると評価された。 大規模ダムにおける余剰貯留容量：水バランス計算の結果、2030 年に必要とされる都市用水、灌漑用水を考慮しても、貯水に余裕が生じる大規模ダムが存在することが明らかとなった。こうした余剰貯留容量は、灌漑用水供給、都市用水供給、ファーム発電量の増強、下流の洪水ピーク流量の低減、環境保全のための放流など、様々な用途への活用が考えられる <Ogun-Oshun 流域（シナリオ B に対する追加水源の検討）> シナリオ B ではシナリオ A と比べて Lagos 州全体で 910MCM/年の追加水源が必要であり、このうち主たる追加必要水源としては、Ogun 川 Akute 地点において 11MCM/年、Oshun 川 Odomola 地点において 142MCM/年、さらには特定されない水源 676MCM/年が必要となる。これに対応し、追加水源のオプション、1982 年マスタープランで取り上げられた大規模ダム候補地点、水バランス検討、暫定推奨案を提案した。
第 6 章	**水源開発計画**	
6.1	地下水開発	• 適切な地下水開発方法 地下水涵養量と群井の理論を用いて、帯水層ごとの地下水開発ポテンシャルを検討した。水理地質的特性に基づき風化帯水層と複合帯水層の代表的パラメータを設定した。揚水可能量は、地下水涵養量、井戸本数、井戸間隔の関数として近似式で示した。 • 帯水層ごとの地下水開発計画（新規井戸掘削によって開発する地下水量はリハビリ可能地下水量を考慮し算定） <HA-1>2030 年の水需要に対応する新規動力ポンプ井戸 15,361 本（都市および小都市・町）、9,105 本（村落）。ハンドポンプの新規掘削数量は 82,538 本。 <Ogun-Oshun 流域>2030 年の水需要に対応する新規動力ポンプ井戸 657 本（都市および小都市・町）、5,797 本（村落）。ハンドポンプの新規掘削数量は 1,228 本。
6.2	表流水開発	• 全国水資源マスタープラン 2013 における表流水開発の戦略と提案事業（既存ダムの機能回復、向上、偏在する水資源量を考慮しつつ増加する水需要量に対応する表流水水源の準備） • 既存ダムの機能回復、向上（ダム管理能力強化事業、ダムの適正運用管理のための機材リハビリテーション事業、ダムリハビリテーション事業） <HA-1>既存ダムの事例を取り上げて議論した。 <Ogun-Oshun 流域>今後ますます水利用の増加とそれに対応する水資源施設の開発が必要となる中上流ダム群と下流の取水施設の管理者が異なる中でこれらの連携した運用による効率的な水利用を推進する必要がある。 • 偏在する水資源量を考慮しつつ増加する水需要量に対応する表流水水源の準備（都市用水水源開発事業、灌漑用水水源開発事業、総合開発事業）

		〈HA-1〉 都市用水水源開発事業：Sakin Noma/Gusau Dam Project 灌漑用水水源開発事業：Kasanu Dam Project 〈Ogun-Oshun 流域〉 都市用水水源開発事業（シナリオ A）：Ibu Dam Project、Ota Dam Project、Araromi Ake/ Ijebu-Ode-Yemoji Dam Project、Ododele Dam Project 都市用水水源開発事業（シナリオ B）：Ibu Dam Project、Ota Dam Project、Araromi Ake/ Ijebu-Ode-Yemoji Dam Project、Ododele Dam Project、Aiyete Dam、Oba Dam Project
6.3	水源保全	地下水：地下水保全の目的と意義、保全の方針、地下水開発・管理の手法、管理における制度的課題が提案された。 表流水：表流水保全の課題、保全の枠組みが提案された。 〈HA-1〉乾季の水質悪化、富栄養化、堆砂、農地からの残留農薬流出の可能性、Sokoto 浄水場の原水のコロイド状の高濁度水、Sokoto 川の流路変動 〈Ogun-Oshun 流域〉生活廃水の適切な処理、ラグーンの水質および水量の包括的な調査を必要性、一部地域での重金属類、富栄養化傾向
第７章	**水資源サブセクター開発計画**	
7.1	給水・衛生事業	• 給水スキームの現況把握 表流水（浄水）施設の稼働率（HA-1:48.4%、Ogun-Oshun 流域：40.3%） • 給水・衛生開発計画の基本計画条件（原単位水量、水源の設計生産水量、既存施設の改修事業、新規施設の開発事業、給水スキーム施設構成、居住地分類別による衛生施設基準、衛生開発事業のメニュー） • 給水・衛生開発計画 〈HA-1 主要 4 州〉 給水：2015～2030 年に、改修事業と新規事業を併せて、水資源収支上では 1,139MLD、施設計画上は 1,321m3/日 衛生：2015～2030 年に開発すべき公衆便所、最終処分場、下水道建設等を提案。必要な各世帯の衛生施設（家庭用便所）の数は 2.8 百万に達する。 〈Ogun-Oshun 流域主要 4 州〉 給水：2015～2030 年に、改修事業と新規事業を併せて、シナリオ A で水資源収支上では 2,636MLD、施設計画上は 3,167m3/日、シナリオ B で水資源収支上では 5,000MLD、施設計画上は 6,122m3/日である。 衛生：2015～2030 年に開発すべき公衆便所、最終処分場、下水道建設等を提案。必要な各世帯の衛生施設（家庭用便所）の数はシナリオ A で 8.0 百万、シナリオ B で 12.9 百万に達する。
7.2	灌漑・排水事業	公共灌漑事業を以下に分類した。 • 既往灌漑事業 ：整備終了事業 、整備拡張予定事業 • 新規灌漑事業：補給灌漑事業、ダム掛り灌漑事業、総合開発事業 〈HA-1〉 • 整備終了事業:既に開発された整備済み面積 24,941ha に対して評価面積 24,441ha となり、灌漑の水需要量に対して表流水ポテンシャルが不足するスキームがある。 • 整備実施中事業:表流水ポテンシャルに基づく評価面積が計画灌漑面積より小さくなる灌漑スキームは 3 地区である。 • 整備拡張予定事業:計画灌漑面積まで整備拡張を行うことは可能である。 • ダム掛り灌漑事業:中規模ダムによる新規灌漑開発サイトは 1 箇所である 〈Ogun-Oshun 流域〉 • 整備終了事業:既に開発された整備済み面積 1,154ha に対して評価面積 474ha となり、灌漑の水需要量に対して表流水ポテンシャルが不足するスキームがある。 • 整備実施中事業: FMWR が実施中の公的灌漑スキームは 4 地区であり、これらのスキームは早期に完工すべきである。 • 整備実施中事業: FMWR が実施中の公的灌漑スキームは 4 地区であり、これらのスキームは早期に完工すべきである。 • 整備拡張予定事業:リハビリのみを対象とするほとんどのスキームでは水源に豊富な水量を有していることから、計画灌漑面積まで整備拡張を行うことは可能である。
7.3	その他サブセクターの事業	洪水・土壌侵食対策および内陸水運： 〈HA-1〉 • Sokoto-Rima 川において、上流ダムの放流管理と、下流の氾濫原の管理（水位予測、影響範囲の予測）を行う。 • 土壌侵食による河川水の高い濁度の原因を調査し、その軽減を図る。 • Rima 川の取水地点周辺の河道の安定を図り、ひいては乾季の養魚場としての河道

		の利用、地元住民の水運の利便性を高める必要がある。 • 戦略として氾濫原の管理、土壌侵食対策、Rima 川取水の改善（河道安定化） 〈Ogun-Oshun 流域〉 • Ogun 川の氾濫原の管理、Ibadan 都市浸水対策、Lagos 都市浸水対策、都市内の土壌侵食対策、Ogun 川等における内陸水運の開発 • 戦略として、州政府と RBDA は Ogun 川の氾濫原の地形を測量し、河道の流下能力（流量と水位の関係）を把握し、所定の流量に対して、Ogun 川の沿川の地域の浸水程度を調査する必要がある。さらに、上流のダムを管理する RBDA は、ダムの放流の情報を、下流の州政府（SEMA)や LGA その他防災関連組織に伝達する仕組みを確立するべきである。 内陸漁業：水利用において灌漑セクターと基本的には競合する。その一方、人造湖や農業用ため池で淡水養殖をするなど、灌漑開発に養殖を取り入れることが提案される。漁業セクターの開発構想と灌漑・農畜産諸部門の開発構想は密接に関連するので、これらの関連部門間で協議し、水資源の有効利用を図りながら開発を進めることが提案される。 畜産：移牧による家畜は湖沼、河川、農業用貯水池、用水路等の水を飲用している。畜産セクターの開発構想と灌漑セクターの開発構想は密接に関連するため、両セクターで協議して水資源の有効利用を図りながら開発を進めることが必要である。
第８章　水資源管理計画		
8.1	概説	水資源管理の 4 つの戦略を設定し、対策を検討した。 • 水資源の量と質の提供 • 水資源の量と質の規制・保全 • 組織間の調整とユーザー間の調停 • 水資源開発・利用・管理の促進と改善
8.2	水資源管理体制	流域管理における参加型アプローチに焦点を当て、流域内のすべての利害関係者が適切な流域管理の実行に参加する流域全域にわたる総合的な組織体制を構築することが重要である。流域管理調整委員会（Catchment Management Coordinating Committee: CMCC)、技術諮問委員会（Technical Advisory Committee）及び州政府統合水資源管理委員会（State IWRM Committee）で構成されることになる。かかる方針に基づき以下を提案した。 • 組織上の主な課題 • 組織体制強化のための基本的アプローチ • 水資源管理体制の提案 • 利害関係者会議に関する将来計画
8.3	施設の運営・維持管理	• 表流水施設の運営維持管理 管理の対象となるのは、ダム堤体施設の管理、ダム貯水池の管理、ダム貯水池の制御操作（高水操作、低水操作）である。 〈HA-1〉Sokoto-Rima 川に Bakorori、Goronyo、Zobe、Jibiya、その他 Gusau 〈Ogun-Oshun 流域〉Ogun 川、Osun 川に新規ダムが運用・計画されているこ。 これら複数のダム群を効率よく高度に運用することが、限られた水資源開発にはきわめて重要である。表流水施設の運営維持管理に関し、ダム管理の高度に対する課題、ダム統合管理のあるべき姿、水資源統合管理を目指すために必要となる整備（ソフトとハードの両面）を提案した。 • 地下水施設の運営・維持管理 地下水利用施設の運営・維持管理の現況と課題、その改善策に関連し下記項目に関して記述した。 • 帯水層の運営・維持管理、深井戸利用施設の運営・維持管理、深井戸の揚水能力、深井戸の建設体制、過剰揚水による地下水位低下、地下水汚染、北部鉱山地域の地下水汚染（HA-1 のみ)、井戸成功率の向上、地下水涵養の促進（HA-1 のみ)、地下水位観測と干ばつ対策、海水侵入（Ogun-Oshun 流域のみ)、地盤沈下（Ogun-Oshun 流域のみ）
8.4	水文モニタリング	• 表流水に関わる水文モニタリング 表流水モニタリングネットワークの整備、RBDA および州政府による表流水モニタリングに関する提案 • 地下水に関わる水文モニタリング 現況の地下水モニタリング、地下水モニタリングの方向性（HA-1)、モニタリング目的・手法の明確化、都市部における地下水環境問題、地下水開発可能量の評価、水質の評価
8.5	水資源データ・情報管理	• 戦略目標（知見の共有、NIHSA と CMO によるデータベースの運用及び保守） • 管理対象のデータについて • 観測データ取得方針

		• データ収集及び蓄積に係る管理
8.6	気候変動、越境水に起因するリスクの考慮	• 気候変動に起因する水資源に関するリスクの推定 • 越境水に起因する水資源に関するリスクの推定 <HA-1>Niger 川上流に計画される Kandaji ダム、越境地下水 <Ogun-Oshun 流域>越境地下水 • リスクへの対応（水関連情報の精度向上によるリスク特定の精緻化、順応的管理の推進、洪水・渇水に対する危機管理体制の強化、水需要管理の推進）
8.7	水環境管理	水環境保全と水質管理という 2 つの要素が、適正な水環境管理の根本をなすと考えられる。水環境保全に関しては、良好な森林管理が流域の水資源を守るために重要な役割を担う。水質管理に関しては、汚染源コントロールと水質モニタリングが水源水質保全の基本サブコンポーネントとなる。水環境管理に関して特定された重要な問題と課題である飲料水水質、水質汚濁防止、水環境保全のそれぞれで提案した。
8.8	水の配分と規制	• 全国水資源マスタープラン 2013 で提案された水の配分と規制に関わるフレームワーク 水資源管理の実務は NIWRMC の HA ごとの事務所である CMOs が主体となって実施する。これらの活動の技術的側面は NIWRMC 本部により監督される。さらに、FMWR は監督官庁としてこれらの活動全般を監督する。流域レベルでの CMO の活動は、マクロ管理におけるステークホルダー間の調整、ミクロ管理における規制者としての日常的水管理活動の、2 つに大きく分かれる。 • 水の配分と規制に関わるフレームワークの提案 流域管理計画は対象流域における水の配分と規制に関わるマクロ管理の第一歩と位置付けられ、実施したステークホルダー会議をさらに発展させ、ステークホルダーフォーラムを形成し、将来的には CMCC を正式に立ち上げる。また、ステークホルダーの能力強化の実施と、適切な水料金設定を提案する。 • 地下水の水配分と規制 地下水開発・利用の現況、未秩序な地下水開発・利用、地下水開発と利用の規制、地下水利用の優先性、地下水の管理機関、地下水利用に対する規制方法
8.9	水資源管理のためのコミュニケーション戦略	水セクターにおける広報は主として FMWR の PR Unit が担当し、FMWR の立てた広報戦略をベースにしてアクションプランを提示した。これに合わせて、流域水資源管理の視点から、CMP の広報に関する以下の提案を行った。 • 基本方針、具体的取組み（季刊誌の充実化、Website の充実化、メディア活用、効率的な公文書管理、参加型プロセス等）
8.10	官民連携（PPP）	全国水資源マスタープラン 2013 と同じアクションプランを提案した。PPP Unit の強化、能力開発、予算配分、Project Delivery Team およびステアリングコミッティの設置、プロセスに関わる定期的利害関係者協議、民間セクター参入の促進のための政策・戦略の定期的更新。
8.11	人材・組織の能力開発	全国水資源マスタープラン 2013 における人材資源開発に係る方針に照らし、流域レベルにおける IWRM に焦点を当てた人材及び組織能力開発プロジェクトを提案した。
8.12	モニタリング・評価	計画された事業を着実に実施するため、プロジェクト準備段階の M&E システムの検討が必要である。 • プロジェクト起案書の作成 • 実現性調査（F/S）の実施 • 事業計画書の作成
第９章　事業実施プログラム		
9.1	事業実施工程	提案事業を以下のよう大分類した。 • 水源開発事業：表流水開発、地下水開発 • サブセクター開発事業：給水・衛生事業、灌漑・排水事業 • 水資源管理関連事業：水文モニタリング、水の配分と統制、水環境管理 事業の実施実施を第 1～3 ステージに区分し、各事業の実施工程はそれぞれの開発方針に基づき提案した。
9.2	事業費の積算	<HA-1> 表流水開発事業費は 87 億ナイラ、地下水開発事業費は 152 億ナイラで両者の合計額は 238 億ナイラである。給水・衛生事業費は 2,563 億ナイラ、灌漑・排水事業費は 516 億ナイラである。また、水資源管理関連事業費は 35 億ナイラである。 <Ogun-Oshun 流域（シナリオ A）> 表流水開発事業費は 246 億ナイラ、地下水開発事業費は 53 億ナイラで両者の合計額は 299 億ナイラである。給水・衛生事業費は 1 兆 2,995 億ナイラ、灌漑・排水事業費は 1,069 億ナイラである。また、水資源管理関連事業費は 32 億ナイラである。 <Ogun-Oshun 流域（シナリオ B）> 表流水開発事業費は 679 億ナイラ、地下水開発事業費は 50 億ナイラで両者の合計額は 729 億ナイラである。給水・衛生事業費は 2 兆 6,693 億ナイラ、灌漑・排水事業

		費は 1,069 億ナイラである。また、水資源管理関連事業費は 32 億ナイラである。
9.3	事業実施の財務プログラム	<HA-1> 水源開発事業費（表流水と地下水）のステージごとの投資比率は、第 2 ステージの投資比率が他ステージより高い。給水・衛生事業の投資比率は第 1 ステージにおける投資比率が最も高くその後に漸減する。灌漑・排水事業の投資比率は第 1 ステージにおける投資比率が高い。 <Ogun-Oshun 流域（シナリオ A）> 水源開発事業費（表流水と地下水）のステージごとの投資比率は、第 2 ステージの投資比率が他ステージより高い。給水・衛生事業の投資比率は第 1 ステージにおける投資比率が最も高くその後に漸減する。灌漑・排水事業の投資比率は第 1 ステージにおける投資比率が高い。 <Ogun-Oshun 流域（シナリオ B）> 水源開発事業費（表流水と地下水）のステージごとの投資比率は、第 2 ステージの投資比率が他ステージより高い。給水・衛生事業の投資比率は第 2 ステージにおける投資比率が最も高くその後に漸減する。灌漑・排水事業の投資比率は第 3 ステージにおける投資比率が高い。
第１０章　流域管理計画の評価		
10.1	経済・財務面の評価	<HA-1> • 給水改修事業：都市給水では全体で EIRR は 41%と経済的妥当性は極めて高い。村落給水でも全体で EIRR24%と高い経済的妥当性を示した。 • 給水新規事業：都市給水では全体で EIRR は 8%と資本の機会費用である 10%を下回る結果となった。試算によると EIRR が 10%を超えるには建設費を 15%削除する必要がある。村落給水では全体で EIRR は 9.2%と資本の機会費用 10%を下回ったが、村落部の低い水支払可能額を勘案すれば経済的には概ね妥当とみられる。 • 灌漑改修事業の EIRR は 30.5%、灌漑整備実施中事業の EIRR は 9.7%、拡張予定事業、ダム掛かり事業は両事業とも EIRR が 10%を下回る結果となった。 <Ogun-Oshun 流域> • 給水改修事業：都市給水はシナリオ A およびシナリオ B とも経済的妥当性は極めて高い。村落給水は都市と同じように EIRR が 37%と高い経済的妥当性を示した。 • 給水新規事業：都市給水はシナリオ A およびシナリオ B とも資本の機会費用である 10%を超え経済的妥当性を示した。シナリオ A の村落給水は EIRR が 13.9%と資本の機会費用 10%を上回った。 • 灌漑改修事業の EIRR は極めて高く、HA-6 では 45.5%を示した。灌漑整備実施中事業はシナリオ A およびシナリオ B とも EIRR は 10%を超え、経済的妥当性を示した。拡張予定事業は EIRR が 14.3%と経済的に妥当な数値を示した一方、ダム掛かり事業は 10%を若干下回った。
10.2	社会・環境面の評価	流域管理計画（案）を構成する事業は、主として都市・村落給水、灌漑・排水、衛生の 3 つのセクターに対して便益をもたらす。事業実施によるいくつかの社会・環境面での負のインパクトが想定されるが、提案される緩和策の実施によりそれらのインパクトは緩和される。
第１１章　勧告		
		• 流域管理体制の整備と流域管理計画の確立 - 流域管理体制の整備 - 流域管理計画の確立） • 流域管理計画の活用と定期的なレビュー - 流域管理計画の活用 - 流域管理計画の定期的なレビュー • 水資源開発の実施 - 給水開発計画 - 灌漑・排水開発計画 - その他サブセクターへの関与 • 水資源管理の実施 • 着実な投資 - 政府の直接投資 - その他資金源

出典：JICA プロジェクトチーム

付　録

- 会議録 1～6
- 流域管理計画に関連したステークホルダー会議 (HA-1 及び Ogun-Oshun 流域)の協議内容
- 同上参加者リスト

付録-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 Atachment-2, and the tentative list of Counterpart Team members for the Project as attached to Atachment-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)

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 ADRESS	PHONE NO.	SIGN
1	Amb. (Dr.) Godknows Igali	Permanent Secretary	FMWR			
2	Mrs. L.D Bagaiya	Director	PRS	ldbagaiya@yahoo.com	08034507939	
3	Olufemi Odumosu	Director	Office of Perm. Sec.	olufemiodumosu@yahoo.com	08033243845	
4	Engr. R.A.K Jimoh	Coordinating Director	NIWRMC	razaqjim@yahoo.com	08033212348	
5	S.O Ome	Director	DRO	samuelome@yahoomail.com	08065292254	
6	P.A Nlekwa	Director	NIHSA	patnlekwa@yahoo.com	08036635786	
7	Dr. Martins Edivie	Coordinator, RWSSC	NWRI	martinsedivie@yahoo.com	08036400061	
8	Engr. R.A Oyewole	Rep. Dir (IRW)	FMWR (I&D)	oyewole@yahoo.com	08033208490	
9	R.O Ikpeawum	Representing Director (DRO)	FMWR	Regyikpe2003@yahoo.com	08037239557	
10	Engr. Y.K Dalha	Ag.D (ESS)	NIWRMC	ydalha@yahoo.com	08065399058	
11	Engr. R.E Onye-Anusi	DD(RWS) REP. DWS	WS(FMWR)	rufusonyeanusi@yahoo.com	08074155922	
12	Anthonia A. Ekpa (Phil)	DD(M&E)	FMWR	anthoniaekpa@gmail	08034583477	
13	Abiola C. Bawa	DD PRS	FMWR	abiolabee@yahoo.co.uk	08035127767	
14	B.Ldialo	AD (P)	FMWR	ldialoofure@yahoo.com	08065300333	
15	Dachir B.H	AD (POLICY)	FMWR	Bhdachir@yahoo.com	08082728047	
16	Shettima Abba Alhaji	AD (Research)	PRS/FMWR	abbashettima@ya-hoo.com	08033140831	
17	Shemu M.L	AD(M&E)	FMWR	firstshemum@yahoo.com	08065599023	
18	Pam Jidama Dawoh	AD(R&S)	FMWR		08036774018	
19	Adetunji Idowu	AD(WS)	FMWR	santunjidowu@yahoo.com		
20	Dr. Alayande A. Waheed	Head of Land/Water	NWRI	walayande@gmail.com		
21	Babarinde S.M	Head, Climate Change Unit	FMWR	babarindesm@yahoo.com		
22	Elizabeth Ugoh	CSO	DWQ&S	ugohe@yahoo.com	08059692633	
23	Bassey E.A	CS(P)	FMWR	efybassey@yahoo.com	08036145428	
24	Engr. N.O Madu	CCE	FMWR	maduengr@yahoo.co.uk	08034065991	
25	James Inomohimi	CTSS	GWMA	timiyaysuccess@yahoo.com	08068924557	
26	Ogundoro M.J	EIO	FMWR	theamog4sure@yahoo.com		
27	Anda A.Y	ACTO	NIWRMC	andayalako@yahoo.com	08035965652	
28	M.B.A Adekola	ACTO	RBOL	mbaadekola@yahoo.com	08039374963	
29	Stephen Jude	ACAO	FMWR	Stephenjude68@yahoo.com	07032333731	
30	Musat .B. Tafida	FAO (Iles)	FMWR	musatafida@yahoo.com	08037861390	
31	Ihuoma Anthony	SSO(PRS)	FMWR	anthonyemmanuelihuoma@yahoo.com	08036011659	

(2)

32	Akor Onoja Victor	STAT 1	FMWR	onojaakor@yahoo.com	08062091039	
33	Agwuma, G.A	SSO	FMWR	tagwuma@yahoo.com	08059692451	
	Nwatu Lynda Ndidi		Press			
NATIONAL PLANNING COMMISSION						
34	Faniran S.O.	Desk Officer (Asia)	NPC	depofaniran@yahoo.com	08034264007	
JICA TEAM						
35	Anjano Yusuke		JICA HQ			
36	Kiyo Takashima	Deputy Director	JICA HQ			
37	Yoshiro MASUNA	Representative	JICA , Nigeria	www.yoshiroojica.go.jp	07059835350	
38	Dele Olatunji	Staff	JICA, Nigeria	Olatunjiwaheed.ngjicago.jp	08037871140	
39	Masatomo WATANABE	Team Leader	JICA Project Team			
40	Todanori Kitamura	Gwduter	JICA Project Team Leader	kitamura@tiffi.co.jp		
41	Hirosh Naka MURA	Ground Water	JICA Study Team	hi-wel@eku.aft.ne.jp		

(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)

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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	TELPHONE 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	

(5)

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.

(6)

付録-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)

(1)

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 Kieriama	Secretary JICA Project Team	JICA PROJECT TEAM

(2)

付録-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.Bagarya
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)

(2)

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 Efiong.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

(3)

付録-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

渡辺正知

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)

(1)

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. Oyeniyi	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

(2)

付録-5: Minute of Meeting of Draft Final 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)

(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

(3)

付録-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

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,

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_{97DS}90%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	ogbonnakn@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 Kierlama	JICA TEAM	Secretary	08152349276	informprestige@yahoo.ca

付録-7：流域管理計画に関連したステークホルダー会議(HA-1 及び Ogun-Oshun 流域)の協議内容

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 Anaysis 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 Maanagement 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	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	Groundwater pollution, sea water intrusion	

Date	Meetings/Workshop	Highlight of Discussion	Identified Issues, Constraints,Problems and Challenges	Proffered Solution by affected States
	and Osun States and Patricipants from FMWR,NIWRMC,CMO.	development and 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 stataes, indaquate funding, lack of coordination among Stakeholders, Lack of spareparts, Problem of Turbidity with raw water, lack of skill personnels, absence of active public participation,lack of capacity building, non-remittance of water tarriff by goverment institutions	
24/07/2013	Stakeholders Workshop for HA 1 (4 States)	The Project Teammembers 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	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

Date	Meetings/Workshop	Highlight of Discussion	Identified Issues, Constraints,Problems and Challenges	Proffered Solution by affected States
		resources development and management. In addition each State was given oppotunity to propose/provide the water demand projection if different from what was prroposed under the JICA Master Plan 2013		projections shall be 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 Ochekpe 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 reversed 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 Ochekpe

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 Ochekpe as is unavoidable absent and the 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 desire quality and standard by means of hydrological and hydro-meteorological information could be obtain 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 attended 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 Mater Plan in the water sector could led 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 Honouable 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.) - Ms. Bako (Water Quality & Sanitation
  Part-3
- 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. Recommandations/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 Masterlplan 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.

Oyeniyi 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 Mater 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 m^3 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 incorpate 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 (HA_1) and Western Littoral (HA_6). 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 HA_6.

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
• 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.	• 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, execess 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
• 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?	• 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 (HA_1) and Western Littoral (HA_6).
- 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 (HA_1) and Western Littoral (HA_6) 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 HA_6.**

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
• Relevant NGOs, CBOs should be invited to all subsequent workshops for a wider contributions	• Engr. Dimeji, EU
• Owiwi Dam should be included among dams that are for Irrigation.	• Sonde O, RUWATSA Ogun
• Lagos State already develop drainage Master Plan which can be forwarded for inclusion into the Catchment Management Plan.	• Adepegba. LSME
• Shallow groundwater (Washbore) used for Agricultural and Domestic purpose is to be captured in the report.	• Adenuga Fatai, OME
• Monitoring of the implementation is necessary after the MP.	• Akiwowo. T.A. LSWC
• Lagos State population should be considered in the NWRMP as all developmental plans is based on its figure.	• Engr. Okedara, OWC
• Federal Government to establish a central body to avoid uncoordinated and scattered water resources data	• Engr. Okedara, OWC
• 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	

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 - 18th 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
• Aquatic weeds in Nigeria's natural water bodies should be eliminated for effective fishing • Only Large & Medium scales Irrigation were considered in the presentation,	• Awoyemi, A OMA • Engr. RAK

Contributions/Comments	Remarks
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 should be "Yewa River". • 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.	Jimoh NIWRMC • Eduku .P LSWC • 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	**Opening** 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

S/NO	Issues
	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.
2	**Presentation of the Framework of Catchment Management Plan for Hydrological Area 1 by Mr. Watanabe** 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. Thereafter, he gave a vivid outline of the presentations which focused on the following: ▪ 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	**Clarification of Current Institutions for Water Resources in HA 1 and Proposal for Institutional Improvement by Engr. K. S. Sunmonu.** 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: ▪ 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

<table>
<tr><th>S/NO</th><th>Issues</th></tr>
<tr><td></td><td>

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.

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 :

The need to create comprehensive institutional frameworks (Systems) responsible for the implementation of CMP
Strengthening the institutional capacity of NIWRMC and CMOs for integrated basin management system
Decentralization and Integration of state and federal level institutions
Promotion of Joint Management practices for inter-state water issues
Enforcement of Regulatory system of the river basin
Creation of CBOs
Strengthening of RUWASSAs
Institutional reform for the public irrigation management authorities
Creation of new unit or department within FMWR for WRM at State Level
Development of data sharing protocols amongst states
Dissemination of national water policy, Water Resources Master Plan, CMP and other Legislation in consultation with the PR Unit of FMWR
Organize programmes, workshops and seminars on the role of water in the society
Develop cost effective water services using the private sector
Creation of PPP Unit at State Level
Project for Capacity Development at Catchment Level

</td></tr>
<tr><td>4.0</td><td><u>Comments, Questions and Suggestions Arising from the Presentation by Participants</u></td></tr>
<tr><td>4.1</td><td>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.

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</td></tr>
<tr><td>4.2</td><td>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.

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 Reps, State houses of Assemblies and their respective committees on water resources.</td></tr>
<tr><td>4.3</td><td>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</td></tr>
</table>

S/NO	Issues
4.4	catchment and desertification 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 new unit in the Ministry may not be necessary. 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. Name: Engr. Ekanem Nayanaso 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.
5.0	**<u>Plan on Stakeholder Meetings for Water Resources management for HA 1 by Engr. K. S. Sunmonu</u>** 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.
6.0	**<u>Discussion/ Clarification on the Proposal for Institutional Development in HA 1:</u>** 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. 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

S/NO	Issues
	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 carry out a comprehensive study in order to finding a lasting solution to this menace. 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.
7	**Remarks by EU-WSSSRP** 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.
8	**Contribution from JICA-Nigeria Office** 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.
9	**Closing Remarks** 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.
10	**Closing Prayer** The meeting came to an end at 2.38pm

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 seeked 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 (HA_6), 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
• 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, Sates and Local Governments.	Olanigan K. U, MRD, Lagos Rufai D. A MP&UD, Lagos

Response

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

OGUN STATE

Contributions/Comments	Remarks
• 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.	*Engr. Tomi. O OSWC Sonde. O.O, RUWATSA, Ogun*

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
• 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 Sate	Akindele A.O, Planning & Budgeting, Oyo State Akinde N.P, Economic Planning Oyo Sate.

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
• 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.	Agbeja O.J RUWESA, Osun State Ibrahim F.A, RUWESA, Osun State

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 immerse 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: • 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: • 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	Scenario-A: the construction of the proposed Odedele dam is necessary to meet the future water demand in Ibadan. Scenario-B: construct a new dam in Oyo State is recommended to meet the future water demand in Lagos.
Osun	Scenario-A: main water sources for municipal water supply can meet the future water demand in 2030. Scenario-B: construction of a new dam in Osun State is recommended to meet the future water demand in Lagos.

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

	• 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
	• 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)
	• 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
	• 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)
	• 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	SMWR&RD(Tech. Asst. to Hon. Comm.) Mrs. Judith)

	project implementation (Data collection and clarification of issues) was not effected in the Final Draft MP.	
	• Since the existing boreholes presuppose the functioning ones therefore should be added together. (slide 30) • 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.	Engr. RAK JImoh (Consultant RAKIM Engineering Ltd
	• 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.
	• More than one model to be considered in data analysis for reliability purpose.	Scientific officer NESREA
	• Stakeholders in Water Resources to pay more emphasis on data generation for future water resources development.	
	• 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
	• 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

付録-8：流域管理計画に関連したステークホルダー会議（HA-1 および Ogun-Oshun 流域）の参加者リスト

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	Oyeniyi 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 Ezeka	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	
53	Adamu Icwami	DD	UBRBDA	Adamawa

S/NO	NAME	POSITION	ORGANIZATION	STATE
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	Sojinu 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	
108	Dr. Alayande .A. Waheed	Head L&W, R&D	NWRI	
109	Dr. Ben Aneke	HOD (Hydrology)	Anambra-Imo River	

S/NO	NAME	POSITION	ORGANIZATION	STATE
			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	0gun
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 Oyeniyi	DFPM	Min of Finance	
13	Dauda D.M.	D(OPS)	MWR	Kebbi
14	Engr. Segun Ajara	Director	Osun State Water Corporation	Osun

S/N	NAME	POSITION	ORGANIZATION	STATE
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 Watrer Board	Katsina
28	R.A. Habu	Direrctor	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 Olaija	Desk Officer, WLCO	NIWRMC	Osun
61	Sojinu Olasunkanmi	Head, Assessment Unit	Min of Environment	Lagos
62	G.A. Agwuma	SSO(P)	FMWR	

S/N	NAME	POSITION	ORGANIZATION	STATE
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	Erinoso K.S.	TO	FMWR
9	Fadunsin E.B	Asst Chief Geologist	Lagos State Min of Rural Dev
10	Olanigan U.K.	AC(WS)	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. Adejumobi	DSG	Office of the Surveyor General	Osun
12	Mr. A.A. Ojo	Director	Min of Agric	0sun
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	OORBDA	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	Geoogist	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	OORBDA	
9	Engr. Akin Soyemu	ED(P&D)	OORBDA	
10	Engr. Jimi Sokunle	Ag. ED	OORBDA	
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, Rura 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	OORBDA	
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)	OORBDA	
26	Bintu Ali	Snr. Hydrolologist	GWMA	
27	Ogbonna K.E.	Snr. Hydrologist	FMWR	
28	Ipinlaye O.	CMO	NIWRMC	
29	Saliu A.J.	Public Relations	OORBDA	Ogun
30	Mr. Adewale S. Taiwo	TPO I	Min of Urban & Planning	Ogun
31	Musa Ganiyu	Planning Officer II	OORBDA	

	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, F 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 A Coop	Lagos
54	Engr. Agbolade M.O.	Engineer	Lagos State Min of A Coop	Lagos
55	Mrs Said	BLDR	MPPSUD	Lagos
56	Rufai D.A.	Town Planner	MPP&UD	Lagos
57	Adepegha A.	Hydrologist	MOE	Lagos

Seminor on 3rd December, 2013

S/N	NAME	POSITION	0RGANIZATION	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	0RGANIZATION	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 Vice Chancellor(Admin)	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	Oyedeji 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	0RGANIZATION	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 0.	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


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