NATIONAL WATER RESOURCES INSTITUTE (NWRI)
FEDERAL MINISTRY OF WATER RESOURCES (FMWR)

PROJECT FOR ENHANCING THE FUNCTION OF RURAL WATER SUPPLY AND SANITATION CENTRE FOR CAPACITY DEVELOPMENT IN NATIONAL WATER RESOUCES INSTITUTE (RWSSC PROJECT) IN THE FEDERAL REPUBLIC OF NIGERIA

PROJECT COMPLETION REPORT

DECEMBER, 2014

JAPAN INTERNATIONAL COOPERATION AGENCY
(JICA)

YACHIYO ENGINEERING CO., LTD

GE
JR
14 − 202

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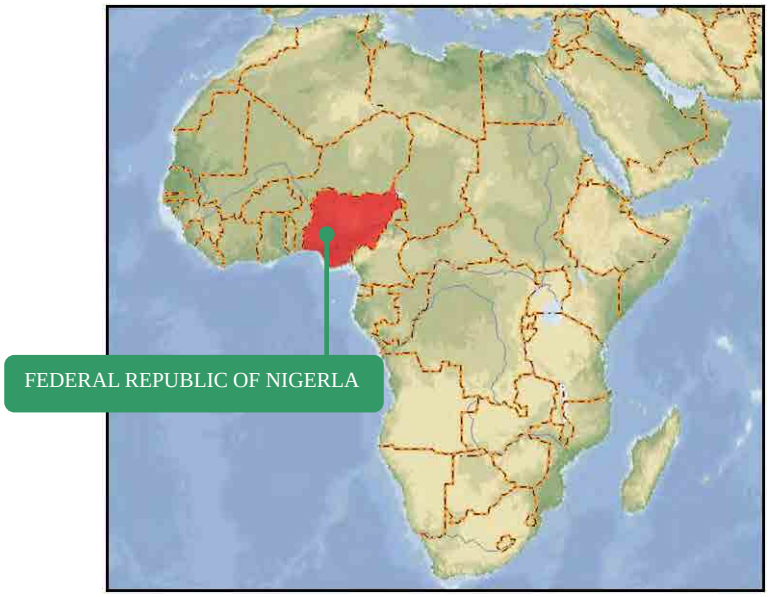
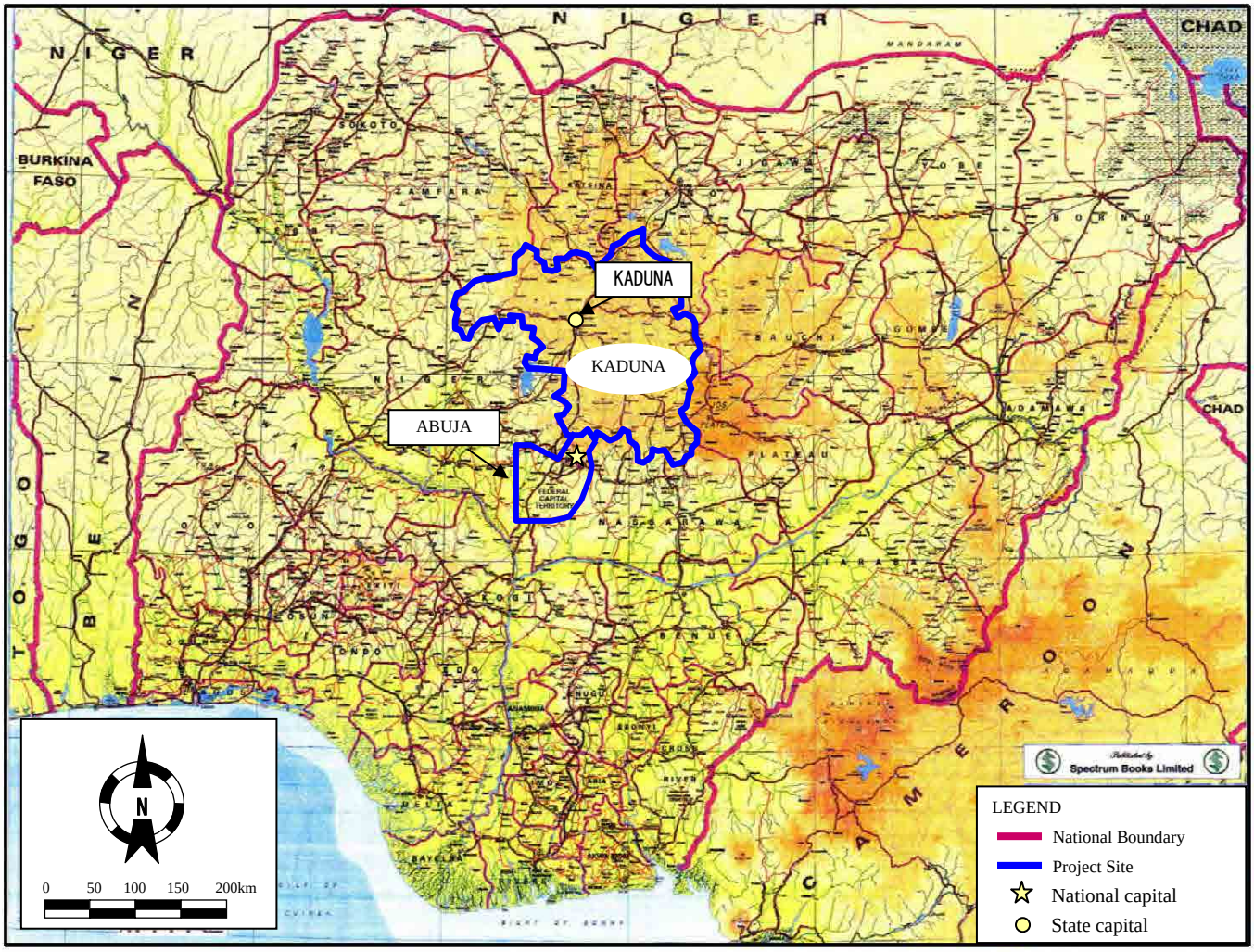
In this report the following exchange rates are applied (as of December,2014)

Exchange Rate
₦1＝JPY 0.675（December, 2014）





Location Map

【Project site (Kaduna and Abuja)】

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>NWRI building (Kaduna)</td><td>Entrance of NWRI (Kaduna)</td></tr>
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<tr><td>Map of NWRI (Kaduna)</td><td>Entrance of RWSSC (Kaduna)</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>FCT Water Board Facility at Lower Usuma Dam(Project site from 3rd Year) (Abuja)</td><td>Conference Hall at Lower Usuma Dam (Training venue from 3rd year) (Abuja)</td></tr>
</table>

【Course 1】Groundwater Investigation Technique

	
Scene at the registration desk A student signs his name on the registration list (Main Entrance, Conference Hall)	Opening ceremony (Classroom inside Conference Hall)
	
Classroom scene Main Instructor O.O.Yaya explaining about geophysical prospecting techniques used in groundwater investigations (Classroom inside Conference Hall)	Classroom scene Question and answer session between students and Main Instructor O.O.Yaya (Classroom inside Conference Hall)
	
Practice with McOHM electrical sounding (Campus of Lower Usuma Dam Junior High School)	Practice with TEM electromagnetic sounding （Campus of Lower Usuma Dam Junior High School）

【Course 2】Borehole Construction Management

	
Borehole camera	Instruction of usage of borehole logger （Lower Usuma Dam）
	
Practice about pumping test (Lower Usuma Dam）	Practice about borehole camera (Lower Usuma Dam）
	
Practice about borehole logging (Lower Usuma Dam）	Practice about water quality analysis (Lower Usuma Dam）

【Course 3】Drilling Technology

	
Training about the construction of mud pit （Drilling site at Buhari）	Training about the usage of mud pump （Drilling site at Buhari）
	
Training about mud management (Drilling site at Buhari）	Training about drilling method (Drilling site at Buhari）
	
Training about the installation of drill bit (Drilling site at Buhari）	Commemorative photograph closing ceremony

【Course 4】Drilling Machinery Maintenance

	
Lecture by Course coordinator(Engr. S.G. Sara) （Lecture room in Usuma Dam)	Opening speech by Project manager (Dr. M. Eduvie)
	
Training using new drilling rig （Lower Usuma Dam yard）	Training using old type drilling rig （Near Usuma Dam）
	
Training using new compressor （Lower Usuma Dam yard）	Training using old type compressor （Near Usuma Dam）

【Course 5】Handpump Installation, Operation and Maintenance

	
Classroom scene Maintenance method for RUWATSAN II was explained. Trainer: Olatunji (Class room inside Conference Hall)	Classroom scene Platform construction method was explained by video material. Trainer: Mr.Jera (Class room inside Conference Hall)
	
Classroom scene One of the participants was explaining by local language for other participants who does not understand English.	Scene of practical training Repair work of broken RUWATSAN I was carried out. Pump rod was taken out. (Kaduna city)
	
Scene of practical training The condition of plunger was confirmed after removal of pump rod. (Kaduna city)	Scene of practical training Function was checked after repair work for RUWATSAN I. (Kaduna city)

【Course 6】Borehole Rehabilitation and Maintenance

	
Classroom scene 15participants join this course from RUWASSA, LGA of Katsina, Taraba, Kaduna State. Trainer and course coordinator: Mr.Yaya	Classroom scene Handpump structure is explained by material. Trainer: Mr.Bunmi （Classroom of Conference Hall）
	
Borehole with submersible pump which is used for field practice. Private borehole is selected.(Kaduna city)	Compressor for borehole cleaning (Kaduna city)
	
Scene of practical training Cleaning of borehole by air lift with is carried out. (Kaduna city)	Scene of practical training After pumping test, submersible motor pump is removed for borehole cleaning

【Course 8】Hygiene and Sanitation Promotion

	
Group work to discuss problems faced by the participants as a hygiene promotion officer	Instructor explaining facilitation skill
	
Role play	Practical training in a community （community mapping）
	
Practical training in a community （Faeco-oral transmission routes）	Group work to discuss school WASH promotion

【Course 9】Community Mobilization and Management

	
Group work to discuss required knowledge and skill as a community mobilization officer	Group work for gender awareness
	
Problem tree made by the participants	Practical Training （Selection of WASHCOM members
	
Debriefing of the field trip	Making action plans

Project for enhancing the function of rural water supply and sanitation centre for capacity development in national water resources institute (RWSSC project) in the Federal Republic of Nigeria

Project Completion Report

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Abbreviations

DO	Dissolved Oxygen
DTH	Down The Hole Hammer
EC	Electric Conductivity
FMWR	Federal Ministry of Water Resources
G.L.	Ground Level
GNP	Gross Domestic Product
JICA	Japan International Cooperation Agency
LGA	Local Government Areas
M/D	Minutes of Discussion
MDG	Millennium Development Goal
MWR	Ministry of Water Resources
NEEDS	National Economic Empowerment and Development Strategy
NGN	Nigerian Naira
NPC	National Planning Commission
NWRI	National Water Resources Institute
OJT	On-the-Job Training
O&M	Operation and Maintenance
PDM	Project Design Matrix
PVC	Polyvinyl Chloride
RD	Record of Discussion
RUWASSA	Rural Water Supply and Sanitation Agency
RWSSC	Rural Water Supply and Sanitation Centre for Capacity Development
UNICEF	United Nations International Children's Fund
uPVC	Unplastised polyvinyl Chloride
VLOM	Village Level Operation and Maintenance
WASHCOM	Water, Sanitation and Hygiene Committee
WATSAN Project	Water and Sanitation Project
WHO	World Health Organization

CHAPTER 1. PROJECT PROFILE

CHAPTER 1 PROJECT PROFILE

1.1 Background of the Project

The Government of the Federal Republic of Nigeria (hereinafter simply called "Nigeria") has been pursuing the goals of providing the whole nation with a supply of safe water by 2011 and achieving 30 liters of water supply per person per day day in all rural communities with population of no more than 5,000, water carrying distance to no more than 250m and providing water supply points for every 250-500 perople the National Water Supply and Sanitation Policy (1999) and the Rural Water Supply and Sanitation Program (Strategic Initiative (2004)). Under the influence of a growing population and other adverse effects, however, the ratio of population having access to safe water has moved sideways from 49% (1990) to 48% (2004), with water-caused diseases, such as diarrhea or cholera resulting from the use of unsanitary water, spreading over the rural areas among elsewhere.

Fedral Ministry of Water Resources (FMWR) realizes the value of boosting capacity development for the Rural Water Supply and Sanitation Agency (RUWASSA), which takes primary responsibility for improving the rates of water supply and status of sanitation in each individual states, and the State Ministry of Water Resources for the purpose of improving the status of water supply in the rural areas and achieving the goals above set forth, and also the value of training capacity development for the National Water Resources Institute (NWRI), which administers technical training programs for State officials personnel concerned. Since the NWRI has conducted training sessions on water supply at the urban or small-town level to date but no or few training sessions in the fields of rural water supply and sanitation, the Rural Water Supply and Sanitation Centre for Capacity Development (the RWSSC) has been launched as part of the NWRI to concentrate on handling these fields, reinforcing the development of human resources working on the issues of rural water supply.

In this background, this technical cooperation project has been called upon to seek Japan's experience and technical support to aid in the development of the RWSSC's training capacities with self-sustaining expansibility.

Responsive to this urge, JICA conducted a preliminary detailed planning survey in September 2009 and a secondary detailed planning survey in March 2009 and Nigeria's National Water Resources Institute and JICA signed a Record of Discussion (R/D) on October 21, 2009 on the basis of findings of these two surveys.

"The Project for Enhancing the Function of Rural Water Supply and Sanitation Centre for Capacity Development in National WaterResouces Institute (RWSSC Proejct)" (hereinafter called the "Project") is implemented by JICA, within the framework below set forth.

(1) Outcome

Project Purpose and Objectively Verifiable Indicators

＜Project Purpose＞

- Rural Water Supply and Sanitation Centre for Capacity Development (RWSSC) is effectively operated

＜Objectively Verifiable Indicator＞

- The evaluation result by the trainee at the end of the Project is increased compared with the ones at the beginning of the Project.
- 350 people will attend RWSSC trainings in total by the end of the Project.

Overall Goal and Objectively Verifiable Indicators

＜Overall Goal＞
- Service Delivery of RWSS is improved in Nigeria through Capacity Development of Stakeholders

＜Objectively Verifiable Indicators＞
- The rate of functional rural rwater supply facilities is increased compared with the ones before the participation to the Training at RWSSC in the specific States which received the Grant Aid Project.

(2) Output and Activities

Output 1

"Capacity Gap of RWSSC (NWRI) and RWSS stakeholders at States,LGAs and Community levels area identified."

＜Objectively Verifiable Indicators＞
- Capacity Assessment Reports are made in the first year of project and revised by the end of the Project.
- RWSS stakeholders including ESAs share the identified capacity gaps of RWSS stakeholders.

＜Activities＞
1-1 Determine capacity assessment procedures and selection of target institutions (National, State, LGA and Community levels).
1-2 Conduct capacity assessment of sampled institutions and produce reports.
1-3 Organize stakeholders workshop to present and improve the assessment reports
1-4 Disseminate the reports to major stakeholders.

Output 2

"Responsible and dffective training system (Module, materials, and facilities, etc.) is developed."

＜Objectively verifiable Indicators＞
- Revised and newly developed training materials including manuals are utilized in trainings according to Training Modules and Programme by 2010.
- Facilities and equipment are maintained and arranged for trainings and training Programme.

＜Activities＞
2-1 Formulate training strategy for RWSSC and create RWSSC mission report.
2-2 Review and Formulate Training Programmes, Courses and Modules required as a result of the capacity assessment.
2-3 Review and revise existing training materials
2-4 Develop training materials for newly developed courses
2-5 Inventorize and procure required facilities and equipment
2-6 Produce users' manuals of facilities and equipment
2-7 Provide On-the-Job-Training (OJT) to users on facilities and equipment handling, operationand maintenance

Output 3

"Training capacity in RWSSC is enhanced"

＜Objectively Verifiable Indicators＞
- More than 80% of trainees evaluate the trainers as "good"
- RWSSC managers and JICA experts judge ToT recievers'capacity in terms of knowledge, attitude and skills are improved

＜Activities＞
3-1 Identify relevant trainers (qualification, skills, role workload, etc.)
3-2 Formulate Training of Trainers (ToT) programme
3-3 Make ToT materials
3-4 Implement ToT Programme
3-5 Evaluate ToT programme and its implementation
3-6 Develop and maintain database of trainers

Output 4

"Trainings are delivered based on a PDCA cycle"

＜Objectively Verifiable Indicators＞
- M&E are conducted on Training activities, Modules, Programme, Materials, Facilities and Equipment arrangement, Trainers and Traineess according to the M&E plan.
- Revising procedure was taken as scheduled from the 2012 year's training cycle.

＜Activities＞
4-1 Develop a M&E Plan for the training courses, Modules, Materials, Trainees and Resource persons/Facilitators
4-2 Prepare and deliver trainings of stakeholders at State, LGA and Community level
4-3 Conduct M&E on the training Modules, materials, resource persons/ facilitators and trainees as planned and revise them as necessary
4-4 Revise M&E Plan as necessary

Output 5

"Management of RWSSC is improved"

＜Objectively Verifiable Indicators＞
- Logistics and administrative matters are conducted according to the manual/work plan by March 2013
- More than 10 States are informed of the contents and period of Training at RWSSC.

＜Activities＞
5-1 Publicize RWSSC's mandate/mission, objectives, functions and strategies to all stakeholders
5-2 Develop logistics and administrative manuals/work plans (budget, account, human & materials resources, training advertisement and "5S", etc)
5-3 Assign clear job description to each RWSSC staff
5-4 Deliver appropriate management training to RWSSC staff
5-5 Provide adequate enabling environment (office space, equipment stationeries and transportation, etc) for RWSSC
5-6 Collate database of trainers, trainees and trainings conducted
5-7 Propose to the Federal Ministry of Water Resources to allocate C/P funding to the Project.

1.2 Summary of Inputs to the Project

(1) List and Assignment Terms of Japanese Experts

Table 1.1 shows the list and assignment terms of Japanese experts at 1st year.

Since confirmation of training contents and development of the training materials such as text books were performed at 1st year, all Japanese experts were assigned. The total dispatch period was 26.7 M/M.（Japanese experts dispatch schedule at 1st year is attached in the appendix）

Table-1.1 1st year (March 2010 to February 2011)

Name	Field in Charge	Assignment Term	M/M
Dr. Kenji YOSHIDA	Chief Advisor/Rural Water Supply/Organization Management	March-April 2010 June-July 2010 October-November 2010 January-February 2011	5.10
Mr. Nobuyuki IIJIMA	Hydrogeology/Groundwater Development	March-May 2010 September-October 2010 January-February 2010	5.60
Mr. Yoshimi HIDA/ . Mr. Yasuo ONOZUKA	Drilling Technology	September-October 2010 January-February 2010	3.00
Mr. Koji TAKAHASHI	Borehole Rehabilitation and Maintenance	June-August 2010 January-February 2010	3.00
Mr. Tsugio ISHIKAWA	Geophysical Exploration/Analysis	June-August 2010 January-February 2010	3.00
Mr. Hiroaki OKADA	Drilling Machinery Maintenance	June-August 2010 January-February 2010	3.00
Ms. Megumi KANEDA	Rural Development/Community Mobilization and Sanitation	September-October 2010 January-February 2010	3.00
Mr. Tetsuo YATSU	Procurement Supervision and Plan	November-December 2010	1.0

The list and assignment terms of Japanese experts at 2nd year are shown in Table 2. Due to the delay of procurement of the training equipement from Japan, the training courses which do not need the equipment were implemented. Therefore, Japanse experts who are in charge of those training courses were dispatched. In addition, the Japanese expert to support publicity work was also dispatched. The Japanese expert in charge of “Hydrogeology/Groundwater Development”was schedule to travel twice. However, his 2nd trip to Nigeria was cancelled due to the security reason in Kaduna. The security situation of Kaduna was deteriorated at the end of 2011. The total dispatch period was 12.27 M/M.（Japanese experts dispatch schedule at 2nd year is attached in the appendix）

Table-1.2 2nd year (April 2011 to March 2012)

Name	Field in Charge	Assignment Term	M/M
Dr. Kenji YOSHIDA	Chief Advisor/Rural Water Supply/Organization Management	July-August 2011 September-October 2011 November-December 2011 January-March 2011	6.27
Mr. Nobuyuki IIJIMA	Hydrogeology/Groundwater Development	September-October 2011	1.50
Mr. Koji TAKAHASHI	Borehole Rehabilitation and Maintenance	July-August 2011	1.13
Mr. Tsugio ISHIKAWA	Geophysical Exploration/Analysis	September-October 2011	1.00
Ms. Megumi KANEDA	Rural Development/Community Mobilization and Sanitation	November-December 2011	1.00
Mr. Hisashi OURA	Publicity Works	September-October 2011	1.37

Table 1.3 shows the list and assignment terms of Japanese experts at 3rd year. Due to the security reason, 3rd year activities were not able to start on time and it was delayed by one year. Project site was moved to Abuja Water Board facility near Usuma dam, Abuja from NWRI, Kaduna from 3rd year since security situation at Kaduna has not been improved. In addition, Project covered only training courses using procured equipment such as course 1, 2, 3 and 4 from 3rd year. Thus Japanese experts in charge of the four courses were dispatched. Moreover, the experts of "drilling technology" and "drilling machinery maintenance" who worked at the previous year could not join in their convenience and had to change. The total dispatch period was 11.9 M/M.（Japanese experts dispatch schedule at 3rd year is attached in the appendix）

Table-1.3 3rd year (January 2013 to December 2013)

Name	Field in Charge	Assignment Term	M/M
Dr. Kenji YOSHIDA	Chief Advisor/Rural Water Supply/Organization Management	February-March 2013 April-May 2013 June-August 2013 October-November 2013	7.00
Mr. Takashi NAMEKAWA	Drilling Technology	April-May 2013	0.90
Mr. Tsugio ISHIKAWA	Geophysical Exploration/Analysis	April-May 2013 October-November 2013	2.50
Mr. Minoru MURATA	Drilling Machinery Maintenance	July-August 2013	1.50

Table 1.4 shows the list and assignment terms of Japanese experts at 4th year. After the implementation of traing by C/Ps in 3rd year, it was considered that C/Ps can carry out the training without support of Japanese experts in charge of earch course. Therefore in 4th year, implementation and evaluation of OJT, ToT and training were carried out by Nigerian side and dispatchment of the experts of "drilling technology" and "drilling machinery maintenance" was cancelled. On behalf of them, a chief advisor carried out the support of implementation and evaluation of the training courses.

In 4th year, the expert for publicity work was assigned to support the creation and updating of training database. The expert for Hydrogeology/Groundwater Development was also assigned to conduct the training inpact and need surveys at Niger state. The total assignment period was 9.0 M/M.（Japanese experts dispatch schedule at 4th year is attached in the appendix）

Table-1.4 4th year (February 2014 to December 2014)

Name	Field in Charge	Assignment Term	M/M
Dr. Kenji YOSHIDA	Chief Advisor/Rural Water Supply/Organization Management	February-March 2014 April-May 2014 May-July 2014 August-September 2014 October-November 2014	7.00
Mr. Nobuyuki IIJIMA	Hydrogeology/Groundwater Development	September-October 2014	1.00
Mr. Hisashi OURA	Publicity Works	June-July 2014	1.00

(2) List of Equipment Procured for the Project

List of procured equipment and place of storage, as well as operational status of equipment are shown in **Table 1.5**. Training equpiment was planned to arrive in August, 2011 but did not arrive until February 2013 due to delay in procurement of equipment and the training using the equipment was started from the 3rd year. Japanese experts implemented OJT for the C/P (trainers and training assistants) with regard to the use and maintenance of equipment. In addition, Japanese experts conducted ToT for the trainers in order to use the equipment efficiently in the training.

RWSSC project manager will play a central role in maintenance of the equipment upon completion of the project. As for securing the cost of equipment maintenance, annual maintenance plan has been prepared by using spare parts list and maintenance manual as reference, and budget application has been submitted based on this plan.

Certiticate of Handover of the training equipment is attached in Appendix.

Table-1.5 List of Equipment

	Item	Specifications	Quantity	Value (JPY)	Date of Procurement	Store Plance	Operational Status
1	Drilling rig and tools	Truck-mounted, maximum drilling depth 100m, combined mud DTH drilling	1 set	54,081,800	Feb-2013	Store at NWRI yard	Operational
2	High pressure compressor truck	Truck-mounted Pressure emitted: 2.01MP or above Volume emitted: 11.3m3/min. or more	1 set	23,760,000	Feb-2013	Store at NWRI yard	Operatioal
3	Drill bit	Tricone bit, hammer bit	1 set	3,443,200	Feb-2013	NWRI store	Operational
4	Water tank car	Tank capacity: 8m3 or more Pump capacity: 500L/min. or more	1	14,190,000	Feb-2013	Store at NWRI yard	Operational
5	Crane truck	Hoisting capacity: 3 tons Cargo bed dimensions: 6.0m or longer	1	14,300,000	Feb-2013	Store at NWRI yard	Operational
6	Simple mud tank	5m3 (simple water tank)	1 set	292,500	Feb-2013	NWRI store	Operational
7	Borehole camera	Used for well diagnostics	1 set	2,215,500	Feb-2013	NWRI store	Operational
8	Repair tools	Taps, etc. for repairing handpumps	1 set	294,700	Feb-2013	NWRI store	Operational
9	Hole logging equipment	Investigation depths of 100 m and deeper, 100V, 120mA, A/D converter	1	2,116,400	Feb-2013	NWRI store	Operational
10	Electrical sounding equipment	Investigation depths of 100 m and deeper, 100V, 120mA, A/D converter, 2 surface electrodes	1	6,436,000	Feb-2013	NWRI store	Operational
11	Electomagnetic prospecting equipment	Investigation depths of 100m and deeper, DC12V	1	15,705,500	Feb-2013	NWRI store	Operational
12	Submersible pump set (incl. flow meter and pressure gauge)	30L/min. @ 70 m or deeper	1	786,100	Feb-2013	NWRI store	Operational
13	Generator	5kvA or greater	1	616,200	Feb-2013	NWRI store	Operational
14	V-notch	For measuring water	1	288,800	Feb-2013	NWRI store	Operational
15	Water gauge	Measuring depth: 100m	1	44,100	Feb-2013	NWRI store	Operational
16	Water quality analyzer	Measurements: pH, dissolved oxygen, EC, TDS	1	374,400	Feb-2013	NWRI store	Operational
17	Aquifer test analysis	For calculating well efficiency	1 set	218,400	Feb-2013	Project office	Operational
18	Groundwater analysis	For estimating groundwater development potential	1 set	680,300	Feb-2013	Project office	Operational

(3) Changes of PDM

Changes in PDM are shown in **Table 1.6**. As can be seen in the Table, PDM has been revised four times (see attachment for details of each PDM). The original PDM 1.0 was prepared at the time of detailed planning survey in 2009 and was attached to the minutes signed with Nigeria on March 9, 2009 and revised again prior to the commencement of the Project. Ex-ante evaluation form was prepared based on PDM 1.1 and the Project was started in accordance with this version of PDM 1.1.

Then the indicators of Project Purpose and the indicators of Outputs were changed during the mid-term evaluation in October 2011. According to initial explanation from Nigeria, the training was going to be implemented by using NWRI budget. However, activities for promoting training participants such as publicity for the States were added following the change of the implementation of the training by using the budget for personnel training allocated to each State.

Volatility increased at the Project Site in Kaduna in the latter hald of 2011 with coordinated terrorist explosions occurring at 3 locations including the air forace facility near the Project Office. Terrorist explosions continued thereafter in Kaduna and the Ministry of Foreign Affairs issued a warning in May 2012 to postpone travel to the entire Kaduba State including the City of Kaduna. As a result, it became impossible for Japanese experts to work in Kaduna and the Project was suspended.

Subsequent discussion with Nigeria in October 2012 led to decisions including extension of the Project period, change of Project Location from Kaduna to Abuja, reduction of Training Course and changes in Project Activities, followed by signing of minutes. PDM 3.0 that reflected the changes was prepared at this point. In particular, activities for organizational strengthening of RWSSC in Output 5 (which were added in PDM 2.0) were deleted due to limitations in Project activities following the change in location of activities.

Table-1.6 Revised version of PDM

Ver	Date of revision	Contents of revision	Previous sentence	Revised sentence
1.0	Attached on M/M signed on 19th March, 2009 at Detailed Planning Survey	Origial PDM		
1.1	Before the Project start	Change of indicators of Project Purpose,	Satisfaction of those trained in RWSSC will improve by 70% by 2013 from start of the Project	Deleted
		Change of Activities (Output 1)	Review the capacity assessment activities and reflect outcome in the training system	Deleted
2.0	At the mid-term evalution (October, 2011)	Change of indicator of Overall Goal,	Rural water access rate is 100% nationwide by 2018	The rate of functional rural water supply facilities is increased compared with the ones before the participation to the Training at RWSSC in the specific States which received the Grant Aid Project.

		Change of indicator of Project Purpose	RWSS Trainings are delivered without delay according to the Programme	The evaluation result by the trainee at the end of the Proejct is increased compared with the ones at the beginning of the Project
		Change of indicator related to Output 5	Budget is allocated and disbursed as scheduled	More than 10 States are informed of the contents and period of Training at RWSSC.
		Change of acitivities related to Output 5	Disseminate centre activities to stakeholders (eg. Web page)	①Produce the public relation tools such as Web page, pamphlet and others ②Send the sensitization mission to the States, to explain the contents of the Training at RWSSC and to encourage them to secure the budget so that they can send their technical staff to the Training ③Propose to the Federal Ministry of Water Resources to allocate C/P funding to the Proejct
3.0	Attached on M/M signed on 2nd October 2012	Change of Projetct period	March 2010～November 2013	March 2010～November 2014
		Change of indicator of Project Purpose	400 RWSS staff will attend RWSSC trainings in total by the end of the Project	350 RWSS staff will attend RWSSC trainings in total by the end of the Project
		Change of acitivities related to Output 5	①Prepare the detailed annual training/activities plan every year. ②Produce the public relation tools such as Web page, pamphlet and others ③Send the sensitization mission to the States, to explain the contents of the Training at RWSSC and to encourage them to secure the budget so that they can send their technical staff to the Training.	These items were deleted and the other activites related to Output 5 teminated in 2nd year

(4) Work Schedulle

JICA Expert Team implemented project activities required to attain the goal, achievements, and indicators of the Project.

The executiong agency for the project activities is the Counterpart on the Federal Republic of Nigeria side. JICA Expert Team mainly followed up on the management of the progress of activities, provide technical support, support capscity development of the Nigeria side, and also made efforts to help them to administrate the RWSSC operation by Nigeria side themselves.

The basic project activity flow and implementation policy plan were subject to change for improvement according to discussions with the C/P and results of project progress management. The change of activities at each year is shown in **Table 1.7**.

Table 1.7 Changes of Work Schedule

	Contents of revision	Previous work schedule	Revised work shceudle
2nd year	Activity of Output 1-4 (Disseminate the reports to major stakeholders) was supposed to complete before the end of 1st year. Draft report was completed in 1st year but, could not finalized since as the workshop to comfirm the contents of the report was delay and held at the end of 1st year.	Distribution of the report was supposed to completed in 1st year	Distribution was continued in 2nd year
3rd year	All acitiviies schedule due to the suspension of the Project	Activities of 3rd year was supposed to start in April, 2012	Activities of 3rd year started in February, 2013
	Due to the delay of procurement of equipment, schedule of the following two acitiviets was changed. 2-6 Produce users' manuals of facilities and equipment 2-7 Provide on the Job Training (OJT) to users on facilities and equipment handling, operationand maintenance	Both activities (2-6 and 2-7) were supposed to start in July , 2011.	Both activities started in March, 2013
	Delete of acitivites related to Ourput 5 by the correction of PDM	Activities related to Output 5 which were described in PDM 2.0 (publicity work etc) was supposed to start in July,	Those acitivities were deleted from work schedule
4th year	Nothing in paticular		

Project activity flow which reflects the above changes is shows in Figure 1.1.

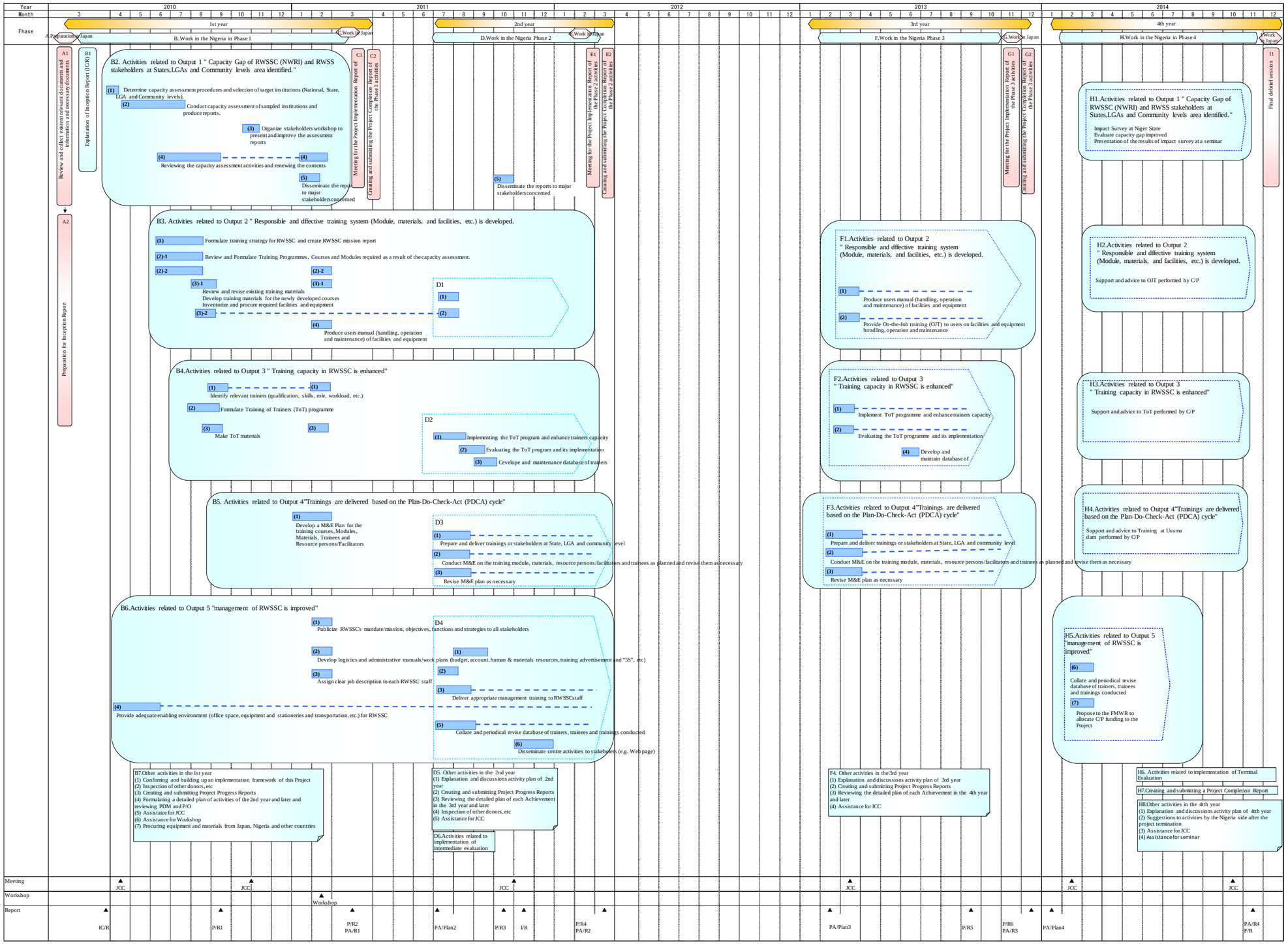

Figure 1.1 Project activity flow

1.3 Method for Achievement of Output and Implementaion method of Technical Transfer

(1) Method for Achievement of Output

The project was pursued in collaboration with the Nigerian counterpart pursuant to the Project Design Matrix (PDM) and the Plan of Operations (P/O) to ensure efficient functional enhancement. This project was committed to a stated goal of "Rural Water Supply and Sanitation Centre for Capacity Development (RWSSC) is effectively operated". The optimal approach to keeping training quality should be by building a PDCA cycle (Plan, Do, Check, Act) on the training system. Accordingly, this operation would be directed by a guiding concept to build a PDCA cycle while developing the individual capacities of PDCA. While capacity development (hereinafter simply called "CD") to organization (RWSSC) and individual (C/P) was performed based on the capacity development policy which is explained as follow;

1) CD on Project

Policy of the Capacity Development on this project refers to the following document.

JICA March 2006, "Capacity Development (CD) "

According to the document, as shown in Figure 1.1, capacity can divide into three levels, such as individual, organization and society. Then capacity can be defined as the development process of capability through the process of solving a problem by that an individual, organization and society carry out the role individually or collectively and the aim is attained, namely it can be defined as a subject coping ability.

Background of this definition can be described as follows;

For solution of a development problem, it is not enough that individual capability just improves. For problem solving, the improvement of organization and administration of public organization and private company is also required. Furthermore, it is thought that improvement in a society's as a whole synthetic capability is required. Based on the above mentioned definition and description, implementation plan for the capacity development in this project is as follows.

It aims at RWSSC being managed efficiently by improving capability and enforcement organization in the level of all individual, organization, and society. Therefore, effective support for implementation of capacity development about all the levels of an individual, an organization, and society is offered.

Moreover, in order to support the endogenous improvement in capability by the self-reliance by the side of C/P, JICA experts decides to bear a role of facilitator who offers side support of the capacity development of C/P.

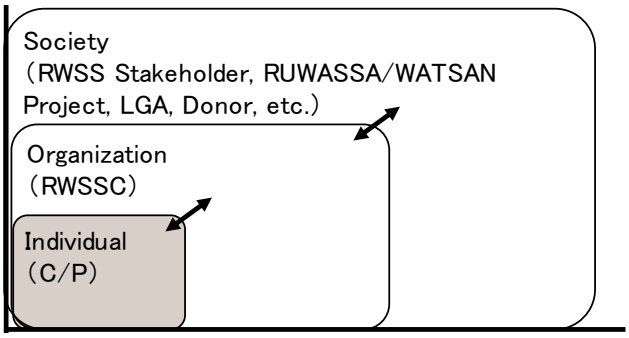

Figure 1.2 Framework of CD (Trilaminar)

Table 1.8 shows the implemented or expected activities in this project, and contents of individual,

organizational and social capacity of which improvement is expected.

Table 1.8 Target of the CD, contents of capacity and activities

Level	Target	Contents of Capacity	Activities for Capacity Development
Individual	C/P	The intention and power which set up a behavioral objective with their knowledge and skill, and are attained	・ Examination of course contents ・ Examination of course timetable ・ De ・ Support by JICA expert for above mentioned activities ・ Implementation of ToT
Organization	RWSSC	Decision making process, management system and organization framework required for effective management of RWSSC	・ JCC ・ Project team meeting ・ Formulation of RWSSC management plan ・ Formulation of RWSSC training strategy ・ Formulation of RWSSC training plan ・ Formulation of Administration and Office Work Manual and Plan ・ Formulation of ToT programme ・ Development of ToTmaterials ・ Implementation of ToT ・ Formulation of monitoring and evaluation plan ・ Examination of course implementation cost ・ Make up of the list of Training Equipment and Tools ・ Make up of RWSSC trainers database ・ Make up if RWSSC stuff database ・ Digitize and compile a database of above mentioned plan and database ・ Digitize and compile a database of training materials ・ 5S activity
Society	RWSS Stakeholders, RUWASSA, WATSAN Project, LGA, Donor, etc.	Environment and condition required for being demonstrated the capability of an individual or an organization level. RWSS stakeholders understand the contents of training in RWSSC, and perform motivation to training participation.	・ Holding of seminar and workshop ・ Publicity work of training activity and its contents

① CD Policy on Individual Level

The contents can be explained in the 2)

② CD Policy on Organization Level

Through the practical activity, such as a meeting and planning for management and training plan of RWSSC, capacity development about a decision-making process, management system and organizational framework of RWSSC required for effective management of RWSSC should be carried out.

③ CD Policy on Society Level

Through the seminar, workshop and publicity work by RWSSC, RWSS stakeholders understand the training activities of RWSSC and their contents. As a result, capacity development of the RWSS stakeholders is carried out so that the participation to training of the engineer of RUWASSA/WATSAN Project and LGA who is the training target may be urged on a social level.

2) CD on Individual (C/P) level

It is necessary to perform CD on individual level as well as CD on Project which is mentioned in previous sentence to achieve project purpose "RWSSC is effectively operated". CD on individual level is not independent from others activities but "Process of developing trainer's capacity" through various activities on this project.

Like other activities, CD on individual level is also programmed activities based on PDCA cycle as shown in following figure.

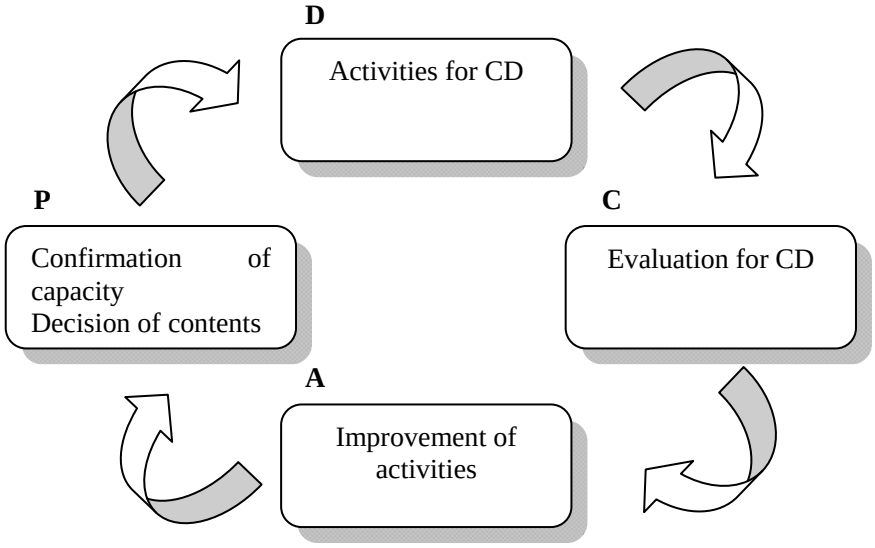

Figure 1.3 PDCA cycle of CD on individual level

Considering above mentioned concept of CD, following three capacities were necessary to be developed through this project.

- Teaching skills
- Technical knowledge
- Self-management such as time management

Approach and degree of necessity differ with each capacity. The contents of each capacity and approach for development are shown as follows;

① Teaching skill

[Capacities of C/P]

Most of the C/P has been teaching from 1990's as NWRI lecturers. From the results of observation of their teaching at classroom, C/P s have high level for "teaching skill" such as;

-Comprehensible way of talking

-Confirmation of participant's degree of understanding

Therefore the necessity of this CD was relatively low, however more improvement in capacity was aimed.

[Approach]

CD approach for teaching skill was performed by ToT program (Teaching skill).

② Technical kncowledge

[Capacities of C/P]

It is necessary to learn how to operate and maintenance of newly procured equipment. Even in the courses which do not have procured equipment, to have knowledge of case studies of other African countries helped understanding of relevant issue of the course widely since, in general, the knowledge of C/P is limited only in case of Nigeria.

[Approach]

CD approach for technical knowledge will be performed by ToT program (Technical knowledge), OJT (On the Job Training) and so on. Although detailed contents are different by each course, the important point is that JICA expert should pay attention not to be too intrusive when transferring Japanese technology. For example, consideration is required that usage method of procured equipment should correspond to actual condition of Nigeria. It is advisable that JICA expert should play a part as a facilitator in order that trainer may harmonize his work experience/knowledge and characteristic of procured equipment.

③ Self-management capacity like time management

[Capacities of C/P]

Although it does not have direct relation with the contents of lecture, it was observed that self-management capacity of trainers was not sufficient. Insufficiency of self-management capacity was seen such as always coming delay meeting or not doing expected work within the limit. Improving self-management capacity extremely contributed to the Project Purpose which is "RWSSC is effectively operated". Therefore, the necessity of CD for self-management is relatively high.

Specific self-management capacity include the following contents

-Be punctual to the meeting, appointment

-Making plan, arrangement, and finishing work within limit and so on.

[Approach]

Self-management capacity was not only an issue of individual effort but also relation with upper framework like a culture/custom of Nigeria or organizational rules of NWRI. Therefore CD in this project may not resolve to improve their capacities, although the high necessity of CD for self-management capacity. However it is rather better to take any action for improvement of capacity positively than doing nothing. Experience with counterpart shows that top-down communication from JICA expert did not work effectively. Accordingly approach for CD does not take specific action but JICA expert just showed the setting an example worth following in various cases. During four years of project implementation period, making steady effort like this has stimulated gentle change of self-managing capacity.

(2) Implementation Method of Technical Transfer

The Japanese experts and Nigerian C/Ps for each course worked together during discussions, seminars and workshops in order to achieve the output objectives. This process also allowed the Japanese experts to transfer skills to the Nigerians in each activity. Also, Japan provided necessary training equipment and transferring the skill to use and maintain such equipment to the C/Ps through the training in order to create an effective, engaging training environment for participants.

In the Project, skills were generally transferred through the following: ① daily implementation of the Project at the training center, ② discussions within formed committees, ③ workshops

① Technical transfer through daily operations

In the course of daily activities, the Japanese experts keeped skill transfer in mind while running the project. OJT programs for maintenance of provided equipment were one such example.

(3) Technical transfer in committees

Within the project, the following committees have been formed to track project progress and improve the capacities of training center staff.

1) Project Team Meetings

In order to check project daily progress and issues, these meetings are generally held weekly while the Japanese experts are in Nigeria. Japanese experts could not visit RWSSC/NWRI, Kaduna due to the security reason after 3rd year. Then the meetings with Japanese experts were terminated in 2nd year. The meetings between Japanese expert and C/P of each training course, however, were continued by the end of the Project. The meetings between Japnaese expert and C/P were held after the imlentation of each training course at Abuja. The meetings were carried out three times at course 1, 2 and 3 and two times at course 4.

2) Joint Coordinating Committee (JCC)

Japanese experts transfered skills to the Nigerians via these committees. In addition to confirming results andutput achievement levels for the project as a whole, the JCC served to approve project annual plans, monitor and evaluate the project and annual plans, discuss and advise on key project issues, and coordinate between the Nigerian and Japanese parties. The JCC was scheduled to meet twice in each fiscal year, with timing of the meeting and other such details up for discussion between the Nigerian and Japanese parties.

3) Technical transfer through seminars and workshops

Seminars and workshops are mostly run for RWSSC/NWRI. These work to improve the coordination capability of RWSSC staff, as well as ensure sustainability after project completion. Seminars and workshops to transfer skills to NWRI officials were held in 1st year. Due to the security reason, Project site was moved to Abuja from RWSSC/NWRI, Kaduna and the seminars and workshop were suspended after 2nd year. In 4th year, RWSSC workshop was resumed. The worshop in 4th year was prepared and run by only RWSSSC staff. Threre were some problems such as the mistake of agenda and insufficient logistics. However as a whole the workshop was successful. The information of workshop was distributed to state RUWASSAs beforehand and the attendace was confirmed before the workshop. This means that RWSSC staff acquired the skills of the implementation and RWSSC can continue to run of semiorars/workshops by themselves.

RWSSC workshop in 1st year		
RWSSC workshop in 4th year		

Figure 1.4 Photo of RWSSC Workshop

CHAPTER 2. PROGRESS OF THE PROJECT

CHAPTER 2 PROGRESS OF THE PROJECT

2.1 Status of the Achievement of the Project Purpose

Achievement level of Project purpose is shown in Table 2.1.

Table 2.1 Achievement of Project purpose

Project Purpose	Indicator	Level of Achievement
Rural Water Supply and Sanitation Centre for Capacity Development (RWSSC) is effectively operated	The evaluation result by the trainee at the end of the Project is increased compared with the ones at the beginning of the Project.	Result of evaluation of four training course become higher than beginning of the Project Average of evaluation Scores at four courses was improved from the beginning (5.0 is highest) ① Groundwater Investigation Technique (At first 3.6, Now 4.1) ② Borehole Construction Management (At first 4.0, Now 4.6) ③Drilling Technology (At first 4.4, Now 4.6) ④Drilling Machinery Maintenance (At first 4.2, Now 4.5)
	350 people will attend RWSSC trainings in total by the end of the Project.	405 participants have attended the trainings be the end of the Project

As mentioned above, both indicators were attained. However 75% of total participants (405) was financed by JICA in-country training fund, and, there were very few participants funded by Nigerian side as the whole. In the 4th year, 53 participants attended the training courses at the burden of a state. In future, it is expected that a situation will improve.

2.2 Status of the Achievement of Each Output

Achievement of the Outputs is as shown in Table 2.2. As for Output 1, it was not possible to determine the status of improvement in the six states where capacity assessment survey was conducted in the 1st year (Kebbi, Yobe, Bauchi, Niger, Ondo and Taraba) due to deterioration of local security (especially in the north). For this reason, a survey was conducted only in Niger state where security situation is relatively stable to grasp the impact of the training.

Table 2.2 Achievement of the Outputs

		Indicator	Level of Achievement
Output 1	Capacity Gaps of RWSSC (NWRI) and RWSS stakeholders at States, LGAs and Community levels are identified.	Capacity Assessment Reports are made in the first year of project and revised by the end of the Project.	Capacity assessment report was prepared in the 1st year. Training impact survey was conducted at RUWASSA of Niger state in the 4th year to grasp the status of

			improvement in capacity gap. The result of the survey was presented at RWSSC seminar and the contents of improvement of capacity gap by RWSSC training at Niger state RUWASA was shared among RWSS stakeholders.けい
		RWSS stakeholders including ESAs share the identified capacity gaps of RWSS stakeholders.	A seminar was held in Abuja in the 1st year to announce the content of capacity assessment report. Report was also distributed among agencies concerned.
Output 2	Responsive and effective training system (Modules, materials, and facilities, etc) is developed.	Revised and newly developed training materials including manuals are utilised in trainings according to Training Modules and Programme by September 2010.	Training materials including text revised and developed according to training curriculum module are utilized in the training..
		Facilities and equipment are maintained and arranged for trainings and training Programme.	Although procurement of training materials was delayed by 18 months, they have been utilized in the training from the 3rd year onward.
Output 3	Trainers capacity in RWSS is enhanced.	More than 80% of trainees evaluate the trainers as "good".	The results of training evaluation show that more than 90% (96.6% average) of trainees responded that the trainers were fully competent.
		RWSSC managers and JICA experts judge ToT receivers' capacity in terms of knowledge, attitude and skills are improved.	Both RWSSC managers and experts determined that the skills of ToT trainees had improved
Output 4	Trainings are reviewed based on a Plan-Do-Check-Act (PDCA) cycle.	M&E are conducted on Training activities, Modules, Programme, Materials, Facilities and Equipment arrangement, Trainers and Trainees according to the M&E plan.	Evaluation is performed for each training according to M&E through training evaluation sheet and assurance test.
		Revising procedure was taken as scheduled from the 2012 year's training cycle.	Content of training is reviewed based on evaluation results. Changes in training content are summarized in the annual report.
Output 5	Management of RWSSC is improved.	Logistics and administrative matters are conducted according to the manual/work plan by March 2013.	Work manual/work plan are in place. However, activities at RWSSC have not been implemented after the place of training was moved to the Water Board facility in Abuja in the 3rd year. Therefore one cannot say that all administrative work is being performed in accordance with the work manual/work plan in all cases. At least, administrative work associated with the training at Abuja was not conducted using work

			manual by administrative staff since the staff stayed in Kaduna.
		More than 10 States are informed of the contents and period of Training at RWSSC.	Training plan is prepare every year and announced publicly in newspapers along with the NWRI training period and disseminated among RUWASSA and other agencies involved.

Output 2 has been utilized in training since the 3rd year despite the delay in the procurement of training materials. In addition, C/P (trainers, assistant trainers) have been able to operate and maintain the equipment without any problem after the Japanese experts offered OJT on efficient operation and maintenance of equipment.

The content of activities for Output 3 was revised after moving the place of activities from Kaduna to Abuja in the 3rd year and it was decided that the Project covered only courses 1 through 4 following the deterioration of securities. Therefore, ToT was performed only on trainers that were involved in courses 1 through 4 among a total of 9 courses. As for Output 4, improvement of training was also performed only for courses 1 through 4 among a total of 9 courses from the 3rd year.

Sufficient support is not being offered to Output 5 activities from the 3rd year onward after the Japanese expert had to leave RWSSC in Kaduna. PDM was revised before 3rd year and almost all activities related Output 5 was terminated in 2nd year. Administrative staff who stayed in Kaduna could not conducted paperwork associated with training since training was carried out in Abuja

In spite of this, according to the hearing conducted with C/Ps during Terminal Evaluation, paperwork related to logistics and administration except for that related to training is being carried out smoothly. An effort was made to initiate RWSSC publicity activities in the 2nd year by launching a publicity team and developing manuals. However, publicity by Japanese experts in local areas became impossible after security situation started to deteriorate around the middle of the 2nd year. In addition, publicity activities were deleted from PDM in 3rd year. In Output 5 indicators was achieved however some planned activities were not completed.

2.3 Summary of Technical Products

(1) Technical Project at 1st year

Table 2.3 gives a list of the main technical products as prepared in the first year. For those documents prepared for Outputs 2-5, working drafts produced by JICA experts were fleshed out through consultation with C/Ps.

Table 2.3 List of Technical Products (1st year)

Output	Name of Product	Summary
Output 1	Capacity assessment report	Compiles capacity assessments from RUWASSAs, LGAs and communities in Bauchi, Kebbi, Niger, Ondo, Taraba and Yobe. Compiled by local subcontract.
Output 2	RWSSC training strategy	Compiles RWSSC training outline including training strategy, target, training content and other details.
	RWSSC training plan	Compiles the RWSSC training courses, course summaries and training schedule for the project period for 2011-2013.
	2011 RWSSC training calendar	Gives 2011 RWSSC training schedule.
	Course texts	Training materials (textbooks) for each course.
	List of required materials and equipment for training	List of materials and equipment required for training in each course according to revisions to existing texts and courses

Output 3	RWSSC instructor database	Database compiled from individual data sheets of RWSSC internal instructors, giving specialties, work history, qualifications, skills roles and other details.
	ToT program	Program for training instructors, listing procedures and tools for improving teaching methods and expertise based on current understanding and evaluation of teaching methods and expertise of internal RWSSC instructors for each course. (Drafts are completed for some courses with details currently under discussion with Nigeria. This will be completed before second year ToT.)
	ToT materials	Tools used in the above program. Includes ToT texts, PowerPoint presentations and other materials. (Drafts are completed for some courses with details currently under discussion with Nigeria. This will be completed before second year ToT.)
Output 4	M&E plan	M&E (monitoring and evaluation) plans for the training system, instructors and participants. Monitoring and evaluation extracts issues and needed improvements for the training system.
Output 5	RWSSC management plan	Comprehensive management plan for RWSSC, placed at the front of the management and office work manual. (Draft written in first year. Documentation was completed in second year.)
	Management and office work manual and plan	Manual and plan for office work related to organizational management. The manual describes methodology for budgeting, accounting, human resources, stationery, asset management, trainee recruiting, public relations and "5S" (sorting, straightening, systematic cleaning, standardizing and sustaining) activities. (Draft written in first year. Documentation was completed in second year.)

(2) Technical Project at 2nd year

Technical products created in 2nd year are explained in Table 2.4.

Table 2.4 List of Technical Products (2nd year)

Output	Name of Product	Summary
Output 5	RWSSC management plan	Comprehensive management plan for RWSSC, placed at the front of the management and office work manual. (completed in 2nd year)
	Management and office work manual and plan	Manual and plan for office work related to organizational management. The manual describes methodology for budgeting, accounting, human resources, stationery, asset management, trainee recruiting, public relations and "5S" (completed in 2nd year)
	・ Publicity Plan ・ Publicity work manual ・ Pamphlet ・ RWSSC homepage	RWSSC publicity tool for promotion of participants and explanation of RWSSC activities.

(3) Technical Project at 3rd year

Technical products in 2nd year are shown in Table 2.5.

Table 2.5 List of Technical Products (3rd year)

Output	Name of Product	Summary
Output 2	Operation manual of Mc-OHM electrical sounding equipment	It contains information about items that should be given special attention to ensure safety when operating the equipment, performance/capacity of the equipment, and the proper way to handle it.
	Maintenance manual of Mc-OHM electrical sounding equipment	It compiled to provide information about managing the equipment using operating charts, and points that require special attention for maintaining and managing equipment after it is used.
	Operation manual of TEM electromagnetic sounding equipment	covers components of the equipment, a look at the measuring system, use of measuring equipment (receiver, transmitter), how to operate the equipment, and the positional relationship between the transmitter loop and the measuring equipment
	Handbook of manual of TEM electromagnetic sounding equipment	This simple handbook includes information about how to operate the equipment and conditions for setting up measurements.
	Maintenance manual of EM electromagnetic sounding equipment	Both the transmitter and receiver of the TEM electromagnetic sounding equipment contain a highly integrated circuit board, so information about handling and storing them in open-air environments (high temperature/high humidity, exposure to direct sunlight) that should be given special attention is included in the maintenance and management manual
	Operation manual of Mc-OHM borehole logging equipment	The Mc-OHM can serve as survey equipment for conducting physical logging (resistivity, temperature, calipers) in borehole and electrical prospecting on the surface, and it was used in both Courses 1 and 2. When using the Mc-OHM as a physical logging instrument, select the physical logging instrument on the setting menu screen of the main unit. the user manual covers caution points for safe use, the equipment capability and methods of handling.

	Maintenance manual of Mc-OHM borehole logging equipment	The following items are covered in the maintenance and management manual: ・Storage sites ・Main exploration equipment ・Power sources (batteries) ・Peripheral items (connector cables, power cords) ・Shipment and transport ・Maintenance and management data ・Repair centers (dealers/retailers) ・Maintenance inspections ・Review of managing logging equipment
	Operation manual of borehole camera	The borehole camera is extremely easy to operate. Accordingly, a user manual is not thought to be needed, however, a simplified version of the existing operation manual was prepared for the benefit of people using the equipment for the first time
	Maintenance manual of borehole camera	Concerning maintenance, since this is the same as for general prospecting equipment, the maintenance manual prepared for the Mc-OHM was used as a common manual.
	Operation and maintenance manuals of Pumping test equipment	User manual was prepared for the submersible pump, generator, water quality meter and water level gauge. Similarly, a maintenance manual was also prepared.
	Operation manual of drilling rig	It contains the method of setting up drilling rig and pulling back of the rig in the original position. and it describes necessary points to check the working condition.
	Maintenance manual of drilling rig	Important greasing points and oil filling ports which are difficult to find and how to grease and fill oil are explained
	Operation manual of high pressure compressor	The manual contains the inspection before staring engine, the explanation of instrument panel, and the precaution during operation (points to prevent danger)
	Maintenance manual of high pressure compressor	It explains the periodical maintenance schedule, content of periodical maintenance and its method and check list during continuous operation
	Operation manual of crane truck	It explains the readiness before operation, prohibited matters, operation of each parts, and method of using a loading meter
	Maintenance manual of crane truck	It mentions the periodical maintenance schedule and the content of periodical maintenance schedule and its methodology.
	Operation manual of CYZ type truck	The manual shows the method of reading instrument panel at driving cabin and explanation of each switch（Differential lock, Accelerator, Lighting position)
	Maintenance manual of CYZ type truck	It shows the content and the way of periodical maintenance and precaution for maintenance

(4) Technical Project at 4th year

Technical products created in 4th year are explained in Table 2.5. OJT manuals, ToT manuals and training materials which created in the previous year were not changed.

Table 2.6 List of Technical Products (4th year)

Output	Name of Product	Summary
Output 1	Training impact survey report at Niger state	Contents and result of training impact survey carried out in Niger state in September, 2014. It also contains the result of training needs at Niger RUWASSA.
Output5	Training database guideline	It is explained how to create and update the training database.

CHAPTER 3. ACTIVITIES RELATED TO OUTPUT 1 (1-4 YEAR)

CHAPTER 3 ACITVITIES RELATED TO OUTPUT 1 (1-4 YEAR)

Output 1

"Capacity Gap of RWSSC (NWRI) and RWSS stakeholders at States,LGAs and Community levels area identified."

＜Objectively Verifiable Indicators＞
- Capacity Assessment Reports are made in the first year of project and revised by the end of the Project.
- RWSS stakeholders including ESAs share the identified capacity gaps of RWSS stakeholders.

＜Activities＞
1-1 Determine capacity assessment procedures and selection of target institutions (National, State, LGA and Community levels).
1-2 Conduct capacity assessment of sampled institutions and produce reports.
1-3 Organize stakeholders workshop to present and improve the assessment reports
1-4 Disseminate the reports to major stakeholders.

3.1 Summary of Output1

Activities of Output 1 were carried out to clalify the capacity gap of RWSS stakeholders. In the 1st year, capacity assessment survey was conducted in 30 LGA and 150 communites in six states (Kebbi, Yobe, Bauchi, Niger, Ondo and Taraba). In order to share the result of capacity assessment survey and understanding capacity gap of rutal water supply and sanitation stakeholders, Stakeholder's workshop was held at Abuja. After having commnets by stakeholders, the capacity asssement report was finalized and produced. In the 2nd year, the report was distributed to RWSS stakeholders such as RUWASSA. The training impact survey was conducted in the 4th year in order to understand the status of improvement of capacity gap at Niger state RUWASSA by RWSSC training. The result of the suvey was presented at Stakeholder's workshop at Abuja on 9th December, 2014. 11 States RUWASSAs, FCT Water Board, and NGO attended the workshop. The contents of workshop are disbribed in **3.5 (4)**.

3.2 Summary of Acitivities of Output1 (1st Year)

(1) Capacity assessment survey

The capacity assessment survey in 30 LGAs and 150 communities in six States (Kebbi, Yobe, Bauchi, Niger, Ondo and Taraba) was carried out by local consultants. The results of the survey showed capacity gaps in RWSS sectors, and management capacity problems are revealed to be large as same as technical capacity problems of RWSS sectors. The summary of capacity assessment of RUWASSA (or WATSAN Project) and LGA s mainly carrying out RWSSC services is shown in Table 3.1..

Table 3.1 Result of Capacity Assessment Survey

Items	RUWASSA/WATSAN Project	LGAs
Institution	✓ Imbalance in water supply personnel against community mobilization and hygiene promotion staff ✓ Staff does not Identify the roles and responsibilities	✓ Staff does not identify the roles and responsibilities
Ground water investigation	Lack of the following items	✓ Lack of advising

techniques	✓ Site specific groundwater occurrence study ✓ Borehole siting where there is no geophysical equipment ✓ Simple means of resistivity graph interpretation ✓ Standardized drill sample identification ✓ GPS and site location maps ✓ Data management	communities on location of water and sanitation facilities
Borehole construction and management	Lack of the following items ✓ Gravel pack selection and installation ✓ Overcoming fine sand incursions ✓ Overcoming circulation loss ✓ Borehole disinfection ✓ Borehole record keeping ✓ Drilling supervision ✓ Data management	✓ Lack of drilling supervision
Drilling Machinery Maintenance Technology	Lack of the following items ✓ Compressor maintenance ✓ Workshop management ✓ Store keeping	
Hand-pump Installation, Operation and Maintenance	Lack of the following items ✓ Fishing out dropped pumps ✓ Data management	Lack of the following items ✓ Fishing out dropped pumps ✓ Supervision of community mechanics ✓ Development of area mechanics
Borehole Rehabilitation and Maintenance	Lack of followings ✓ Importance of Identifying boreholes for rehabilitation ✓ Procedures of borehole rehabilitation	Lack of the following items ✓ Identifying boreholes for rehabilitation ✓ Procedures of borehole rehabilitation
Hygiene and Sanitation Promotion	✓ Lack of developing hygiene promotion materials	✓ Lack of developing hygiene promotion materials
Community Mobilization and Management	Lack of following items ✓ Improved communication skills ✓ Responsibilities of WASHCOM ✓ WASHCOM operation ✓ Development of monitoring and evaluation skills	Lack of following items ✓ Improved communication skills ✓ Responsibilities of WASHCOM ✓ WASHCOM operation ✓ Development of monitoring and evaluation skills

(2) Site Survey related to current situation and problems of RWSS sectors

JICA experts and Nigerian C/Ps were divided into four groups and carried out the site survey for understanding the current situation and problems of RWSS sectors in eight States (Kano, Yobe, Kebbi, Sokoto, Zamfara, Kogi, Enugu and Niger) in July and September, 2010. The results of the survey and interviews of the engineers of RUWASSAs (or WATSAN Project) and LGAs were examined and reflected in the new training system. Examination about the current condition and problems about the following points was performed.

① **Development of Well**

② **Drilling wells**

③ Operation and maintenance of Drilling machinery

④ Operation and maintenance of water supply system

⑤ Hygiene, sanitation and community mobilization

⑥ Development of alternative water sources

(3) First stakeholder's workshop

The first stakeholder's workshop was held in Abuja on January 28, 2011. The results of the surveys mentioned in section 1) and 2) above was made known to the RWSS stakeholders

3.3 Summary of Acitivities of Output1 (2nd Year)

The summery of capacity assessment survey report was only distributed to RWSS sectors in the 1st stakeholder's workshop in the 1st year. In the 2nd year, distribution of the report to RWSS sectors started, and was performed in Kano, Sokoto, Zamfara, Bauchi and Katsina States. Also, the report was distributed to the states through participants of the training courses and by NWRI

3.4 Summary of Acitivities of Output1 (3rd Year)

There were no activities related to Output 1 in the 3rd year.

3.5 Summary of Acitivities of Output1 (4th Year)

(1) Training Impact and needs survey at Niger state

The purposes of the survey are as follows;

① To assess the impact of training on rural water supply through an interview and questionnaire to the participant of each training course and member of each department, and based on the result of site survey of constructed boreholes

② To determine the training needs of the staff of Niger State RUWASSA through a questionnaire of the member of each department

1) Preparation of survey

Prior to the survey, the data list which should be collected from RUWASSA and questionnaires were created. The contents of the created questionnaire are shown in Table 3.2.

Table 3.2 Contents of Questoionare

	Contents
Capacity of RUWASSA	In order to compare with the baseline data obtained by the capacity assessment suvey in 2010, the number of the personnel, qualification of staff, the organizational chart, the budget, etc. were asked.
Training Impact	The work situation after training was asked to participants of RWSSC training courses. In particular, asked the condition of improvement of work after the training
Training Needs	Training needs was aksed to staff of each department of RUWASSA (10person each department, in total 50 person at 5 department). A quistonare used for this survey was same as that used in 2010 so that it could compare to the needs in 2010.

2) Survey Schedule

The survey was conducted from 15th to 19th September 2014 by two Japanese experts and four C/P. The schedule of survey is showm in Table 3.3.

Table 3.3 Survey Schedule

	Contents
15th September 2014	Move to Niger state RUWASSA, courtesy call to Permanent Secretly/ General Manager (PS/GM) of NIGER RUWASSA, meeting with staff of RUWASSA. Interview with each Head of Department (HOD). Discussion about the questionnaires with all the respondents, distribution of questionnaire of training needs to each HOD, planning for community visits with staff of RUWATSSA.
16th September 2014	Interview (Course 3) , meeting with PS/GM, visit selected communities
17th September 2014	Collection of Questionnaire of training needs from each HOD, and interview of HOD, visit selected communities
18th September 2014	Site survey, presentation of the result of site visit
19th September 2014	Data colletion and move to Abuja

(2) Result of Survey

1) Organization, Equipment and Activities of Niger state RUWASSA

A comparison of RUWASSA organization and activities between 2010 when capacity assessment survey was conducted and 2014 is shown in Table 3.4. It can be seen that aspects of equipment condition, work environment and human resource development have been improved. Number of staff has decreased due to the retirement of staff.

Table 3.4 Comarision of RUWASSA Organization and Activities

	2010	2014
Staff	147（Female 14）	125（Female 9）
Dapartment	Five department (Administration; Water Supply; Sanitation, Community Mobilization; Workshop/Stores, Planning, Monitoring and Evaluation)	Same as 2010. Pump test and Data Management unit has established in Water supply department in 2014.
Budget (release from state government)	368,703,750 Naira, in this year, RUWATSAN purchased a new drilling rig and relevant equipment by government budget. (Budget was released after the capacity assessment survey in 2010)	85,000,000 Naira
Training	None	OJT of drilling equipment during Japan Grant Aid Project , Training by RWSSC
Office	Inadequate, dilapidated, needed complete refurbishment. Windows, doors are missing, the paint on the walls is mildewed and the furniture rickety. The roof of the workshop needs replacement.	Items mentioned in 2010 have been renovated and fixed.
Drilling rigs	2 set: 1 New PAT 401 provided by government,1 Refurbished UNICEF rig	4 set; in addition to 201-, one was provided by state government in 2010. One is provided by JICA in 2014.
Compressor	1 sets	3 sets
Trucks	2 new light trucks	5 sets
Functionality of Handpump faciltiies	53%	75%
Water coverage	23%	47%

2) Borehole Construction and Rehabilitation

The numbe of boreholes constructed and rehabilitated from 2010 to 2014 was shown in Table 3.5. According to Table 3.5, Niger state RUWASSAS constantly constructs borehole every year. In 2014, 55 boreholes were constructed by using the drilling rig provided by Japan Grant Aid and others were constructed by existing rigs.

Table 3.5 Number of Drilled and Rehabilitated Borehole from 2010 to 2014

Project	2010	2011	2012	2013	2014
Drilled Borehole	109	68	75	71	61 (55 by JICA Rig) (Jan-Aug)
Rehabilitations in 25 LGAs	47	152	344	207	41 (Jan-Aug)

3) Critical Problem of RUWASSA and Staff

Critical problems faced by RUWASSA organization and its staff are as shown below. Compared with the survey in 2010, no reference was made to shortage of training because OJT on equipment operation was conducted through RWSSC training and grant aid project. However, new problems with the community and problems related to human relations emerged.

Table 3.6 Critical Problem of RUWASSA and Staff

	Contents
Problems (both 2010 and 2014)	Shorage of Budget、Shortage of Equipment (Workshop and PlanningDepartment), Shortage of Allowance
Problem only in 2010	Lack of Training
Problem appered in 2014	Community problem, Problem on human relation

4) Impact of Training (Participants)

The following response came with regard to the content of capacity development for training participants. Responses indicate improvement in working capacity of participants as a result of training.

Table 3.7 Capacity Development by Training (Participants)

Training Course	No of Participants from Niger RUWASSA	Improvement
Groundwater Investigation Technique	8	Knowledge of survey equipment
		Knowledge of investigation
Borehole Construction Management	8	Borehole logging for well development
		Pumping test analysis
Drilling Technology	8	Code of Practice of borehole construction
		Borehole record
		Safety at site
Drilling Machinery Maintenance	7	Maintence of drilling rig and DTH
		Mainttenace of compressor and engine
		Maintenance record

Total 31

5) Institutional Capacity Development by Training

The following response was given with regard to strengthening of Ruwassa's organization capacity through training. While it is difficult to link some of them to the effect of training, it shows that training is contributing to strengthening of Ruwassa's organization capacity.

Table 3.8 Capacity Development by Training (RWWASSA)

Possible impact of training	Reason
Success rate of borehole	Rate is improved, however it is no only by training butslso providing of new survey equipment
Number of borehole construction, water coverage	RUWASSA constructed 55 boreholes in 2014 by newdrilling rig provided by Japan Grant Aid.
Fuctionality of handpump	Although handpump maintenance course and community mobilization course in order to improve the functionality of handpump, are carried out in RWSSC there is no participant from Niger state RUWASSA to these courses. Then it is hard to consider that the functionality has been improved by the previous training.
Number of rehabilitated boreholes	Although the boreholel rehabilitation course is carried out by RWSSC, there is no participant from Niger state RUWASSA. Therefore, it is difficult to call it the direct impact of training.

Hundpump borehole requires at least 10 L/min, If the borehole can procduce the amount it is determined that the borehole is productive. Success rate indicates the percentage of the productive borehole of the total number of drilled boreholes. Niger state RUWASSA constructed 56 boreholes by procured drilling rig by Japan Grant Aid in 2014. Only one borehole was dry and 55 boreholes were productive. The success rate of boreholes reached 98%/ The average of success rate of boreholes in Niger state RUWASSA is about 80%. It indicates that the rate has been improved.

6) Factors that Impede the Impact of Training

Whereas the contents of each training course is set target for immature engineers and new employees who does not have enough knowledge and experience of the development of borehole, all participants from Niger RUWASSA are composed from middle to top level engineers. This is due to the age structure of Niger RUWASSA and it seems to be an organizational problem on Niger RUWATSAN. For this reason, there is a gap between contents of training and attendance of each training course. Therefore it was difficult to evaluate the impact of training. There are some engineers/artisans who can hardly speak, read and write English, especially mechanics of the Workshop Department. Those engineers/artisans are hard to participate the training.

(3) Result of Training Needs Survey

The contents of training needs are shown in the following table.

Table 3.9 Result of Training Needs

	Contents
①PS/GM	Training for new employee, Water quality analysis
②Head of Water Supply Department	Accuracy of physical survey to improve success rate of borehole, training for young engineer, knowledge of water resources (alternative water sources)
③Staff of Water Supply Department	Borehole design, borehole drilling, borehole drilling supervision. procurement, costing and pricing and contract management of borehole construction, maintenance of equipment. pumping test, borehole geophysical logging, computer appreciation
④Head of Workshop/Store Department	Maintenance skill of engine parts and gear box
⑤Staff of Workshop/Store Department	Maintenance of drilling equipment , pump installation and maintenance (submersible pump and hand pump)

⑥Head of Sanitation Department	Knowledge of construction latrine (VIP: ventilated improved pit), database for management
⑦Staff of Sanitation Department	Health, water and sanitation, data analysis and storage, computer appreciation
⑧Head of Planning, Monitoring and Evaluation Department	Water quality test training (by using standard laboratory equipment), water quality interpretation, water treatment of groundwater, reporting
⑨Staff of Planning, Monitoring and Evaluation Department	Health, water and sanitation, water quality analysis, hygiene promotion, data analysis and storage, computer appreciation, project monitoring, report writing
⑩Head of Community Mobilization and Hygiene Education Department	Knowledge of community mobilization for young engineer
⑪Staff of Community Mobilization and Hygiene Education Department	Community mobilization and sensitization, health, water and sanitation, hygiene promotion

There was no significant difference with the results of the survey conducted in 2010 as a whole, although new contents that emerged as training needs included computer, database management and water quality analysis. It was confirmed that the existing content of the course does not have to be changed as the content of RWSSC training course is decided according to the result of 2010 needs survey. Meanwhile, decision was made to consider the need for creation of a new course on water quality analysis (which requires expert knowledge) by looking at the results of survey in other states.

(4) RWSSC Seminor (Presetntation of Impact Survey Result)

Initial plan was to hold a seminar on 4th November 2014 to announce the results of the survey conducted in Niger state to RUWASSA and relevant organizations. However, it was postponed for reasons attributable to Nigerian side. Therefore, Japanese experts were not able to participate directly in the seminar. Confirmation of the content of training impact survey and support for preparation of presentation materials were completed during the experts' stay, and the aforementioned seminar was held on 9th of December. As the presentation materials and agenda for the seminar were made available, this seminar attended solely by Nigerian participants was held without any problem. 11 states RUWASSA (Yobe, Bauchi, Katsina, Kebbi, Niger, Cross River, Delta,, Kaduna, Kogi, Plateau, Sokoto), FCT Water Board and NGO attended the seminar. Participants recognized the importance of training.

In addition to the presentation of result of training impact survey at Niger State RUWASSA, issue related to human resource development in RWSS secotor was discussed. Participants asked NWRI to carry out training not only at NWRI, Kaduna but also at the local so that RUWASSA staff and stakeholeders can attend the training easily. The feasibility of traing at the local will be considered. RWSSC explained the schedule of impact survery in 2015 and ask them to cooperate.

(5) Further Impact Survey

A decision was made to hold similar training impact/needs survey after the termination of the project in states other than Niger where grant aid projects were conducted (Kebbi, Ondo, Taraba, Enugu, Bauchi and Katsina).

Table 3.10 Contents of Training Conducted to the Six States

Name of State	Training Courses Conducted by RWSSC
Kebbi	Course 1（Groundwater Investigation Technique）, Course 2 (Borehole Construction Mangament), Course3 (Drilling Technology), Course 4 (Drilling Machinery Maintenance)
Ondo	
Taraba	
Enugu	

Bauchi	Course 5 (Handpump Installation, Operation and Maintenance, Course 6 (Borehole Rehabilitation and Maintenance), Course 8 (Sanitation and Hygiene Promotion), Course 9 (Community Mobilization)
Katsina	

Through this survey in Niger state, technical trainsfer was made from Japanese experts to C/P and it was confirmed that Nigerian side could perform survey by their own in the future. Technical transfer was also conducted so that survey results can be analyzed by C/P.

CHAPTER 4. ACTIVITIES RELATED TO OUTPUT 2 (1-4 YEAR)

CHAPTER 4 ACITVITIES RELATED TO OUTPUT 2 (1-4 YEAR)

Output 2

"Responsible and dffective training system (Module, materials, and facilities, etc.) is developed."

＜Objectively verifiable Indicators＞
- Revised and newly developed training materials including manuals are utilized in trainings according to Training Modules and Programme by 2010.
- Facilities and equipment are maintained and arranged for trainings and training Programme.

＜Activities＞
2-1 Formulate training strategy for RWSSC and create RWSSC mission report.
2-2 Review and Formulate Training Programmes, Courses and Modules required as a result of the capacity assessment.
2-3 Review and revise existing training materials
2-4 Develop training materials for newly developed courses
2-5 Inventorize and procure required facilities and equipment
2-6 Produce users' manuals of facilities and equipment
2-7 Provide On-the-Job-Training (OJT) to users on facilities and equipment handling, operationand maintenance

4.1 Summary of Output 2

The activities of Output 2 were implemented with the goal of developing an effective training system for trainings conducted at the newly established RWSSC. Training strategy and training plan for RWSSC were prepared in the 1st year. Training system was also improved based on the results of capacity assessment and field study. In the 2nd year, training system was improved as needed in response to the results of training. Preparation of manual and OJT related to use and maintenance of training equipment were scheduled to start in the 2nd year but were not implemented until the 3rd year due to delay in arrival of equipment. OJT by C/P for new users of training equipment had been scheduled in the 4th year was not conducted due to delay in final approval of employment by the Ministry of Finance. Database for the manual needed for OJT was developed instead. Soft copy of operation manuals and Maintenace manuals of equipment was stored in PC. Procedure and schedule of OJT were comfirmed between Japanese experts and CPs.

4.2 Summary of Acitivities of Output 2 (1st Year)

(1) Formulation of RWSSC training strategy

In order to develop and establish a training strategy of the RWSSC, JICA Expert Team supported the activity of CP. However, the RWSSC has already established the "RWSSC Mission" which applies to the strategy and the function of RWSSC which stood on the long-term vision.

The result of deliberations with C/P, for this project aimed at supporting the start-up of the RWSSC, and development and establishment of its organization structure and function, JICA Expert Team and C/P Team concluded that it is necessary to develop and establish the training strategy for this project period. Then JICA Expert Team and C/P Team decided to develop and establish the "RWSSC Training Strategy."

Then JICA Expert Team supported the development and establishment of "RWSSC Training Strategy".

The following contents were clarified in this Strategy in order to express the policy of the RWSSC to the related organizations and persons.

- The training principles

- The strategy of effective training
- Training target
- The required training courses
- The training fundamental principles

The contents of the "RWSSC Training Strategy" are as follows.

①Introduction

To introduce the strategy and function of the RWSSC described in the existing "RWSSC Mission" which stood on the long-term vision as follows

- Background of Establishment
- Vision
- Mission
- Function

②Training Target for the training by this project

③Concept of Training Course for the training by this project

④Training Course and Outline for the training by this project

⑤Training Course Delivery Plan for the training by this project

⑥Training Equipment and Materials

⑦Training System based on the PDCA Cycle (a concept for improvement of the training system)

The RWSSC training strategy established by C/P Team and JICA Expert Team is shown as attached document.

(2) Outline of "RWSSC training plan"

Based on the training courses which were examined and established in the "RWSSC Training Strategy", "RWSSC Training Plan" is established by C/P Team in order to describe the outline of each training course, a training calendar of this project duration in 2011and implementation cost of each training course and Breakdown cost. JICA Expert Team supported C/P Team regarding the establishment of the plan.

The contents of the "RWSSC Training Plan" are as follows.

①Training Calendar from 2011 to 2013

②Training Calendar for 2011

③List of Training Courses and Name of Coordinator

④Outline of Training Courses

⑤Implementation Cost of each Training Course and Breakdown Cost

The details of the above mentioned contents will be modified based on the results of the meeting between C/P Team and JICA Expert Team.

(3) Improvement of training course

The improvement of training course shown in Table 4.1 was carried out based on the examination of the following items.

①Analysis and collection of existing teaching materials

②Improvement of training system based on RWSS site survey and capacity assessment results

③Creation of list of equipment required for training

Table 4.1 Training Course Improvements and Notes

Course Name	Assumed Issues from Field Study	Influence to Training Course
1. Groundwater Investigation Technique	• Electrical sounding equipment operated improperly • Exploration results are not appropriately interpreted and used in selecting borehole drilling point	Course material - the following has been added or enhanced to improve these issues: •Items for participants to understand relationships between geology/geological properties and groundwater development in Nigeria • Analysis programs used for analysis •In addition to the representative survey, introduced aerial photo analysis, remote sensing, seismic survey, gravity survey and other geophysical survey methods •Investigation and analytical methods with Japan-provided electromagnetic sounding and electrical sounding Training period and class size: Training period and class size revised based on training material changes.
2. Borehole Construction and Management	• RUWASSA and LGAs not properly managing borehole construction • Borehole drilling records and geological data not managed or stored • No coordination between RUWASSA and LGAs on well data or management	Course material - the course was aimed to have the knowledge of supervision of borehole construction. Accordingly, the course name changed to "Borehole Construction and Management." Training period and class size: Training period and class size revised based on training material changes.
3. Drilling Technology	• Insufficient borehole drilling knowledge and skill • Workers inept at handling drilling accidents, requiring much time to recover • Frequent troubles with drilling machinery during drilling due to improper maintenance	Course material - the following has been added or enhanced to improve these issues: • Pumping test methods and analysis • Pump selection and installation • Drilling accident recovery and prevention measures • Site management and administration Training period and class size: Training period and class size revised based on training material changes.
4. Drilling Machinery Maintenance	• Improper maintenance of air compressors and other drilling machineries	Course material – the following has been added or enhanced to improve these issues: • Rig construction, purpose of maintenance, types of maintenance, and the basics of preventative maintenance, including appropriate maintenance for machinery • Safety management. • Maintenance records and their utilization Training period and class size: Training period and class size revised based on training material changes.

Course Name	Assumed Issues from Field Study	Influence to Training Course
5. Hand-pump Installation, Operation and Maintenance	• Many villages maintained hand-pumps improperly • Inadequate borehole inventory development and management	Course material – the following has been added or enhanced to improve these issues: • Creation of efficient hand-pump maintenance and monitoring system • Capacity building of borehole inventory information management Training period and class size: Training period and class size revised based on training material changes.
6. Borehole Rehabilitation and Maintenance	• Workers did not properly understand causes of the problem to boreholes that need rehabilitation. • Effect of borehole repairs are not confirmed, and record management is inadequate. Therefore, it is difficult to know whether boreholes are being maintained properly.	Course material – the following has been added or enhanced to improve these issues: • Pumping tests added to confirm well repairs • Borehole inventory management added as in Course 5 Training period and class size: Training period and class size revised based on training material changes.
7. Development of Alternative Water Sources	• Alternative water sources not developed systematically • Not enough skill to plan alternate water source development • No inventory record of constructed facilities • Improper maintenance of constructed facilities • RUWASSA and LGAs' engineers not teaching communities how to properly maintain water sources • Insufficient management capacity in water source development	Course material – the following has been added or enhanced to improve these issues: • Established 3 sub-courses: "Spring Development," Hand-dug Wells," and "Rainwater Harvesting" • Alternative water source development planning • Conservation and community participation for alternative water sources • Selection, design and construction for alternative water sources • Alternative water source maintenance Training period and class size: Training period and class size revised based on training material changes.
8. Hygiene and Sanitation Promotion	• Few community hygiene and sanitation improvement activities, and low sanitation levels • No emphasis placed on core hygiene and sanitation knowledge • Operational actions in terms of maintaining hygiene and sanitation neglected • Little interest in hygiene and sanitation in schools	Course material: the following has been added or enhanced to improve these issues. Accordingly, course name changed from "Hygiene and Sanitation Program" to "Hygiene and Sanitation Promotion." • Learning and planning for community participation • Hygiene and sanitation promotion for schools Training period and class size: Training period and class size revised based on training material changes.
9. Community Mobilization and Management	• Communities do not understand how to mobilize residents and promote participation • WASHCOMs not functioning • No resident ownership to water facility.	Course material – the following has been added or enhanced to improve these issues: • How and why to mobilize residents • Community water sanitation project management • Community management Training period and class size: Training period and class size revised based on training material changes.

(4) Development of training materials for new courses

1) Course 1 (Groundwater Investigation Technique)

① Course Text

A new course text was created from existing short course materials. The new course text explained various groundwater investigation techniques based on geophysical investigation theory, and knowledge of groundwater. This course will use a new text that includes explanations of electrical and electromagnetic investigations. The contents of the new text are as follows.

(a)Groundwater penetration

(b)Geological distributions of Nigeria

(c)Overview of geophysical exploration techniques and measurement methods.

(d)Groundwater survey techniques.

(e)Overview of electromagnetic sounding and measurement methods.

(f)Overview of electrical exploration and measurement methods.

(g)Comparisons of electromagnetic sounding and electrical exploration results.

(h)Analysis of vertical electrical exploration (theoretical standard curves and analytical software).

(i)Management of Pre-existing data

(j)Importance of project management.

(k)Measurement problems and how to fix them.

② PowerPoint materials

In addition to course texts, power point presentation was created. Effective techniques for visualization of data were taught. To increase understanding of practical training topics, case studies of groundwater investigations and measurement techniques was covered.

③ Theoretical standard curves (Simple Analysis of Electrical Prospecting)

The course explained analysis methods using of both standard curves and analysis software for vertical electrical exploration. The standard curve method applies both standard curves and auxiliary curves to the investigation method (electrode configuration). This course did vertical electrical explorations using Schlumberger electrode configurations. A sample analysis was conducted with Schlumberger standard and auxiliary curves.

④ Electromagnetic Exploration Equipment and Analysis Software

Procured electromagnetic survey equipment was used. Electromagnetic sounding acquire readings quickly, and doesn't require electrodes, like electrical exploration does. So, this type of techniques is very effective in areas with exposed bedrock or high ground resistivity. It's also quite good at sampling fault and fracture zones, making it faster than electrical surveys. Analysis was carrid out using the sampled data and a laptop computer.

⑤ Electrical Exploration Equipment and Analysis Software

Procured electrical exploration equipment was used. Electrical surveys measure ground conditions based on resistivity to an applied direct current. Measurement is carried out with both horizontal and vertical electrical prospecting. The horizontal electrical explorations were used to measure the distribution of resistivity at certain underground depths. But they can't acquire the exact depths of these distributions. So, non-conforming data points from the horizontal electrical exploration were extracted, and cross-checked with vertical electrical surveys. Analysis was carried out in the field using the data from the vertical electrical explorations.

⑥ Equipment Operations and Measurements Manual

Simplified equipment operations guides and measurement manuals will be created and used in practical training.

⑦ Measurement Tools

A measurement location map is necessary as a deliverable of investigation results. Determining the measurement points, survey lines, and well drilling location points based on survey points will employ GPS, tape measures, and compasses. Survey maps was made by using survey points, survey lines, buildings and roads as landmarks, and included scale markings.

⑧ Measurement Field note and Measurement Data

Single and double logarithmic graphs were used for charting electrical and electromagnetic survey readings. Electrode interval and measurements taken were charted and any changes to the depths of underground readings from the electrode spacing were noted. A plotting of the resistivity lines taken from the horizontal electrical exploration and vertical exploration surveys was also be created and used as an example.

2) Course 2 (Borehole Construction Management)

①Course Text

The text was created by improving the exiting text. The contents of new text are listed below:-

(a)Basic Geology and Hydrogeology

(b)Overview of Borehole Drilling Methods

(c)Borehole Construction and Completion

(d) Review of Code of Practice in Borehole Drilling

(e)Management of Drilling Programme

(f)Well Completion Reports

② PowerPoint materials

Power point are produced for the purpose of explain important points, over highlighted points visually, and avoid so preoccupied with text commentary and or just a lecture. Drawings and photos were used to deepen understanding. Slide and movies were used to allow easier understanding which seems difficult to understand by sentence only.

③ PowerPoint for field practice guidance

PowerPoint material was developed to explain the contents of field practice beforehand. It helps participant to perform and understand the contents of field practice more effectively.

④ Field record sheet for pumping test

At the pumping test in field practice, pumping test recording sheet was developed. Each participant takes a pumping test record with this sheet to understand the test methodology. This sheet was also used for analysis of test result.

⑤ Logging record

Logging record at existing borehole was taken by electric logging machine at field practice. After the logging, each participant was requested to make screen position plan. In general, logging data which is taken with casing borehole does not show the exact record due to the affect of casing. Screen

position panning was then used another logging data which is taken by without casing hole.

3)Course 3 (Drilling Technology)

①Course Text

The contents of text are listed below:

(a)Basic concept of groundwater occurrence

(b)Groundwater distribution in geological formation in nigeria

(c)Basic groundwater exploration techniques

(d)Overview of drilling methods

(e)Rotary drilling methods

(f)Borehole design

(g)Well completion and disinfection

(h)Borehole rehabilitation techniques

(i)Pumping test

(j)Pump selection and installation

(k)Solution of borehole drilling and well problem

(l)Drilling equipment management

(m)Site issues on the job (safety)

②PowerPoint materials

PowerPoint materials were created to provide visual explanation on particularly important teaching points mainly in the texts. Considerations were given to avoid monotonous lectures consisting of mere explanation of texts. Moreover, slides are provided to explain work points that are difficult to understand through written text only.

③Fishing tools and tricone bits

Drilling accessory such as fishing tools and tricone bits were explained in the field practice. Fishing tools were used to demonstrate how to recover fallen downed material from actual borehole. Tricone bit was used to explain how to repair after consumption.

④Drilling field handbook

The contents of drilling field handbook included various data/information with regards to drilling equipment, tool and materials such as exact diameter and weight of drilling rod and casing pipe,etc. The participants were able to carry this handbook for reference when they drill borehole by themselves after the course.

4) Course 4 Drilling Machinery Maintenance

①Course Text

There is no exiting text for this course, Therefore, the text was made from scratch. The content was shown as follows;

(a)Basic knowledge

(b)Spindle rotary type drilling machine

(c)Top head drive (T.H.D) Type drilling machine

(d)Diesel engine and injection pump

(e)Air compressor

(f)Down the hole air hammer

(g)Percussion type drilling machine

(h)Lubrication

(i)Safety

(j)Maintenance record

②Maintenance Record for explanation

For better understanding of daily maintenance for Drilling Machineries, how to describe maintenance record was shown as per drawing.

③Maintenance field handbook

Portable maintenance field handbook was developed to explain important point on maintenance of engine. It also included how to use maintenance tools such as torque wrench, micrometer, and caliper.

5) Course 5 (Handpump Installation, Operation and Maintenance)

①Course Text

Course text for the classroom was used newly developed text which modified from the existing course text. The content of new text is shown as follows;

(a)Principle Type of Pump

(b)Platform and drain construction

(c)Procedure of installation of RUWATSAN I handpump

(d)Maintenance procedure for RUWATSAN I handpump

(e)Procedure of installation of RUWATSAN II handpump

(f) Maintenance procedure for RUWATSAN II handpump

(g)Community Management

(h)Well Inventory Management

②A digital movie of handpump reparation

A digital movie of actual handpump (RUWATSAN II) reparation is used in classroom.This digital movie enables to explain the point on reparation which is difficult to understand only from course text.

③Handpump sample for explaining function

Handpump sample which is cut outside is used in class room to understand the function of pumping as shown in Figure-4.1.


Figure 4.1 Handpump sample for explaining function
（left: cylinder of RUWATSAN I　　right: pump head of RUWATSAN I）

④Portable manual for handpump maintenance and spare parts

This was a manual of A4 size with rumination amd the material was prepared both RUWATSAN I and RUWATSAN II which are handled with this course. The daily maintenance methods (In the case of RUWATSAN II, taking out of handle bar, dismantling inner rod, collection of foot vale with fishing tool, changing of consumable part such as O-ring, U-seal are include) are explained with visual figure. The participants were able to carry this manual for reference when they repair handpump in community after graduate this course. Using more figure than text enable the person who does not familiar with English to understand the contents easier.

6) Course 6 (Borehole rehabilitation and maintenance)

①Course Text

Course text for the classroom is used newly developed text which modified from the existing course text. The content is shown as follows;

(a)Introduction

(b)Well component and basic drilling method

(c)Borehole rehabilitation facility maintenance

(d)Pumping test of borehole

(e)Ground water quality assessment and management

(f)Community mobilization and management

(g)Well inventory management

②A digital movie of Borehole Camera

A digital movie of Borehole Camera which was taken by another project is used in classroom. This digital movie enabled to explain the point on checking the inside borehole and characteristic of the equipment which is difficult to understand only from course text. An explanation point is as follows;

7) Course 7 (Development of Alternative Water Sources)

①Course Text for Lecture

Based on the examination results of existing training text and its contents, new training course content was developed. The text for lecture covered all contents of them. In addition developed text shows enough tables and figures in order that trainees can understand subjects easily.

②Course Text for Practcal Construction Work]

The text for practical construction work was composed of important points, which were extracted from the text for lecture, regarding construction work, construction supervision, operation and maintenance.

8) Course 8（Hygiene and Sanitation Promotion）

①Course Text

The new text (manual) was developed based on the NWRI/UNICEF "Participatory Hygiene and Sanitation Promotion Manual". The sequence of the topics has been changed in the new manual compared to the previous one so that readers can easily follow the logic flow. Revised or additional descriptions with tables or figures have been added to the parts where further explanation was needed for better understanding.

The new manual is composed of 6 modules as follows.

Module 1	Overview of Hygiene and Sanitation Promotion
Module 2	Participatory Methods for Behavior Change (Participatory Learning and Planning)
Module 3	Planning of Hygiene and Sanitation Promotion （Hygiene Message and its communication）
Module 4	WASH Promotion in School
Module 5	Developing and Action Plan
Module 6	Preparation for Field Visit

An annex whchi summarizes the basic hygiene knowledge and practices has also been developed. The trainees can review and use the annex for the field actitivities after taking the course

②PowerPoint materials

As the lecture style that a trainer just reads out the text is boring, the presentation materials in Power Point were prepared to receive attention from trainees and increase the level of their understanding. Bullet points, tables, figures and photos are used to highlight the important points.

③Illustrations of Good and Bad Hygiene Behavior and Faeco-Oral Diseases Transmission Route for Participatory Leaning

The illustrations developed along with NWRI/UNICE manual will be used in the new course too. These illustrations in A4 size were drawn by a Nigerian illustrator and reflect the culture of Nigeria. Illustrations describe differences in the Islam and Christian culture and tribes.

9) Course 9（Community Mobilization and Management）

①Course Text

The text was developed based on the NWRI/UNICEF "Community Management Manual". The sequence of the topics were changed in the new manual compared to the previous one so that readers can easily follow the logic flow. New topics wrere added, and revised or additional descriptions with tables or figures were also added to the parts where further explanation was needed for better understanding.

The new manual is composed of 7 modules as follows.

Module 1	Overview of Community Mobilization and Management
Module 2	Understanding the Target Community
Module 3	Making a Plan of Action
Module 4	Establishment of Management Committee in Community WASH
Module 5	Financial Management
Module 6	Monitoring and Evaluation
Module 7	Preparation of Field Visit

②Illustrations for Participatory Activities such as Selection of WASHCOM Members and Understanding Community Participation and Management

The illustrations developed along with NWRI/UNICE manual will be used in the new course too. These illustrations in A4 size were drawn by a Nigerian illustrator and reflect the culture of Nigeria. Illustrations describe differences in the Islam and Christian culture and tribes.

4.3 Summary of Acitivities of Output 2 (2nd Year)

The schedule was to develop teaching materials necessary for the training course in the 1st year and implement activities 2 through 5 below from the 2nd year. However, preparation of user's manual and OJT could not be performed due to delay in procurement of equipment.

As it was not possible to conduct training using equipment in the 2nd year, only the training not requiring the use of equipment was conducted in an effort to improve the training system according to the results of evaluation. Courses that required improvement and outline of changes in courses are as shown below.

(1) Course 1 (Groundwater Investigation Technique）

Table 4.2 Changes to the Training System (Course 1)

Item	Modificaiton
Course duration and training schedule	・ To improve the efficiency of field training, the process of field training was explained in the lecture ・ The objective of this course is to teach the trainees how to determine the best areas for drilling wells based on electromagnetic and electrical surveys. However, we didn't have enough class time for these survey techniques, so we weren't able to explain enough about them to the trainees. So, next time we will allocate more time for lectures.
Instructors	・ The instructors were able to cover all the material except for two modules that require two specialized instructors. Adding those two instructors would allow us to cover all the material.
Course contents (Lectures)	・ Explaining the hydrogeology along with the geological distributions of Nigeria helps trainees to understand how they correlate, which is useful in groundwater surveys.
Course contents (Practical training)	・ Increasing laboratory analysis time for standard curves helps trainees understand the specifics of analysis.
Traiing Materials (Lecture)	・ Adding Code of Practice and Professional Ethics（Textbook and Power Point） ・ Adding hydrogeological map
Traiing Materials (Practical)	・ Adding analytic sheets of the theoretical curve (one sheet for the main curve, two sheets for sub-curves) ・ Coordinate calculations (UTM and WGS84) ・ Revision of the measurement data sheets and measurement plot figures ・ Comparison of numerical values of current and potential electrodes and diagra

(2) Course 2 (Borehole Construction and Management)

Table 4.3 Changes to the Training System (Course 2)

Item	Modificaiton
Course duration	・Module of a termination test is added.

and training schedule	・Duration of practical training for borehole logging and pumping test increases from one (1) day to two (2) days. Further, module of data analysis is included during the practical training.
Course contents (Lectures)	・The previous day of the practical training, a lecture for practical training by using practical text and PPT as a prior explanation of the practical training will be conducted from now on.
Traiing Materials (Lecture)	・Utilization of an additional document, For the lecture of "well construction management", following additional document will be distributed. It makes participants understand about the topic of code of practice for water well construction easily. ・Code of practice for water well construction

(3) Course 5 (Handpump Installation, Operation and Maintenance)

Table 4.4 Changes to the Training System (Course 5)

Item	Modificaiton
Course duration and training schedule	Ppractical training in platform construction was not done since it was difficult to find a well construction site to use near the training facilitiy.
Course contents (Lectures)	During the "Platform Construction" lecture, perticipants watched a video of platform construction and pump installation.
Traiing Materials (Lecture)	Some of the internal and external instructor, other than coordinators, used personally prepared lecture materials separate from the materials we prepared for the first year. Typically, we would need to review those materials before they're used in the lecture; however these were often last-minute decisions on the part of the lecturer, making advance review difficult. In these cases, we reviewed the materials after the lecture in conjunction with the counterparts, and made plans to add them to our teaching materials in the future. ・Lecture (construction of platform) (About video fifteen minutes) ・Community Mobilization and Participation (About the power point 24 slide)
Traiing Materials (Practical)	The following important points and specific examples have been added to the first-year training text. ・Information about the preparation of the investigation table before the work starts. ・Method for investigating the cause of declining ability. ・Repairing hand pumps（Top and inside of the hand pump, re-installment after repair） ・Procedure for confirming functionality after repair.

(4) Course 6 (Borehole Rehabilitation and Maintenance)

Table 4.5 Changes to the Training System (Course 6)

Item	Modificaiton
Traiing Materials (Lecture)	In addition to the materials created in the first year, internal instructors besides the coordinator, as well as external instructors, used some training materials in the classroom instruction that they had previously used. It used to be that the contents of these materials were checked before the lectures, but it was difficult to check the contents beforehand in this case because the lecturers were decided just before the classes, among other reasons. Therefore, the contents it was decided that the counterpart will be checked after the lectures, and will be sued as additional training materials in future lectures. ・Basic Drilling Methods (About 10 slides)・・・Presented by internal instructor. ・Well Rehabilitation and Facility Maintenance (About 3 slides)・・・Presented by external instructor
Traiing Materials	Regarding the practical training texts used in the practical training, the following specific

(Practical)	tasks during the training, items to note, etc., have been added to those texts that were created in the first year. ・There is information about creating a preliminary study chart for wells before the commencement of work. ・There is also information about various survey methods (water level, water volume, water quality, etc.) for investigating the reasons for decline in well capacity.

(5) Course 8 (Hygiene and Sanitation Promotion）

Table 4.6 Changes to the Training System (Course 8)

Item	Modificaiton
Traiing Materials (Practical)	Based on discussion between the C/P and Japanese expert during ToT, the text for practical training (the field text) was revised. This course comprises of participatory activities which can be used in the filed too. Therefore, the course text is mainly used in the practical training. The text for practical training is a supplemental text which summarizes tips to hold participatory workshops. The original field text was rather general one because it was prepared in a way that participants could refer to at their workplace. This filed text was modified by adding the tasks to be done in the course after the field visit, that is SWOT analysis and making a community profile

4.4 Summary of Acitivities of Output 2 (3rd Year)

In the 3rd year, creation of user manuals of training equipment and OJT wrere carried out since the training equipment that was procured from Japan arrived in Abuja at the end of January, 2013

(1) User Manual and Maintenace Manual of the Equipment

In Courses 1, 2, 3 and 4, the operation manuals and maintenance manuals for the newly procured training equipment were prepared, and OJT was implemented on how to operate and maintain the equipment. The following equipment was newly procured for the training:

・Drilling Equipment (Drilling rig, Compressor, Crane truck, Water Tanker)

・Borehole investigation Equipment (Borehole logger, Borehole camera, Pumping test equipment)

・Geophysical Equipment (Electrical sounding equipment, Electromagnetic sounding equipment)

The list of manals is shown in table 4.7 and the contents of manuals are explained as follows.

Table 4.7 List of User and Maintenance Manuals

	Name of Manuals
Course 1	・ Operation, maintenance manuals of Mc-OHM electrical sounding equipment ・ Operation, maintenance manuals of TEM electromagnetic sounding equipment
Course 2	・ Operation, maintenance manuals of Mc-OHM borehole logging equipment ・ Operation, maintenance manuals of borehole camera ・ Operation, maintenance manuals of Pumping test equipment
Course 3 and 4	・ Operation, maintenance manuals of drilling rig ・ Operation, maintenance manuals of high pressure compressor

	・ Operation, maintenance manuals of crane truck ・ Operation, maintenance manuals of CYZ type truck

1) Mc-OHM electrical sounding equipment

Mc-OHM electrical sounding equipment has measuring functions that can be applied to electrical sounding from the ground surface and geophysical logging (electricity, temperature, caliper) using boreholes. This equipment can be used in the practical training in Course 2. It should be noted that when using Mc-OHM electrical sounding equipment for electrical sounding, the electrical sounding function should be selected from the menu shown on the display screen of this equipment.

The user's manuals contain information about items that should be given special attention to ensure safety when operating the equipment, performance/capacity of the equipment, and the proper way to handle it. Furthermore, to protect the user from electrical shock, there is also important information about preventing electrical shock when connecting cables and electrodes. The contents of manuals are shown in Table 4.8.

Table 4.8 Contents of Manuals (Mc-OHM electrical sounding equipment)

	Contents
User Manual	・Features of Mc-OHM electrical sounding ・Mc-OHM electrical sounding equipment ・List of all menu items ・Proper way to operate the equipment during electrical sounding ・Proper way to use the system menu ・Data format ・Specifications when used for electrical sounding ・Error message display ・Proper handling methods
Maintenance Manual	・Storage sites ・Main exploration equipment ・Power sources (batteries) ・Peripheral items (connector cables, power cords) ・Tools ・Shipment and transport ・Maintenance and management data ・Repair centers (dealers/retailers) ・Maintenance inspections ・Review of managing geophysical prospecting equipment

2) TEM electromagnetic sounding equipment

The manual covers components of the equipment, a look at the measuring system, use of measuring equipment (receiver, transmitter), how to operate the equipment, and the positional relationship between the transmitter loop and the measuring equipment. The maintenance manual is universal for Mc-OHM electrical sounding equipment.

Table 4.9 Contents of Manuals (TEM electromagnetic sounding equipment)

	Contents
User Manual	・Transmission loop of the TEM electromagnetic sounding equipment ・Measurement equipment of the TEM electromagnetic sounding equipment ・Methods for taking measurements with TEM electromagnetic sounding equipment ・Display panel of the receiving equipment ・How to acquire data
Maintenance Manual	・Storage sites ・Main exploration equipment ・Power sources (batteries) ・Peripheral items (connector cables, power cords) ・Tools ・Shipment and transport ・Maintenance and management data ・Repair centers (dealers/retailers) ・Maintenance inspections ・Review of managing geophysical prospecting equipment

3) Mc-OHM borehole logging equipment

The Mc-OHM can serve as survey equipment for conducting physical logging (resistivity, temperature, calipers) in borehole and electrical prospecting on the surface, and it was used in both Courses 1 and 2. When using the Mc-OHM as a physical logging instrument, select the physical logging instrument on the setting menu screen of the main unit. The following items are covered in the user manual:

Table 4.10 Contents of Manuals (Borehole logging equipment)

	Contents
User Manual	・Features of Mc-OHM borehole logging ・Mc-OHM borehole logging equipment ・List of all menu items ・Proper way to operate the equipment during logging ・Proper way to use the system menu ・Error message display ・Proper handling methods

Maintenance Manual	・Storage sites ・Main exploration equipment ・Power sources (batteries) ・Peripheral items (connector cables, power cords) ・Tools ・Shipment and transport ・Maintenance and management data ・Repair centers (dealers/retailers) ・Maintenance inspections ・Review of managing logging equipment

4) Borehole camera

The borehole camera is extremely easy to operate. Accordingly, a user manual is not thought to be needed however, a simplified version of the existing operation manual was prepared for the benefit of people using the equipment for the first time. Concerning maintenance, since this is the same as for general prospecting equipment, the maintenance manual prepared for the Mc-OHM was used as a common manual.

5) Pumping test equipment

Concerning the pumping test equipment, a user manual was prepared for the submersible pump, generator, water quality meter and water level gauge. Similarly, a maintenance manual was also prepared.

6) Drilling rig

The contents of the manual are described below.

Table 4.11 Contents of Manuals (Drilling rig)

	Contents
User Manual	・Inspection before staring (oil level of drilling rig, mud pump, injection pump and winch and so on, greasing and check of rig condition). ・Directions for us of PTO ・Directions for use of mast and jack ・Confirmation of condition of drill head ・Precaution of transportation
Maintenance Manual	・Precaution of operation ・Periodical maintenance schedule ・Content of periodical maintenance and its method ・Greasing points and oil filing point

7) High pressure compressor

A compressor is the equipment indispensable for constructing borehole and it should be kept in a good condition to improve the advancement of drilling. The operation of compressor is not difficult. Control of lubricating oils is very important like other equipment. Therefore, the description of importance of paying attention to the check of each oil is added into the operation manual. The

following items are mentioned in the operation manual:

Table 4.12 Contents of Manuals (High pressure compressor)

	Contents
User Manual	・Inspection before staring engine ・Explanation of instrument panel ・Precaution during operation (points to prevent danger)
Maintenance Manual	・Periodical maintenance schedule ・Content of periodical maintenance and its method ・Check list during continuous operation ・Precaution for maintenance

8) Crane truck

Crane truck is convenient since it is capable of loading and unloading work and transport work Crane operation causes many accidents that an operator is held between truck body and crane since the crane operation is carried out at a side of truck. Therefore, articles of “readiness before operation” and “prohibited matters” are added and explained in details since they are important to ensure safety. The method of use of load meter to prevent the turning over is explained in the operation manual since procured crane truck does not have any device for preventing tuning over other than load meter.

Table 4.13 Contents of Manuals (Crane truck)

	Contents
User Manual	・Inspection before starting engine ・The readiness before operation ・Prohibited matters ・Operation of each parts ・Method of using a loading meter
Maintenance Manual	・Periodical maintenance schedule ・Content of periodical maintenance schedule and its methodology

9) CYZ-type truck

CYZ-type truck is used for drilling rig, high pressure compressor truck, crane truck and water tanker. The way of operating a CYZ-type truck is the same as an ordinary truck but it has the following features.

The features of CYZ-type truck are follows:

・High power output truck loaded with the electrical controlled super high pressure injection engine

・All air controlled brake

・Electrical tilt type cabin

The contents of manuals are shown in Table 4.14.

Table 4.14 Contents of Manuals (CYZ type truck)

	Contents
User Manual	・Inspection before start engine

	・Method of reading instrument panel at driving cabin ・Explanation of each switch（Differential lock, Accelerator, Lighting position) ・Precaution for operation
Maintenance Manual	・Periodical maintenance schedule ・Content and the way of periodical maintenance ・Precaution for maintenance

(2) OJT of the Equipment

1) OJT of Mc-OHM and TEM

Table 4.15 Overview of OJT (Mc-OHM and TEM) 1st time

Date	16th April, 2013 (1 day）
Place	Lecture in office, Practical training on the Lower Usuma Dam grounds
Participants	Main Instructor Dr. O. O. Yaya, Lecturer Engr. T Olabode, Technichan Mr.Peter, RWSSC Coordinator Dr. Martin O. Eduvie
Contents of training	Taking measurements with Mc-OHM electrical sounding; using, managing and maintaining sounding equipment; analysis of Mc-OHM electrical sounding results; taking measurements with TEM electromagnetic sounding

The participants were the main instructor and the staff who handle the equipment during the training sessions, for both Course 1 and Course 2. The main instructor in these courses has had experience using electrical sounding equipment made by ABEM (Sweden) and GEOTRON (South Africa), and he has studied basic methods for using Mc-OHM electrical sounding equipment.

On the other hand, none of the participants had ever used the TEM electromagnetic sounding equipment before, so guidance was provided to them regarding the names and subtleties of the working parts of the equipment, the way to connect each type of equipment, methods for acquiring and forwarding data, analyses, and so on, using the detailed manual and simple handbook as references.

Table 4.16 Overview of OJT (Mc-OHM and TEM) 2nd time

Date	29th October, 2013 (1 day)
Place	Lecture in Lower Usuma Dam office and practical training on the training grounds and the grounds in front of the office
Participants	Main instructor Dr. O. O. Yaya
Contents of training	Explanations about methods for operating PROTEM measuring equipment, measurements and data transfer, and contents of analysis

In the TEM electromagnetic sounding measurements in the recently completed session, each of the default settings was varied to determine the conditions under which the most optimal numerical values could be obtained. In addition, even though the measurement data were displayed on the LCD display panel of the PROTEM equipment, instruction was given in how to ascertain the quality of the acquired data and how to determine if the measurement data have been saved.

2) OJT of pumping test equipment, borehole logging and borehole camera

Table 4.17 Overview of OJT(Pumpig test, borehole logging and camera)

Date	30th April and 3rd May, 2013 (2 days)
Place	Lecture in office, Practical training on the Lower Usuma Dam grounds
Participants	Main Lecturer Engr. T Olabode, Technichan Mr.Peter, RWSSC, Coordinator Dr. Martin O. Eduvie
Contents of trainings	Usage of Pumping test equipment Measurement with Mc-OHM borehole logger and its maintenance, Measurement with borehole camera

The lecturers and technical staff related to course 2 took part in the OJT. Training on operation of the Mc-OHM was briefly implemented because OJT had already been implemented in Course 1. Also, because the borehole camera is easy to use, the participants required only a simple explanation in order to use it.

3) OJT of drillig equipment (Drilling rig, Compressor, Crane Truck, Water Tanker)

The main instructor had enough technical knowledge and was familiar with general drilling equipment. Then there was not serious problem to OJT However, the newly procured equipment have its original devices at the part of engine concerning all the trucks and at high pressure compressor. Thus these devices were explained in details.

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Table 4.18 Overview of OJT (drilling equipment)

Date	2nd July 2013 (1 day)
Place	Lecture in office, Practical training inside the Lower Usuma Dam site
Paticipants	Main instructor: Engineer. S.G.Sara
Content of training	・Handling of drilling rig, high pressure compressor, crane truck ,water tanker, Explanation of outline of drilling equipment and operation of drilling equipment ・Safety issue on above drilling equipment (Danger of touching revolving parts and dropping the lifting materials. ・Explanation of maintenance work using the equipment (Inspection places and oil refilling ports/ greasing points)

The Contents of instruction for each equipment are shown bellow;.

① Drilling rig

The power load to work rig parts by reading gauges were explained after understanding the relation between each operation lever and rig work. In operation and maintenance, caution points related to hydraulic system, the place and method of greasing were explained.

② High pressure compressor

The function and the object of instrumental panel display, and how to handle safety valve to avoid any danger were explained since this equipment uses high pressure compressed air. In operation and maintenance work, the places of confirming lubrication oil level for engine and compressor, and the content of inspection before starting engine were explained.

③ Crane truck

The movement of each type of lever and crane work, and how to use load meter to prevent the truck from turning over were explained. In operation and maintenance, the place of greasing points and how to inspect periodically wire were explained.

④ Water tanker

In the operation lesson, handling of changing PTO, valves of water supply and water pump were instructed. In operation and maintenance cleaning method of absorbing strainer was explained and instructed,

⑤ Part of truck

The explanation of the instrumental panel in the driving cabin and each type switches (PTO, differential lock, etc.) was given. The tilt up function of driving cabin used to check engine was also explained. Precaution of the engine maintenance was explained in operation and maintenance.

4.5 Summary of Acitivities of Output 2 (4th Year)

(1) Implementaton of OJT conducted by C/P

OJT of operation for trainers and training assistances using equipment in the training was completed in the 3rd year. However, OJT to be conducted by the trainers and training assistants who took OJT in the 3rd year for staff newly hired by RWSSC in the 4th year did not materialize as approval for new employment was not issued by the Ministry of Finance. OJT will be conducted after the newly hired staffs are assigned. Incidentally, there is no problem with regard to the personnel for instructing equipment operation in local trainings because such personnel have been hired.

In 4th year, database of OJT materials such as operation manuals and maintenance manuals was prepared and all soft copy of those manuals was stored in PC so that CPs can use them smoothly. In addition, procedure and contents of OJT were comfirmed between Japanese experts and C/Ps. Through the acvitites of the above, C/Ps have the capability of conduct ing OJT to new staff by their own.

Staffs that are not newly hired but are scheduled to move from another department of NWRI to the center as drilling rig operator participated in Course 3 (drilling skills) tolearn not only instruction of machinery operation but also basic drilling skills.

(2) Maintenace of Training Equipment

Drilling rig comsumable such as drill bits and spare parts were brought over from Usuma dam to the NWRI warehouse in Kaduna. Annual maintenance cost will be earmarked in the 2015 budget through calculation based on the list of spare parts and timing of oil change. In addition, lecurers in charge will prepare an annual maintenance plan for training equipment and perform maintenance according to this plan.

CHAPTER 5. ACTIVITIES RELATED TO OUTPUT 3 (1-4 YEAR)

CHAPTER 5 ACITVITIES RELATED TO OUTPUT 3 (1-4 YEAR)

Output 3

"Training capacity in RWSSC is enhanced"

＜Objectively Verifiable Indicators＞
- More than 80% of trainees evaluate the trainers as "good"
- RWSSC managers and JICA experts judge ToT recievers'capacity in terms of knowledge, attitude and skills are improved

＜Activities＞
3-1 Identify relevant trainers (qualification, skills, role workload, etc.)
3-2 Formulate Training of Trainers (ToT) programme
3-3 Make ToT materials
3-4 Implement ToT Programme
3-5 Evaluate ToT programme and its implementation
3-6 Develop and maintain database of trainers

5.1 Summary of Output 3

Activities in Output 3 were implemented for the purpose of enhancing the capacity of trainers at RWSSC. ToT program was prepared in the first. The C/P (trainer) had more than 20 yearss of experience as trainer at NWRI and was extremely skilled at training. For this reason, emphasis was placed on offering support needed for lectures that are easy to follow through effective utilization of teaching materials and use of Power Point. In the 1st year, database was created by organizing the trainers' data. In the 2nd year, ToT was conducted for trainers. ToT mostly consisted of that for trainers responsible for courses that do not involve equipment because of the delay in procurement of equipment from Japan. In the 3rd year ToT was conducted for trainers involved in trainings using equipment because equipment arrived from Japan. In the 4th year, the plan was to have C/Ps (trainers) that had completed ToT up to the third conduct ToT for the new trainers. However, the plan was not carried out due to delay in employment of trainers. Instead, ToT teaching materials were upgraded and stored as database so that future ToT can be performed smoothly. Furthermore, Japanese experts comfirmed the procedure and contents of ToT which will be carried out by C/Ps and checked the implementation structure.

5.2 Summary of Acitivities of Output 3 (1st Year)

Before implementation of ToT for the 2nd Year, ToT programme and ToT materials were prepared.

(1) Trainer's Database

The database should be utilized to search trainers inside/outside of RWSSC adapted for the contents of a selected course and deploy them at appropriate time when the RWSSC makes a training plan.

(2) Preparation of ToT Programme

Table 5.1 is a compilation of measures taken to improve instructor capacities in the necessary fields of expertise by creating the ToT programs and teaching materials for each course.

Table 5.1 Points of ToT

Course No.	ToT Program	ToT Material	ToT Practical
1	As the instructor was thought to already possess expertise and general knowledge on the topic, considerations were taken to make training more effective. As the training course is meant to teach electromagnetic prospecting and electrical sounding as groundwater investigation techniques, weight was placed upon these fields.	Text materials and PowerPoint presentations were prepared for the class, with an emphasis placed on measurement, data processing, and analysis through electromagnetic prospecting and electrical sounding, as well as the flow up to drilling point selection. Presentations make extensive use of illustrations and diagrams, making them easy to follow.	The class took 3 days, focusing on investigation methods (electromagnetic prospecting, electrical sounding (horizontal and vertical)), operation of drilling equipment, analytical methods, and selection of well drilling positions.
2	The instructor already possessed expertise and general knowledge on the topic. This course focused on teaching well data acquisition, also teaching about data management and pumping tests.	Text materials and PowerPoint presentations were prepared for the class. A presentation was put together to clearly explain the flow for the entire course text and its points. In particular, the practice ToT was made such that participants could clearly understand the work involved in electrical sounding and pumping tests for well construction.	The class was made such that instructors could clearly explain the work, focusing on electrical sounding and pumping tests for well construction. The course involved 2 days of lecturing and 1 day of practice.
3	The instructor already possessed expertise and general knowledge on the topic. The program covered a wide range of knowledge on water quality issues, pump selection and the latest excavation techniques.	Text materials and PowerPoint presentations were prepared for the class. A presentation was put together to clearly explain the flow for the entire course text and its points.	There were 2 days of lecturing, focusing on water quality, pump selection and the latest excavation techniques.
4	The instructor had almost no knowledge of borehole drilling equipment. The class aimed to teach general and expert knowledge on borehole drilling equipment and inspection methods, as well as usage of tools used in inspections through lectures and practice.	A PowerPoint presentation was put together to clearly explain the flow for the entire course text and teaching points. In particular, the practice ToT was made such that the class could clearly understand the work involved in electrical sounding and pumping tests for well construction.	There were 5 days of practice, focused on actual handling of drilling equipment, inspection tools and other equipment.
5	The class was designed to teach general theory on hand-pump maintenance, including real conditions and issues in Nigeria. It also aimed to teach well inventory creation and maintenance clearly through lectures and practice.	Text materials and PowerPoint presentations were prepared for the class. Prepared training materials aimed to deepen knowledge on hand-pumps and related issues. As in other courses, presentations made extensive use of charts to make them easy	The course involved 2 days of lecturing and 1 day of practice. In practice, instructors learn an overview on hand-pump installation and maintenance. In lectures, lecturers explain the state of well maintenance and ledgers in Nigeria, as well as issues

Course No.	ToT Program	ToT Material	ToT Practical
		for instructors to follow and explain to the participants.	with the same.
6	The instructor already possessed expertise and general knowledge on the topic. However, as this course did not include any information on borehole diagnostics using borehole cameras, such information was included in the ToT Program to give the instructor teaching points to impart to participants.	Text materials and PowerPoint presentations were prepared for the class. The lecture focused on images of borehole cameras in use on actual sites, as well as existing borehole surveys and repairs with borehole cameras. This made site conditions easy for inexperienced instructors to understand.	The course involved 1 day each of lecturing and practice. Planners expected to use actual NWRI wells for practice.
7	As the instructor already possessed expertise and general knowledge on the topic, the course focused on checking new text material made through lectures and practice along with teaching points for participants. In contrast, sections on project management were made simpler than other sections due to limited instructor experience in that respect.	Text materials and PowerPoint presentations were prepared for the class. The text and presentations actually used in training were generally used, showing the overall flow of the course text and points to teach participants within the flow.	The course involved 2 days of lecturing and 1 day of practice. Practice was made so that instructors could reconfirm points on general construction, site management, and maintenance by checking existing alternative water source facilities.
8、9	It is apparent that the instructors understand the theories behind the basic and specialized knowledge for the class, but they are researchers with limited experience in community health and sanitation activity. Therefore, the aim was to bridge the gap between theory and practice by having them introduce concrete examples of hygiene and sanitation activities to learn the results they produce.	Text materials and PowerPoint presentations were prepared for the class. The teaching materials basically extract the key points from those used in the actual training course made, so that the instructors could understand the key lecture points.	The course was 2 days in lecture format, focusing on materials outlined on the left.

5.3 Summary of Acitivities of Output 3 (2nd Year)

Before implementation of each training course, ToT was carried out to C/P (main instructor). Due to to the delay of procurement of training quipment from Japan, ToT which used those eqiopment could not be conducted. The contents of ToT of each course are explained as follows;

(1) Course 1 (Groundwater Investigation Technique)

Table 5.2 Overview of ToT Impementation (Course 1) 2nd year

Date	23rd September – 27th September, 2011（4 days）
Place	NWRI

Instructors	Main Instructor Dr. O. O. Yaya	
Contents of Training	23rdSeptember 10.30am-2.30pm	Lecture: Explanation of the ToT programme, features of different physical prospecting methods, measurement methods for electromagnetic prospecting and electrical sounding, resolving problems with measurements
	24th September 9.00am-10.30am 2.00pm-4.00pm	Lecture: Methods for analyzing theoretical curves in electrical sounding, effectiveness of electromagnetic prospecting EM34 and TEM measurements, etc.
	26th September 4.30pm-5.30pm	Lecture: Methods for analyzing theoretical curves in electrical sounding, interpreting results of software-based analyses, etc.
	27th September 11.30am-2.00pm	Practical training: Measurements in vertical electric sounding, analyses after acquiring data

ToT had been scheduled for 3 days, but as shown in the table, it was conducted intermittently. The reason for this was because the main instructor was busy with NWRI and preparing for the next week's course, making it difficult to have ToT on continuous days. In addition, it was not possible to rent exploration equipment for the practical training before the regular training began, so practical training began after other training had begun. ToT training was conducted when other instructors were giving lectures, and after lectures were given by the main instructor. ToT practical training was scheduled for 2 days, but since the electromagnetic prospecting equipment could not be rented, it ended up being half-day training in electrical sounding.

(2) Course 2 (Borehole Construction and Management)

Table 5.3 Overview of ToT Impementation (Course 2) 2nd year

Date	23rd September – 27th September, 2011（4 days）	
Place	NWRI	
Instructors	Main Instructor Engr. O. Olabode	
Contents of Training	27th September 4.30pm-5:30pm	Lecture:Confirmation contents of training module of the next day, such as code of practice for water well construction and borehole drilling management, was carried out.
	28th September 4.30pm-5:30pm	Lecture:Confirmation of contents and programme of the practical training in the next day. (Pumping test)
	29th September 4:30pm-5.30pm	Lecture:Confirmation contents of training module of the next day, such as borehole drilling management (analysis of pumping test result, data required for well report and report writing), and content of termination test.
	7th October 1:00pm-3:00pm	Confirmation of Tot evaluation result

Pumping test and borehole logging were not trained at the time of ToT due to the delay of procurement of equipment. Table 5.2 shows the schedule and contents of ToT.

(3) Course 7 (Alternative Water Supply Sources)

Table 5.4 Overview of ToT Impementation (Course 7) 2nd year

Date	11th – 13th October 2011（3days）
Place	NWRI

Instructors	Main Instructor Engr. J. Onemano	
Contents of Training	11th October 2.00pm-5:00pm	Lecture: Explanation of the ToT programme Project management and Project planning Sub-course 7-1: instruction point of spring development
	12th October 2:00am-5.00pm	Lecture: Sub-course 7-2: instruction point of development of hand dug well
	13th October 2:00pm-5:00pm	Lecture: Sub-course 7-3: instruction point of development of rainwater harvesting facility

(4) Course 8（Hygiene and Sanitation Promotion）

Table 5.5 Overview of ToT Impementation (Course 8) 2nd year

Date	8th , 20th and 23rd November, 2011（3 days）	
Place	NWRI	
Instructors	Main Instructor Alh. Hassan	
Contents of Training	18th November 10:00am-11:30am	Check the highlights to be taught in the training Slightly change how to do the group works according to the backgrounds of participants Share information of the community to be visited and plan activities for the practical training during the field visit
	20th November 2:00pm-3:30pm	Check the highlights to be taught in the training Introduce and study other counties' case studies of hygiene messages and school Water, Sanitation and Hygiene (WASH) projects
	23rd November 11:00am-12:00am	Check the important points in organizing participatory workshops and revise the filed manual for the practical training

(5) Course 9（Community Mobilization）

Table 5.6 Overview of ToT Impementation (Course 9) 2nd year

Date	23rd, 27th November and 5th December, 2011（3 days）	
Place	NWRI	
Instructors	Main Instructor: Dr Dosah	
Contents of Training	23rd November 2:00pm-4:00pm	Check the highlights to be taught in the training Introduce and study gender mainstreaming, operation and maintenance (O&M) and water tariff Slightly change how to do the group works according to the backgrounds of participants Share information of the community to be visited in the field visit and plan activities for the practical training Check the important points in organizing participatory workshops
	27th November 5:00pm-6:00pm	Check the highlights to be taught in the training
	5th December	Additionally study gender mainstreaming, O&M and water tariff

	10:00am-11:00am	

5.4 Summary of Acitivities of Output 3 (3rd Year)

(1) Development of a RWSSC Trainers' Database (including external and internal resources)

For the upcoming courses, new external and internal instructors added data to the database. This information/data included personal information such as area of expertise, c.v., work history, technical skills, names of affiliated academic societies and organizations, and number of years of experience as a trainer, research history, research results (authorship, publication of papers), overseas experience, qualifications (teaching licenses, etc.), and fields of interest, among other things. The database was updated with information about the two external instructors who have been involved with on-site activities related to courses 1-4 since April, 2013.

(2) Implementation of ToT

In 3rd year, training course 1 to 4 were carried out. ToT was implemented in order to enable equipment that were procured as training equipment to be efficiently utilized in the training. The contents of the ToT were as follows.

1)Course 1 (Groundwater Investigation Techniques) 1st time in 3rd year

Table 5.7 Overview of ToT Impementation (Course 1) 1st time in 3rd year

Date	17th April – 18th April, 2013（2 days）	
Place	Lecture in office, Practical training on the Lower Usuma Dam grounds	
Participants	Main Instructor Dr. O. O. Yaya, Lecturer Engr. T Olabode, Assistant Mr.Peter, RWSSC Coordinator Dr. Martin O. Eduvie	
Contents of Training	17th April	There are explanations about measurements, analyses, and measurement troubleshooting associated with TEM electromagnetic sounding. There are also explanations about measuring and analytical methods with Mc-OHM electrical sounding.
	18th April	There an explanation about the concepts of TEM electromagnetic sounding as well as practical training for measurements and analyses. There is practical training for measurements and analyses with Mc-OHM electrical sounding.

・ToT related to McOHM electrical sounding

Instruction was given on survey methods using McOHM electrical sounding, and the data that were obtained were subsequently analyzed using the software "WinSev6". Electrical sounding instruction can be conducted according to plan.

・ToT related to TEM electromagnetic sounding

TEM equipment was used to provide instruction in sounding methods, and data were analyzed after they were acquired. PowerPoint materials were used to about the analytical procedure. There was also an introduction to the results of actual analyses, as well as an explanation of methods for comparing the results with geology.

2)Course 1 (Groundwater Investigation Techniques) 2nd time in 3rd year

Table 5.8 Overview of ToT Implementation 2nd time in 3rd year（Part 1）

Date	22nd October – 23rd October, 2013（2 days）
Place	Lower Usuma Dam Lecture in office, Practical training on the Campus of Lower Usuma Dam Junior High School
Participants	Main Instructor Dr. O. O. Yaya, Lecturer Engr. T. Olabode, Technician Mr. Meter
Contents of training	Mc-OHM electrical sounding measurements, analysis using acquired data, transfer of TEM electromagnetic sounding data, and explanation about analytical methods.

Table 5.9 Overview of ToT Implementation 2nd time in 3rd year（Part 2）

Date	29th October, 7th – 8th November, 2013 (3 days)
Place	Lecture in office, Practical training: Grounds in front of the Usuma Dam office
Participants	Main Instructor Dr. O. O. Yaya
Contents of training	Contents of implementation: TEM electromagnetic sounding measurements, points to note when operating PROTEM equipment, data processing before analysis (data transfer method, checking the quality of measurement data), explanation about the analytical procedure, evaluations of the analysis and analytical results, and explanation about points of special concern when conducting an analysis

・ToT related to McOHM electrical sounding

The ToT participants took measurements with the Mc-OHM electrical sounding equipment. After that, the acquired data were analyzed using WinSev6 software. Instruction about analyses included how to use analytical software to convert data files stored on a floppy disk into files that can be read out directly, calculating apparent resistivity, resistivity model input, analysis of the resistivity model, and how to store file data, among other things.

・ToT related to TEM electromagnetic sounding

TEM electromagnetic sounding measurements were conducted on 29 October. The lectures on November 7~8 involved analyzing the data acquired during the practical training. Instruction about analyses included how to transfer measurement data files saved in the PROTEM equipment to a PC. The transferred data were further converted using two types of software (TEM2IX1D and DostoWin), after which the data were analyzed using the analytical software IX1D.

3) Course 2 (Borehole Construction Management)

Table 5.10 Overview of ToT Implementation (Course 2) 3rd year

Date	30th April and 3rd May, 3013 (2 days)
Place	Lecture in office, Practical training on the Lower Usuma Dam grounds
Participants	Main Lecturer Engr. T Olabode, Technician Mr.Peter, RWSSC, Coordinator Dr. Martin O. Eduvie
Contents of trainings	Data measurement and analysis by McOHM borehole logger, Trouble shooting of borehole logger, effectiveness of borehole camera and application to the training, Set up and analysis of Pumping test.

・ToT concerning the Mc-OHM logger

The procured logger is capable of performing resistivity measurement, temperature measurement and

caliber measurement. In the ToT, explanation was conducted on how to analyze these measurement results and how to use them in borehole management work. Measurements were conducted in a borehole constructed using the procured drilling rig.

・ToT concerning the borehole camera

Guidance was conducted on caution points when using the borehole camera in training and on how to teach about it in the practical training. Moreover, because this equipment can be used to record images from inside boreholes, explanation was conducted to encourage the use of such images in the lectures.

・ToT concerning pumping test

The information required by lecturers to implement practical training was compiled into the ToT practical training text. Concerning the pumping test, this describes the types and objectives of pumping tests. Guidance was also provided on the method of use of analysis software that was procured for the pumping test.

4) Course 4 (Drilling Machinery Maintenance)

Table 5.11 Overview of ToT Implementation (Course 4) 3rd year

Date	3rd July -4th July 2014（2 days）
Place	Lecture in office, Practical training on the Lower Usuma Dam grounds
Participants	Main Lecturer Engr. S.G. Sara
Contents of trainings	Confirmation of the points to teach in the training course, Explanation of the method of operation & maintenance for drilling equipment and kind of lubricant oil, Confirmation of the points which will be made topics in the lecture. (Suitable answers when questions were given), Instruction of maintenance work. (Importance of periodical maintenance for changing oil, greasing and inspection), Explanation of safety measures (eg. the prohibition issue for entering to the working area of equipment and for unsafe behaviors), Explanation of outline and name of each part of drilling equipment

Lecture of ToT was implemented to confirm the important points of ToT materials prepared in the 1st year. The operation and maintenance for characteristics and function of the new drilling equipment was instructed in addition to the peration and maintenance for general drilling equipment. In the ToT practical training, the important parts (oil filter port, grease point & gauge) which are required to take maintenance were explained using new equipment. In addition to that, the inspection parts and inspection method for maintenance of new equipment were also explained. In order to keep safety work, the instruction that the equipment and engine should be completely stopped in the maintenance period was given.

5.5 Summary of Acitivities of Output 3 (4th Year)

(1) Implementation of ToT

Japanese experts conducted ToT for trainers in charge of lecture in the 3rd year. In the 4th year, trainers in charge that took ToT in the 3rd year were scheduled to conduct ToT for trainers that were newly employed at the training center. However, ToT was not conducted because new employment could not be approved by the Ministry of Finance and carried out by NWRI. There is no problem with regard to implementation of trainings because the trainers in charge of these courses are equipped with abilities needed to conduct the training. Trainer in charge will conduct ToT after new trainers are assigned in

the future.

(2) Supporting of ToT Conducted by C/P

It was not possible to offer direct support for ToT conducted by the trainer in charge because ToT was not conducted. Instead of that, database of ToT materials such as ToT manuals and practical manuals was constructed. All soft copy data was stored in PC and it was devided into each course so that they can be utilized. Furthermore procedure and contents of ToT were confirmed between Japanese experts and C/Ps and the implementation structure was checked by both of them. It was considered that C/Ps aquire the capaciy of conduct ing OJT to new staff by their own.

CHAPTER 6. ACTIVITIES RELATED TO OUTPUT 4 (1-4 YEAR)

CHAPTER 6 ACITVITIES RELATED TO OUTPUT 4 (1-4 YEAR)

Output 4

"Trainings are delivered based on a PDCA cycle"

＜Objectively Verifiable Indicators＞
- M&E are conducted on Training activities, Modules, Programme, Materials, Facilities and Equipment arrangement, Trainers and Traineess according to the M&E plan.
- Revising procedure was taken as scheduled from the 2012 year's training cycle.

＜Activities＞
- 4-1 Develop a M&E Plan for the training courses, Modules, Materials, Trainees and Resource persons/Facilitators
- 4-2 Prepare and deliver trainings of stakeholders at State, LGA and Community level
- 4-3 Conduct M&E on the training Modules, materials, resource persons/ facilitators and trainees as planned and revise them as necessary
- 4-4 Revise M&E Plan as necessary

6.1 Summary of Output 4

As for Output 4 activities, plans for monitoring and evaluation of training were prepared in the 1st year and training for institutions concerned was started in the 2nd year. In the 2nd year, training without the use of equipment was conducted due to delay in procurement of training equipment from Japan. In the 3rd year, however, the project activities had to be limited by moving the location of training to Abuja due to deterioration of public order. For this reason, only four courses (courses 1 through 4) were conducted from the 3rd year onward. As shown below, traininga were offered to a total of 405 persons by the end of the project.

Table 6.1 Contents of Training

	Course	Year	Start	End	No of Participants
1	Groundwater Investigation Technique	2011	26-Sep	9月30日	9
		2013	22-Apr	26-Apr	18
		2013	28-Oct	1-Nov	20
		2014	25-Aug	29-Aug	26
2	Borehole Construction and Management	2011	26-Sep	1-Oct	14
		2012	13-Feb	18-Feb	25
		2013	6-May	10-May	20
		2014	10-Feb	14-Feb	18
		2014	25-Aug	29-Aug	27
3	Drilling Technoloty	2013	15-May	26-May	20
		2014	3-Mar	13-Mar	22
		2014	9-Jun	14-Jun	10
4	Drilling Machinery Maintenance Technique	2013	8-Jul	11-Jul	20
		2014	17-Feb	21-Feb	19
5	Hand Pump Installation, Operation and Maintenance	2011	18-Jul	23-Jul	30
		2011	17-Oct	21-Oct	14
6	Borehole Rehabilitation and Maintenance	2011	11-Jul	15-Jul	15
		2011	12-Dec	16-Dec	18
8	Sanitation and Hygiene Promotion	2011	25-Jul	29-Jul	14
		2011	21-Nov	25-Nov	16
9	Community Mobilizaiton and Mangement	2011	11-Jul	15-Jul	14
		2011	28-Nov	2-Dec	16
				Total	405

The training was evaluated using the following 3 methods:

(1) Evaluations using evaluation charts

Evaluations were made from the following types of questions. Part 1 contained questions that pertained to all courses, while Parts 2 and 3 were changed to include questions about individual courses.

The evaluations were made on a scale of 1 to 5, with 1 = “strongly disagree”, 2 = “disagree”, 3 = “average”, 4= “agree” and 5 = “strongly agree”, with the points totaled for each Part.

Please note that items with an average score of less than 3 were treated as problems and were considered for improvement.

(2) Evaluation methods using assurance test

As the goal was acquiring skills for classroom and practical training for the courses, there were fundamental problems that were related to this. The tests were simple, with only 30 minutes allotted to answering the questions. Improvement measures were considered for questions that had a correct answer rate of less than 60%.

(3) Evaluations based on meetings with C/P

After the training session had ended, a meeting was held with the chief instructor to discuss issues with the training system and corrective actions, based on the self-evaluation sheets

The improvement measures of the training by the result of evaluations have been carrid out since 2nd year of the Project. In 4th year, there were no items which had low evaluation and high-quality training can now be implemented. Evaluation scores (5.0 is highest) for each course in 4th year were as follows;

Course 1 (Groundwater Inverstigation Technique): 4.1 point

Course 2 (Borehole Construction Management): 4.6 point

Course 3 (Drilling Technology): 4.6 point

Course 4 (Drilling Machinery Maintenance) : 4.5 point

About the improvement of the contents of training, there were no technical problems to be improved in training since training evaluation was high in 4th year and participants could understand the contents of training, Instead of that, there was a request of having more time of practical training and participants needed more praictiocal training of operaion of equipment. About these requests, a time table will be revised so that more practical time can be allocated in future.

6.2 Summary of Acitivities of Output 4 (1st Year)

Before the implementation of training course, the monitoring and evaluation plan for the training system, trainer and trainee was formed in the 1st year. Contents of the monitoring and evaluation plan for the training system, trainer and trainee are described below.

1. Objectives

This monitoring and evaluation is carried out for the purpose of evaluating whether training is attractive for trainees and training with high quality is carried out continuously or not.

2. Index of Evaluation

Following three points are set as the index of evaluation.
1) Consistency: along the flow of training from start to the end, evaluation is implemented based on the appropriate evaluation items and indicators at suitable timing.
2) Objectivity: In order to ensure objectivity for the evaluation result, the training situation by a course trainer is inspected by trainers of RWSSC or NWRI as an evaluator.
3) Sustainability: Sustainability is given to the evaluation activities by continuous evaluation accompanying implementation of training.

3. Evaluation Items/ Indicator

1) Effectiveness of the Training	Degree of Improvement	1) Technical Knowledge 2) Degree of satisfaction
2) Contents of the Training	Capacity of the Trainer	1)Teaching Skill 2)Technical Knowledge
	Quality of Training Course	1) Training Course/ Curriculum 2)Training Course Modules/ Time table 3)Training Materials 4)Training Facility/ Equipment/ Environment

Further, in the future some of the evaluation items, for example how the training participants, who returned to their place of work, utilizing the training result for their job, are thought to be added as evaluation items. However, only two items are listed in the table since this stage is at a beginning of operation of newly developed training system.

4. Method, Time of Implementation and Evaluator

Evaluator	Method	Time of Implementation	
Trainee	Evaluation of Training course by a monitoring questionnaire	At the end of training or at the end of each training day	Terminal evaluation
Trainer of RWSSC,NWRI	Inspection of target training Evaluation of training by a monitoring questionnaire	At the end of inspection	Intermediate evaluation
Trainer	Self-evaluation by a monitoring questionnaire	At the end of training	Terminal self-evaluation
Director of RWSSC and Training Director of NWRI	Overall evaluation based	After completion of above mentioned evaluations	Post-evaluation

In addition, it is necessary to select evaluators from the counterpart in consideration of establishing the committee in NWRI or RWSSC in the future.

5. Method of Monitoring Evaluation

(1) Evaluation of the training system of the target training course by the trainee
Trainees evaluate the training system of the target training course by using a monitoring questionnaire.
This monitoring and evaluation is carried out at the end of the training.
(2) Inspection and evaluation of training condition by trainers of RWSSC and NWRI
Trainers of RWSSC and NWRI inspect the target training module. Trainers, who carry out inspection, carry out evaluation by a questionnaire from the view of whether high quality is carried out and trainer has adequate teaching skill and technical knowledge and so on.
This monitoring and evaluation is carried out at the time of inspection and after inspection.
(3) Self-evaluation by trainer of the target training course in terms of training quality and teaching skill
Trainer of the target training course carries out self-evaluation by a questionnaire in terms of quality of the training and his/ her capacity.
This monitoring and evaluation is carried out at the end of training of each day.
(4) Overall Evaluation
Director of RWSSC (Dr. M.O. EDUVIE) and Director of Training (Mr. A.N. Egbulem) carry out overall evaluation of the Training system. And with the target training course trainer, points to be improved and measure for improvement is examined.

By the overall evaluation, two of evaluation items namely 1) effectiveness of the training and 2) contents of the training are evaluated in three ranks of "Good", "Medium", and "Poor". However, main purpose of the overall evaluation is extraction of the concrete point to be improved for the improvement of Training system, and examination of measures for improvement of Training system.

6.3 Summary of Acitivities of Output 4 (2nd Year)

(1) Implementation of Training Courses

In the 2nd year activity, the training course 1, 2, 5, 6, 8 and 9 were performed. Outlines of implementation of training courses in the 2nd year are shown in the following tables.

1) Course 1 (Groundwater Investigation Technique)

Table 6.2 Overview of Training (Course 1) 2nd year

Date	26th September to 30th September,2011 (5 days)	
Place	Lecture : training institute Practical training : training institute	
Instructors	Mr. O. O. Yaya and others	
Participants 9 persons	Kaduna	・Ministry of Water Resources (2 persons) (Chief technical officer and Principal technical officer) ・ Private-sector: 3 persons (Project co-coordinator, Hydrogeologists) * Company involved with Irrigation and Ground water investigation
	Bauchi	・RUWASSA: 3 persons (Technical officer, Surveyor, Geophysicist)
	Niger	・Upper Niger River Basin Development Authority 1 person (Water engineer)

2) Course 2 (Borehole Construction Management)

Table 6.3 Overview of Training (Course 2) (1st time) 2nd year

Duration	From 26th September to 1st October, 2011 (6 days)	
Place	Lecture: NWRI, Practical Training: Existing Borehole Site near NWRI	
Instructors	Engr. O.T.Olabode Dr.Martin Mr. O.O Yaya	
Participants 14 persons	Kastina State 13 persons	・RUWASSA 2 persons (Water Supply Officer) ・LGA 11 persons (Water Supply Officer)
	Kaduna State 1person	・WATSAN 1person (Water Supply Officer)

Table 6.4 Overview of Training (Course 2) (2nd time) 2nd year

Duration	From 13th to 18th February, 2012 (6 days)	
Place	Lecture: NWRI, Practical Training: NWRI	
Instructors	Engr. O.T.Olabode Dr.M. Edvie Engr. O.O Yaya Mr D. Adokie	
Participants 25 persons	Bauchi State 16 persons	・RUWASSA 2 persons (Hydrogeologist, Drillier) ・LGA 11 persons (Wash Officer)

	Delta State 9 person	・MWR 9 person (Water Supply Officer)

3) Course 5 (Handpump Installation, Operation and Maintenance)

Table 6.5 Overview of Training (Course 5) 2nd year

Duration	18th July to 23rd July, 2011 (6days)	
Place	Lecture: Institute Field practice: existing borehole in Kaduna city	
Instructors	Engr. S. G. Sara and others	
participants 30persons	Kastina State 13 person	・RUWASSA 2persons （Head of plumbing section/Head of pump installation officer) ・LGA 11persons (Water Supply Officer*) *including technician who repair hand-pump at site
	Sokoto State 17persons	・WATSAN 2persons (Head of water dept./Head of Mechanic Unit) ・LGA 12persons（Deputy directors of Works*, Section Heads of Water*) *including technician who repair hand-pump at site ・NGO 3persons （Project Officers）

4) Course 6 (Borehole Rehabilitation and Maintenance)

Table 6.6 Overview of Training (Course 6) (1st time) 2nd year

Duration	11th July to 15th July, 2011 (5days)	
Place	Lecture: Institute Field practice: existing borehole in Kaduna city	
Instructors	Mr. O. O. Yaya	
participants 15persons	Kastina State	・RUWASSA 2 person (Chef work superintendent/pump maintenance officer) ・LGA 3 person (Director of water supply) ・LGA 8 person（Water Supply Officer)
	Taraba State	・RUWASSA 1person（Geologist)
	Kaduna State	・Church 1person（Pump maintenance technician)

Table 6.7 Overview of Training (Course 6) (2nd time) 2nd year

Duration	12th December to 16th December, 2011 (5days)	
Place	Lecture: NWRI Field practice: NWRI	
Instructors	Engr. O. O. Yaya and others	
participants 18persons	Bauchi State	・RUWASSA 2 person (Water Supply officer and driller) ・LGA 14 person（WASH officer)
	Benue State	・RUWASSA 1person（Hydrogeologist)
	Benin	・River Basin Authority 1person（Geologist

5) Course 8 (Hygiene and Sanitation Promotion)

Table 6.8 Overview of Training (Course 8) 2nd year

Date	21st to 25th November, 2011 (5 days)
Place	Lecture：NWRI Practical Training：Anguwan Bagudu community in Kaduna
Instructors	Ahmed Hassan (Course coordinator)

	External instructor （RUWASSA staff from Zamfara state） Megumi Kaneda (JICA Expert)	
Participants 21 persons	Bauchi state	RUWASSA 2 LGA 14
	NWRI	5 from the water quality department

6) Course 9 (Community Mobilizations and Management)

Table 6.9 Overview of Training (Course 9) 2nd year

Date	28th November 2011 to 2nd December, 2011（5 days）	
Place	Lecture：NWRI Practical Training：Anguwan Bagudu community in Kaduna	
Instructors	Bilkisu Dossah (Course coordinator) 2 external instructors（Professor from University of Nigeria and freelance consultant）	
Participants 16 persons	Bauchi state	RUWASSA 2 LGA 14

(2) Evaluation of Training

1) Evaluation by evaluation form and assurance test

Analysis of evaluation form and result of assurance test was conducted. Based on this, the training was assessed and the measurs to improve the training were examined.

① Course 1 (Groundwater Investigation Technique)

Table 6.10 Evaluation of Training (Course 1）2nd year

	Item	Problem	Improvement Measure
Evaluation form	Part1: About the overall course	Site of practical training was not suitable	Look for a place big enough to accommodate training for all the trainees. Also, thinking about measurement lines and methods, we will work to find a site that will serve to improve the effectiveness of the training in question.
	Part2: About the lecture	Explanation was not sufficient in some parts and understanding of participants was low.	The effective use of PowerPoint and analysis software are considered so that participants can easily understand..
	Part3: About the practice	There was only one prospecting apparatus for praictical training, and everyone gathered around one unit, and some trainees were left with nothing to do.	Next time, 2 sets of prospecting equipment will be procured for the practical training. The practical training trainees will be divided into groups depending on their number, as will the types of prospecting, in order to allow every trainee to participate and make the practical training more effective.
Assurance test		There was not a sufficient explanation of such things as the theory of vertical electric sounding and electromagnetic prospecting, units of data to be acquired, etc.	The instructor’s explanations and materials used are reviewed and improved accordingly.

② Course 2 (Borehole Construction Management)

Table 6.11 Evaluation of Training (Course 2) 2nd year

	Item	Problem	Improvement Measure
Evaluation form	Part1: About the overall course	There are less of intelligible figures and tables that make participants easy to understand in the textbook. Practical training of borehole logging could not be carried out as it planned.	Content of text is reconfirmed. Important points of each topic are explained in detail to participants by PowerPoint. Next training course can be implemented according to the original training plan since borehole logging equipment is procured..
	Part2: About the lecture	There is no table and figure in the section of down the hole hammer in the textbook. And there is no explanation about down the hole hammer in the PPT	Same as above
	Part3: About the practice	Borehole logging was not conducted in this training. Therefore, trainee could not understand about borehole logging.	Same as above
Assurance test		Incorrect answers are identified in the wide field of borehole construction and management.	Review of lecture of previous day is set up. Lecture is carried out with confirmation of trainee's degree of understand. Emphasized explanation should be given to trainees in terms of important point of each topic.

③ Course 5 (Handpump Installation, Operation and Maintenance)

Table 6.12 Evaluation of Training (Course 5) 2nd year

	Item	Problem	Improvement Measure
Evaluation form	Part1: About the overall course	Due to the cancellation of the platform construction, the practical training was shortened by one day, creating a problem with the ratio of classroom instruction to practical training.	Practical training in platform construction will be cancelled because it appears that there is no suitable construction site in the local area that can be prepared. Therefore, the practical training period will be shortened to make it more effective.
	Part2: About the lecture	The previous lecture exceeded its allotted time, so this lecture could not start at its originally-scheduled time.	Check the contents of lecture and time table and modify it if necessary.
	Part3: About the practice	The practice had too many trainees, reaching 30. Thus, the trainees were divided into teams in the practice. However, due to a lack of tools for reparation, some teams received no such tools. All the trainees of these teams were unable to handle such tools at all during the practice.	It needs to grasp the exact number of trainees before practice is held. Such trainees must be divided into teams. Tools for reparation must also be prepared before practice.

④ Course 6 (Borehole Rehabilitation and Maintenance)

Table 6.13 Evaluation of Training (Course 6) 2nd year

	Item	Problem	Improvement Measure
Evaluation form	Part1: About the overall course	The project initially planned to distribute textbooks to trainees in lecture and practice. However, the textbooks were not provided because they were not completed in time.	Besides the textbooks, other teaching materials are necessary. Thus, in consultation with C/P, other teaching materials should be devised and distributed to trainees to improve the training. (Text bookd was prepared and distributed in the nexr course held on December, 2011)
	Part2: About the lecture	The characters in the table of monitoring check sheet and the diagram were too small for the trainees to read and understand the content.	The lecturers examine items, photos and diagrams to add so that trainees can understand the content more easily.
	Part3: About the practice	Practical training initially planned to use the well in practice within the NWRI. However, the site was changed to a well in the vicinity to the center. Because of this, data on the well conditions was not collected prior to practice. This is why the diagnosis failed to identify the causes of the problems properly	By arranging moving time more efficient from the next time, practical training will have enough time in well-prepared arrangements.

⑤ Course 8 (Hygiene and Sanitation Promotion)

Table 6.14 Evaluation of Training (Course 8) 2nd year

	Item	Problem	Improvement Measure
Evaluation form	Part1: About the overall course	None	
	Part2: About the lecture	No group work was conducted and this topic was only explained by the instructor.	For the topics without group work, we will try to make participants to raise their ideas before lecturing.
	Part3: About the practice	None	
Assurance test		They answered correctly when we recapped it on the next day after it was taught. But it seems easy for them to forget.	New slides will be added in the presentation material and this will be emphasized.

⑥ Course 9 Community Mobilizations and Management

Table 6.15 Evaluation of Training (Course 9) 2nd year

	Item	Problem	Improvement Measure
Evaluation form	Part1: About the overall course	Some of the participants were not given a chance to facilitate in the field visit. It was very windy and dusty on the day we went the community for the field activities.	What filed activities are carried out and how to form groups will be considered carefully in order to give a chance of facilitation to every participant from the next time. The rainy season will be avoided to organize the training as

			much as possible because the road condition to reach communities is bad and difficult to organize an open air workshop.
	Part2: About the lecture	One group did not listen the directions and raised names of facilities such as bore hole, school and health center.	Instructors will go round and check the progress of group works to give timely advice.
	Part3: About the practice	Only several representatives of the participants facilitated the discussion in the community and the rest of them were not given a chance to work with the community members	What activities are carried out and how to form groups will be considered carefully in order to give a chance of facilitation to every participant from the next time
Assurance test		Advantages of participatory/demand driven approach could not be understood since This concept was new to most of them and this was the very first topic of the first day. It seems difficult for them to remember and write the advantages correctly.	They will be instructed to review the course text before the final day when the comprehension test is conducted

2) Evaluation based on discussion with C/P

① Course 1 (Groundwater Investigation Technique)

Table 6.16 Discussion with C/P about the Problems and Corrective Actions (Course 1) 2nd year

Problem	Corrective action
＜Lecture schedule＞ Scheduled lessons were changed at the discretion of the instructor, and sometimes the starting time was delayed and the lecture time was too short. This was not conducive to effective lessons.	Before the training begins, the main instructor of this course should assign times to the other internal instructors, and there should be a good understanding of each instructor's schedule.
＜Procurement of equipment＞ Because the electromagnetic prospecting equipment could not be procured in a timely manner, plans had called for renting equipment. But such equipment could not be rented, so it was not possible to have practical training in electromagnetic prospecting.	The purpose of this course is to help students effectively understand how to make comparisons between data acquired from electrical sounding and electromagnetic prospecting and to use these data together. Since it will probably remain difficult to rent electromagnetic prospecting equipment in Nigeria, practical training should probably be done with equipment that is procured.

② Course 2 (Borehole Construction Management)

Table 6.17 Discussion with C/P about the Problems and Corrective Actions (Course 2) 2nd year

Problem	Corrective action
<Facility of Training> Space of lecture room is adequate. However, power cut was often happened so some of improvement is required.	It is complained to responsible person concerning some of improvement. It is requested that incase power cut is happened, responsible person supply power by a generator immediately.
<Implementation of Practical Training> 1) Preparation of training equipment was done in the morning of the day of practical training. Therefore start of practical test was delayed and	1) It is necessary to finish the preparation of equipment before the training day and practical training should be started from the morning the day of practical training according to timetable.

trainees waste time for the waiting time. 2) It is necessary to have a lecture that instructs trainees the purpose and content of practical training beforehand. 3) At this moment, RWSSC does not have any borehole Logging equipment.	Moreover, following consideration is necessary to improve this situation. - A test yard should be arranged in the public land of NWRI in the future. - Practical training should be carried out in the test yard. - If so loss of time for transfer and preparation of practical training will be eliminated for that. 2) From 4:30pm to 5:00pm on Tuesday the day before practical training, a lecture is set up for that purpose. 3) A borehole logging equipment will be procured later, next training course should be delivered after equipment is procured.
<Training System(Materials, timetable, module)> 1) Training Materials Content of power point of lecture is necessary to enrich its content. 2) Timetable - In case that borehole logging is carried out for the practical training, duration of practical training of existing timetable is not enough. - In case that duration of practical training is extended to two days, duration of lecture is needed to decrease in 3 days. About on Friday, implementation of lecture in accordance with existing timetable is difficult because of religious matter.	1) Review of content is needed. Power point will be improved. Table and figure that help trainees understand each topic will be added after review. 2) -Duration of practical training will be extended from one to two days. - It is possible to decrease the duration of lecture based on the training this time. So duration of lecture decrease in 3 days. - For that case, timetable will be arranged according to particular situation.

③ Course 5 (Handpump Installation, Operation and Maintenance)

Table 6.18 Discussion with C/P about the Problems and Corrective Actions (Course 5) 2nd year

Problem	Corrective action
・Lack of reviewing the previous study prior to class: Prior to taking lecture and practice, trainees should review what they learned in lecture and practice one day before. Otherwise, they fail to recompose what they learned.	・For 30 minutes prior to taking class, the trainees will review what they learned one day before (One trainee must be named one day before who reports, in front of the trainees, what he learned, on the following day.)
・Recording by questionnaire: No recording was made on the information collected before handpump repair practice and on the content of the repair practice. Because of this, the project failed to check the trainees for the defective conditions of the handpumps, locating defects that they repaired, and repair methods they adopted.	・Textbooks to which preliminary questionnaire and post-practice questionnaire are attached should be used in practice to collect series of records on handpump repair. Such questionnaire will help trainees to record on their repair practice after the training. LGA and RUWASSA are expected to keep such repair records.
・Preliminary survey of handpumps: Locating faults of handpumps to repair were not checked prior to handpump repair practice. Because of this, replacement parts were needed during the actual practice, having extra waiting time for work.	・The causes of locating faults of handpumps should be identified as much as possible prior to practice. This preparation will prevent extra time from going out and buying spare parts during practice.

④ Course 6 (Borehole Rehabilitation and Maintenance)

Table 6.19 Discussion with C/P about the Problems and Corrective Actions (Course 6) 2nd year

Problem	Corrective action
・Pumping test method: During practice, the trainees had insufficient guidance on the pumping test method (method of measuring the dynamic water level and pump displacement, etc.). In addition, the lecturer failed to make a good explanation on the comparison of effects before and after the pumping test and on recording the test results.	・A practice textbook and a ToT practice textbook should be used on the pumping test method, including checking the pumping water quantity for appropriateness during practice. ・A questionnaire should be attached to practice textbooks to make comparison of well rehabilitation effects.
・Recording by questionnaire: The project failed to make a sufficient record on the information collected before well rehabilitation practice and on the content of work implemented. Because of this, the project failed to check trainees for what they engaged in the well rehabilitation and for their results.	・A variety of questionnaires (preliminary questionnaire, pumping test sheet, well rehabilitation questionnaire, etc.) should be attached to the practice textbooks so that trainees can record a series of well rehabilitation.
・There was no textbook available for reference to underwater motor pump disassembling practice.	・Documentation on underwater pump disassembling should be added to the practice textbook.

⑤ Course 8 (Hygiene and Sanitation Promotion) and Course 9 Community Mobilizations and Management

Table 6.20 Discussion with C/P about the Problems and Corrective Actions (Course 8 and 9) 2nd year

Problem	Corrective action
As the final day of the course is usually Friday, Muslims whose population is about half of Nigerian population need longer time for prayers and those who come from far states need to leave Kaduna before evening. Thus, the time table was modified as below so that all can be finished by two o'clock on day 5.	1) Debriefing of the field visit planned in the morning time of day 5 has been moved in the afternoon of day 4. 2) Time for making an action plan has been cut and only presentation will be delivered on day 5. If time allows, the presentation will be delivered on day 4 too. 3) Time for a comprehension test has been added on day 5.

6.4 Summary of Acitivities of Output 4 (3rd Year)

(1) Implementaionf of Training

Due to security reason in Kaduna, the 3rd year acitivities were not able to start on time. R/D between NWRI and JICA was concluded in October, 2012 and Project covered only training courses using procured equipments such as course 1, 2, 3 and 4 from 3rd year. Course 1 uses procured equipment such as resistivity and TEM. Borehole logging machine and pumping test equipment which were procured in course 2. In course 3 and 4, procured drilling rig, high pressure compressor and supported trucks are used.

Outlines of implementation of training courses in 3rd year are shown in the following tables.

1) Course 1 (Groundwater Investigation Technique)

Table 6.21 Overview of Training (Course 1) (1st time) 3rd year

Date	11th April to 26th April,2013（5 days）
Place	Lecture in office, Practical training on the Campus of Lower Usuma Dam Junior High School

Instructors	Main Instructor Dr. O. O. Yaya, Lecturer Engr. T Olabode, RWSSC coordinator Dr M.A. Danhassan; Technichan Mr.Peter	
Participants 18 persons	Enugu State	・RUWASSA 3 geologists
	Kebbi State	・RUWASSA 4 persons (2 geologists, 1 hydrogeologist, 1 water engineer)
	Niger State	・RUWASSA 4 geologists
	Ondo State	・WATSAN 3 persons (Geophysicist 2 persons, Hydrogeologist 1 person)
	Taraba State	・RUWASSA 4 persons (1 water engineer, 3 geologists)

Training was conducted for 5 days at Lower Usuma Dam, a suburb of Abuja (3 days of lectures, 2 days of practical training).

Two new training texts were compiled for this training.

(a) TEM electromagnetic sounding methods

(b) Electrical sounding using standard curves and associated analysis

These texts were different from the course texts, so they were added separately from the course texts.

The practical training consisted of methods for Mc-OHM electrical sounding and TEM electromagnetic sounding, and utilization of EM34 simple electromagnetic sounding.

Table 6.22 Overview of Training (Course 1) (2nd time) 3rd year

Date	28th October to 1st November, 2013 (5 days)	
Place	Lower Usuma Dam Lecture in office, Practical training on the Campus of Lower Usuma Dam Junior High School	
Instructors	Main Instructor Dr. O. O. Yaya, Lecturer Engr. T Olabode, Lecturer Mr. Mohammed Garba, RWSSC coordinator Dr Martin O. Eduvie, Technician Mr.Peter Bwankwot, Lecturer Mr. Edwin Emelis (External instructor)	
Participants 20 persons	Enugu State	・RUWASSA 4 persons (2 geologists, 2 borehole maintenance people)
	Kebbi State	・RUWASSA 4 persons (2 geologists, 2 hydrogeologists)
	Niger State	・RUWASSA 4 persons (4 geologists)
	Ondo State	・WATSAN 4 persons (3 geologists, 1 driller)
	Taraba State	・RUWASSA 4 persons (2 water engineers, 1 geologist, 1 driller)

The training was held in the same place as previously that is Usuma Dam on the outskirts of Abuja City. The training period consisted of 5 days: 3 days for classroom work, and 2 days for practical training.

2) Course 2 (Borehole Construction Management)

Table 6.23 Overview of Training (Course 2) 3rd year

Date	6th May to 10th May,2013 (5 days)	
Place	Lecture in office, Practical training on the grounds of Lower Usuma Dam	
Instructors	Main Lecturer Engr. T Olabode, Lecturer Dr. O. O. Yaya, RWSSC coordinator (Dr M. Edviue)	
Participants 20 persons	Enugu State	・RUWASSA 4 person (1 geologist, 3 hydrogeologist)
	Kebbi State	・RUWASSA 4 persons (2 hydrogeologist, 2 water engineer)
	Niger State	・RUWASSA 4 hydrogeologist
	Ondo State	・WATSAN 4 persons (3 hydrogeologist, 1 water engineer)
	Taraba State	・RUWASSA 4 geologist

The training was carried out using the newly procured equipment, the borehole logger, borehole

camera and water quality meter operated without a problem.

3) Course 3 (Drilling Technology)

Table 6.24 Overview of Training (Course 3) 3rd year

Date	15th May to 26th May,2013（12 days）	
Place	Lecture in office, Practical training on the school grounds of Buhari primary school	
Instructors	Main Lecturer Engr. T Olabode, Lecturer Dr. O. O. Yaya, RWSSC coordinator (Dr M. Edviue)	
Participants 20 persons	Enugu State	・RUWASSA 4 person (2 hydrogeologist, 2 driller)
	Kebbi State	・RUWASSA 4 person (2 hydrogeologist, 2 driller)
	Niger State	・RUWASSA 4 person (2 geologist, 2 driller)
	Ondo State	・WATSAN 4 persons (3 hydrogeologist, 1 driller)
	Taraba State	・RUWASSA 4 person (1 geologist, 4 driller)

In order to understand the drilling method and process, a borehole was drilled on the grounds of Buhari elementary school in the practical training.

4) Course 4 (Drilling Machinery Maintenance)

Table 6.25 Overview of Training (Course 4) 3rd year

Date	8th July to 11th July, 2013 (4 days)	
Place	Lecture in office, Practical training on the Lower Usuma Dam	
Instructors	Main instructor: Engineer. S.G.Sara	
Participants 20 persons	Enugu State	・RUWASSA 4 persons (Drilling Engineer 1, Engineer 3)
	Kebbi State	・RUWASSA 4 persons (Drilling Engineer 1, Engineer 1, Geologist 1, Mechanic 1)
	Niger State	・RUWASSA 4 persons (Drilling Engineer 2, Mechanic 2)
	Ondo State	・WATSAN 4 persons (Mechanic 4)
	Taraba State	・RUWASSA 4 persons (Engineer 3, Mechanic 1)

This was the first time of course 4. 20 trainees included one lady coming from 5 states were participated. Original plan of trainings were 5 days and closing ceremony would be held in the morning of Friday, but it was changed on Thursday evening since some of the trainee were coming from a long distance and it takes days to be back. Then the training period was 4 days in total.

(2) Evaluation of Training

1) Evaluation by evaluation form and assurance test

① Course 1 (Groundwater Investigation Techniques)

Table 6.26 Evaluation of Training (Course 1）3rd year

	Item	Problem	Improvement Measure
Evaluation form	Part2: About the lecture	Analytical methods for electromagnetic sounding were explained using PowerPoint and a newly created text. However, there was little understanding,	For the next training, the instructor will be given ToT about analytical methods for TEM electromagnetic sounding, and the analytical methods will

		perhaps because the instructor had little experience with TEM electromagnetic sounding and cut the detailed explanation short.	explained in easy-to-understand terms.
	Part3: About the practice	While trainees know about using theoretical curves in analysis of electrical sounding, they don't know the actual procedure for analysis using theoretical curves. Aanalysis was conducted based on the theoretical curve and supplementary graph of electrical sounding, but this time, there was not enough time for an explanation. Trainees were merely given a text about using theoretical curves and supplementary graphs, resulting in a lower evaluation.	Keep efficient time allocation, and carry out the cotents of training on schedule. It is considered that the closing time can be extended from 4:30 to 5:00 pm.
Assurance test		Participants had insurficient understanding of TEM and electrical sounding. While the course text contained explanations of measurement of TEM and analysis of e lectrical sounding, the instructor shortened the detailed explanation in the lecture, and this may have decreased the level of understanding. This shortened explanation occurred due to the poor allocation (that is, insufficient amount) of time	Have the enough time for the description of method of the analysis Question time is separated from description time so that lecure can be conducted on schedule. As a continuation of the practical training, explanations are given about noise sources that should be given particular attention.

②Course 2 (Borehole Construction Management)

Table 6.27 Evaluation of Training (Course 2) 3rd year

	Item	Problem	Improvement Measure
Evaluation form	Part1: About the overall course	The training was conducted in the offices of Abuja Water Board at Usuma Dam, however, due to the constricted space and inadequate environment	In future, if it is possible to use the new office at Usuma Dam, it is possible to secure a larger training space and solve the problem (In 4th year, training was carried out in the new conference hall and this problem was solved)
Assurance test		The correct thing is for recovery test to be conducted after pump has stopped. In subsequent comparison of answers, almost all of the participants understood this. Therefore, it seems there was simply a misunderstanding	Since this was intended to be a catch question, there is no particular need to improve it.

③ Course 3 (Drilling Technology)

Table 6.28 Evaluation of Training (Course 3) 3rd year

	Item	Problem	Improvement Measure
Assurance test		According to the Nigerian standard, boreholes must be constructed at least 5 meters away from toilets. The correct answer is not 5 meters but rather 15 meters. It is thought that the participants couldn't recollect this because no unified explanation was given regarding figures in the lectures.	In future training, in addition to simply explaining figures, understanding will be boosted through explaining why it is necessary to construct boreholes from toilets by 15 meters.

④ Course 4 (Drilling Machinery Maintenance)

Table 6.29 Evaluation of Training (Course 4) 3rd year

	Item	Problem	Improvement Measure
Evaluation form	Part2: About the lecture	Trainee could not understand the operating principle of Percussion type drilling machine. Movement and operating principle was explained using course text. The reason why low understanding is may be that the way to explain was not suitable or the equipment was not common	Process chart of operation of drilling machine shall prepare for understanding, and to explain movement of drilling machine using it on the next time.
	Part3: About the practice	Trainee could not understand structure of side real and draw works. Side real and drow works of drilling rig were shown in the practical training. However, in the practical training, there were 20 trainees who were surrounding around the drilling rig. Then it is likely that some trainees could not hear the voice of instructor as they were standing far from the instructor.	Basic parts of drilling rig were explained using Power Point materials prior to practical training in the next time
Assurance test		Name of parts such as differential rock switch of drilling rig, drain cock of charging tank o f compressor and air cleaner indicator of compressor could not be answered. In the practical they were explained, It was possibility that the trainees did not take care because of small part.	In the next training, trainees might idenfity these switches since the symbol mark of switches is shown in picture and explained.

2) Evaluation based on discussion with C/P

①Course 1 (Groundwater Investigation Technique)

Table 6.30 Discussion with C/P about the Problems and Corrective Actions (Course 1) 3rd year

Problem	Corrective action
＜Times allocated for the assurance tests and training evaluation sheets＞ There were no times expressly allocated for the assurance tests and training evaluation sheets, so this disrupted the classroom work.	In the time allocations, set aside specific times for the assurance tests and training evaluations.
＜Change the assurance tests＞ Some of the true-false questions were written in a roundabout way or had insufficient explanation, so trainees could not understand them.	The assurance tests is reviewed and changed as needed before the next training.

②Course 2 (Borehole Construction Management)

Table 6.31 Discussion with C/P about the Problems and Corrective Actions (Course 2) 3rd year

Problem	Corrective action
＜Course timetable＞ In the practical training on borehole drilling management, the participants visited a drilling site to learn about borehole drilling, however, on this occasion, there was additional waiting time because of delays in the drilling work.	Drilling does not progress as planned in many cases due to uncertainty of drilling machine situation, geological formation and so on. In order to avoid the wasted time, drilling situation at site will be monitored and checked. By doing this participants can visit a drilling site efficiently. Moreover, instead of going to a site, the process of drilling operation can be recorded by video etc., and this video can be used for them to understand drilling process.
＜Practical training using equipment＞ Since operation procedure of new equipment was not fully understood, it took a time before starting.	This point can be improved by performing the work a number of times in the future. Also the work procedure sheet is prepared if necessary to work more efficiently.

③ Course 3 (Drilling Technology)

Table 6.32 Discussion with C/P about the Problems and Corrective Actions (Course 3) 3rd year

Problem	Corrective action
Since the C/Ps has implemented similar courses for a long time and has inherited many of the contents of the training, it was possible to implement high quality courses as indicated by the results of the evaluations by participants.	In future, in order to further improve the quality of training, it will be important to take steps to ensure that newly procured equipment is effectively utilized in the training. For example, rather than simply using equipment in the practical training, the equipment will be used as training resources for acquiring data and so on.

④ Course 4 (Drilling Machinery Maintenance)

Table 6.33 Discussion with C/P about the Problems and Corrective Actions (Course 4) 3rd year

Problem	Corrective action
＜Contents of training＞ Materials made by Power Point were not used efficiently For example the contents of materials were not informed to external instructor in advance.	The contents and kind of materials shall be informed to instructors prior to training, and used in the training.
＜Period of training＞ Trainees had to spend the time of moving to	The extension of time of practical training is considered and 30 minutes from 1 hour 30 minutes to 2 hours, will be

look the parts of drilling equipment during practical training, Therefore, the shortage of time for explanation and an excess of time for training were occurred.	extended.
＜Drilling equipment＞ The operation of crane on truck is difficult because position of levers is too high	Levers operation is kept on easy using a step of 30cm height.

6.5 Summary of Acitivities of Output 4 (4th Year)

(1) Implementaionf of Training

In the 4th year, course 1 to 4 was carrid out at Usuma dam, Abuja. In course 1 (groundwater investigation technique) procured equipment such as resistivity and TEM are used. In course 2 (borehole construction management), borehole logging machine, borehole camera and pumping test equipment are utilized. In course 3 (drilling technology) and course 4 (drilling machinery maintenance), procured drilling rig, high pressure compressor and supported trucks were used as well as 3rd year.

The following tables show outlines of implementation of training courses in 4th year

1) Course 1 (Groundwater Investigation Technique)

Table 6.34 Overview of Training (Course 1) 4th year

Date	25th August to 29th August,2014（5 days）	
Place	Lecture in conference hall of Usuma Dam, Practical training on the Campus of Lower Usuma Dam Junior High School	
Instructors	Main Instructor Dr. O. O. Yaya, Lecturer Engr. T Olabode, RWSSC coordinator Dr M.A. Danhassan; Technichan Mr.Peter	
Participants 26 persons	FCT	・Water Board 2 geologists ・Nigerian Hydrological Agency 1 hydrogeologist
	Edo State	・River Basin Authority 3 hydrogeologists
	Ogun State	・River Basin Authority 1 hydrogeologist
	Eboni State	・RUWASSA　1 project manager
	Enugu State	・Private 1 geophysist
	Benue State	・River Basin Authority 1 hydrogeologist
	Nasarawa State	・RUWASSA　1 engineer
	Plateau State	・RUWASSA　1 geologist
	Kwara State	・RUWASSA　2 hydrogeologists
	Kaduna State	・RUWASSA　2 hydrogeologists
	Cross River State	・Private 1 engineer
	Imo State	・River Basin Authority 1 hydrogeologist
	Akuwa Ibom State	・RUWASSA　1 hydrogeologist
	Adamawa State	・River Basin Authority 1 hydrogeologist
	Kano State	・River Basin Authority 1 geophysist
	Katsina State	・RUWASSA　2 engineers
	Jigawa State	・RUWASSA　1 engineer
	Sokoto State	・River Basin Authority 1 geophysist
	Borno State	・RUWASSA　1 hydrogeologist

Training was conducted for 5 days (3 days of lectures, 2 days of practical training) at Lower Usuma

Dam. The contents of training were same as last year. It took more time for practical training since there were 26 trainees.

2) Course 2 (Borehole Construction Management)

Table 6.35 Overview of Training (Course 2) (1st time) 4th year

Date	10th Februaryt to 14th February,2014（5 days）	
Place	Lecture in conference hall of Usuma Dam, Practical training on the grounds of Lower Usuma Dam	
Instructors	Main Instructor Engr. T Olabode, Lecturer Dr. O. O. Yaya RWSSC coordinator, Technichan Mr.Peter	
Participants 18 persons	Enugu State	・RUWASSA 4 persons (2 hydrogeologists, 2 engineers)
	Kebi State	・RUWASSA 4 persons (2 hydrogeologists, 1 geologist, 1 engineers)
	Niger State	・RUWASSA 4 persons (3 hydrogeologists,1 drilling engineer)
	Ondo State	・WATSAN 2 persons (1 hydrogeologist, 1 geologist)
	Taraba State	・RUWASSA 4 persons (1 geologist, 1 drillining engineer, 2 engineers)

The training was carried out using the newly procured equipment such as borehole logger, borehole camera and water quality meter as same as previous year. The period of training is 5 days (3 days for lecture, and 2 days for practical training). 20 participants were expected to come. However, it was only 18. 2 persons from Ondo State could not come.

Table 6.36 Overview of Training (Course 2) (2nd time) 4th year

Date	25th August to 29th August,2014（5 days）	
Place	Lecture in conference hall of Usuma Dam, Practical training on the grounds of Lower Usuma Dam	
Instructors	Main Instructor Engr. T Olabode, Lecturer Dr. O. O. Yaya RWSSC coordinator, Technichan Mr.Peter	
Participants 26 persons	FCT	・Water Board 3 geologists ・Nigerian Hydrological Agency 1 hydrogeologist ・Private 1 engineer
	Edo State	・River Basin Authority 2 drilling engineers ・NGO 2 engineers
	Ogun State	・River Basin Authority 1 hydrogeologist
	Eboni State	・RUWASSA 1 engineer
	Benue State	・River Basin Authority 1 hydrogeologist
	Nasarawa State	・RUWASSA 1 engineer
	Plateau State	・RUWASSA 1 geologist
	Kwara State	・RUWASSA 2 hydrogeologists
	Kaduna State	・RUWASSA 1 drilling engineer
	Imo State	・River Basin Authority 1 hydrogeologist
	Akua Ibom State	・RUWASSA 1 geologist
	Adamawa State	・River Basin Authority 1 geologist
	Kano State	・River Basin Authority 1 engineer
	Katsina State	・RUWASSA 2 drilling enginees
	Jigawa State	・RUWASSA 1 hydrogeologist
	Sokoto State	・River Basin Authority 1 engineer
	Borno State	・RUWASSA 1 geologist ・River Basin Authority 1 geologist

The training was held in the same place and had same contents as previous training. The training

period consisted of 5 days (3 days for classroom work, and 2 days for practical training). In this time, participants increased and it was 27 (it was 20 persons last time). Practical training using equipment could be carried out as scheduled without any problems.

3) Course 3 (Drilling Technology)

Table 6.37 Overview of Training (Course 3) (1st time) 4th year

Date	3rd March to 13th March,2014（11 days）	
Place	Lecture in conference hall of Usuma Dam, Practical training on the on the school grounds of Dusse seconcary school grounds	
Instructors	Main Instructor Engr. T Olabode, Lecturer Dr. O. O. Yaya RWSSC coordinator	
Participants 22 persons	Enugu State	・RUWASSA　4 persons (2 drilling engineer, 2 engineers)
	Kebi State	・RUWASSA 4 persons (2 drilling engineer, 1 hydrogeologist, 1 geologist)
	Niger State	・RUWASSA 4 persons (2 drilling engineer, 2 hydrogeologists)
	Ondo State	・WATSAN 6 persons (1 drilling engineer, 1 hydrogeologists, 4 engineers)
	Taraba State	・RUWASSA 4 persons (2 drilling engineer, 2 geologists)

Training took place in Usuma Dam, Abuja. The length of training was 11 days. In order to understand the drilling method and process, a borehole was drilled on the grounds of Dusse secondary school in the practical training. 4 participants from each state were expected. However six persons attended from Ondo states. Expense of 2 extra persons from Ondo state was paid by state.

Table 6.38 Overview of Training (Course 3) (2nd time) 4th year

Date	9th June to 14th June,2014（6 days）	
Place	Lecture in conference hall of Usuma Dam, Practical training on the grounds of Lower Usuma Dam	
Instructors	Main Instructor Engr. T Olabode, Lecturer Dr. O. O. Yaya RWSSC coordinator	
Participants 10 persons	Delta State	・MWR 7 persons (1 hydrogeologist, 2 geologists, 4 engieers)
	Kwara State	・Private 1 drilling engineer
	Edo State	・Private 1 engineer
	Kaduna State	・NWRI 1 drilling engineer

Participants from NWRI will become drilling rig operators in the future. As was done in the first training, lectures covered general matters of drilling including drilling method, while practical training focused on precautions for performing the actual drilling work using drilling rig and efficient ways to perform drilling. The duration of the course had been set for 11 days (which is same as the first course) but was shortened to 6 days to accommodate the needs of participants from Delta State. All lectures and practical trainings in the schedule were given by increasing the number of lectures for each day. All training contents were therefore covered despite the shortening of the period.

4) Course 4 (Drilling Machinery Maintenance)

Table 6.39 Overview of Training (Course 4) 4th year

Date	17h Februaryto 20th February,2014（4 days）	
Place	Lecture in conference hall of Usuma Dam, Practical training on the grounds of Lower Usuma Dam	
Instructors	Main Instructor Engr, S.G.Sara　Lecturer Engr,O.T.Okabode External practical trainer Engr,S.Oyinlala　External practical trainer　Mr.O.Abel	
Participants	Enugu State	・RUWASSA　4 engineers

19 persons	Kebi State	・RUWASSA 4 persons (1 drilling engineer, 2 engineers, 1 geologist)
	Niger State	・RUWASSA 3 persons (1 geologis, 2 mechanics)
	Ondo State	・WATSAN 4 persons (2 engineers, 2 mechanics)
	Taraba State	・RUWASSA 4 persons (1 engineer, 3 mechanics)

The training was conducted at the Water Board facility adjacent to the Usuma Dam outside of Abuja city. Training period was 4 days (2 days of lecture and 2 days of practical training). Lectures were given by the main instructor and an instructor at NWRI. Practical maintenance training for drilling rig and high pressure compressor was conducted by external trainers as in the previous training. A total of 20 participants (4 each from 5 states) had been scheduled but the actual attendance was 19 as only 3 persons attended from Niger state for reasons attributable to RUWASSA.

(2) Evaluation of Training

1) Evaluation by evaluation form and assurance test

① Course 1 (Groundwater Investigation Technique)

Table 6.40 Evaluation of Training (Course 1) 4th year

	Item	Problem	Improvement Measure
Evaluation form	Part3: About the practice	Due to the large number of trainees, there was not much time to operate geophysical equipment.	The course had been conducted with around 20 participants but the number increased this time with 26 persons attending, which appears to be the cause of the comment above. In the future, an environment in which work can be performed with small number of people will be created by dividing teams in such a way that would allow everyone to operate the geophysical equipment. Number of participants will also be limited to around 20.
Assurance test		The reason for participants experiencing difficulty understanding some of the content appears to be in deficiency of their basic skills.	Content of training has been disseminated in advance but additional explanation will be given about the requirements for attending the course.

② Course 4 (Drilling Machinery Maintenance)

Table 6.41 Evaluation of Training (Course 4) 4th year

	Item	Problem	Improvement Measure
Evaluation form	Part3: About the practice	Some participants gave a comment to want to have the knowledge of overhaul of engine.	It could not execute in this training course as this course has limited time and does not have the time for overhaul of engine.

2) Evaluation based on discussion with C/P

① Course 1 (Groundwater Investigation Technique)

Table 6.42 Discussion with C/P about the Problems and Correcive Actions (Course 1) 4th year

Problem	Corrective action
＜Change the assurance tests and evalution form＞ There were some parts which were difficult to understand and the question which was circuitous	They will be revised before next training

explanation.	

② Course 2 (Borehole Construction Management)

Table 6.43 Discussion with C/P about the Problems and Corrective Actions (Course 2) 4th year

Problem	Corrective action
＜Contents of training＞ It took more time for practical training since there are many percipants (27) in 2nd time traininig.	It is considered to separate trainees into some groups so that practical training can be done more efficiently. Or reduce the number of participants in the training.

③ Course 3 (Drilling Technology)

There was no problem regarding to contents of course 3. Therefore no corrective action will be performed. NWRI implemented a similar course over the long term using the existing rig in the past. Moreover, main instructor (Engr. Olabone) has obtained the knowledge and experience in the drilling engineering field. Instead, the mentenace plan of drilling equipment used in practical training was dicussed.

④ Course 4 (Drilling Machinery Maintenance)

Table 6.44 Discussion with C/P about the Problems and Corrective Actions (Course 4) 4th year

Problem	Corrective action
＜Contents of training＞ From participants, there were comments that want to learn the technical skills such as detailed structure and overhaul of engine and electronic control points of compressor.	It could not execute in this training course as this course has limited time and does not have the time.

CHAPTER 7. ACTIVITIES RELATED TO OUTPUT 5

CHAPTER 7 ACTIVITIES RELATED TO OUTPUT 5

Output 5

"Management of RWSSC is improved"

＜Objectively Verifiable Indicators＞

- Logistics and administrative matters are conducted according to the manual/work plan by March 2013
- More than 10 States are informed of the contents and period of Training at RWSSC.

＜Activities＞

5-1 Publicize RWSSC's mandate/mission, objectives, functions and strategies to all stakeholders
5-2 Develop logistics and administrative manuals/work plans (budget, account, human & materials resources, training advertisement and "5S", etc)
5-3 Assign clear job description to each RWSSC staff
5-4 Deliver appropriate management training to RWSSC staff
5-5 Provide adequate enabling environment (office space, equipment stationeries and transportation, etc) for RWSSC
5-6 Collate database of trainers, trainees and trainings conducted
5-7 Propose to the Federal Ministry of Water Resources to allocate C/P funding to the Project.

7.1 Summary of Output 5

Activities in Output 5 were performed to strengthen the management capacity for organizational management and implementation of training at RWSSC. An office work manual work plan for utilization in organizational management was drafted in the 1st year and completed in the 2nd year. Publicity support was also offered in addition to preparation of manual in the 2nd year. The support consisted of startup of publicity team, preparation of publicity plan and preparation of publicity tool. Although the plan was to carry out publicity in local regions in full scale from the 3rd year onward, Output 5 activities were terminated after the place of activity was moved from RWSSC in Kaduna to Abuja as a result of deterioration of public safety in Kaduna. In the 4th year, database was created for the purpose of managing the training course. In addition, database guideline was prepared to organize the system for updating the database.

7.2 Summary of Acitivities of Output 5 (1st Year)

Activities of 1st year are summarized below.

① **5-2 Develop logistics and administrative manuals/work plans (budget, account, human & materials resources, training advertisement and "5S", etc)**
② **5-3 Assign clear job description to each RWSSC staff**
③ **5-5 Provide adequate enabling environment (office space, equipment stationeries and transportation, etc) for RWSSC**
④ **5-6 Collate database of trainers, trainees and trainings conducted**

①and②; as for a manual and work plan concerned with organizational operation of RWSSC, a draft of Administration and Office Manual and Plan" is developed by a cooperative work of JICA expert and the RWSSC staff. RWSSC staff has been drawing up the manual and plan based on the draft.

Moreover, the draft proposal of the "RWSSC management plan" was created as a plan for comprehensive management of RWSSC positioned by the higher rank of the administration and office manual and plan. Regarding this plan, RWSSC staff also has been drawing up the plan based on the draft proposal. Method of Application for RWSSC Short Course is also described in this plan.

③; Office space for the JICA experts and the RWSSC administrative officer is secured. Equipments and stationery required for performing daily operation are suitably supplied by RWSSC initiative.

④; Regarding the database, database of RWSSC internal trainer is prepared.

7.3 Summary of Acitivities of Output 5 (2nd Year)

(1) Development of the Office Work Manual

The RWSSC Office Work Manual was developed from the observations and results of the first year of activity. Activity 5-2 was developed and activity 5S was added. It presents the details of improving the maintenance of the office environment by the existing personnel.
In addition, for public relations activities, a draft of the Public Relations Office Work Manual has been developed for the work team and is attached to the draft Public Relations Activity Plan. The Public Relations Committee (PRC) is still finalizing the details.

(2) Development of the Management Plan

The draft RWSSC Management Plan has been developed by the administration group of the Centre by supplementing the result of Activity 5-2 to Activity 5-6 of the first year, with the basic concepts, purposes, strategy and functions of the Centre.

(3) Public Relations Activities

The present mode and weaknesses of public relations activities of the Centre were reviewed and reorganized. Work on developing the public relations activity started.

1) Implementation of RWSSC Public Relations Activity

i) Set up Public Relations Section
Public Relations Committee (PRC) was established to examine PR strategy and plan of the Centre, and Public Relations Work Team (PRWT) was established to carry out the office work that supports PR activities of the PRC. The members and personnel were assigned.
ii) Activities of the PRC and PRWT
Activities of PRC and PRWT are as follows.

① PRC

- Examination of the draft Public Relations Activity Plan and PRWT Office Work Manual
- Examination and approval of PR activity tools.
- Planning and preparation of PR activity visit

② PRWT

- Drawing up of draft Public Relations Activity Plan and draft PRWT Office Work Manual
- Design and development of PR activity tools (refer to iii) mentioned below.)

The routine work is waiting for the approval of draft PR Activity Office Work Manual.

③ Creation of PR Activity Tools

The tools for PR activity created are as follows:

- RWSSC Pamphlet (approved by PRC and PTM)
- Power point material for RWSSC PR activity (approved by PRC)
- RWSSC PR Activity Plan (Draft),(under review by the PRC)
- RWSSC PR Activity Office Work Manual (Draft) (under review by the PRC)
- RWSSC Homepage trial version (uploading on NWRI intranet to be confirmed)

2) Capacity development of counterpart for PR activity

Capacity development for C/P and section concerning PR activity will be carried out based on the following aspects.

①C/P

(a) Promotion of PRC meeting
(Meeting call, assignment and result confirmation of members in duty, record and information of the minutes)

(b) Operation of PRWT meeting
(Meeting call, detail explanation of staffs' role and routine work, concrete instruction of work contents and result confirmation, record and information of the minutes)

(c) Plan and implementation of visit PR activity

② PR Group

(a) Set up of PRC and PRWT, and activity

(b) Formulation of PR Activity Plan and operation

(c) PR activity office work
- Creation of PR tools（Pamphlet, Power point）and Use
- Upload of Homepage and operation
- Creation of Client list and use
- Set up PR activity office counter and activity implementation

(d) Set up visit PR activity group and activity implementation

7.4 Summary of Acitivities of Output 5 (3rd Year)

Activities related to Output 5 were not performed in the 3rd year because of the decision to revise PDM and complete the majority of Output 5 activities by the end of the 2nd year.

7.5 Summary of Acitivities of Output 5 (4th Year)

(1) Creating and Updating of Training Dababase

Three fundamental databases were constructed. The contents of databses are shown in Table 7.1.

Table 7.1 Contets of Database

	Contents
Trainee Database	Name of traiing course, Date and duration of training, Name of participant, Gender, Organization. Position, State, Contact (phone number and email address
Trainer Database	Name of trainer, Personal information(date of birth,age, qualification, discipline), Origanization, Position, Course name in charge
Taining Dabase	Name of training cours, Contents of training course

In addition to the database above, teaching materials necessary for conducting OJT, ToT and training were complied into database. Collective management of these teaching materials prevents loss of precious assets obtained through RWSSC activities and utilizes them for continuous implementation of training.
As for operational management of this database, a method of database operational management including the role of the person in charge of database and updating procedure has been compiled in the form of database guideline. The person assigned to take charge of the database will be performing the update from now on. Data update of the training conducted in August 2014 was

completed smoothly and the system has been put in place to update the data over the following years.

(2) Lobbying Activity of Budget Allocation from NWRI toFMWR

Activities needed to secure the budget for RWSSC to continue its activities after the termination of this project was discussed at JCC held in February. A request was made to NWRI to approach FMWR to secure budget necessary for the activities of RWSSC from the 4th year onward. The Executive Director of NWRI responded by saying that budget has been allocated with priority from FMWR and that there will be no problem in the future. As for the activities related to promotion of training participants, annual training schedule is distributed by mail to organizations concerned (FMWR. River Basin Authority, State MWR, Water Board, RUWASSA) in addition to sending the application by mail whenever a training is conducted. Phone calls are also made to prospective agencies to encourage participation. Moreover, active publicity is carried out at conferences and lectures held by the National Water Resources Council. The fact that state budget has sent a total of 53 participants to the training in August 2014 reflects the growth attributable to these publicity efforts. These publicity efforts will be continued in the future.

(3) Revised PublicityTools

Among the publicity tools prepared in the 2nd year, publicity pamphlet was revised although it was not included in the initial scheduled activities. This revision included addition of the photos of training equipment procured and maintained in 2013 and the content of training using the training equipment. This revised pamphlet will be printed and utilized for publicity activities.

CHAPTER 8. ISSUE, EFFORTS AND LESSSONS ON THE PROJECT IMPLEMENTATION

CHAPTER 8 ISSUES, EFFORTS AND LESSONS ON THE PROJECT IMPLEMENTATION

8.1 Efforts

(1) Efforts to conduct the training in Abuja

In the 3rd year, Project site was moved to Abuja from Kaduna and the training started in Abuja. Since C/Ps including instructors have worked in NWRI, Kaduna, they are not able to come to Abuja often and come to Abuja when there is training. Therefore C/Ps and Japanese experts were not able to work together like before. In addition, C/Ps had limited time devoted to the preparation of training at Abuja. In order to perform efficient preparation of the training, it was decided to clarify the responsible of work between C/Ps and Japanese experts.For example, C/Ps checked the contents of the lecture and its materials and Japanese experts checked the contents of practical training and its materials. .

Further, prior to the evaluation of training, result of evaluation sheets and the comments both C/Ps and Japanese experts are exchanged by email to each other so that the time required for evaluation can be redueced.

(2) Efforts to conduct the OJT of the equipment

Training using equipment did not start until the 3rd year due to delay procuring training equipment. In addition, as the location of activities was changed from Kaduna NWRI to Abuja due to worsening security, OJT related to use and maintenance of training equipment had to be conducted in Abuja in addition to the training. As C/Ps (instructors, technicians) that participated in OJT were in Kaduna, there was a problem of them not being able to come to Abuja often. For this reason, measures were taken to increase the opportunities to use and learn the equipment by moving the equipment including drilling rig to Kaduna and using the equipment in the existing course of NWRI. As a result, it was possible to perform the operation and maintenance of training equipment until completion of the project without any problem despite the delay in equipment procurement. Moreover, maintenance cost for training equipment has been included in the budget by utilizing the spare parts list and maintenance manual in the annual maintenance plan.

8.2 Issues and Lessons

(1) Sustainability of Training and Emplyment of New Staff

The C/Ps (instructors) already have more than 20 years of experience as trainer and had no particular problem with regard to implementation of ToT for enhancing the ability of trainers. As the Counterpart was unaccustomed to the training equipment that had been newly procured, TOT was conducted with emphasis on efficient utilization of these equipments in the training.

The plan was to have Japanese experts offer ToT for Counterparts in the second and third year, and the Counterparts that took ToT up to the third year offer ToT to new trainers in the fourth year. However, it was not realized because the Ministry of Finance did not give final approval for new hiring that had been scheduled by NWRI. Although the above plan was made because hiring of new trainers had been decided in the third year, it was not carried out as scheduled. Decisions on matters such as implementation of budget generally require much time in Nigeria. The lesson learnt from this incident is that approach should have been made to Nigeria to decide the Counterparts including new trainers prior to commencement of the Project.

(2) Utilizaiton of JICA in-coutry training fund

The quality of training is considered to be high as trainees evaluated the training very highly. The training evaluation performed in accordance with the M&E plan after the training showed the effect of

training improvement. While the trainers are competent in implementing the training, the percentage of trainees covered by the state budget was low as 75% of trainees that participated in trainings offered up to the fourth year used JICA in-country training fund. JICA in-country training fund was utilized because trainings are needed for capacity building of RWSSC trainers and improvement of training quality. However, this gave Nigeria the impression that training fee will be covered by JICA.

Advantages and disadvantages of using JICA in-country training fund are mentioned in the Terminal Evaluation performed at the end of the project. NWRI should have made self-help effort from the outset even if it led to small number of participants.

(3) Modification of Project Avitities and PDM

Place of activity was moved to Abuja from the third year onward due to deterioration of security at the project site (Kaduna). For this reason, PDM was revised by completing the majority of activities in Output 5 at the end of the second year. In addition deterioration of securities in local regions including Kaduna also limited the publicity and educational activities that were scheduled in local regions. As a result, promotion among training participants was not performed fully. In spite of the significant changes of project acvtivites as described above the contents of Ouputs has not been changed at PDM. Consequently, necessary acitivities to achieve the Outputs do not contain in the present PDM. In restarting the project at 3rd year, it may have been wise to revise the PDM including the activity output itself in view of the possibility that activities related to Output 5 cannot be performed.

CHAPTER 9. RECOMMENDATION

CHAPTER 9 RECCOMMENDATION

Based on the project activities, the recommendations to achieve the project overall goal are as shown below.

9.1 Subtainablity of Implementatoin of Training

(1) Promotion of RWSSC Activity and Securement of Trainng Participants

The majority of 405 participants that took the training during the project period were RUWASSA employees that used JICA in-country training fund. Those participating with state budget were few in number. There is a pressing need to secure a sustainable number of training participants, even though situation improved in the fourth year with 53 persons attending with the state budget. While a recommendation has been made with regard to "encouraging budget allocation for training at RWSSC from FMWR to each state" in Terminal Evaluation, RWSSC should also make maximum effort in securing training participants through their publicity activities described in 7.5 (2)..

(2) Securing and Training Human Resources at RWSSC

OJT and ToT for new trainers scheduled in the fourth year could not be implemented because the Ministry of Finance did not issue final approval. All OJT manuals and ToT materials have been stored in database so that they can be put to use at any time. The system for implementing ToT aimed at strengthening the training immediately after a new trainer is assigned has been put in place. Securing and cultivating young trainers have become a task, as current trainers at RWSSC are over 50 years of age. It will be desirable to implement OJT and ToT immediately once the new trainers and training assistants are assigned. The importance of new employment has been proposed in Terminal Evaluation as "Transfer of skills/knowledge to younger generation."

9.2 Training Needs and Modificantion ofTraining

A survey was conducted on training needs in Niger state RUWASSA in the fourth year. While the content of training needs was almost identical to that found in a similar survey conducted in the first year, new needs for training have also been identified. The needs for new training courses shall be considered in view of the training needs surveys that will be conducted from the next year onward at six states (Kebbi, Katsina, Bauchi, Taraba, Ondo, Enugu) because it is difficult to determine such needs from the results of Niger state alone. Offering trainings in accordance with local needs should lead to increase in number of participants.

9.3 Enhancement of Capacity of RWSSC

(1) Utilization of Administrative Manuals

Training was carried out after 3rd year in Abuja and RWSSC administration staff who stayed in Kaduna could not be involved the activities such as preparation and support of training. Therefore one can hardly say that the administration manual prepared during the first and second year and to be used above acitvities is being fully utilized. Making use of these manuals in day-to-day office work is desired.

(2) Utilization of Training Database

A system for building a training database and assigning a person in charge of updating this database was put in place in the fourth year. While database has been properly updated so far, this process shall be continued without any interruption in the future.

(3) Securement of the Budget for RWSSC Actvitites

The budget for activities has been allocated from FMWR without any problem during the project period. It will be important to continue making the effort to secure the budget so that the activities will be implemented continually after the completion of the project.

9.4 Efforts for Improvement of Rural Water Supply and Sanitation Environment

Improvement of water supply and sanitation in rural area cannot be attained through development of human resources alone. The efforts of not only RWSSC but also FMWRI and RUWASSA are indispensable in attaining the Overall Goal. In the Terminal Evaluation, reference has been made to "the need to make efforts on various matters for achieving Overall Goal" as a recommendation to continue the efforts made with regard to allocation of budget by Nigeria, continued well monitoring and rehabilitation as well as establishment of spare parts supply by RUWASSA and improvement of maintenance of water supply facilities by WASHCOM.

9.5 Response to Recommendation from Terminal Evaluation

Terminal Evaluation Team has issued the following recommendations to NWRI/RWSSC. Recommendations (1) and (3) for NWRI/RWSSC overlap with aforementioned recommendations but need to be addressed properly from now on.

(1) Continuation of needs assessment

(2) Realizaiton of long term training courses

(3) Transfer of skills/knowledge of younger generation

ANNEX

1. PDM (Project Design Matrix)

2. Project Inputs

   2.1. Input from Japanese Side

      a. Japanese Experts Dispatch Schedule

      b. Certificate of Handover

      c. Financial Support for Local Expense

   2.2. Input from Nigerian Side(List of C/P Personnel)

3. Minute of Meeting of JCC (1～5)

4. Collected documents

1. PDM (Project Design Matrix)

Project Name : Project for Enhancing the Function of RWSSC in NWRI (RWSSC Project) PDM Ver. 1.0

Target Group : RWSSC-NWRI, Kaduna **Duration : July 1, 2009～March 31, 2013 (45 months)** 19 March 2009

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Overall Goal			
Service Delivery of RWSS is improved in Nigeria through Capacity Development of stakeholders	1. Rural water access rate is 100% nationwide by 2018 2. Capacity of RWSS stakeholders is judged improved compared with the Project started in 2009	1. National Statistics Office Data 2. Capacity Assessment Reports	
Project Purpose			
Rural Water Supply and Sanitation Centre for Capacity Development (RWSSC) is effectively operated	1. RWSS Trainings are delivered without delay according to the Programme 2. 400 RWSS staff will attend RWSSC trainings in total by March 2013 3. Satisfaction of those trained in RWSSC will improve by 70% by 2013 from start of the Project 4. RWSS stakeholders'evaluation on RWSS courses will improve by 2013 compared to that in the Project started.	1. Modules and Programme, Annual Training Implementation Reports (2010, 2011, 2012), M&E Reports 2. Training participants Database 3. Training participants evaluation results 4. Questionnaire survey to selected RWSS institutions	Necessary RWSS investments are made according to the National RWSS Programme
Outputs			
1. Capacity Gaps of RWSSC (NWRI) and RWSS stakeholders at States, LGAs and Community levels are identified	1.1 Capacity Assessment Reports are made in the first year of project and revised by the end of the Project 1.2 RWSS stakeholders including ESAs share the identified capacity gaps of RWSS stakeholders.	1.1 Capacity Assessment Report 1.2 Workshop reports	Governments and other stakeholders continue to send RWSS staff for trainings
2. Responsive and effective training system (Modules, materials, and facilities, etc) is developed	2.1 RWSSC training strategy is determined 2.2 Revised and newly developed training materials including manuals are utilised in trainings according to Training Modules and Programme by June 2010 2.3 Facilities and equipment are maintained and arranged for trainings and training Programme	2.1 Training strategy 2.2 Training Modules and Programmes、Annual Training Action Plan, Revised /developed training materials 2.3 Facilities and equipment list	
3. Trainers capacity in RWSS is enhanced	3.1 More than 80% of trainees evaluate the trainers as "good" 3.2 Supervisors (RWSSC managers and JICA experts) judge ToT receivers' capacity in terms of knowledge, attitude and skills are improved	3.1 Trainees evaluation, Check list 3.2 Supervisors' evaluation, Reports of ToT Trainings, Check list, Annual Training Implementation Reports (2010, 2011, 2012),	
4. Trainings are delivered based on a Plan-Do-Check-Act (PDCA) cycle	4.1 M&E are conducted on Training activities, Modules, Programme, Materials, Facilities and Equipment arrangement, Trainers and Trainees according to the M&E plan 4.2 Revising procedure was taken as scheduled from the 2010 year's training cycle.	4.1 M&E plan, M&E report 4.2 Annual Training Implementation Reports (2010, 2011, 2012),	
5 . Management of RWSSC is improved	5.1 Logistics and administrative matters are conducted according to the manual/work plan by March 2013 5.2 Budget is allocated and disbursed as scheduled 5.3 Dissemination activities are done periodically and when needed (including webpage) by March 2013.	5.1 Logistics and administrative manuals/work plans, Job description, Database of trainers, trainees, Questionnaire survey to the administration staff 5.2 Budget and audit reports 5.3 Web Page	

Activities	Inputs	
	Japan	Federal Republic of Nigeria
1.1 Determine capacity assessment procedures and selection of target institutions (National, State, LGA and Community levels)	***Personnel***	***Personnel***
1.2 Conduct capacity assessment of sampled institutions and produce reports	- Chief Advisor / Rural Water Supply / Training Program - Hydrogeology / Groundwater Development - Well Drilling Technology / Drilling Machine - Well Development / Water Supply Facilities / Well Rehabilitation - Geophysical Survey / Survey Analysis - Mechanical Equipment / Operation and Maintenance - Community Mobilization / Rural Development - Sanitation & Hygiene Promotion	- Project Director Counterparts at working level - Project Manager - Coordinator (Handpump) - Coordinator (Groundwater) - Coordinator (Capacity Assessment) - Coordinator (Drilling) - Coordinator (Information & Doc.) - Coordinator (Altr. WS) - Coordinator (Comm. Dev.) - Coordinator (Sant. & Hyge.) Office staff - Administrative Officer - Finance Officer - Secretary/Typist - Clerical officer Technical assistant - System Analyst - Driller - Driller
1.3 Organize stakeholders workshop to present and improve the assessment reports		
1.4 Review the capacity assessment activities and reflect outcome in the training system		
1.5 Disseminate the reports to major stakeholders		
2.1 Review and Formulate Training Programmes, Courses and Modules required as a result of the capacity assessment		
2.2 Review and revise existing training materials		
2.3 Develop training materials for the newly developed courses	***Training***	
2.4 Inventorize and procure required facilities and equipment	In Japan and/or in third countries as per required	
2.5 Produce users manuals of facilities and equipment		
2.6 Provide On-the- Job- Training (OJT) to Users on facilities and equipment handling, operation and maintenance		
3.1 Identify relevant trainers (qualification, skills, role, workload, etc)	***Equipment***	***Facility, equipment and services***
3.2 Formulate Training of Trainers (ToT) programme	- Training rig and related equipment - Well rehabilitation equipment - Geophysical prospecting equipment - Pumping test equipment - Monitoring equipment - Computers - Vehicles - Office utilities	- Project office, meeting room and necessary facilities for the Experts - Facilities and services such as supply of electric power, desks, chairs, shelves, telephone line, internet connection necessary for the Project activities - Other facilities mutually agreed on as appropriate.
3.3 Make ToT materials		
3.4 Implement ToT programme		
3.5 Evaluate ToT programme and its implementation		
3.6 Develop and maintain database of trainers		
4.1 Develop a M&E Plan for the training courses, Modules, materials, trainees and resource persons/facilitators		
4.2 Prepare and deliver trainings of stakeholders at States, LGA and Community levels		***Local Cost***
4.3 Conduct M&E on the training Modules, materials, resource persons/facilitators and trainees as planned and revise them as necessary		
4.4 Revise M&E Plan as necessary		
5.1 Publicize RWSSC's mandate/mission, objectives, functions and strategies to all stakeholders		
5.2 Develop logistics and administrative manuals/work plans (budget, account, human & materials resources, training advertisement and “5S”, etc)		
5.3 Assign clear job description to each RWSSC staff		
5.4 Deliver appropriate management training to RWSSC staff		
5.5 Provide adequate enabling environment (office space, equipment stationeries and transportation, etc) for RWSSC		
5.6 Collate database of trainers, trainees and trainings conducted		
5.7 Disseminate centre activities to stakeholders (eg. Web page)		

Pre-conditions
The building of RWSSC is completed and the staff and budget are allocated

Project Name : Project for Enhancing the Function of RWSSC in NWRI (RWSSC Project)

Target Group : RWSSC-NWRI, Kaduna **Duration : March, 2010～November, 2013** PDM Ver. 1.1

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Overall Goal			
Service Delivery of RWSS is improved in Nigeria through Capacity Development of stakeholders	1. Rural water access rate is 100% nationwide by 2018 2. Number of water supply facilities is increased compared with to 2009Capacity of RWSS stakeholders is judged improved compared with the Project started in 2009 3. Number of factional handpump borehole is incresed as the result of establishment of WASHCOM	1. National Statistics Office Data 2. Capacity Assessment Reports	
Project Purpose			
Rural Water Supply and Sanitation Centre for Capacity Development (RWSSC) is effectively operated	1. RWSS Trainings are delivered without delay according to the 2. Programme 3. 400 RWSS staff will attend RWSSC trainings in total by May 2013 RWSS stakeholders'evaluation on RWSS courses will improve by 2013 compared to that in the Project started.	1. Modules and Programme, Annual Training Implementation Reports (2011, 2012, 2013), M&E 2. Reports 3. Training participants Database 4. Training participants evaluation results Questionnaire survey to selected RWSS institutions	Necessary RWSS investments are made according to the National RWSS Programme
Outputs			
1. Capacity Gaps of RWSSC (NWRI) and RWSS stakeholders at States, LGAs and Community levels are identified	1.1 Capacity Assessment Reports are made in the first year of project and revised by the end of the Project 1.2 RWSS stakeholders including ESAs share the identified capacity gaps of RWSS stakeholders.	1.1 Capacity Assessment Report 1.2 Workshop reports	Governments and other stakeholders continue to send RWSS staff for trainings
2. Responsive and effective training system (Modules, materials, and facilities, etc) is developed	2.1 RWSSC training strategy is determined 2.2 Revised and newly developed training materials including manuals are utilised in trainings according to Training Modules and Programme by September 2010 2.3 Facilities and equipment are maintained and arranged for trainings and training Programme	2.1 Training strategy 2.2 Training Modules and Programmes、Annual Training Action Plan, Revised /developed training materials 2.3 Facilities and equipment list	
3. Trainers capacity in RWSS is enhanced	3.1 More than 80% of trainees evaluate the trainers as "good" 3.2 RWSSC managers and JICA experts judge ToT receivers' capacity in terms of knowledge, attitude and skills are improved	3.1 Trainees evaluation, Check list 3.2 Supervisors' evaluation, Reports of ToT Trainings, Check list, Annual Training Implementation Reports (2011, 2012, 2013),	
4. Trainings are delivered based on a Plan-Do-Check-Act (PDCA) cycle	4.1 M&E are conducted on Training activities, Modules, Programme, Materials, Facilities and Equipment arrangement, Trainers and Trainees according to the M&E plan 4.2 Revising procedure was taken as scheduled from the 2012 year's training cycle.	4.1 M&E plan, M&E report 4.2 Annual Training Implementation Reports (2011, 2012, 2013),	
5 . Management of RWSSC is improved	5.1 Logistics and administrative matters are conducted according to the manual/work plan by March 2013 5.2 Budget is allocated and disbursed as scheduled according to anual 5.3 plan 5.4 Advatisement for training course is carried out according to anual plan Dissemination activities are done periodically and when needed (including webpage) by March 2013.	5.1 Logistics and administrative manuals/work plans, Job description, Database of trainers, trainees, Questionnaire survey to the administration staff 5.2 Budget and audit reports 5.3 Web Page	

Activities	Inputs		
	Japan	Federal Republic of Nigeria	
1.1 Determine capacity assessment procedures and selection of target institutions (National, State, LGA and Community levels) 1.2 Conduct capacity assessment of sampled institutions and produce reports 1.3 Organize stakeholders workshop to present and improve the assessment 1.4 Disseminate the reports to major stakeholders 2.1 Formulate training strategy for RWSSC and creae RWSSC mission report 2.2 Review and Formulate Training Programmes, Courses and Modules required as a result of the capacity assessment 2.3 Review and revise existing training materials 2.4 Develop training materials for the newly developed courses 2.5 Inventorize and procure required facilities and equipment 2.6 Produce users manuals of facilities and equipment 2.7 Provide On-the- Job- Training (OJT) to Users on facilities and equipment handling, operation and maintenance 3.1 Identify relevant trainers (qualification, skills, role, workload, etc) 3.2 Formulate Training of Trainers (ToT) programme 3.3 Make ToT materials 3.4 Implement ToT programme 3.5 Evaluate ToT programme and its implementation 3.6 Develop and maintain database of trainers	***Personnel*** - Chief Advisor / Rural Water Supply / Operation Mangement - Hydrogeology / Groundwater Development - Well Drilling Technology / Drilling Machine - Well Development / Water Supply Facilities / Well Rehabilitation - Geophysical Survey / Survey Analysis - Mechanical Equipment / Operation and Maintenance - Community Mobilization/ Sanitation & Hygiene Promotion - Procurement Management ***Training*** In Japan and/or in third countries as per required ***Equipment*** - Training rig and related equipment - Well rehabilitation equipment - Geophysical prospecting equipment - Pumping test equipment - Monitoring equipment - Computers - Vehicles - Office utilities	***Personnel*** - Project Director Counterparts at working level - Project Manager - Coordinator (Handpump) - Coordinator (Groundwater) - Coordinator (Capacity Assessment) - Coordinator (Drilling) - Coordinator (Information & Doc.) - Coordinator (Altr. WS) - Coordinator (Comm. Dev.) - Coordinator (Sant. & Hyge.) Office staff - Administrative Officer - Finance Officer - Secretary/Typist - Clerical officer Technical assistant - System Analyst - Driller - Driller ***Facility, equipment and services*** - Project office, meeting room and necessary facilities for the Experts - Facilities and services such as supply of electric power, desks, chairs, shelves, telephone line, internet connection necessary for the Project activities - Other facilities mutually agreed on as appropriate.	

Activities	Inputs		
	Japan	Federal Republic of Nigeria	
4.1 Develop a M&E Plan for the training courses, Modules, materials, trainees and resource persons/facilitators 4.2 Prepare and deliver trainings of stakeholders at States, LGA and Community levels 4.3 Conduct M&E on the training Modules, materials, resource persons/facilitators and trainees as planned and revise them as necessary 4.4 Revise M&E Plan as necessary 5.1 Publicize RWSSC's mandate/mission, objectives, functions and strategies to all stakeholders 5.2 Develop logistics and administrative manuals/work plans (budget, account, human & materials resources, training advertisement and “5S”, etc) 5.3 Assign clear job description to each RWSSC staff 5.4 Deliver appropriate management training to RWSSC staff 5.5 Provide adequate enabling environment (office space, equipment stationeries and transportation, etc) for RWSSC 5.6 Collate database of trainers, trainees and trainings conducted 5.7 Disseminate centre activities to stakeholders (eg. Web page)		***Local Cost***	**Pre-conditions** The building of RWSSC is completed and the staff and budget are allocated

Project Name : Project for Enhancing the Function of RWSSC in NWRI (RWSSC Project)

Target Group : RWSSC-NWRI, Kaduna **Duration : March, 2010～November, 2013** ***PDM Ver. 2.0***

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Overall Goal			
Service Delivery of RWSS is improved in Nigeria through Capacity Development of stakeholders.	1. *The rate of functional rural water supply facilities is increased compared with the ones before the participation to the Training at RWSSC in the specific States which received the Grant Aid Project.*	1. National Statistics Office / Statistic Data at RUWASSA	
Project Purpose			
Rural Water Supply and Sanitation Centre for Capacity Development (RWSSC) is effectively operated.	1. *The evaluation result by the trainee at the end of the Proejct is increased compared with the ones at the beginning of the Project.* 2. 400 RWSS staff will attend RWSSC trainings in total *by the end of the Project.*	1. Training participants evaluation results 2. Training participants Database	*The trainees who participated to the Training at RWSSC remain working at his workplace.* *The budget for the RWSS at the specific States which receive the Grant aid Project will not be reduced compared with the one before the participation to the Training.*
Outputs			
1. Capacity Gaps of RWSSC (NWRI) and RWSS stakeholders at States, LGAs and Community levels are identified.	1.1 Capacity Assessment Reports are made in the first year of project and revised by the end of the Project. 1.2 RWSS stakeholders including ESAs share the identified capacity gaps of RWSS stakeholders.	1.1 Capacity Assessment Report 1.2 Workshop reports	Governments and other stakeholders continue to send RWSS staff for trainings.
2. Responsive and effective training system (Modules, materials, and facilities, etc) is developed.	2.1 Revised and newly developed training materials including manuals are utilised in trainings according to Training Modules and Programme by September 2010. 2.2 Facilities and equipment are maintained and arranged for trainings and training Programme.	2.1 Training Modules and Programmes、Annual Training 2.2 Action Plan, Revised /developed training materials Facilities and equipment list	
3. Trainers capacity in RWSS is enhanced.	3.1 More than 80% of trainees evaluate the trainers as "good". 3.2 RWSSC managers and JICA experts judge ToT receivers' capacity in terms of knowledge, attitude and skills are improved.	3.1 Trainees evaluation, Check list 3.2 Supervisors' evaluation, Reports of ToT Trainings, Check list, Annual Training Implementation Reports (2011, 2012, 2013),	
4. Trainings are *reviewed* based on a Plan-Do-Check-Act (PDCA) cycle.	4.1 M&E are conducted on Training activities, Modules, Programme, Materials, Facilities and Equipment arrangement, Trainers and Trainees according to the M&E plan. 4.2 Revising procedure was taken as scheduled from the 2012 year's training cycle.	4.1 M&E plan, M&E report 4.2 Annual Training Implementation Reports (2011, 2012, 2013),	
5 . Management of RWSSC is improved.	5.1 Logistics and administrative matters are conducted according to the manual/work plan by March 2013. 5.2 *More than XXXX States are informed of the contents and period of Training at RWSSC.*	5.1 Logistics and administrative manuals/work plans, Job description, Database of trainers, trainees, Questionnaire survey to the administration staff 5.2 *Questionnaire survey to the States*	

Activities	Inputs		
	Japan	Federal Republic of Nigeria	
1.1 Determine capacity assessment procedures and selection of target institutions (National, State, LGA and Community levels). 1.2 Conduct capacity assessment of sampled institutions and produce reports. 1.3 Organize stakeholders workshop to present and improve the assessment 1.4 Disseminate the reports to major stakeholders. 2.1 Formulate training strategy for RWSSC and creae RWSSC mission report. 2.2 Review and Formulate Training Programmes, Courses and Modules required as a result of the capacity assessment. 2.3 Review and revise existing training materials. 2.4 Develop training materials for the newly developed courses. 2.5 Inventorize and procure required facilities and equipment. 2.6 Produce users manuals of facilities and equipment. 2.7 Provide On-the- Job- Training (OJT) to Users on facilities and equipment handling, operation and maintenance. 3.1 Identify relevant trainers (qualification, skills, role, workload, etc). 3.2 Formulate Training of Trainers (ToT) programme. 3.3 Make ToT materials. 3.4 Implement ToT programme. 3.5 Evaluate ToT programme and its implementation. 3.6 Develop and maintain database of trainers.	***Personnel*** - Chief Advisor / Rural Water Supply / Operation Mangement - Hydrogeology / Groundwater Development - Well Drilling Technology / Drilling Machine - Well Development / Water Supply Facilities / Well Rehabilitation - Geophysical Survey / Survey Analysis - Mechanical Equipment / Operation and Maintenance - Community Mobilization/ Sanitation & Hygiene Promotion - Procurement Management ***Training*** In Japan and/or in third countries as per required ***Equipment*** - Training rig and related equipment - Well rehabilitation equipment - Geophysical prospecting equipment - Pumping test equipment - Monitoring equipment - Computers - Vehicles - Office utilities	***Personnel*** - Project Director Counterparts at working level - Project Manager - Coordinator (Handpump) - Coordinator (Groundwater) - Coordinator (Capacity Assessment) - Coordinator (Drilling) - Coordinator (Information & Doc.) - Coordinator (Altr. WS) - Coordinator (Comm. Dev.) - Coordinator (Sant. & Hyge.) Office staff - Administrative Officer - Finance Officer - Secretary/Typist - Clerical officer Technical assistant - System Analyst - Driller - Driller - Mechanic ***Facility, equipment and services*** - Project office, meeting room and necessary facilities for the Experts - Facilities and services such as supply of electric power, desks, chairs, shelves, telephone line, internet connection necessary for the Project activities - Other facilities mutually agreed on as appropriate.	

Activities	Inputs		
	Japan	Federal Republic of Nigeria	
4.1 Develop a M&E Plan for the training courses, Modules, materials, trainees and resource persons/facilitators. 4.2 Prepare and deliver trainings of stakeholders at States, LGA and Community levels. 4.3 Conduct M&E on the training Modules, materials, resource persons/facilitators and trainees as planned and revise them as necessary. 4.4 Revise M&E Plan as necessary. 5.1 Publicize RWSSC's mandate/mission, objectives, functions and strategies to all stakeholders *(including the Private sector).* 5.2 Develop logistics and administrative manuals/work plans (budget, account, human & materials resources, training advertisement and “5S”, etc). 5.3 Assign clear job description to each RWSSC staff. 5.4 Deliver appropriate management training to RWSSC staff. 5.5 Provide adequate enabling environment (office space, equipment stationeries and transportation, etc) for RWSSC. 5.6 Collate database of trainers, trainees and trainings conducted. 5.7 *Prepare the detailed annual training/activities plan every year.* 5.8 *Produce the public relation tools such as Web page, pamphlet and others.* 5.9 *Send the sensitization mission to the States, to explain the contents of the Training at RWSSC and to encourage them to secure the budget so that they can send their technical staff to the Training.* 5.10 *Propose to the Federal Ministry of Water Resources to allocate C/P funding to the Proejct.*		*Local Cost*	**Pre-conditions** The building of RWSSC is completed and the staff and budget are allocated.

Project Name : Project for Enhancing the Function of RWSSC in NWRI (RWSSC Project)

Target Group : RWSSC-NWRI, Kaduna **Duration : March, 2010～November, 2014** ***PDM Ver. 3.0***

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Overall Goal			
Service Delivery of RWSS is improved in Nigeria through Capacity Development of stakeholders.	1. The rate of functional rural water supply facilities is increased compared with the ones before the participation to the Training at RWSSC in the specific States which received the Grant Aid Project.	1. National Statistics Office / Statistic Data at RUWASSA	
Project Purpose			
Rural Water Supply and Sanitation Centre for Capacity Development (RWSSC) is effectively operated.	1. The evaluation result by the trainee at the end of the Proejct is increased compared with the ones at the beginning of the Project. 2. 350 RWSS staff will attend RWSSC trainings in total by the end of the Project.	1. Training participants evaluation results 2. Training participants Database	*The trainees who participated to the Training at RWSSC remain working at his workplace.* *The budget for the RWSS at the specific States which receive the Grant aid Project will not be reduced compared with the one before the participation to the Training.*
Outputs			
1. Capacity Gaps of RWSSC (NWRI) and RWSS stakeholders at States, LGAs and Community levels are identified.	1.1 Capacity Assessment Reports are made in the first year of project and revised by the end of the Project. 1.2 RWSS stakeholders including ESAs share the identified capacity gaps of RWSS stakeholders.	1.1 Capacity Assessment Report 1.2 Workshop reports	Governments and other stakeholders continue to send RWSS staff for trainings.
2. Responsive and effective training system (Modules, materials, and facilities, etc) is developed.	2.1 Revised and newly developed training materials including manuals are utilised in trainings according to Training Modules and Programme by September 2010. 2.2 Facilities and equipment are maintained and arranged for trainings and training Programme.	2.1 Training Modules and Programmes、Annual Training Action Plan, Revised /developed training materials 2.2 Facilities and equipment list	
3. Trainers capacity in RWSS is enhanced.	3.1 More than 80% of trainees evaluate the trainers as "good". 3.2 RWSSC managers and JICA experts judge ToT receivers' capacity in terms of knowledge, attitude and skills are improved.	3.1 Trainees evaluation, Check list 3.2 Supervisors' evaluation, Reports of ToT Trainings, Check list, Annual Training Implementation Reports (2011, 2012, 2013),	
4. Trainings are reviewed based on a Plan-Do-Check-Act (PDCA) cycle.	4.1 M&E are conducted on Training activities, Modules, Programme, Materials, Facilities and Equipment arrangement, Trainers and Trainees according to the M&E plan. 4.2 Revising procedure was taken as scheduled from the 2012 year's training cycle.	4.1 M&E plan, M&E report 4.2 Annual Training Implementation Reports (2011, 2012, 2013),	
5 . Management of RWSSC is improved.	5.1 Logistics and administrative matters are conducted according to the manual/work plan by March 2013. 5.2 More than 10 **States** are informed of the contents and period of Training at RWSSC.	5.1 Logistics and administrative manuals/work plans, Job description, Database of trainers, trainees, Questionnaire survey to the administration staff 5.2 Questionnaire survey to the States	

Activities	Inputs		
	Japan	Federal Republic of Nigeria	
1.1 Determine capacity assessment procedures and selection of target institutions (National, State, LGA and Community levels).	*Personnel*	*Personnel*	
1.2 Conduct capacity assessment of sampled institutions and produce reports.	- Chief Advisor / Rural Water Supply / Operation Mangement - Hydrogeology / Groundwater Development - Well Drilling Technology / Drilling Machine - Well Development / Water Supply Facilities / Well Rehabilitation - Geophysical Survey / Survey Analysis - Mechanical Equipment / Operation and Maintenance - Community Mobilization/ Sanitation & Hygiene Promotion - Procurement Management	- Project Director Counterparts at working level - Project Manager - Coordinator (Handpump) - Coordinator (Groundwater) - Coordinator (Capacity Assessment) - Coordinator (Drilling) - Coordinator (Information & Doc.) - Coordinator (Altr. WS) - Coordinator (Comm. Dev.) - Coordinator (Sant. & Hyge.) Office staff - Administrative Officer - Finance Officer - Secretary/Typist - Clerical officer	
1.3 Organize stakeholders workshop to present and improve the assessment			
1.4 Disseminate the reports to major stakeholders.			
2.1 Formulate training strategy for RWSSC and creae RWSSC mission report.			
2.2 Review and Formulate Training Programmes, Courses and Modules required as a result of the capacity assessment.			
2.3 Review and revise existing training materials.			
2.4 Develop training materials for the newly developed courses.	*Training*		
2.5 Inventorize and procure required facilities and equipment.	In Japan and/or in third countries as per required	Technical assistant - System Analyst - Driller - Driller - Mechanic	
2.6 Produce users manuals of facilities and equipment.			
2.7 Provide On-the- Job- Training (OJT) to Users on facilities and equipment handling, operation and maintenance.			
3.1 Identify relevant trainers (qualification, skills, role, workload, etc).	*Equipment*	*Facility, equipment and services*	
3.2 Formulate Training of Trainers (ToT) programme.	- Training rig and related equipment - Well rehabilitation equipment - Geophysical prospecting equipment - Pumping test equipment - Monitoring equipment - Computers - Vehicles - Office utilities	- Project office, meeting room and necessary facilities for the Experts inlcuding those in Federeal Capital Territory to be used after third year of the Project - Facilities and services such as supply of electric power, desks, chairs, shelves, telephone line, internet connection necessary for the Project activities inlcuding those in Federeal Capital Territory to be used after third year of the Project - Other facilities mutually agreed on as appropriate.	
3.3 Make ToT materials.			
3.4 Implement ToT programme.(Course 1-4 until the end of Project, Course 4 -9 for the first two years of Project)			
3.5 Evaluate ToT programme and its implementation.(Course 1-4 until the end of Project, Course 4 -9 for the first two years of Project)			
3.6 Develop and maintain database of trainers.			

Activities	Inputs		
	Japan	Federal Republic of Nigeria	
4.1 Develop a M&E Plan for the training courses, Modules, materials, trainees and resource persons/facilitators. .(Course 1-4 until the end of Project, Course 4 -9 for the first two years of Project)			
4.2 Prepare and deliver trainings of stakeholders at States, LGA and Community levels.(Course 1-4 until the end of Project, Course 4 -9 for the first two years of Project)		*Local Cost*	
4.3 Conduct M&E on the training Modules, materials, resource persons/facilitators and trainees as planned and revise them as necessary. (Course 1-4 until the end of Project, Course 4 -9 for the first two years of Project)			
4.4 Revise M&E Plan as necessary.(Course 1-4 until the end of Project, Course 4 -9 for the first two years of Project)			
5.1 Publicize RWSSC's mandate/mission, objectives, functions and strategies to all stakeholders (including the Private sector) for first two years of Project.			**Pre-conditions**
5.2 Develop logistics and administrative manuals/work plans (budget, account, human & materials resources, training advertisement and “5S”, etc) for first two years of Project..			The building of RWSSC is completed and the staff and budget are allocated.
5.3 Assign clear job description to each RWSSC staff for first two years of Project..			
5.4 Deliver appropriate management training to RWSSC staff for first two years of			
5.5 Provide adequate enabling environment (office space, equipment stationeries and transportation, etc) for RWSSC for first two years of Project..			
5.6 Collate database of trainers, trainees and trainings conducted.			
5.7 Propose to the Federal Ministry of Water Resources to allocate C/P funding to the Project.			

2. Project Inputs

2.1. Input from Japanese Side

a. Japanese Experts Dispatch Schedule

b. Certificate of Handover

c. Financial Support for Local Expense

2.2. Input from Nigerian Side(List of C/P Personnel)

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2.1. Input from Japanese Side
a. Japanese Experts Dispatch Schedule

Expert Dispatch Scheule (1st year)

	Expert	Name	Modification	JFY 2010 3	4	5	6	7	8	9	10	11	12	1	2	3	M/M Nigeria	M/M Japan
Nigeria	Chief Advisor/Rural Water Supply/ Organization and Project Management	Kenji YOSHIDA	None		37		38					30			48		5.10	
	Sub-team leder／Hydrogeology／ Groundwater Development	Nobuyuki IIJIMA	None		45					60					63		5.60	
	Drilling Technology	Yoshimi HIDA/ Yasuo ONOZUKA	Plan				60								30		3.00	
			Actual				18			42		19			30		3.00	
	Borehole Rehabilitation and Maintenance	Koji TAKAHASHI	None				60								30		3.00	
	Geophysical Exploration／Analysis	Tsugio ISHIKAWA	None				60								30		3.00	
	Drilling Machinery Maintenance	Hiroaki OKADA	None				60								30		3.00	
	Rural development／Community Mobilization and Sanitation	Megumi KANEDA	None							60					30		3.00	
	Procurement Supervision and Plan	Testuo YATSU	Plan						51								1.70	
			Actual										30				1.00	
																	26.70	
Japan	Chief Advisor/Rural Water Supply/ Organization and Project Management	Kenji YOSHIDA	None													3		0.10
	Sub-team leder／Hydrogeology／ Groundwater Development	Nobuyuki IIJIMA	None	3												3		0.20
	Drilling Technology	Yoshimi HIDA/ Yasuo ONOZUKA	None															0.00
	Borehole Rehabilitation and Maintenance	*****	None															0.00
	Geophysical Exploration／Analysis	*****	None															0.00
	Drilling Machinery Maintenance	*****	None															0.00
	Rural development／Community Mobilization and Sanitation	*****	None															0.00
	Procurement Supervision and Plan	*****	None															0.00
																		0.30
	Submission schedule	Report				△ IC/R												
		Progress report									①					②		
		1st year completion report														①		
Total M/M																	26.70	0.30
																	27.00	

: Nigeria　　IC/R: Inception report

: Japan

: Consultant own cost

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Expert Dispach Schedule (2nd year)

	Expert	Name	Modification	JFY 2011 3	4	5	6	7	8	9	10	11	12	1	2	3	M/M Nigeria	Japan
Nigeria	Chief Advisor/Rural Water Supply/ Organization and Project Management	Kenji YOSHIDA	Plan					36		45		48			51		6.00	
			Actual					36		45		42			65		6.27	
	Sub-team leder／Hydrogeology／ Groundwater Development	Nobuyuki IIJIMA	Plan							45					45		3.00	
			Actual							45							1.50	
	Drilling Technology	*****	None														0.00	
	Borehole Rehabilitation and Maintenance	Koji TAKAHASHI	Plan					30									1.00	
			Actual					34									1.13	
	Geophysical Exploration／Analysis	Tsugio ISHIKAWA	None							30							1.00	
	Drilling Machinery Maintenance	*****	None														0.00	
	Rural development／Community Mobilization and Sanitation	Megumi KANEDA	None									30					1.00	
	Publicity Work	Hisashi Oura	Plan							45							1.50	
			Actual							41							1.37	
	Procurement Supervision and Plan	*****	None														0.00	
																	12.27	
Japan	Chief Advisor/Rural Water Supply/ Organization and Project Management	Kenji YOSHIDA	None															0.00
	Sub-team leder／Hydrogeology／ Groundwater Development	Nobuyuki IIJIMA	None															0.00
	Drilling Technology	*****	None															0.00
	Borehole Rehabilitation and Maintenance	*****	None															0.00
	Geophysical Exploration／ Analysis	*****	None															0.00
	Drilling Machinery Maintenance	*****	None															0.00
	Rural development／Community Mobilization and Sanitation	*****	None															0.00
	Procurement Supervision and Plan	*****	None															0.00
																		0.00
	Submission Scheule	Report										△ IC/R						
		Progress report										③				④		
		Completin report														②		
Total M/M																	12.27	0.00
																		12.27

: Nigeria　　IT/R: Interim report

: Japan

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Expert Dispatch Schedule (3rd year)

	Expert	Name	Modification	2013 1	2	3	4	5	6	7	8	9	10	11	12	Total Nigeria	Total Japan
Nigera	Chief Advisor/ Rural Water Supply/ Organization and Project Management	Kenji YOSHIDA	None		45		60			60				45		7.00	
	Hydrogeology／Groundwater Development	*****	None														
	Drilling Technology	Takashi NAMEKAWA	Plan				45			45						3.00	
			Actual				27									0.90	
	Borehole Rehabilitation and Maintenance	*****	None														
	Geophysical Exploration／Analysis	Tugio IAHIKAWA	None				46						29			2.50	
	Drilling Machinery Maintenance	Minoru MURATA	None							45						1.50	
	Rural development／Community Mobilization and Sanitation	*****	None														
	Publicity Work	*****	None														
	Procurement Supervision and Plan	*****	None														
																11.90	
Japan	Chief Advisor/ Rural Water Supply/ Organization and Project Management	Kenji YOSHIDA	None														0.00
	Hydrogeology／Groundwater Development	*****	None														0.00
	Drilling Technology	Takashi NAMEKAWA	None														0.00
	Borehole Rehabilitation and Maintenance	*****	None														0.00
	Geophysical Exploration／Analysis	*****	None														0.00
	Drilling Machinery Maintenance	*****	None														0.00
	Rural development／Community Mobilization and Sanitation	*****	None														0.00
	Procurement Supervision and Plan	*****	None														0.00
																	0.00
	Submission Schedule	3rd year implementation plan		△													
		Progress report									⑤			⑥			
		3rd year Completion Report												③			
Total M/M																11.90	0.00
																11.90	

:In Nigeria

:In Japan

Expert Dispatch Schedule (4th year)

	Expert	Name		2014												Total	
				1	2	3	4	5	6	7	8	9	10	11	12	Nigeria	Japan
Nigeria	Chief Advisor/ Rural Water Supply/ Organization and Project Management	Kenji YOSHIDA	None		60		30			45		45		30		7.00	
	Hydrogeology／Groundwater Development	Nobuyuki IIJIMA	None									30				1.00	
	Drilling Technology	*****	None														
	Borehole Rehabilitation and Maintenance	*****	None														
	Geophysical Exploration／Analysis	*****	None														
	Drilling Machinery Maintenance	*****	None														
	Rural development／Community Mobilization and Sanitation	*****	None														
	Publicity Works	Hisashi OURA	Plan							30				45		2.50	
			Actual							30						1.00	
	Procurement Supervision and Plan	*****	None														
																9.00	
Japan	Chief Advisor/ Rural Water Supply/ Organization and Project Management	Kenji YOSHIDA	None											□ 4			0.20
	Hydrogeology／Groundwater Development	Nobuyuki IIJIMA	None														0.00
	Drilling Technology	*****	None														0.00
	Borehole Rehabilitation and Maintenance	*****	None														0.00
	Geophysical Exploration／Analysis	*****	None														0.00
	Drilling Machinery Maintenance	*****	None														0.00
	Rural development／Community Mobilization and Sanitation	*****	None														0.00
	Publicity Works	*****	None														0.00
	Procurement Supervision and Plan	*****	None														0.00
																	0.20
	Submission Schedule	4th year Implementation Plan		△													
		4th Year Completion Report													④		
		Project Completion Report													△		
Total M/M																9.00	0.20
																9.20	

: In Nigeria

: In Japan

CERTIFICATE OF HANDOVER

PROJECT TITLE:

Project for enhancing the function of Rural Water Supply and Sanitation Center for Capacity Development in National Water Resources Institute (RWSSC) in the Federal Republic of Nigeria

This is to confirm that the equipment in the attached list for above mentioned project has been handed over properly to Project Manager, RWSSC Kaduna during the project period.

Kenji Yoshida
Chief Advisor
RWSSC Project, JICA

Dr. Martin Eduvie
Project Manager,
RWSSC, Kaduna

5th November, 2014, Abuja

List of items to handed over to RWSSC

Item	Spec	Procured date	QTY
Training Equipment			
Drilling Rig	FSW-71-L	February, 2013	1 Set
Drilling Tools	See attached sheets for detals	February, 2013	1 Lot
Drilling Consumable	Drag Bit, Tricon Bit, Down the Hole Hammer	February, 2013	1 Lot
Air Compressor	PDS-J750S	February, 2013	1 Set
Cargo Truck	TM-ZE503MH	February, 2013	1 Set
Water Tank Truck	CYZ61K	February, 2013	1 Set
Spare Parts for Trucks	See attached sheets for detals	February, 2013	1 Lot
Well Delveloping Tools	Air Lift Pipe, Air Swivel, Jet Nozzle	February, 2013	1 Set
Fishing Tools	Taps and Chain Block	February, 2013	1 Set
Pumping Test Equipment	Submersible pump, Generator, Water Level Meter, Water Quality Meter	February, 2013	1 Set
Borehole Camera System	Rcam-1000	February, 2013	1 Set
Geophysical Survey Equipment (Resisitivity)	McOHM-EL	February, 2013	1 Set
Geophysical Survey Equipment (Electro magnetic)Resisitivity)	PROTEM 47	February, 2013	1 Set
Computer Software	Aquifer Test and Visual Modflow	February, 2013	1 Set
Office Equipment and Project Vehicle			
Note Book Computer	HP 620	September. 2011	5 Sets
Copy Machine	Sharp AR5516	May, 2010	1 Pc
Portable Printer	HP Office Jet 7000	May, 2010	1 Pc
Project Vehicle	MISTUBISHI Pajero (No. 25P-09FG)	September. 2011	1 Set

All items are transferred to Rural Water Suppy and Sanitation Centre for Capacity Development (RWSSC), Kaduna and to be managed by Dr. Martin Eduvie (08036400061), Project Manager

1st shipment

No.	Equipment Name	Specifications, Model	Manufacturer	Q'TY	UNIT PRICE (FOB)	TOTAL PRICE (FOB)
6	Water Tank	[Model] NK-4 Assembling Tank (Square Type)	National Marine Plastic	1	292,500	292,500
7-1	Borehole Camera System	[Model] Rcam-1000 DUALCAM Borehole camera system 1 set	LAVAL Underground Surveys	1	2,100,000	2,100,000
		(Consiting of)				
		lower shaft direction/side direction 360 degree rotational camera (with LED illumination) (1 set)				
		Portable 12VDC Elsotric driven reel (with 300m cable reel) (1 set)				
		Pulley support wagon with arm				
		Camera copntrol unit (1 set)				
		Finch LCD color monitor (1 set)				
		12VDCPortable DVD recorder for recording (1 set)				
		12VDC portable battery pack and charger (1 set)				
		Connection cable (1 set)				
		Standard accessories :				
		English operation manual (1 copy)				
		Special accessories :				
		Auxiliary lighting head (for borehole inside diameter 16~20")		1	115,500	115,500
		Centering band		1	34,600	34,600
		Spares • consumables :				
		Cable head repair kit		1	69,300	69,300
		External battery pack		1	115,500	115,500
		Monitor		1	31,500	31,500
		Winch motor		1	26,000	26,000
7-2	Fishing Tool for Well Pump					
7-2-1	Fishing tools	[Model] Drill rod collecting tap	KOKEN			
		[Consisting of]				
		Inside tap, Air lift pipe, for BQ pipe		1	80,600	80,600
		Outside tap, Air lift pipe, for BQ pipe		1	68,200	68,200
7-2-2	Chain block	[Model] VL.-5 (1.5t, 6m)	KOKEN			
		[Consisting of]				
		LV-5 Chain block, 1.5 ton, 6m length		1	68,200	68,200
		VK-20 Tripod head, 2 ton capacity		1	19,900	19,900
		Steel pipe, 70A, 3pcs/set, 5.5m		1	12,600	12,600

(1/10)

8-1	Electrical Exploration	[Model] McOHM-EL Resistivity Meter	OYO CORPORATION			
	Instrument	[Consisting of]				
		2119E McOHM-EL Resistivity Meter with carrying bag		1	2,992,500	2,992,500
		02999-0502 Cable with Reel(400m, black color)		1	110,200	110,200
		2510 Current electrode AB-1		4	39,300	157,200
		02917-0501 Power Booster for McOHM-EL		1	871,500	871,500
		02999-0501 Cable with Reel(400m, red color)		1	110,200	110,200
		02999-0507 Cable with Reel(200m, blue color)		1	81,900	81,900
		02999-0506 Cable with Reel(200m, green color)		1	81,900	81,900
		1167 Battery pack with carrying bag 12V 24Ah		1	60,900	60,900
		3895 Power winch w/ cable 310m (w/battery)		1	1,496,200	1,496,200
		3819 Sheave		1	427,300	427,300
		3951 Surface electrode stick, 2pcs w/vinyl		1	46,200	46,200
		02510-0504 Surface electrode stick		2	39,300	78,600
		3174 Resistivity-SP probe (25,50,100cm)		1	367,500	367,500
		3973 Caliper prove		1	458,800	458,800
		3671 Temperature probe		1	220,500	220,500
		3978 Weight for probe		1	47,200	47,200
		3829 Well head stand		1	277,200	277,200
		Standard accessories				
		English operation manual (1 copy)				
		Special accessories :				
		Battery charger 220VAC		1	49,300	49,300
		Measuring tape, 100m length		10	21,000	210,000
		18984-1111 Recording paper, thermal		10	1,900	19,000
		Tester and Tools Set		1	31,500	31,500
		18626-2130 Hammer, 1.1kg		4	3,900	15,600
		17214-0031 Winsev for interpretation software		1	341,200	341,200
8-2	Electro Magnetic	[Model] Time area EM Detecting device(TDEM)	Geonics			
	Exploration Instrument	[Consisting of]				
		PROTEM Receiver		1	9,090,000	9,090,000
		TEM47 Transmitter		1	1,900,000	1,900,000
		high frequency coil		1	1,974,000	1,974,000
		40x40m transmission loop		1	1,365,000	1,365,000
		100x100m transmission loop		1	525,000	525,000
		Analytical software		1	535,500	535,500
		12VDC battery (a set of 2 pcs)		1	48,300	48,300
		Battery charger (a set of 2 pcs)		1	57,700	57,700
		Lap top computor		1	210,000	210,000
		Standard accessories :				
		English operation manualo (1 set)				

9-1	Submersible Pump	[Model] OPD4-32-0.75-14(2GS)	OKAMOTO			
		[Consisting of]				
		OPD4-32-0.75-14(2GS)		1	148,000	148,000
		Ground section SS32A screw-in type (with bolts, nuts, linings, connecting flange)		1	89,200	89,200
		Delivery bend pipe, air purge valve, compound gauge, sluice valve, check valve)				
		Column pipe SGP(white)32A x 2750mm Screw-in type (set of 26 pcs)		1	155,600	155,600
		Underwater cable 2.0mm2 x 80m		1	23,500	23,500
		Low water level electrodes cable for clear water		1	26,100	26,100
		(VCT-F 2C x 0.5mm2)with 80m (2 pcs)				
		CLF1-V Control panel Outdoor frame type, self-standing		1	173,200	173,200
		Leakage circuit breaker well or receiving tank electrode				
		Standard accessories :				
		English operation manual (1 copy)				
		Special accessories :				
		Cable band for 32A (1 set of 52pcs)		1	24,100	24,100
		Flor meter 32A Screw-in type Dry type water meter		1	47,200	47,200
		Delivery short pipe 32A x 1m(incl. Hose nipple)		1	15,700	15,700
		Sunny hose 32A x 10m(with hose nip)		1	5,200	5,200
		Spare・consumables :				
		Impeller		7	3,100	21,700
		Diffuser		7	6,300	44,100
		Bearing		1	10,500	10,500
9-2	Generator	[Model] TLG-7.5LSK Sound proof Diesel Generator	DENYO	1	609,000	609,000
		Standard Accessories :				
		English operation manual (1 copy)				
		Spare・Consumables :				
		15853-32430 Oil filter		1	1,500	1,500
		17021-43580 Fuel filter		1	800	800
		0602046391-2 Air filter		1	4,900	4,900
		19705-72530 Fan belt		1	1,400	1,400
9-3	Triangular Weir	[Model] Triangular weir(W600×L900×H600mm, SS+SUS valve 2 pcs supplied)	OKAMOTO	1	286,600	286,600
		[Consisting of]				
		V-notch(Triangular weir) JIS Standard angle90°				
		Weir: Stainless steel made、Box: steel made、W600×L900XH600mm、				
		with 2 pcs of valve				
		Standard accessories :				
		Japanese operation manual (1 copy)				
		Type ' Throw in type(analogue)				

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9-4	Water Level Meter	【Model】 RWL-100M Million water level meter 100m	YAMAYO			
		[Consisting of]				
		RWL100N Million water level meter 100m		1	44,100	44,100
		Standard accessories :				
		English operation manual (1 copy)				
9-5	Water Quality Analyzer	【Model】 WQC-24 Portable multipupose water quality meter	DKK TOA			
		[Consisting of]				
		WQC-24 Portable multi pupose water quantity meter		1	286,600	286,600
		(Meter main body : standard sensor module set)				
		Standard accessories :				
		Dry battery AA type (5 pcs)				
		pH6.86 reference solution,600mL (1 bottle)				
		pH4.01 reference solution,500mL (1 bottle)				
		Comparison electrode gel internal solution ,50mL (1 bottle)				
		Liquid junction for pH replacement (1set)				
		Diaphragm set for DO electrode (2 pcs)				
		Electrolyte for DO electrode 50mL (1 bottle)				
		Dedictated tool (spanner, screw driver') (1 set)				
		Calibration vessel (2 pcs)				
		Silicon grease (1 bottle)				
		Soft case(with Shoulder belt) (1 pc)				
		Connection cable (1 pc)				
		English/Japanese operation manual (1 copy each)				
		English/Japanese performance test sheet (1 copy each)				
		Special accessories :				
		143F193 Borate pH buffer pH9.18(500mL)		1	1,000	1,000
		Spare・consumables :				
		143F060 powder reagent pH4.01for pH standard solution (for preparation 500mL 5 bags)		4	1,400	5,600
		143F061 powder reagent pH6.86 for pH standard solution (for preparation 500mL 5 bags)		4	1,400	5,600
		143F062 Powder reagent pH9.18 for pH standard solution (500mL for preparation g bags)		4	1,400	5,600
		143F235 Comparison electrode gel inside solution ,50mL		4	700	2,800
		ELP-023 Glass electrode tip' (pH)		2	8,800	17,600
		ELR-001 Comparison electrode		1	22,000	22,000
		6784580K Liquid conjunction Ass' y		1	1,400	1,400
		6788790K DO Diaphragm set(2 pcs)		4	4,400	17,600
		0BG00007 DO Electrolyte R-9 50mL(3 bottles)		2	2,200	4,400
		143A030 Sodium, fulfite(50g)		6	700	4,200

10-1	Aquifer Test Analysis	[Model] AquiferTest Pro	Schlumberger			
	Software		Water Services			
		[Consisting of]				
		AquiferTest Pro		1	218,400	218,400
		Standard accessories :				
		English operation manual (1 copy)				
10-2	Groundwater Analysis	[Model] Visual MODFLOW premium	Schlumberger			
	Software		Water Services			
		[Consisting of]				
		Visual MODFLOW premium		1	669,900	669,900
		Special accessories :				
		English operation manual (Printed)		1	5,200	5,200
		Japanese operation manual (CD-ROM)		1	5,200	5,200
SUB TOTAL						30,300,000

		1st shipment equipment total cost (FOB JAPAN)				30,300,000
		Freightage		1	4,200,000	4,200,000
		First time delivery total cost (C&F)				34,500,000

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2nd shipment

No.	Equipment Name	Specifications, Model	Manufacturer	Q'TY	UNIT PRICE (FOB)	TOTAL PRICE (FOB)
1	Drilling rig system					
	Drilling Rig System					
1-1	Drilling Rig System	【Model】 FSW-7T-L Well drilling rig	KOKEN			
		[Components]				
		(Break down)				
		FSW-7T-L Main unit		1	35,500,000	35,500,000
		Spare parts for rig main unit		1	2414000	2,414,000
		(approx. 6.8% of item 1-1Drilling roig system price)				
		and spare parts for vehicle section		1	426000	426,000
		(approx. 1.2% of item 1-1 Drilling rig system price)				
		Standard accessories :				
		Operation manual (English 1 set)				
		Maintenance manual (English 1 set)				
		Parts catalog (English 1 set)				
		Repair tool kit (1 set)				
		Spare tyre (1 pc)				
1-2	Drilling tools					
	Drilling Tools					
1-2-1	Operating Accessories	【Model】 Disassembling special tools for Drilling machine and pump 1 set	KOKEN			
	for Drilling Rig	[Components]				
		1) Disassembling special tools for drilling machine and pump		1	232,800	232,800
		2) Built-in type air/water swivel (built-in main body)		1	86,100	86,100
		3) Drive spindle sub with damper for 4-3/4" dril pipe		1	70,800	70,800
		4) Hoisting swibvel for drilling pipe		1	84,800	84,800
		5) lifting lag for dril color		1	21,500	21,500
		6) High pressure swivel hose with metal band : 50mm x 5.7m		1	26,500	26,500
		7) high pressure middle hose with fittings : 50mm x 1.3m		1	109,500	109,500
		8) High pressure mixer hose		1	172,600	172,600
		9) Suction hose with quick coupling		1	83,000	83,000
		10) Foot valve with fittings : 100mm		1	16,300	16,300
		11) Hoisting wire rope with safety clevis : 14mm x 50m		1	75,200	75,200
		12) Sand line wire rope with safety clevis : 9mm x 260m		1	103,800	103,800
		13) Hanger assembly for drilling pipe		1	26,200	26,200
		14) Single sieve travelling block 10ts withstand load		1	259,200	259,200
		15) Break out tongue for drilling pipe		1	231,800	231,800
		16) Break out tongue for 4-3/4" drilling collar		1	196,700	196,700
		17) Back up wrench for drilling pipe		1	38,400	38,400
		18) Back up wrench for 4-3/4" drilling collar		1	38,400	38,400
		19) Jet hopper type mud mixer with 50mm hose connection		1	171,400	171,400
		20) Suction filter for injection pump		1	3,400	3,400
		21) Drilling pipe trolley		1	309,800	309,800
		22) Dust collector		1	163,300	163,300

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1-2-2	Drilling Strings	[Model] Drilling pipe, 4-3/4" O.D. x 3-1/2" IF x 6m and others 1set	KOKEN			
		[Components]				
		Drilling pipe, 4-3/4" O.D. x 3-1/2" IF x 6m		20	140,000	2,800,000
		Drilling pipe, 4-3/4" O.D. x 3-1/2" IF x 3m		2	941,400	1,882,800
		Drilling collar, 4-3/4" O.D. x 3-1/2" IF x 6m		3	305,700	917,100
		Bit sub, 3-1/2" REG (B) x 3-1/2" IF (B)		3	46,000	138,000
		Bit sub, 6-5/8" REG (B) x 3-1/2" IF (B)		3	78,900	236,700
		Stabilizer, 10-5/8" x 3-1/2" IF x 1m		4	167,600	670,400
		Stabilizer, 6-1/4" x 3-1/2" IF x 1m		4	143,700	574,800
1-2-3	Down the Hole Hammer	[Model] Hammer disassembling tools and others 1 set	KOKEN			
	Tools	[Components]				
		Disassembling tools and cutting wrench		1	326,500	326,500
		Pneumatic grinder with 10 pcs of grinding cup		1	192,400	192,400
		High pressure air hose with 50mm x 20m fitting		1	40,700	40,700
		3-1/2" REG (B) x 3-1/2" IF (B) ハマーヂク'		1	46,000	46,000
1-2-4	Casing Handling Tool	[Model] Casing elevator for PVC 4" casing and others 1 set	KOKEN			
		[Components]				
		1) Casing elevator for PVC4" casing		1	27,100	27,100
		2) Elevator link, withstand load 19.6kN (2000kg)		1	116,200	116,200
		3) Casing band, for PVC4"		1	52,300	52,300
		4) Work casing, F.J type, STPG8" x 5.5m		6	202,000	1,212,000
		5) Work casing FJ type, STPG8" x 3.0m		2	120,400	240,800
		6) Work casing, F.J type, STPG8" x 2.0m		1	57,000	57,000
		7) Casing band, for 8" work casing		1	169,200	169,200
		8) Casing swivel, 8" x 3-1/2" IF (B)		1	74,600	74,600
		9) Casing head, for 8" work casing		1	17,400	17,400
		10) Casing metal shoe, for 8" work casing		1	24,600	24,600
1-2-5	Well Developing Tools	[Model] Air lift pipe with BQ x 3m screw and others 1 set	KOKEN			
		[Components]				
		1) Air lift pipe with BQ x 3m screw		34	1,800	61,200
		2) BQ x 3-1/2" IF coupling		2	45,900	91,800
		3) BQ Holsting plug		1	63,200	63,200
		4) BQ pipe holder		1	53,200	53,200
		5) Air swivel with BQ pipe joint		1	144,200	144,200
		6) Air lift manifold (for 4" PVC casing mounting)		1	82,100	82,100
		7) Dirt valve bailer 6 m for 4" casing		1	144,700	144,700
		8) BQ jet nozzle		1	132,500	132,500
		9) Air hose 1" x 10m for compressor		1	2,200	2,200

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1-2-6	Miscellaneous	[Model] Bit breaker for 10-5/8" tri-cone bit and others 1 set	KOKEN			
	Drilling Tools	[Components]				
		1) Bit breaker for 10-5/8" tri-cone bit		1	76,000	76,000
		2) Bit breaker for 6-1/4" tri-cone bit		1	28,400	28,400
		3) Inside tap for drilling pipe		1	89,000	89,000
		4) Outside tap for drilling pipe		1	75,600	75,600
		5) Drilling pipe pulling band		1	143,800	143,800
		6) 25tx2 Hydraulic jack assembly with hydraulic jack anvil		1	167,800	167,800
		7) Funnel type viscosimeter for mud viscosity measurement		1	36,400	36,400
		8) Mud balance for mud specific gravity		1	91,600	91,600
		9) 1200mm pipe wrench		2	27,700	55,400
		10) 900mm pipe wrench		2	19,300	38,600
		11) 600mm pipe wrench		2	8,700	17,400
		12) 460mm pipe wrench		2	5,500	11,000
		13) ST-2 Super tongue		2	13,700	27,400
		14) ST-3 Super tongue		2	38,500	77,000
		15) 6.3kg Sledge hammer		1	9,800	9,800
		16) Round shavel		2	1,800	3,600
		17) Square shavel		2	1,900	3,800
		18) 3.6x5.4m Vinyl sheet		3	1,800	5,400
		19) Screen for gravel classifying		2	29,000	58,000
		20) Slinging wire diameter 12mmx length 6m		2	2,200	4,400
		21 Slinging wire diameter 12mm x length 3m		2	1,400	2,800
		22) Slinging wire, diameter 12 mm x length 1.5 m		2	1,000	2,000
		23) SC6N shackle		5	200	1,000
		24) SC16N shackle		5	600	3,000
		25) SC20N Shackle		5	800	4,000
		26) Wire brush		2	100	200
		27) 200g plastic hammer		2	1,200	2,400
		28) 150mm taper pin punch set		1	1,700	1,700
		29) 250mm file set, round, flat, flat-round		2	2,200	4,400
		30) 200mm flat, crossout chisel		2	1,100	2,200
		31) Metal saw with spare blade		1	2,200	2,200
		32) Pick with handle		5	2,700	13,500
		33) Ax with handle		2	9,800	19,600
		34) Engineers mobile tool kit		1	38,400	38,400
		35) 5t Chain block		1	75,100	75,100
		36) 2L oil jug		2	800	1,600
		37) 80cc jet oiler		3	100	300
		38) Wire cutter for 10 mm thick wire		2	1,700	3,400
		39) 900mm Bar		2	2,100	4,200
		40) Manila rope diameter 18mm x length 30m		2	6,800	13,600

1-2-7	Equipment	【Model】 Centrifugal pump, dengine driven, displacement : 600L/min,	KOKEN			
	for Drilling Works	With standard accessories and others 1 set				
		[Components]				
		1) Centrifugal pump, Engine driven, Displacement : 600L/min,		1	156,400	156,400
		With standard accessories				
		2) Drum pump, manual operated, 1L/rotation		1	900	900
		3) Drum stand, size : 580 x 440 x 680mm		1	23,300	23,300
		4) Drum tap, Length : 50mm		1	8,800	8,800
		5) Oil meter, Capacity : 2L		1	700	700
		6)Oil meter, capacity : 4L		1	900	900
		7) Fuel can, capacity : 20L, Plastic made		1	1,700	1,700
		8) Grease injector, Capacity : 600cc		1	3,400	3,400
		9) Micro hose for grease injector , length : 300mm		1	1,700	1,700
		10) Power cord reel, Rated capacity : 15A, length : 20m		1	23,300	23,300
		11) Digital multi tester		1	4,300	4,300
		12) Cable for battery charging, Rated capacity : 100A x 400mm		1	4,600	4,600
		13) Booster cable, Rated capacity : 200A, length : 2m		1	16,000	16,000
		14) Booster hydrometer set		1	10,600	10,600
		15) Battery filler, 4L		1	2,700	2,700
		16) Polyethylene made funnel, diameter 175mm		1	500	500
		17) Silicon quick charger		1	118,200	118,200
		18) Crimped terminal kit, range : 1.25~5.5mm2		1	6,300	6,300
		19) Switch box assembly, Assembling type, with breaker and terminal base		1	112,000	112,000
		20) Cabtyre cable, 5.5mm2 x 2 core x 60m		1	38,600	38,600
		21) Floodlight projector, capacity : 200W		1	2,900	2,900
		22) Spare lamp, capacity : 200W		2	1,200	2,400
		23) Wheel barrow unicycle		1	8,400	8,400
		24) Concrete preparation plate, length : 900mm x width 1800mm		1	2,900	2,900
		25) Scaffold member, wood board 4.0m x 0.24m x 30mm		5	7,300	36,500
		26) waterproof sheet, 3.8 x 5.4m		10	3,400	34,000
		27) Saw for woodwork		1	1,000	1,000
		28) Metal trowel for concrete, morter		1	2,400	2,400
		29) Iron made bench		1	4,000	4,000
		30) Manila rope, diameter : 9mm x length : 100m		1	5,500	5,500
		31) Large hammer, Wood made		1	2,600	2,600
		32) Large hammer steel made		1	3,500	3,500
		33) High speed cutter, 110mm		1	57,300	57,300
		34) Spare blade, diameter 405mm		5	600	3,000
		35) Welder/generator (with standard accessories)		1	713,300	713,300

1-3	Drilling Consumables					
1-3-1	Drag bit and three	[Model] Drag bit, for surface drilling, 10-5/8" x6-5/8" REG (P)	KOKEN			
	cutter roller bit	and others 1 set				
		[Components]				
		Drag bit for surface drilling, 10-5/8" x6-5/8" REG (P)		1	179,500	179,500
		Tri-cone bit (S type) , for drilling viscose, sandy soil, soft rock,		4	231,600	926,400
		10-5/8" x6-5/8" REG (P)				
		Tri-cone bit (MS type) , for drilling sandy soil, soft rock		3	231,000	693,000
		10-5/8" x6-5/8" REG (P)				
		Tri-cone bit (S type) , for drilling sandy soil, soft rock		4	106,400	425,600
		6-1/4" x3-1/2" REG (P)				
		Tri-cone bit (MS type) , for drilling sandy soil, soft rok		3	100,400	301,200
		6-1/4" x3-1/2" REG (P)				
1-3-2	Down the Hole Hammer	[Model] Down the hole hammer for 6" hole and others 1 set	KOKEN			
	and Bit	[Components]				
		1) Down the hole hammer for 6" hole (1 pc)		1	246,100	246,100
		2) 6-1/4" hammber bit (9 pcs)		9	74,600	671,400
SUB TOTAL						57,525,000

		Second time delivery equipment costs total (FOB JAPAN)				57,525,000
		Freightage		1	6,420,000	6,420,000
		Second time delivery total cost				63,945,000

2nd Contract

No.	Equipment Name	Specifications, Model	Manufacturer	Q'TY	UNIT PRICE (FOB)	TOTAL PRICE (FOB)
1	High Pressure					
	Air Compressor					
		[Model] PDSJ750S-4B2 portable screw compressor	Hokuetsu			
		[Components]				
		Consisting of				
		PDSJ750S-4B2 Main unit		1	11,200,000	11,200,000
		Spare parts (2years) set		1	1,120,000	1,120,000
		Standard accessories :				
		English Instruction Manual (1 set)				
2	Vehicle (Truck)	[Model] CYZ51Q Truck	KOKEN			
		[Components]				
		Consisting of				
		CYZ51Q Main unit		1	10,400,000	10,400,000
		Spare Parts (10% of Main unit price)		1	1,040,000	1,040,000
		Standard accessories :				
		English Instruction Manual (1 set)				
		English Maintenance Manual (1 set)				
		English Parts List (1 set)				
3	Vehicle	[Model] CYZ51K Water Tank Truck	KOKEN			
	(Water Tank Truck)	[Components]				
		Consisting of				
		CYZ51K Main unit		1	12,900,000	12,900,000
		Spare Parts (10% of Main unit price)		1	1,290,000	1,290,000
		Standard accessories :				
		English Instruction Manual (1 set)				
		English Parts List (1 set)				
		English Maintenance Manual (1 set)				

4	Vehicle	[Model] CYZ510LX + YM-ZE503MH Cargo Truck with Crane	KOKEN			
	(Cargo Truck	[Components]				
	with Crane)	Consisting of				
		CYZ510LX + YM-ZE503MH Main unit		1	13,000,000	13,000,000
		Spare Parts (10% of Main unit price)		1	1,300,000	1,300,000
		Standard accessories :				
		English Instruction Manual (1 set)				
		English Maintenance Manual (1 set)				
		English Parts List (1 set)				
SUB TOTAL						52,250,000

		Delivery equipment costs total (FOB JAPAN)				52,250,000
		Freightage		1	9,600,000	9,600,000
		Delivery total cost				61,850,000

SPARE PARTS LIST:

Item	Item of the Equipment		Q'ty	Unit Price	Amount
SPARE PARTS for 1&2			**1**		**2,160,000**
1)	PLUG; GLOW	1825130431	6	1,800	10,800
2)	GASKET; STRAINE	1096230570	2	120	240
3)	PLUG; OIL DRAIN	9096620120	1	360	360
4)	THERMOSTAT	1137700891	2	5,000	10,000
5)	BELT; COOLING F	1136714631	1	4,000	4,000
6)	NOZZLE ASM; INJ	8976034156	6	28,000	168,000
7)	ELEMENT KIT; FU	1878109760	2	1,320	2,640
8)	ELEMENT; OIL FI	1132402330	2	1,200	2,400
9)	ELEMENT; OIL FI	1132402410	2	2,880	5,760
10)	FILTER; ACL,INN	1142152170	1	4,900	4,900
11)	FILTER; AIR CLE	1142152030	1	9,800	9,800
12)	CARTRIDGE KIT;	8981232560	2	4,800	9,600
13)	DISC; CLUTCH	1312408760	1	27,800	27,800
14)	SHOE; BRK,FRT	1471703160	2	23,000	46,000
15)	SHOE; BRK,FRT	1471703170	2	23,000	46,000
16)	SHOE; BRK,FRT	1471703180	2	23,000	46,000
17)	SHOE; BRK,FRT	1471703190	2	23,000	46,000
18)	LINING SET; FRT	1883113140	2	15,480	30,960
19)	REPAIR KIT; EXP	1855764030	4	6,240	24,960
20)	REPAIR KIT; BOO	1855764040	4	2,000	8,000
21)	SHOE; BRK,RR	1471703240	2	26,500	53,000
22)	SHOE; BRK,RR	1471703250	3	32,100	96,300
23)	SHOE; BRK,RR	1471703260	3	27,600	82,800
24)	SHOE; BRK,RR	1471703270	4	31,930	127,720
25)	LINING SET; RR	1883107751	4	20,520	82,080
26)	REPAIR KIT; EXP	1855764030	8	6,240	49,920
27)	REPAIR KIT; BOO	1855764040	8	2,000	16,000
28)	BULB; HEADLAMP	1821940630	2	2,000	4,000
29)	FUSE; 15A	5825160030	42	120	5,040
30)	FUSE; 7.5A	8941590070	42	120	5,040
31)	FUSE; 25A	5825160050	4	120	480
32)	BLADE; WIPER	1868100290	2	1,900	3,800
33)	BLADE; WIPER	8971345612	4	1,680	6,720
34)	RUBBER; FRT WIP	8978079650	4	480	1,920
35)	RUBBER; FRT WIP	1868100510	2	480	960
36)	AIR ELEMENT, FOR COMPRESSOR	32143 15900	4	32,700	130,800
37)	AIR ELEMENT, FOR COMPRESSOR	32143 16000	4	62,500	250,000
38)	AIR ELEMENT, FOR ENGINE	32143 15900	4	32,900	131,600
39)	AIR ELEMENT, FOR ENGINE	32143 16000	4	62,500	250,000
40)	ENGINE OIL FILTER ELEMENT KIT	ME180514	4	14,160	56,640
41)	FUEL FILTER CARTRIDG	ME150631	4	12,840	51,360
42)	FILTER CARTRIDGE, COMPRESSOR	37438 04600	4	30,300	121,200
43)	FUEL FEED PUMP GASKET	43531 00700	6	360	2,160
44)	ELEMENT FOR FUEL PRE-FILTER	43541 01400	4	31,560	126,240
SPARE PARTS for 3 Vehicle (Water Tank Truck)			**1**		**1,290,000**

Item		Item of the Equipment		Q'ty	Unit Price	Amount
		(For Truck)				
1)		PLUG; GLOW	1825130431	6	1,800	10,800
2)		GASKET; STRAINE	1096230570	2	120	240
3)		PLUG; OIL DRAIN	9096620120	1	360	360
4)		THERMOSTAT	1137700891	2	5,000	10,000
5)		BELT; COOLING F	1136714631	1	4,000	4,000
6)		NOZZLE ASM; INJ	8976034156	6	28,000	168,000
7)		ELEMENT KIT; FU	1878109760	2	1,320	2,640
8)		ELEMENT; OIL FI	1132402330	2	1,200	2,400
9)		ELEMENT; OIL FI	1132402410	2	2,880	5,760
10)		FILTER; ACL,INN	1142152170	1	4,900	4,900
11)		FILTER; AIR CLE	1142152030	1	9,800	9,800
12)		CARTRIDGE KIT;	8981232560	2	4,800	9,600
13)		DISC; CLUTCH	1312408760	1	27,800	27,800
14)		SHOE; BRK,FRT	1471703160	2	23,000	46,000
15)		SHOE; BRK,FRT	1471703170	2	23,000	46,000
16)		SHOE; BRK,FRT	1471703180	2	23,000	46,000
17)		SHOE; BRK,FRT	1471703190	2	23,000	46,000
18)		LINING SET; FRT	1883113140	2	15,480	30,960
19)		REPAIR KIT; EXP	1855764030	4	6,240	24,960
20)		REPAIR KIT; BOO	1855764040	4	2,000	8,000
21)		SHOE; BRK,RR	1471703240	2	26,500	53,000
22)		SHOE; BRK,RR	1471703250	2	32,100	64,200
23)		SHOE; BRK,RR	1471703260	2	27,600	55,200
24)		SHOE; BRK,RR	1471703270	4	31,930	127,720
25)		LINING SET; RR	1883107751	4	20,520	82,080
26)		REPAIR KIT; EXP	1855764030	8	6,240	49,920
27)		REPAIR KIT; BOO	1855764040	8	2,000	16,000
28)		BULB; HEADLAMP	1821940630	2	2,000	4,000
29)		FUSE; 15A	5825160030	42	120	5,040
30)		FUSE; 7.5A	8941590070	42	120	5,040
31)		FUSE; 25A	5825160050	4	120	480
32)		BLADE; WIPER	1868100290	2	1,900	3,800
33)		BLADE; WIPER	8971345612	4	1,680	6,720
34)		RUBBER; FRT WIP	8978079650	4	480	1,920
35)		RUBBER; FRT WIP	1868100510	2	480	960
		(For Tank)				
		SPARE PARTS KIT;		1	309,700	309,700
36)		MANHOLE PACKING	LS17-W0052A	1		
37)		INTAKE COVER PACKING	LS17-W0395	1		
38)		4-WAY BALL VALVE	LS82-S0096A	1		
39)		2-WAY BALL VALVE	LS82-S0098	2		
40)		PACKING	LS89-W0213A	10		
41)		PACKING	AH70-S0036A	1		
42)		PACKING	ZH85-0053065	1		
43)		O-Ring, WATER PUMP	VD00-S0240-15	1		
44)		O-Ring, WATER PUMP	VD00-S0240-16	1		
45)		OIL SEAL, WATER PUMP	VD00-S0240-29	1		
46)		OIL SEAL, WATER PUMP	VD00-S0240-30	1		
47)		SHEET PACKING, WATER PUMP	VD00-S0240-33	1		
48)		SHEET PACKING, WATER PUMP	VD00-S0240-34	2		
49)		SPLIT PIN, WATER PUMP	VD00-S0240-43	1		

Item	Item of the Equipment		Q'ty	Unit Price	Amount
50)	O-Ring, WATER PUMP	VD00-S0240-49	1		
51)	O-Ring, WATER PUMP	VD00-S0240-50	1		
52)	HOSE ASSY	LS93-W0056B	2		
53)	PACKING	LS84-W0002A	2		
SPARE PARTS for 4 VEHICLE (Cargo Truck with Crane)			**1**		**1,300,000**
	(For Truck)				
1)	PLUG; GLOW	1825130431	6	1,800	10,800
2)	GASKET; STRAINE	1096230570	2	120	240
3)	PLUG; OIL DRAIN	9096620120	1	360	360
4)	THERMOSTAT	1137700891	2	5,000	10,000
5)	BELT; COOLING F	1136714631	1	4,000	4,000
6)	NOZZLE ASM; INJ	8976034156	6	28,000	168,000
7)	ELEMENT KIT; FU	1878109760	2	1,320	2,640
8)	ELEMENT; OIL FI	1132402330	2	1,200	2,400
9)	ELEMENT; OIL FI	1132402410	2	2,880	5,760
10)	FILTER; ACL,INN	1142152170	1	4,900	4,900
11)	FILTER; AIR CLE	1142152030	1	9,800	9,800
12)	CARTRIDGE KIT;	8981232560	2	4,800	9,600
13)	DISC; CLUTCH	1312408760	1	27,800	27,800
14)	SHOE; BRK,FRT	1471703160	2	23,000	46,000
15)	SHOE; BRK,FRT	1471703170	2	23,000	46,000
16)	SHOE; BRK,FRT	1471703180	2	23,000	46,000
17)	SHOE; BRK,FRT	1471703190	2	23,000	46,000
18)	LINING SET; FRT	1883113140	2	15,480	30,960
19)	REPAIR KIT; EXP	1855764030	4	6,240	24,960
20)	REPAIR KIT; BOO	1855764040	4	2,000	8,000
21)	SHOE; BRK,RR	1471703240	2	26,500	53,000
22)	SHOE; BRK,RR	1471703250	3	32,100	96,300
23)	SHOE; BRK,RR	1471703260	3	27,600	82,800
24)	SHOE; BRK,RR	1471703270	4	31,930	127,720
25)	LINING SET; RR	1883107751	4	20,520	82,080
26)	REPAIR KIT; EXP	1855764030	8	6,240	49,920
27)	REPAIR KIT; BOO	1855764040	8	2,000	16,000
28)	BULB; HEADLAMP	1821940630	2	2,000	4,000
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30)	FUSE; 7.5A	8941590070	42	120	5,040
31)	FUSE; 25A	5825160050	4	120	480
32)	BLADE; WIPER	1868100290	2	1,900	3,800
33)	BLADE; WIPER	8971345612	4	1,680	6,720
34)	RUBBER; FRT WIP	8978079650	4	480	1,920
35)	RUBBER; FRT WIP	1868100510	2	480	960
	(For Crane)				
36)	SWITCH ASSY	313-719-22000	1	7,920	7,920
37)	CORD	361-323-85060	2	19,080	38,160
38)	STOPPER ASSY	360-902-99510	1	14,640	14,640
39)	GAUGE, OIL	]361-024-85010	1	1,440	1,440
40)	PLUG	361-020-75020	1	1,440	1,440
41)	ELEMENT	531-560-05011	2	11,760	23,520
42)	HOSE	370-024-68770	1	11,160	11,160
43)	HOSE	370-024-68780	1	11,040	11,040

Item		Item of the Equipment		Q'ty	Unit Price	Amount
44)		FILTER, OIL	366-725-90000	2	24,000	48,000
45)		HOSE	370-024-54570	1	29,880	29,880
46)		VALVE, PILOT CHECK	366-239-30000	1	72,800	72,800

Financial Support for Local Expense

Expenditure Item	Expense by Fiscal Year (JPY)				
	2010	2011		2013	2014
Local labor cost	107,164	622,149		392,915	765,813
Office supplies	83,349	10,573		3,708	
Printing		114,478			
Rent car and maintenance of project car	3,000,235	647,411		1,123,115	963,615
Allowance of CP at Usuma dam				824,355	447,115
Sundry expenses	119,265	188,793		120.668	233,235
Sub-Total	**3,310,013**	**1,583,404**		**2,344,214**	**2,409,778**
Total	**9,647,409**				

List of C/P personnel

Position	Name
NWRI Director	Dr. Olusarijo A. Barngbye
NWRI Training Director	Mr. A.N. Egbulem, Mr. O.O. Oni
RWSSC Director	Dr. Martin O. Eduvie
Course-1 Groundwater Investigation Techniuque	Mr. O.O.YaYa
Couyrse-2Borehole Construction and Management	Mr. O.T.Olabode
Course-3 Drilling Technology	Mr. O.T.Olabode
Course-4 Drilling Machinery Maintenance	Mr. S.G.Sara
Course-5 Handpump Installation, Operation and Maintenance	Mr. S.G.Sara
Course-6 Borehole Rehabilitation and Maintenance	Mr. O.O.YaYa
Course-7 Development of Alternative Water Sources	Mr. J.Onemano
Course-8 Hygiene and Sanitation Promotion	Mr. H.S.Ahmed
Course-9 Community Mobilization and Management	Mrs. B.O. Dossah
Administrative: General Administration	Mr. A. T. Garba
Administrative: General Administration	Mr. Dor Joshua
Administrative: Typist	Mrs. L.J. Alegbe
Administrative: Clerical	Mr.Guga Albakar
Financial Officer	Mr. Uthman Abba

3. Minute of Meeting of JCC (1～5)

Minute of meeting of 6th JCC was not included since it was not prepared by the Nigerian side before the end of the Project

Minutes of Meeting

On

The First Joint Coordinating Committee

For

The Project for Enhancing the Function of Rural Water Supply and Sanitation Centre for Capacity Development

In National Water Resources Institute (RWSSC Project)

In the Federal Republic of Nigeria

Abuja, 1st of April, 2010

Dr. Olusanjo A. BAMGBOYE
Acting Executive Director
National Water Resources Institute
Federal Ministry of Water Resources

Mr. Yoshitaka SUMI
Chief Representative
Japan International Cooperation Agency
Nigeria Office

Engr. B.M. TAHIR, FNSE
Acting Director
Department of Water Supply, Quality Control
and Inspectorate
Federal Ministry of Water Resources

Dr. Kenji YOSHIDA
Chief Adviser for RWSSC
Japan International Cooperation Agency

Mr. U.S. NWOZUZU
Assistant Chief Planning Officer
Department of International Cooperation
National Planning Commission

Upon the commencement of the Project for Enhancing the Function of Rural Water Supply and Sanitation Centre for Capacity Development in National Water Resources Institute (RWSSC Project) (hereinafter referred to as "the Project"), the first Joint Coordination Committee (hereinafter referred to as "JCC") for the Project was held on 1st of April, 2010 in Abuja. The JICA expert team (hereinafter referred to as "The Expert Team") headed by Dr. Kenji Yoshida, Chief Adviser of the Project, presented the Inception Report which describes implementation policy of the Project. JCC members noted with delight the content of the report, made some useful suggestions and subsequently approved it in principle.

The major points discussed and agreed are summarized as follows:

1. PDM ver. 1.1 and PO ver. 1.1 of the Project

JCC agreed that Project Design Matrix (PDM) should be modified as Ver.1.1 shown in the Inception Report. JCC also agreed that Plan of Operation (PO) should be modified as Ver.1.1 in accordance with the agreed activity plan.

2. 2011 Budget allocation for RWSSC

In order to carry out activities described in the PO for the Project, RWSSC will present the estimate budget for 2011 at the 2nd JCC.

3. Staff allocation for RWSSC

Expected number of counterpart (C/P) personnel for the Project is 10 persons (2 senior Management staff and 8 Technical Coordinators). In addition, 4 Office staff and 7 Technical Assistants would be assigned for the Project. NWRI will make efforts to assign all staff by June 2010.

4. Procurement of equipment by JICA and the duty exemption

The Expert Team proposed the procured equipment specification in the Inception Report. JCC agreed to the proposal. The Expert Team will formulate the procurement plan and then, JICA will start the procurement works in accordance with the agreed specifications.

Nigerian side will prepare the necessary documents for custom clearance and tax exemption before arrival of the equipment and materials at Lagos Port and Nigerian side will carry out customs clearance. Nigerian side is also responsible for the inland transportation of equipment & materials to the RWSSC store in Kaduna.

5. The Institutional Assessment (IA)

On the Institutional Assessment (IA) of the States under the project, the Institute had identified and started in 6 States outside the JICA intervention ones and this has been accepted by the Japanese. However, the JICA experts intend to subcontract the part of the IA for the project to a Consultant due to the limited time available. The meeting decided that the Counterpart should be involved in the IA with the JICA Experts and the Consultant that will execute the study for the Counterpart to further have the necessary experience. At the end of the Assessment a comprehensive report will be produced by the RWSSC.

The Chairman went further to say that the National Water Resources Institute is in partnership with Higher Institutions in the country under the National Water Resources Capacity Building Network (NWRCBnet) for broader and wider provision of training services.

Annex 1

List of Participant

[Nigerian side]	
Dr. Olusanjo A. BAMGBOYE	Acting Executive Director, NWRI
Dr. D. BASHIR	Director, NWRI
Engr. A.N. EGBULEM	Director, NWRI
Dr. Martin O. EDUVIE	Project Manager, RWSSC
Mr. Idowu ADETUNJI	Deputy Director, FMWR
Mr. U.S. NWOZUZU	Assistant Chief Planning Officer, NPC

[Japanese side]	
Mr. Yoshitaka SUMI	Chief Representative, JICA Nigeria Office
Mr. Yoshiro MASUDA	Representative, JICA Nigeria Office
Dr. Kenji YOSHIDA	Expert for Chief Adviser
Mr. Nobuto WATANABE	First Secretary, Embassy of Japan

Minutes of Meeting

of

The Second Joint Coordinating Committee (JCC)

for

The Project for Enhancing the Function of Rural Water Supply and Sanitation Centre for Capacity Development

in National Water Resources Institute (RWSSC Project)

in the Federal Republic of Nigeria

21st of October, 2010

Dr. Olusanjo A. Bamgboye
Executive Director
National Water Resources Institute
Federal Ministry of Water Resources

Mr. Yoshitaka Sumi
Chief Representative
Japan International Cooperation Agency

Engr. B.M. Tahir, FNSE
Acting Director
Department of Water Supply
Federal Ministry of Water Resources

Dr. Kenji Yoshida
Chief Adviser for RWSSC
Japan International Cooperation Agency

National Water Resources Institute, Kaduna

Rural Water Supply and Sanitation Centre (RWSSC)

MINUTES OF THE SECOND JOINT COORDINATING COMMITTEE (JCC) MEETING held at RWSSC on the 21st October, 2010

1. ATTENDANCE

S/N	NAMES	ORGANIZATION	PHONE	EMAIL
1	DR D. BASHIR	NWRI, Kaduna	08033110265	dogara.nwri@gmail.com
2	YOSHITAKA SUMI	JICA, Abuja	0904612660	Sumi.yoshitaka@jica.go.jp
3	YOSHIRO MASUDA	JICA, Abuja	07059835350	masuda.yoshiro@jica.go.jp
4	NOBUYUKI IIJIMA	JICA EXPERT	08037907819	dge07675@nifty.ne.jp
5	YASUO ONOZOKA	JICA EXPERT	07053916380	onozoka@tone-eng.co.jp
6	MEGUMI KANEDA (Ms)	JICA EXPERT	08058884402	meg_kaneda@yahoo.co.jp
7	IDOWU ADETUNJI	FMWR, ABUJA	08033280737	santunjiidowu@yahoo.com
8	DR MARTIN EDUVIE	NWRI, Kaduna	08034600061	martineduvie@yahoo.com
9	ENGR A.N EGBULEM	NWRI, Kaduna	07067770840	an_egbulem@yahoo.com
10	SANI D AHMED	NWRI, Kaduna	08029416311	sdaud@yahoo.com
11	DOSSAH BILKISU (MRS)	NWRI, Kaduna	08064189517	billiedossah@yahoo.com
Apology	Mr. Nobuto Watanabe	Embassy of Japan		Nobuto.Watanabe@mofa.go.jp
Apology	Mr. U.S Nwozuzu	NWRI, Abuja		

2. OPENING

The meeting started at 12.20pm with opening prayer by Mr Adetunji Idowu of the Federal Ministry of Water Resources, Abuja. Thereafter the agenda of the meeting was read by the Chairman as follows:

SECTION A

i. Opening prayer

ii. Adoption of Agenda

iii. Chairman's Opening Remarks

iv. Reading and adoption of the 1st minutes of JCC meeting held on 1st of April, 2010

v. Matters arising from the minutes of 1st JCC meeting of 1st April, 2010.

SECTION B

i. Progress report on RWSSC Activities

ii. Comments on the RWSSC activities report

SECTION C

i. A.O.B

ii. Closing Remarks by the JCC Chairman

iii. Closing Prayer.

2

2.1 ADOPTION OF AGENDA

The agenda for the meeting was adopted by the members.

2.2 CHAIRMAN'S OPENING REMARKS

The Chairman welcomed all members present. He thanked the representative of the Federal Ministry of Water Resources and JICA office for making out time despite their tight schedule to attend the 2nd JCC meeting. He stated that RWSSC is working very hard and every activity is in progress. He used the opportunity to announce the cancellation and postponement of the 2nd National Water and Sanitation Conference, and the official commissioning of the RWSSC earlier scheduled for the 25th to 27th October, 2010 due to circumstances beyond the NWRI control.

It was observed by the Chairman that others ESAs like UNICEF were not in the meeting as suggested. He therefore recommended that they should always be invited to subsequent JCC meetings.

2.3 BRIEF BY THE JICA COUNTRY REPRESENTATIVE

The Country Representative (Mr Yoshitaka Sumi) appreciated the effort of the RWSSC and NWRI Management in the progress recorded so far. Concerning the postponement of the 2nd National Water and Sanitation Conference, he informed the members that he will be leaving for Japan next week and hope to be back at the end of November.

2.4 READING ADOPTION OF THE MINUTES OF THE 1ST JCC MEETING

The minutes was read and adopted by members after minor corrections were made.

2.5 MATTERS ARISING FROM THE 1ST JCC MEETING

2.5.1 Working Environment

Presently, the Counterpart staff share office accommodation with the JICA Experts for ease of cordial and effective sharing of ideas. The Experts reported that the present arrangement for office accommodation is quite appropriate.

2.5.2 Clearance of Machineries to be imported by JICA

It was stated by JICA representative that four important documents were requested by the Federal Ministry of Finance for the processing of duty exemption certificate before the clearance and conveyance of the equipment to Nigeria. These are: i Copy of Exchange of Notes, ii Pro-forma Invoice, iii Copy of the contract agreement with the Contractor, iv Marine Insurance Certificate.

It was also reported that the procurement process of the materials and equipment that need to be purchased in Japan are in progress. However, NWRI will be required to transport the materials and equipment from the port to the Kaduna State according to the Minutes of Meeting signed.

For the materials and equipment that need to be purchased in Nigeria, JICA Nigeria will do the purchase but will not be responsible for the payment of VAT and other levies.

It was agreed that exemption for VAT and other levies on local purchases will be handled by Mr. Idowu from the Federal Ministry of Water Resources, Abuja.

2.5.3 Staff Allocation

It was reported by the RWSSC Coordinator that all the necessary Administrative and Finance staff have been posted to the Centre on percentage basis by the Institute. The posted staff members are Administrative Officer, Finance Officer, Office Assistant, Secretary and Assistant Driller.

2.5.4 Motivation for attendance of Training

On the issue of the modality for trainees to attend the training, the problem of poor or lack of sponsorship of trainees by their organizations was raised. It was the opinion of the members of the meeting that trainees will value the training if payments are made for the training. The issue of sustainability of the training courses was also equally raised. The Director of Training asked if JICA can pay a portion of training implementation cost as a subsidy or not. JICA Nigeria responded that it was not possible from the view of sustainability of training courses to be organized by the RWSSC. It was resolved that NWRI should find ways of sponsoring the trainees to the trainings if possible.

2.5.5 Institutional/Capacity Assessment

The Institutional/ Capacity assessment is presently contracted to a Consultant who is still working. The JICA expert in the RWSSC reported that the Consultant has submitted a draft report but yet to be finalized.

In view of the above the Chairman requested JICA expert team to instruct the Contractor to brief NWRI on the Institutional/ Capacity assessment conducted. JICA expert team promised to call on the Consultant to brief the RWSSC on the findings of the survey appropriately.

2.5.6 Budget

The Chairman directed the RWSSC to submit its budget requirements for the nine (9) training courses coming up in 2011 to NWRI Management by next week (29th October, 2010) for it to be incorporated into the NWRI budget.

2.6 Progress report on RWSSC Activities

The RWSSC Coordinator made presentation on the activities of the Centre in the 1st year to the JCC. After the presentation there was no comment. The chairman then commended the Centre for the accurate reporting of the RWSSC activities since inception.

2.7 Closing Remarks

The Chairman of the JCC thanked all members for making out time to attend the 2nd JCC meeting. He said, hopefully the Centre will be formally commissioned by the Honourable Minister of Water Resources very soon. Next meeting has been tentatively fixed for May, 2011.

2.8 Closing

The meeting came to an end at 2.25pm with a closing prayer by Engr. S.D Ahmed.

Minutes of Meeting

Of

The Third Joint Coordinating Committee (JCC)

For

The Project for Enhancing the Function of Rural Water Supply and Sanitation Centre for Capacity Development

In National Water Resources Institute (RWSSC Project)

in the Federal Republic of Nigeria

Abuja, 5th October, 2011

Dr. Olusanjo A. Bamgboye
Executive Director
National Water Resources Institute
Federal Ministry of Water Resources

For **Mr. Yoshitaka Sumi**
Chief Representative
Japan International Cooperation Agency
Nigeria Office

Engr. B. M. Tahir, FNSE
Director
Department of Water Supply
Federal Ministry of Water Resources

Dr. Kenji YOSHIDA
Chief Adviser for RWSCC
Japan International Cooperation Agency

3.0 ATTENDANCE

	NAME	ORGANISATION	PHONE NO	E-MAIL ADD.
	Dr. O. A. BAMGBOYE	NWRI, Kaduna	08054119530	ed@nwrigov.ng samtunji@yahoo.com
	Adetunji IDOWU	FMWR, Abuja	08033280737	sanutunjiidowu@yahoo.com
	Engr. Augustine N. EGBULEM	NWRI, Kaduna	07067770840	An egbulem@yahoo.com
	Dr. D. BASHIR	NWRI, Kaduna	08033110265	Dogara.nwri@gmail.com
	Dr. Kenji YOSHIDA	JICA, Expert	08061512290	Knj-yoshida@gazso-net.nc.jp
	Dr. Martin O.EDUVIE	NWRI, Kaduna	08036400061	martineduvie@yahoo.com
	Yoshiro MASUNA	JICA, Nigeria	07059835350	masunayoshiro@jica.go.jp
	Masato MIKAMO	JICA, Nigeria	08070653442	Mikamo.masato@jica.go.jp
	Keiko ASATO	JICA, Nigeria	0703181350	
	Yuki ZNOVE	JICA Evaluation Team	08160213933	Inoue.yuki@jica.go.jp
	Yoshitaka SUMI	JICA Nigeria Office	09461266160	Sumi.yoshitaka@jica.go.jp
	Minora MIVASAKA	JICA (HQ Evaluation Team)		Miyasaka.minona@jica.go.jp
	S. O. FANIRAN	NPC	08034264007	depofaniran@yahoo.com
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	Dele OLATUNJI	JICA Nigeria	08037871140	olatunjiwaheed@yahoo.ng.jica.go.jp
	Sule DAUDA	NWRI, Kaduna	08035901427	suledauda@yahoo.com
	G. Y. GAPANI	FMWR, HQTRS	08033495197	gapagyai@yahoo.co
	Ibrahim Joshua DOH	NWRI, Kaduna	08028332053	Joshuadoh2007@yahoo.com

3.1 OPENING

The meeting started at 2.27pm with opening prayer by Mr. S. O. Faniran of the National Planning Commission, Abuja.

3.2 ADOPTION OF AGENDA

The Agenda of the meeting was read by the Chairman as follows:

Section A

i) Opening Prayer

ii) Adoption of Agenda

iii) Chairman's Opening Remarks
iv) Reading and Adoption of the 2nd minutes of JCC meeting held on 21st October, 2010
iv) Matters Arising from the 2nd minutes of the 2nd JCC meeting of 21st October, 2010

Section B

i) Presentation of Rural Water Supply and Sanitation Centre (RWSSC) progress report
ii) Report of Evaluation Team on the Rural Water Supply and Sanitation Centre (RWSSC) Project
iii) Remarks on (i) and (ii) above by JCC members

Section C

i) A. O. B.
ii) Closing Remarks by the JCC Chairman
iii) Closing Prayer

The motion for the adoption of the Agenda for the meeting was moved by Dr. D. Bashir of National Water Resources Institute and seconded by Mr. Adetunji Idowu of the Federal Ministry of Water Resources Abuja.

3.3 CHAIRMAN'S OPENING REMARKS

The Chairman welcomed all members present. He appreciated the representatives of JICA office, Evaluation Team and Federal Ministry of Water Resources for creating time to be in attendance despite their schedules.
He presented to the meeting a three man Mid-Term Evaluation Team from Japan whose report was to be deliberated upon during the meeting.
The Chairman went further to say that the goal of the JICA Project is to improve on the general activities of the Centre especially in the area of Capacity Development for Water Supply and Sanitation.

3.4 READING AND ADOPTION OF THE SECONDJCC MINUTES

The minutes was read and adopted with a motion raised by Mr. Adetunji Idowu and seconded by Dr. D. Bashir after minor corrections.

3.5 MATTERS ARISING FROM THE SECOND JCC MINUTES

3.5.1 Clearance of Machineries to be imported by JICA

The Chairman stated that for the purpose of financial economy control, the Federal Government of Nigeria would no longer give tax exemption on the equipment to be imported

by JICA. The end user of the equipment would have to pay for that, though the amount paid shall be refunded after.
He went further to say that the cost of import duties was captured in the institute 2012 budget proposal.
In response, the JICA assured that they shall soon handover the Pro-forma invoice, copy of the contract agreement with the contractor and marine insurance certificate to the Nigeria Government to facilitate the process. He went further says that the important would take a longer time because of Japan Government due process.

3.5.2 Motivation for attendance of training

On how to motivate more participants to attend the RWSSC training, it was reported that the in-country training of JICA grant aid is been used and is contributing in no small measures. Also National Water Resources Institute (NWRI) reported that a Memorandum of Understanding (MOU) has been signed between her and JICA through the in-country training to sponsor ten courses in 2011.

3.5.3 Institutional/Capacity assessment

The Chairman informed the meeting that the Consultant handing the institutional Assessment (IA) has brief National Water Resources Institute (NWRI) on his report.

3.5.4 Budget

The Chairman reported that the RWSCC has submitted its budget requirements for the nine (9) training courses to National Water Resources Institute (NWRI) management and the training has commenced.

3.6 PRESENTATION OF RURAL WATER SUPPLY A ND SANITATION CENTRE (RWSSC) PROGRESS REPORT

The JICA Expert Team presented a progress report on the activities of the RWSSC and proposals of 2nd year activities.
Bearing in mind how expensive it is to run course such as Development of Alternative Water Sources. UNICEF representative who was also in attendance indicate his organizations' willingness to assist in sponsoring such courses. But National Water Resources Institute (NWRI) was advised to initiate.

3.7 REPORT OF EVALUATION TEAM ON THE RURAL WATER SUPPLY AND SANITATION CENTRE (RWSSC) PROJECT

The Japanese Evaluation Team presented their report. The report was accepted after some observations. A summary of the report is as follows:-

3.7.1 Objective of the Review

The mid-term review activities were performed with the following objectives:

i. To review the progress of the project and evaluate the achievement in accordance with the five evaluation criteria, namely relevance, effectiveness, impact, and sustainability.

ii. To identify factors that promoted or impeded the project implementation and achievement.

iii. To consider necessary actions to be taken and to make recommendations for the Project.

iv. To revise the Project Design Matrix (PDM) and the Plan of Operation (PO), if necessary.

v. To make the Review Report.

3.7.2 Result of Review by 5 Criteria

Relevance: Excellent

- The Project is consistent with both Nigerian and Japanese Government Policy. The Project meets the needs of target group of Nigeria.

Effectiveness: Fair

- Difficult to achieve the Project Purpose within the current Project period.
- Rural Water Supply and Sanitation Centre (RWSSC) cannot implement the training program as planned due to delay of equipment and lack of sponsorship for trainees.

Efficiency: Fair

- The timing of the input (Equipment and Budget for trainees) was delayed.

Impact: Good

- Early to judge, but we already observed the positive effect by the project.

Sustainability: Good

- The institutional, organizational and technical aspect is sustainable. The financial issue needs to be resolved.

3.7.3 Factors Promoting/Impending the Project Factors Promoting Project Factors impending the Project

Funding support from NGO in Sokoto	Delay of the procurement of the equipment
Linkage with in-country Training Program	Lack of budget for the trainees' participation
Previous Cooperation with other Donors	Low awareness of RWSSC and its training Courses by RWSS stakeholders

3.7.3 SHORT TERM RECOMMENDATIONS

To take an action to reduce the delay of equipment and request for extension of the Project

- To diversify the sources of budget and take necessary actions
- To involved counterparts into project activities
- To reduce recurrent expenditure in the counterpart funding
- To modify Project Design Matrix based on the Review

3.8 REMARKS ON EVALUATION REPORT ABOVE BY JCC MEMBERS

The Chairman responded by saying that the evaluation report was considered necessary and needful because it would go a long way help to improve and guide in areas that require improvement.

On how the project would be sustained after the Japanese had left, one of the JICA experts called on the Nigerian government to improve on its budgetary allocation and willingness to improve in marketing the training programs.

In response, the Chairman who is the Executive Director of NWRI assured JICA of institutes' readiness and willingness to adopt new strategies of advocacies to increase the awareness of the various stakeholders on the center's activities and the need to patronize.

3.9 ANY OTHER BUSINESS (AOB)

3.9.1 Visit to the Honorable Minister and Permanent Secretary, Federal Ministry of Water Resources (FMWR)

The Chairman informed the JCC members that the Hon. Minister Federal Ministry of Water Resources (FMWR) and the Permanent Secretary were to be visited on the 6th October, 2011 at 10.00am. During the visit, they were to be briefed on the activities of the Centre and present the report of the JICA Mid-Term Evaluation Report.

3.10 CLOSING REMARKS

The Chairman thanked all in attendance for the fruitful deliberations and wished all journey mercy.

3.11 CLOSING

The meeting came to an end at 4.38pm with closing prayer by Alh. Sule Dauda the Director of Admin. And Finance National Water Resources Institute, Kaduna.

Dr. O.A.Bamgboye
CHAIRMAN

Mr. Joshua Doh IBRAHIM
SECRETARY

Minutes of Meeting

Of

The Fourth Joint Coordinating Committee (JCC)

For

The Project for Enhancing the Function of Rural Water Supply and Sanitation Centre for Capacity Development

In National Water Resources Institute (RWSSC Project)

in the Federal Republic of Nigeria

Abuja, 11th March, 2013

Dr. Olusanjo A. Bamgboye
Executive Director
National Water Resources Institute
Federal Ministry of Water Resources

Mr. Tetsuo SEKI
Chief Representative
Japan International Cooperation Agency
Nigeria Office

Dr. Kenji YOSHIDA
Chief Adviser for RWSCC
Japan International Cooperation Agency

4.0 ATTENDANCE

S/N	NAME	ORGANISATION
1	Dr. O. A. BAMGBOYE	NWRI, Kaduna
2	Adetunji IDOWU	FMWR, Abuja
3	Dr. D. BASHIR	NWRI, Kaduna
4	Dr. Kenji YOSHIDA	JICA, Chief Adviser for RWSSC
5	Dr. Martin O.EDUVIE	NWRI, Kaduna
6	Tetsuo SEKI	CR/JICA, Nigeria Office
7	Chie SHIMODAIRA	JICA Nigeria Office
8	Dele OLATUNJI	JICA Nigeria
9	Baba Gombe YAHAYA	NWRI, Kaduna
10	Ibrahim, Joshua DOH	NWRI, Kaduna

4.1 APOLOGY

i. Alhaji Sule Dauda NWRI

ii. Mr. O. O. Oni NWRI

4.2 OPENING

The meeting started at 9.37am with opening prayer by Mr. Ibrahim Joshua DOH of National Water Resources Institute, Kaduna.

4.3 AGENDA

The Agenda of the meeting was read by the Chairman as follows:

Section A

i) Opening Prayer
ii) Introduction of members
iii) Chairman's Opening Remarks
iv) Reading and Adoption of the 3rd minutes of JCC meeting held on 5thOctober, 2011
v) Matters Arising from the 3rd minutes of meeting held on5th October, 2011

Section B

i) Brief on Rural Water Supply and Sanitation Centre (RWSSC) / presentation of RWSSC activities for 2013/2014
ii) RWSSC Equipment and commissioning by supplier.
iii) Remarks by JICA Country Representative (JICA Nigeria Office)

Section C

i) A. O. B.

ii) Closing Remarks by the JCC Chairman

iii) Closing Prayer

The motion for the adoption of the Agenda for the meeting was moved by Dr. Martin O. Eduvie and seconded by Dr. Dogara Bashir of National Water Resources Institute

4.4 INTRODUCTION OF MEMBERS

The Chairman called on all members in attendance for self-introduction.

4.5 CHAIRMAN'S OPENING REMARKS

The Chairman welcomed all members present. He apologized for the inability to have held another meeting after the visit of the evaluation team due to the security challenges in Nigeria. Also this meeting had to be re-scheduled due to health reasons.

4.6 READING AND ADOPTION OF THE THIRD JCC MINUTES

The minutes was read and adopted with a motion raised by Dr. D. Bashir and seconded by Mr. Adetunji Idowu after minor corrections.

4.7 MATTERS ARISING FROM THE THIRD JCC MINUTES

4.7.1 Clearance of Machineries to be imported by JICA

The Chairman reported that all equipment have been cleared and presently at Usuman Dam Abuja. He further informed the meeting that the manufacturers from Japan are already in Nigeria for the training of Institute Staff on the equipment.

4.7.2 Motivation for attendance of training Courses

It was reported that the motivation of the in-country training of JICA grant aid organized for the trainers has improved the training in terms of participants' attendance and quality.

4.7.3 Institutional/Capacity assessment

On Institutional/Capacity Assessment, the Chairman reported that the presentation of the Consultant's report was postponed till when the JICA Experts return from Japan. It is expected that all stakeholders are given the opportunity to contribute positively to the execution of the project.

4.7.4 Budget

The Chairman reported that budget constraints and late release of funds affected the conduct of the nine (9) training courses organized by RWSSC. He went further to report that for 2013, the budget has been approved and will be accessed.

4.7.5 Report of Evaluation Team on the Rural Water Supply and Sanitation Centre (RWSSC) Project

It was reported that the Hon. Minister of Water Resources was happy with the Evaluation report and the Institute was working hard to maintain the good tempo of the project for effective service delivery.

The meeting was further informed that there was improvement in the area of awareness creation on the Centre's activities. The Centre was not only running JICA courses but other RWSSC courses like CLTS, Hygiene and Sanitation and climate change.

4.8 NEW ISSUES

4.8.1 Brief on RWSSC/Presentation of RWSSC Activities for 2013/2014

The JICA expert presented the RWSSC activities with the following highlights:

- Background, Objectives and Principles for Project Implementation
- Work Schedule
- RWSSC Training Plan 2013-2014
- 3rd Year Assignment Schedule of JICA Expert Team

From April 2014, Japan would no longer provide funds to run the outstanding trainings. Based on this, the Institute was called upon to make budgetary provision for that.

Also it was highlighted that some areas of the Plan-Do-Check-Act (PDCA) cycle were amended especially in the area of training periods.

In response, the Executive Director of NWRI appreciated the Chief Representative of JICA and other Japanese involved in the project for making it a success.

He went further to report that beside the JICA in- country training, the Institute through the RWSSC conducted other trainings on Rural Water Supply and Sanitation. A total of 409 participants have been trained at the RWSSC since the inception of the project.

4.8.2 RWSSC Equipment and Commissioning by Supplier

It was reported that the equipment (One (1) Drilling Rig, One (1) Water Tanker Vehicle, One (1) Compressor, Spare Parts etc.) donated to the Institute by the Japanese Government has arrived from Japan. Following the re-allocation of the Project Office from National Water Resources Institute Kaduna to Lower Usuman Dam Abuja due to the security challenges in the Northern States, some of the subsequent training that involved the use of equipment shall be conducted

in the same venue, and all the equipment will be moved to Kaduna at a later date when security situation improves.

The Institute Auditor and Store Officer were expected to come to Abuja for stock taking of all the new equipment and spare parts after which the spare parts shall be moved to NWRI for safe keeping.

4.8.3 Remarks by JICA Chief Representative (JICA Nigeria Office)

The JICA Chief Representative (JICA Nigeria Office) remarked on the following

- JICA intervention has recorded a high success through the in country trainings. Twenty nine (29) participants had been trained in Bauchi and Katsina while twenty (20) participants were undergoing training in Enugu and other states.
- He wished this training will greatly transform the lives of people and that the project will continue to make progress.
- National Water Resources Institute was commended for the success recorded in the project.
- JCC was called upon to look at the progress report for higher achievement.
- The JICA Chief Representative stated that this was his first appearance in the JCC meeting.

In response the Executive Director of NWRI appreciated the JICA Country Representative for the indepth knowledge on the project despite the short period he has spent in Nigeria.

4.9 ANY OTHER BUSINESS (AOB)

4.9.1 In-House Evaluation

A call was made for the Institute to have an in-house evaluation to know the impact of the training before the Japan Evaluation Team come again.

4.9.2 Way Forward of the Project

It was asked whether the Institute would expect some further interventions from the side of JICA on completion of the project. This was to be considered by the JICA Country Representative.

Also in response to the above, JICA was called upon not to forget the Institute in their subsequent planning of capacity building especially in the area of water resources. This will help the Institute to develop its younger staff for continuity and sustainability of its programs.

4.9.3 Visit to the Ministry

It was agreed that JCC members would pay a farewell visit to the Permanent Secretary of Federal Ministry of Water Resources who has been transferred to Federal Ministry of Power.

4.9.4 Commissioning and Handing Over of Equipment to the Institute

The Official Commissioning and Handing over of the Japan donated equipment to the Institute was to be done after the Executive Director of NWRI had discussed with the Honorable Minister.

4.10 CLOSING REMARKS

The Chairman thanked all in attendance for their contributions and efforts toward the progress of the project and wished all journey mercies.

4.11 NEXT MEETING

The next JCC meeting was scheduled for the middle of November 2013.

4.12 ADJOURNMENT

The meeting was adjourned after a motion was raised by Adetunji Idowu(FMWR) and seconded by Dele Olatunji (JICA Nigeria Office).

4.13 CLOSING

The meeting came to an end at 11.03am with closing prayer by Dr. Dogara Bashir.

Dr. O.A.Bamgboye
CHAIRMAN

Mr. IBRAHIM, Joshua Doh
SECRETARY

Minutes of Meeting

Of

The Fifth Joint Coordinating Committee (JCC)

For

The Project for Enhancing the Function of Rural Water Supply and Sanitation Centre for Capacity Development

In National Water Resources Institute (RWSSC Project)

In the Federal Republic of Nigeria

Abuja, 13th February, 2014

Dr. Olusanjo A. Bamgboye
Executive Director
National Water Resources Institute
Federal Ministry of Water Resources

Mr. Tetsuo SEKI
Chief Representative
Japan International Cooperation Agency
Nigeria Office

Mr. Adetunji Idowu
Deputy Director
Federal Ministry of Water Resources
Abuja.

Dr. Kenji YOSHIDA
Chief Adviser for RWSCC
Japan International Cooperation Agency

5.0ATTENDANCE

S/N	NAME	ORGANISATION
1	Dr. O. A. BAMGBOYE	NWRI, Kaduna
2	Adetunji IDOWU	FMWR, Abuja
3	Dr. D. BASHIR	NWRI, Kaduna
4	Dr. Kenji YOSHIDA	JICA, Chief Adviser for RWSSC
5	Dr. Martin O.EDUVIE	NWRI, Kaduna
6	Tetsuo SEKI	CR/JICA, Nigeria Office
7	Chie SHIMODAIRA	JICA Nigeria Office
8	Dele OLATUNJI	JICA Nigeria Office
9	T. M. ATEMA	NWRI, Kaduna
10	O.O.O. ONI	NWRI, Kaduna
11	Bade OLOKUN	UNICEF, Abuja
12	Ibrahim, Joshua DOH	NWRI, Kaduna

5.1 ABSENT

i. Representative of National Planning Commission

5.2 OPENING

The meeting started at 11.07am with opening prayer by Mr.Adetunji Idowu.

5.3 AGENDA

The Agenda of the meeting was read by the Chairman as follows:

Section A

i) Opening Prayer
ii) Introduction of Members
iii) Chairman's Opening Remarks
iv) Reading and Adoption of the 4th Minutes of JCC Meeting held on 11th March, 2013
v) Matters Arising from the 4th Minutes of Meeting held on11th March, 2013

Section B

i) Presentation of RWSSC Activities – Dr. Yoshida/ Dr. Martin Eduvie
ii) Sustainability of RWSSC after the period of the Project
a) Training Activities
b) Equipment/ Management Sustainability
c) Research on Water Supply, Sanitation, CLTS and Impact of RWSSC/JICA trainings on the RUWASSA

Section C

i) Remarks by JICA Nigeria Office Chief Representative

ii) A. O. B.

iii) Closing Remarks by Chairman

iv) Closing Prayer

Motion for the adoption of the Agenda for the meeting was moved by Mr. T. M. Atema and seconded by Mr. Adetunji IDOWU.

5.4 INTRODUCTION OF MEMBERS

The Chairman called on all members in attendance for self-introduction.

5.5 CHAIRMAN'5 OPENING REMARKS

The Chairman welcomed all members present to the 5th meeting of the JCC. He called on all to be positive in participating with an aim to move the project forward especially since the project will be ending December, 2014. As part of effort to adequately publicize the activities of the RWSSC, the meeting was briefed on the National Water Council that took place at the Institute last year 2013 where the activities of the Centre were highly commended. During theCouncil, participants came from all over the country without any security challenge, this indicate that the security situation in Kaduna has improved. Also he informed the meeting that Alhaji Sule Dauda the former Director of Administration and Finance had left the Institute for another presidential assignment and has been replaced by Mr. T. M. Atema who was in attendance during the 5th JCC meeting.

5.6 READING AND ADOPTION OF THE FOURTH (4TH)JCC MINUTES

The minutes was read and adopted with a motion moved by Dr.D. Bashir and seconded by Mr.Adetunji Idowu after minor corrections.

5.7 MATTERS ARISING FROM THE FOURTH (4TH) JCC MINUTE5

5.7.1 Clearance of Machineries to be imported by JICA

The Chairman reported that the training of Institute staff by the manufacturers on the imported machineries from Japan had already being conducted.

5.7.2 Institutional/Capacity assessment

It was reported that presentation and discussion on the Consultant's report of Institutional/Capacity assessment was done.

5.7.3 Budget

The Chairman reported that despite budget constraints and late release of funds the training of some of the nine (9) Courses organized by RWSSC was conducted. He went further to report that 2014 budget has provision for some of the courses due to budget constraints.

5.7.4 In-House Evaluation

It was reported that the in-house evaluation will be carried out in August/ September 2014 on the impact of the training before the Japan Evaluation Mission come again in October, 2014

5.7.5 Way Forward of the Project

Chief Representative reported that the process was not yet clear now whether the Institute would get further interventions from the side of JICA on completion of the project. He reiterated that Water Sector is JICA's priority and they will keep in touch with the Federal Ministry of Water Resources and the Institute on further developments.

In response, the Chairman said that NWRI is part of the planning Committee for the FMWR Master plan. He however observed that in the plan, there was no budgetary allocation for human resources development. The Chairman also noted this is not good for further capacity development in the water sector. The Institute management was making plans to move the equipment provided by JICA to the Institute.

Also in response to the above, JICA was called upon not to forget the Institute in their subsequent planning for capacity building especially in the area of water resources. This will help the Institute to develop its younger staff for continuity and sustainability of its programs.

5.7.6 Visit to the Ministry

It was reported that JCC members paid a farewell visit to the former Permanent Secretary of Federal Ministry of Water Resources who was transferred to Federal Ministry of Power.

The meeting also was reminded that the new Permanent Secretary of Federal Ministry of Water Resources, Abuja had not been visited. Based on this, it was agreed that JCC members should arrange to visit him during the next JCC meeting.

5.7.7 Commissioning and Handing Over of Equipment to the Institute

It was reported that the Official Commissioning and Handing over of the Japan donated equipment to the Institute was done in the public and was published in one of the National Dailies.

In response, the JICA Chief Representative hopes that the Institute would maintain the equipment

5.8 NEW ISSUES

5.8.1PRESENTATION OF RWSSC ACTIVITIES

The Chairman reported that provision was made for the outstanding trainings in May, 2014 but budget had not yet being approved by the National Assembly.

The following highlight the presentation on RWSSC Activities:

- Summary of 3rd year
- Implementation of 4th year
- Evaluation Indicator of PDM (ver. 3.0)
- Schedule of Evaluation Mission and collection of verification indicators

Summary of Training Results by 3rd Year

Training Course	Training Duration	No of Participants
1.Groundwater Investigation (1st)	6	18
1.Groundwater Investigation (2nd)	6	20
2. Borehole Construction and Mangement	6	20
3. Drilling Technology	12	20
4. Drilling Machinery Maintenance Technique	5	20

5. Community Mobilization and Management 8-13 November 2013 20 Participants

Other issues presented under the summary of 3rd year were:

- Goals and Projects Purpose
- Contents of Training Impact at Niger State RUWASSA
- Utilization of Impact Survey Results

Implementation of 4th year

The following briefs were presented as plan for the implementation of the 4th year.

Goal and Project Purpose

- Overall Goal

Service Delivery of RWSS is improved in Nigeria through Capacity Development of stakeholders.

- Project Purpose

Rural Water Supply and Sanitation Centre for Capacity Development (RWSSC) is effectively operated.

YEAR 1

- Determine capacity assessment procedures and selection of target institutions
- Conduct capacity assessment of sampled institutions and produce reports
- Organize stakeholders workshop to present the improve assessment reports

YEAR 4

Evaluation Indicator of PDM

- Training impact survey at Niger state (Sep to Oct, 2014)
- A stakeholders' workshop was to be Organize to present the impact survey result (November, 2014)
- There would be a Contents of Training Impact Survey at Niger RUWASSA to be carried out by C/P and Japanese expert if approval was granted

Utilization of Impact Survey Result

- To develop the responsive and effective training systems
- To enhance trainers capacity in RWSSC

Schedule of Evaluation Mission and collection of verification indicators

- To deliver the trainings base on a Plan – Do – Check – Act (PDCA) cycle
- Comments from members

It was commended that the Institute Desk Officer and the Chief Adviser of Japan were on-course as far as PDM was concern.

It was agreed that the Niger State RUWASSA be written to get ready for the Impact Assessment of the RWSSC training on the agency. In the letter, a date line should be given to meet up with JICA evaluation team visit that will be in October, 2014.

5.8.2 SUSTAINABILITY OF THE RWSSC AFTER THE PERIOD OF THE PROJECT

Training Activities

Proposals for the training activities was presented and discussed.

Equipment/Management Sustainability

The Chairman, Executive Director of NWRI reported that effort is being made to sustain the facilities despite constraint by late release of budget.

Research on Water Supply, Sanitation, CLTS and Impact of RWSSC/JICA training on the RUWASSA

It was adopted that Niger State was to be used as the first pilot state for the imparked of RWSSC/JICA trainings. Other RUWASSA will be assessed separately.

5.8.3 Remarks by JICA Chief Representative (JICA Nigeria Office)

The JICA Chief Representative (JICA Nigeria Office) remarked on the following;

- The project started in the year 2010 and now in the last phase therefore was happy over the success achieved so far
- He reminded the meeting of the objectives of JCC as to make progress, review achievement, address bottlenecks and lesson learned for the improvement of the project.
- JCC members, management of NWRI and JICA have perform well
- The goal was to achieve improved service delivery of Rural Water Supply and Sanitation in Nigeria through capacity development of stakeholders. This necessitated the creation of Rural Water Supply and Sanitation Centre at NWRI
- The project have recorded achievements such as; development of nine 9 training courses, training of over 200 personnel from RUWASSAs states under JICA support and procurement and delivery of training equipment to the Center
- These achievements are a reflection of active participation of all JCC members
- He also highlighted on the challenges experienced during the course of the execution of the project such as; extension of program year after mid-term evaluation, relocation of project site from Kaduna to FCT, Low patronage of self-supported participants to courses, inadequate personnel and budget
- NWRI management was called upon to create more awareness and conducive environment for more patronage from both government and private sectors through advocacy
- Likewise, innovative funding options and PPP model could be employed for the sustainability of the center
- He hoped the benefit of the Project will be even more enhanced in harmonizing with JICA's relevant projects as shown in the Master Plan.
- He wished that RWSSC would be used as a model for not only Nigeria but other African country after completion.

In response the Executive Director of NWRI appreciated the JICA Chief Representative and comment as follows;

- The Institute is going to aggressively market the training programs this year 2014 especially the JICA programs. The following are some of the ways the publicity shall be done;
  - (i) Publicity/Advocacy
  - (ii) Distribution of manuals to various stakeholders
  - (iii) Personal visit of the Institute management team to the stakeholders
  - (iv) Visit to the Hon. Minister requesting her to write letters to all stakeholders in her ministry to patronize the programs and other Institute programs
  - (v) States would be told not to send any of their staff who have attended a particular training to the Institute again for the same training.
  - (vi) The need to recruit more staff would continue to be pursuit with the government to enable young graduates to come into the water sector
  - (vii) The private sectors shall be encouraged to participate in the training
  - (viii) The civil societies, press, etc. to be trained as agents who would help in the dissemination of information to the grass roots about the programs in the water sector despite the budgetary constraints
  - (ix) The Institute has made proposals to SURE-P to assist in the area of Youth Empowerment programs
  - (x) The Institute shall visit the states that are not part of the Japan Assisted Program and Federal Ministry of Niger Delta on the need for them to patronize the training programs relevant to them
  - (xi) During the official handing over of the JICA five states, the Hon. Minister would be requested to make strong presentation to the governors if possible to sign an MOU on capacity building. The Institute management team is to see the Hon. Minister on this

5.9 ANY OTHER BUSINESS (AOB)

5.9.1 Remark by UNICEF Representative

The representative of UNICEF remarked that in the area of training, they are looking at the possibilities of using NWRI for Rural Water and Sanitation. NWRI is one of the places were such can be achieved because of the existing facilities. But the challenge is that of sustainability.

He went further to point out that UNICEF shall continue to support the Federal Government in human resources development especially in the area of Rural Water Supply and Sanitation.

In response, the Chairman appreciated the role UNICEF is playing in the area of RWSS and wish they would continue.

5.10 CHAIRMAN'S CLOSING REMARKS

The Chairman thanked all in attendance for their contributions and efforts toward making the project a success. He remarked that this project has been one of the priority projects of the Institute and wished all journey mercies.

5.11 NEXT MEETING

The next JCC meeting was scheduled for the middle of November 2014.

5.12 ADJOURNMENT

The meeting was adjourned after a motion was raised by Dele Olatunji (JICA Nigeria Office) and seconded by Mr. T. M. Atema (NWRI).

5.13 CLOSING

The meeting came to an end at 1.49pm with closing prayer by Dr. Dogara Bashir.

Dr. O. A. Bamgboye
CHAIRMAN

Mr. IBRAHIM, Joshua Doh
SECRETARY

4. Collected documents

List of Collected Documents

No.	Name of Documents	Org./Copy	Type	Origination of Publication	Published
Course 1 (Groundwater investigation technique)					
1-1	Water resourses of hard rock aquifers in arid and semi- arid zones	Copy	Hard copy	UNESCO Publishing, France	1999
1-2	Groundwater Development and Management in Hard Rock Areas	Copy	No copy	Magnus Liedholm SWECO, Sweden	May 2004
1-3	Applicability of Remote Sensing Techniques to Groundwater Exploration in Semi-Arid Hard Rock Terrain	Original	Hard copy	Chalmers University of Technology Goteborg, Sweden	2002
1-4	Remote Sensing and GIS for Groundwater Assessment in Hard Rock Areas- Application to Water Well Siting in Ghana and	Original	Hard copy	Gologiska Institutionen Goteborg	1996
1-5	G41 Resistivity Meter Manual	Original	Hard copy	Geotron Systems LTD	Aug. 2005
1-6	NWRI Short Course Training Manual on Geophysical Investigations for Groundwater Development and Management	Copy	Hard copy	NWRI	May 1998
1-7	Mineral Logging System	Original	Hard copy	不明	unknown
1-8	Short course on well sitting and borehole construction	Copy	No copy	不明	unknown
Course 2 (Borehole Construction and Manegement)					
2-1	National Code of Practice for Water Well Construction in Nigeria	Copy	Hard copy	NWRI	Aug. 2009
Course 3 (Drilling Technology)					
3-1	Youth Empowermant and Job Creation Programme Training on Water Well Drilling	Copy	Hard copy	NWRI	unknown

No.	Name of Documents	Org./Copy	Type	Origination of Publication	Published
Course 4 (Drilling Macinery maintenance)					
4-1	Youth Empowerment and Job Creation Programme Water Well Driiling Rig Fabrication Training	Copy	Hard copy	NWRI	unknown
4-2	RFC 101: Feature of Drilling Rig	Copy	Hard copy	NWRI	unknown
4-3	Elements of Drilling Rig Design - RFC 115	Copy	Hard copy	NWRI	unknown
4-4	RFC 111: Working Principles of Internal Cambustion Engines	Copy	Hard copy	NWRI	2010
Course 5 (Handpump Installation, Operation and Maintenance)					
5-1	Installation and Maintenance of RUWATSAN 1 Handpumps	Original	Hard copy	UNICEF	Sep.2008
5-2	Installation & Maintenance of RUWATSAN 2 Handpumps	Original	Hard copy	UNICEF	Sep.2008
5-3	Preventive Maintenance of RUWATSAN 1 Handpumps	Original	Hard copy	UNICEF	Sep.2008
5-4	Construction of Platforms and Drains for Handpumps	Original	Hard copy	UNICEF	Sep.2008
5-5	Maintenance Procedure for RUWATSAN 1 & 2 Handpumps	Original	Hard copy	NWRI	2007
5-6	Report of Hand pump maintenance course for motor cycle mechanics and bicycle repairers	Copy	Hard copy	NWRI	Jun. 2009
Course 6 (Borehole Maintenance and Rehabilitation)					
6-1	Trainig Guide for Borehole Maintenance and Rehabilitation Course Code:1012	Copy	Hard copy	NWRI	1997
6-2	NWRI In-House Training Programme Borehole Maintenance and Rehabilitation Course	Copy	Hard copy	NWRI	1997
6-3	Short Course Manual 2008	Copy	Soft Copy	NWRI	2008
6-4	Ground Water and Wells (Second edition) chapter19 well and pump maintenance and rehabilitation	Copy	Soft Copy	U.S.Filter/Jhonson Screens	1995

No.	Name of Documents	Org./Copy	Type	Origination of Publication	Published
Course 7 (Alternative Water Supply Sources)					
7-1	Training on Spring Water Development	Copy	Hard copy	NWRI / UNICEF	1996
7-2	Rainwater Harvesting	Copy	Hard copy	NWRI / UNICEF	unknown
7-3	Dug Well	Copy	Hard copy	NWRI / UNICEF	2003
Course 8 (Sanitation and Hygiene Practice)					
8-1	Trainees Participatory Hygiene and Sanitation Promotion Manual (developed by UNICEF and NWRI)	Original	Hard copy	NWRI/UNICEF	2007
8-2	Trainers Participatory Hygiene and Sanitation Promotion Manual (developed by UNICEF and NWRI)	Original	Hard copy	NWRI/UNICEF	2007
Course 9 (Community Mobilization and Sensitization)					
9-1	Trainees Community Management Manual (developed by UNICEF and NWRI)	Original	Hard copy	NWRI/UNICEF	2007
General					
10-1	NWRI 2008 SHORT COURSE PROGRAMME	Copy	Soft Copy	NWRI	2008