

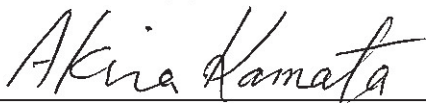
付属資料 3
会議議事録

**MINUTES OF MEETING BETWEEN
JICA EXPERTS AND THE MINISTRY OF WATER RESOURCES
ON
INCEPTION REPORT
OF
ETHIOPIA WATER TECHNOLOGY CENTER PROJECT**

The Japan International Cooperation Agency Experts (hereinafter JICA Expert) and Ministry of Water Resources (hereinafter MoWR) had a meeting on July 12, 2006 on the Inception Report of Ethiopia Water Technology Center (hereinafter EWTEC) Project submitted by JICA experts headed by Dr. Akira Kamata, Chief Advisor of the Project.

As a result of discussion, both sides came to understanding concerning the matters referred to in the document attached hereto.

Addis Ababa, July 12, 2006



Dr. Akira Kamata
Chief Advisor
JICA Experts



Mr. Getachew Abdi
Project Manager
Head of Rural Water Supply and Sanitation
Department, Ministry of Water Resources

1.4) Rope Pump Dissemination

- MoWR suggested that the Rope pump dissemination shall be carried out strategically as much as possible including trainers' training at the respective regions.
- JICA Expert explained that JICA's basic idea on the training for rope pump is the training of local artisan in each region in corporation with local NGOs and government organizations and MoWR accepted the idea. MoWR suggested that the technical vocational centers can also be used for the training of rope pump manufacturing. It is important to encourage all stake holders.

1.5) Periodical Meeting and Joint Coordination Committee (JCC)

- JICA Expert suggested that meetings with local staff in EWTEC will be held every month and MoWR agreed.
- MoWR accepted the idea of having JCC meeting and suggested that MoWR will arrange the meeting. MoWR suggested that the meeting should be held after the workshop on the concept paper and people from other organizations should be invited to discuss the future of EWTEC.

1.6) Monitoring System for Achievement and Output of the Project

- MoWR suggested that monitoring and evaluation of the graduates of EWTEC which now exceed 1200 is necessary to measure the impact of the training and JICA Expert agreed. MoWR explained that gathering the information of graduates such as email address and their current profession has already started.
- MoWR suggested that forming a practitioner group (alumni) is effective in terms of exchanging ideas after graduation and also it will prevent graduate from moving out from their profession.

2) Other issues

2.1) PDM and PO

- MoWR suggested that modification should be made based on the concept paper. The concept paper should reflect the result of training needs assessment conducted in each region. The needs assessment should be completed as quickly as possible. JICA Expert agreed with the idea.

2.2) Others

- MoWR questioned about counterpart training in Japan. JICA Expert explained that it is being processed, however, the counterpart training is under JICA Ethiopia office's responsibility and therefore it is not included in Inception Report.
- MoWR explained that other donors such as UNICEF and ADB are interested to support the

LIST OF ATTENDEE

Ethiopian Side

Mr. Getachew Abdi	Project Manager, Head of Rural Water Supply and Sanitation Department, MoWR
Mr. Markos Tefera	Head of the EWTEC, MoWR

Japanese Side

Mr. Naoki Ando	Deputy Resident Representative, JICA Ethiopia Office
Dr. Akira Kamata	Chief Advisor, Kokusai Kogyo Co., Ltd.
Mr. Shigeki Ishigaki	Training Course Management Expert, JICA
Mr. Masahiko Ikemoto	Training Course Management Expert, Kokusai Kogyo Co., Ltd.

A.

EWTEC Training Course Schedule in Second Project Year (2006-2007)

Training Course	Instructor	Year	2006									2007					
			4	5	6	7	8	9	10	11	12	1	2	3			
Regular Courses																	
Basic Courses																	
Groundwater Management (GM)	CP/LC			■	■	■					■	■	■				
Drilling Technology (DT)	CP/LC			■	■	■					■	■	■				
Drilling Machinery Maintenance Tech. (DMMT)	CP/LC			■	■	■					■	■	■				
Local Social Development (LSD)	CP/LC																
Water Supply Engineering (WSE)	CP/LC							15	■	■	15						
Electro-Mechanical Maintenance Tech. (EMMT)	CP/LC						18	■	■	■	30						■
Advance Course																	
Water Modeling (GWM)	Naoaki SHIBASAKI (JE)									21	■	■	22				
GIS/Information Management (1) GIS(1)	LC															2	
Information Management (2) GIS(2)	Lei PEIFENG (JE)															2	9
Planning and Designing (PD)	Tetsuji NIWANO (JE)									20	■	■	23				
WSE: Operation and Maintenance (OM)	CP/LC																
Remote Sensing (RS)	Kazutoshi MASUDA (JE)									20	■	■	23				
Supplemental On-Demand Courses																	
Rope Pump Manufacturing (RP)	FC																
Geological Investigation of Well (DI)	Tadao SUZUMURA (JE)																
Rehabilitation of Well (RW)	CP/LC																
Electro-Mechanical Maintenance Tech. (EMMT)	CP																
Research Activities																	
Development Study in Butajira-Ziway Area																	
Groundwater Management																	
Geological Survey and Lecture	Yoshitaka NAGAHASHI (JE)																
Artificial Recharge Design and Lecture	Frank van STEENBERGEN (FC)																
Appropriate Technology Development																	
Rope Pump Manufacturing (RP) Follow Up	FC																

CP=Counter Part, JE=Japanese Expert, LC=Local Consultant, FC=Foreign Consultant

Affix number in the bar chart indicates the date

■ MoWR's responsibility with JICA's budgetary support

■ MoWR's full responsibility

■ JICA's assistance (Japanese Expert or Foreign Consultant)

■ JICA's assistance (Local Consultant)

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A.

**MINUTES OF MEETING BETWEEN
JICA EXPERTS AND THE MINISTRY OF WATER RESOURCES
ON
PROGRESS REPORT
OF
ETHIOPIA WATER TECHNOLOGY CENTER PROJECT**

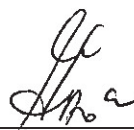
The Japan International Cooperation Agency Experts (hereinafter JICA Expert) and Ministry of Water Resources (hereinafter MoWR) had a meeting on November 30, 2006 on the Progress Report of Ethiopia Water Technology Center (hereinafter EWTEC) Project submitted by JICA experts headed by Dr. Akira Kamata, Chief Advisor of the Project.

As a result of discussion, both sides came to understanding concerning the matters referred to in the document attached hereto.

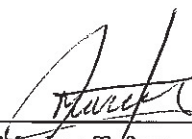
Addis Ababa, November 30, 2006



Dr. Akira Kamata
Chief Advisor
JICA Experts



Mr. Getachew Abdi
Project Manager
Head of Rural Water Supply and Sanitation
Department, Ministry of Water Resources



Mr. Markos Tefera
Head of Ethiopia Water Technology Center
Ministry of Water Resources

ATTACHED DOCUMENTS

1) Explanation of Progress Report (PR/R)

- The JICA Expert explained about the contents of the PR/R. The PR/R summarizes the activities of the EWTEC which were conducted from April to October, 2006.
- The PR/R includes the report of JICA experts on the following training course and study.
 - Groundwater Modeling Course
 - Volcanology Workshop
 - Water Supply Engineering Course (Advance)
 - Remote Sensing Course (Advance)
 - Research and Development in Butajira Ziway Area
 - Rope Pump Dissemination Activity
- The MoWR basically accepted the PR/R.

2) Rope Pump Training and Dissemination Activity

- The JICA Expert explained the history and present status of rope pump dissemination activity of the EWTEC and pointed out importance of quality control of the rope pump manufacturing.
- The MoWR mentioned that the method and number of rope pump distribution shall be mutually discussed with the MoWR, Water Resources Bureaus (hereinafter WRB) in each region and the JICA expert. The MoWR will communicate with the WRBs for smooth implementation of the rope pump distribution.
- The JICA Expert suggested conducting a rope pump training course in February 2007. The venue of the training course was discussed. It will finally be decided by the MoWR and pass on to the JICA Expert.

3) Water Supply Engineering Course

- Both side agreed to have a discussion and exchange opinions on the water supply engineering course in accordance with the results of the advance and basic courses conducted in 2006 for further improvement in 2007.

4) Impact of the Training

- The JICA Expert requested the MoWR to provide information of ex-trainee which has been gathered by the EWTEC. Both side agreed that those information shall be analyzed for impact assessment of the EWTEC project and utilized for further development of the training courses.

A.



LIST OF ATTENDEE

Ethiopian Side

Mr. Getachew Abdi

Project Manager, Head of Rural Water Supply and
Sanitation Department, MoWR

Mr. Markos Tefera


Head of the EWTEC, MoWR

Japanese Side

Dr. Akira Kamata

Chief Advisor, Kokusai Kogyo Co., Ltd



A. 

**MINUTES OF MEETING BETWEEN
JICA EXPERTS AND THE MINISTRY OF WATER RESOURCES
ON
INTERIM REPORT
OF
ETHIOPIA WATER TECHNOLOGY CENTER PROJECT**


The Japan International Cooperation Agency Experts (hereinafter JICA Expert) and Ministry of Water Resources (hereinafter MoWR) had a meeting on March 16, 2007 on the Interim Report of Ethiopia Water Technology Center (hereinafter EWTEC) Project submitted by JICA experts headed by Dr. Akira Kamata, Chief Advisor of the Project.

As a result of discussion, both sides came to understanding concerning the matters referred to in the document attached hereto.

Addis Ababa, March 16, 2007



Dr. Akira Kamata
Chief Advisor
JICA Experts



Mr. Getachew Abdi
Project Manager
Head of Rural Water Supply and Sanitation
Department, Ministry of Water Resources



Mr. Markos Tefera
Head of Ethiopia Water Technology Center
Ministry of Water Resources

ATTACHED DOCUMENTS

1) Explanation of Interim Report (IT/R)

- The JICA Expert explained about the contents of the IT/R. It summarizes the activities of the EWTEC Project which were conducted from April 2006 to March, 2007 (The second year of the Project).
- The IT/R includes the report of activities on the following training courses and studies.
 - Groundwater Modeling Course
 - Volcanology Workshop
 - Water Supply Engineering Course (Advance)
 - Remote Sensing Course (Advance)
 - Well Diagnosis and Rehabilitation Course (On-Demand)
 - Research and Development in Butajira Ziway Area
 - Rope Pump Dissemination Activity
- The MoWR basically accepted the IT/R.

2) Research and Development Activities

- The JICA Expert explained R&D activities in EWTEC Project in the second year. Main subjects of R&D are as follows and these three (3) studies have been completed:
 - ① Development study in Butajira Ziway area.
 - ② Baseline study in the Butajira Ziway area.
 - ③ Study on Appropriate Technology Plan
- Both side agreed that text book and teaching materials for the training courses will be compiled based on the results of R&D in the third year of the Project. The results of R&D will also be disseminated through the seminar and workshop in participation of relevant organizations and personnel in the third year.
- The JICA Expert reported that Pilot Water Supply Systems have been constructed at three locations in Butajira Area.
 - ① Kuno Kertafa : Small scale water supply system by using engine rope pump
 - ② Lerabo village (neighboring area of Kecheber): Animal driven pump
 - ③ Rope pump demonstration in Dobena Bati
- The JICA Expert reported that a preparatory work for rope pump installation has started from February, 2007 in SNNPR. The work will be continued to May, 2007. The JICA Experts requested the MoWR to see the progress of the work during absence of the JICA Experts.
- Durability test of Afridev pump will be continued at EWTEC compound. Operation will be monitored by EWTEC staff.

3) Water Supply Engineering Course

- Both side had common beliefs that Water Supply Engineering (WSE) Course should be operated as one course in the third year of the Project. The course curriculum will be unified with present basic course and advance courses (plan & design, operation & maintenance). WSE course should be conducted continuously in about 2.0 months. This idea of WSE course operation will be conveyed to JICA headquarters and further discussed. Based on the discussion in JICA headquarters, details of the course curriculum will be discussed with MoWR and JICA Expert at the beginning of the third year.

4) Impact Study on EWTEC Training

- The JICA Expert explained a plan of an impact study on the project. A ToR will be prepared by the JICA Expert. The local consultants will be invited for submission of the proposal. The results of the impact study will be utilized for planning of the future EWTEC activities. The MoWR agreed it.

5) Equipment and Materials

- The MoWR requested supply of the equipment for Drilling Machinery Maintenance Technology (DMMT) Course and Electro Machinery Maintenance Technology (EMMT) Course for renewal. The JICA expert will convey this request to JICA headquarters.

6) Transferring Operational Responsibility of EMMT course to MoWR

- The JICA Expert suggested to transfer EMMT course to under MoWR's responsibility as was stated in the Plan of Operation (March 31, 2006). MoWR agreed to it.

7) Joint Coordinating Committee (JCC)

- Both side agreed to hold JCC at the beginning of the third year of the project (May, 2007), as it was not held in the end of the second year. The following matters shall be discussed in JCC according to Record of Discussion signed on March 15, 2005.

- ① Annual and overall progress of the project
- ② Evaluation of the accomplishment of annual target and achievement of the objectives
- ③ Finding out of solutions for major issues.

LIST OF ATTENDEEEthiopian Side

Mr. Getachew Abdi	Project Manager, Head of Rural Water Supply and Sanitation Department, MoWR
Mr. Markos Tefera	Head of the EWTEC, MoWR
Mr. Mulgeta Kenfu	Instructor, EWTEC
Mr. Shumet Kebede	Instructor, EWTEC, MoWR
Mr. Endris Mohammed	Instructor, EWTEC, MoWR

Japanese Side

Dr. Akira Kamata	Chief Advisor, Kokusai Kogyo Co., Ltd
Dr. Lei Peifeng	Expert for GIS
Mr. Masahiko Ikemoto	Expert for Training Course Coordination

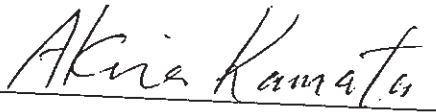
A. 

THE MINISTRY OF WATER RESOURCES OF
THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA
ON JAPANESE TECHNICAL COOPERATION
FOR
THE ETHIOPIA WATER TECHNOLOGY CENTER PROJECT
IN THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA


The Japan International Cooperation Agency (hereinafter referred to as "JICA") and the Ethiopian authorities concerned had a series of discussion as a Joint Coordination Committee (JCC) meeting concerning the Ethiopia Water Technology Center Project in the Federal Democratic Republic of Ethiopia (hereinafter referred to as "the Project").

As a result of discussion, both sides came to understanding concerning the matters referred to in the documents attached hereto.

Addis Ababa, July 2, 2007



Dr. Akira KAMATA
Chief Advisor
EWTEC Project
Japan International Cooperation Agency



H.E. Ato Abera Mekonen
Chief Engineer
Ministry of Water Resources
Federal Democratic Republic of Ethiopia

ATTACHMENT DOCUMENT

1. Schedule for 3rd Year of the Project

The Japanese side explained the contents of EWTEC's activities planned in the Japanese fiscal year 2007 based on the revised Plan of Operation (PO) and Ethiopian side agreed (Appendix 1). The Japanese side informed that the JICA will dispatch the Project Evaluation Team in August 2007 to conduct evaluation and discussion on the Project jointly with the MoWR. Both sides confirmed it.

2. Activities of the Project

Activities of the project, training courses, Butajira/Ziway development study and rope pump dissemination in the past two years were explained by the Japanese side and the following issues were raised as the problems EWTEC is currently facing.

- Lack of equipment for practical training.
- Improvement of instructors' capacity.
- Difficulties in securing guest lecturers from private consulting firms for Basic courses.
- No applicant for the post of the training coordinator.
- Difference in experience among the participants
- Poor capacity of the dormitory
- No recreation facilities

3. Human Resources Development in UAP and EWTEC

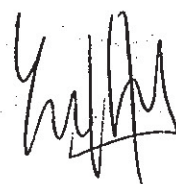
The need of human resources development in the context of Universal Access Program (UAP) was explained by the Ethiopian side. As the framework of human resources development, the required conditions for water sector staff were explained. The conditions are proper skill, knowledge, motivation through adequate rewards including salary as well as the needs of right management structures, institutional arrangements and so on.

The Ethiopian side explained the role of EWTEC is expected to take for the human resources development. Contribution of EWTEC is expected at all levels from the Federal to Woreda level including Regional level to fill the sector capacity gap.

The Ethiopian side explained the detailed role of EWTEC and the training approach in the context of the UAP by showing the diagrams (Appendix 2 and 3).

4. Formulation of the Future Plan of EWTEC

The Japanese side emphasized the need of data collection on present number of staff assigned in



Regional water bureau, Zonal and Woreda water resources offices. Needs of data in Technical Vocational Training College (TVTC) was also emphasized. The Japanese side requested a future plan of EWTEC is formulated by the MoWR and submitted to JICA before the arrival of the Project Evaluation Team. A schedule for planning of future EWTEC was proposed by Japanese side (Appendix 4).

5. Data Collection in Region As a Part of Impact Study

The Japanese side explained that a local consultant is collecting personnel information such as the number of technicians and mechanics under each Region and Woreda during the Impact Study of the Project, which is now being conducted. The Ethiopian sides proposed to assign ministry staff to support the data collection. Both sides recognized that the collected information will be useful not only for the future EWTEC but also whole water sector.

6. Capacity Needs Assessment Survey

The Ethiopian side explained that a capacity needs assessment survey for the use of capacity building pooled fund has been conducted and a draft report of the survey was circulated among DAG committee members. The Ethiopian side suggested including EWTEC as one of the targets of the survey and sharing the results with the results of the Impact Survey conducted by the Japanese side.

7. Human Resources Needs

The Japanese side asked about a guideline for staffing of Regional Bureaus, Zone and Woreda offices and the Ethiopian side answered that there is no guideline for staffing and it depends on each Region.

The Ethiopian side explained that the number of required human resources for the implementation of UAP was calculated based on certain assumptions of the needs of each professional such as hydrogeologists. The human resources gap will be understood by comparing the calculated data and the actual number of staff collected by the Impact Study. The Ethiopian side suggested that the assumption criteria are mentioned in the UAP annex.

8. Training needs in Technical Vocational Training College (TVTC)

The Ethiopian side explained that TVTC has always problems in software as well as hardware. Most of the college teachers are juniors and lacking practical experience and most of the colleges are not well equipped. Especially workshops for water supply section are almost empty.

Ethiopian side proposed that Training of Trainers (TOT) for the teachers in TVTC by EWTEC. Since EWTEC cannot give trainings to all the required staff by the year 2012, the target year of UAP, trained

teachers in TVTC are expected to create more professionals. The timing of training for the TVTC teachers has to be well considered.

The Ethiopian side will prepare another project proposal for training equipment after surveying detailed requirement.

9. Linkage with Universities

Ethiopian side explained that involving universities in the training have been difficult so far because most of the professors are too busy to spend their time for extra purpose. EGRAP has also a linkage with Addis Ababa University for its activities, but currently there are only two professors for 30 to 40 students for hydrogeology major in Addis Ababa University, which is not sufficient. Therefore, the linkage with universities for EWTEC activities might be difficult due to shortage of professors.

10. Possibility to establish EWTEC as Autonomous or Semi-autonomous Institution

The Ethiopian side explained that establishing a training center as an autonomous educational institution is challenging because the Ministry of Education needs to be involved. However, currently the Ministry of Education is not in the position of taking over EWTEC. The certificate of EWTEC, which is currently being provided to the graduates, needs to be upgraded to a publicly acceptable level or diploma level.

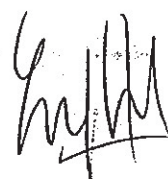
The Japanese side raised the importance of sustainability of EWTEC operation in terms of staffing and asked the reason for the difficulties of recruiting new course coordinators as well as guest lectures for EWTEC. The Ethiopian side explained that the salary of the government staff is controlled by national level and the salary scale is too low compared to the private sector, which does not attract experienced engineers.

11. Research and Development

Ethiopian side explained that Ethiopia is currently considering the groundwater research at the national level. It is good idea that EWTEC conducts research activities and combine with trainings. Ethiopian side suggested that Research & Development Department of MoWR joins EWTEC in the future and further discussion is needed on this matter.

12. Others

The Ethiopian side committed to come up with a proposal for how to upgrade EWTEC and requested suggestion from Japanese side including financial issues.



- Appendix 1 Plan of Operation
- Appendix 2 Position & role of EWTEC in Universal Access Program
- Appendix 3 EWTEC training approach in UAP for human resources development
- Appendix 4 Schedule for Formulating Future Plan of EWTEC
- Appendix 5 List of Attendee in JCC



A.

Appendix 1

Ethiopia Water Technology Center [EWTEC] : Plan of Operation

July 2, 2007

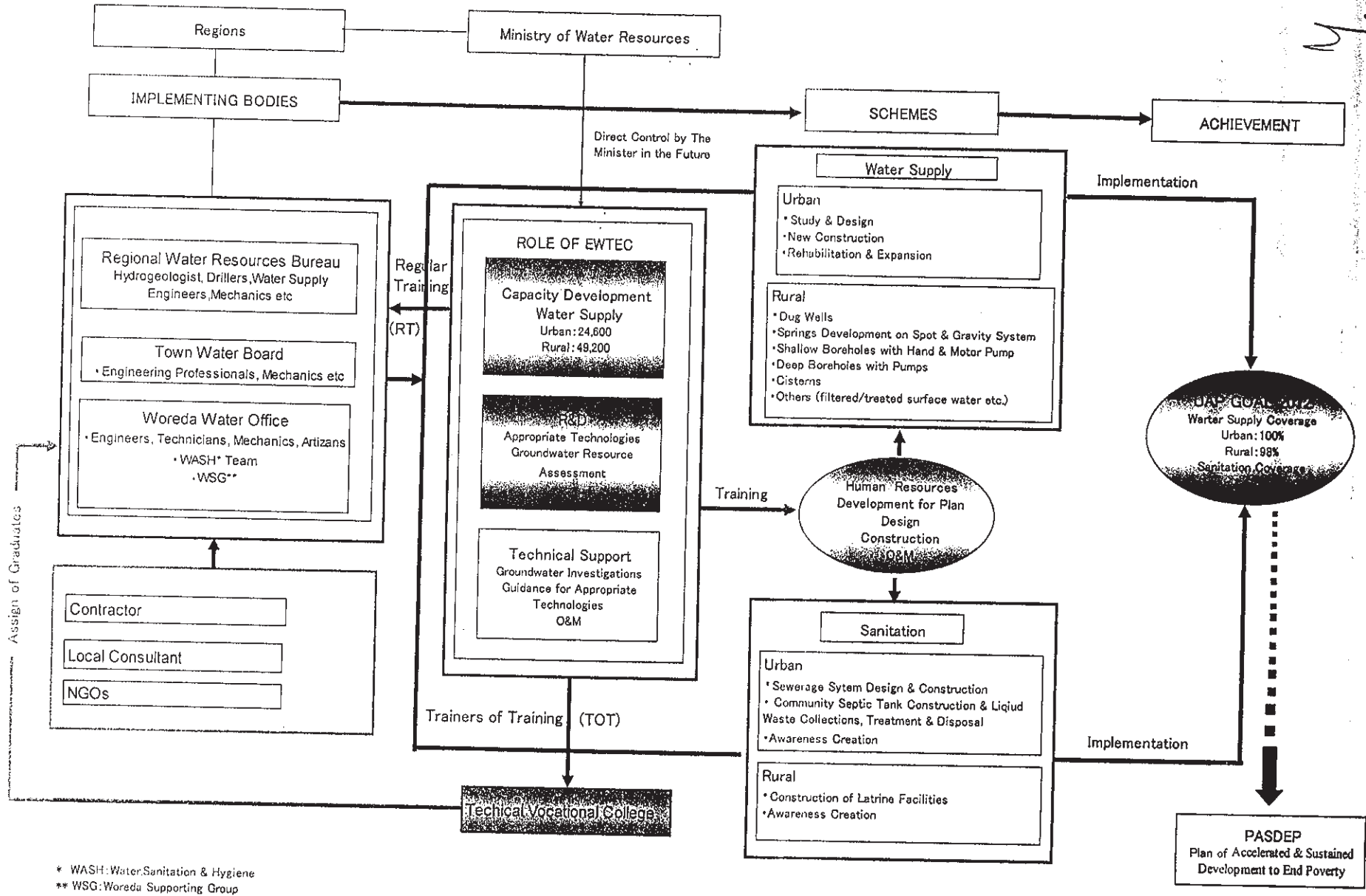
付属資料3

Activities	Location	Duration	No. of Trainee	Instructor	Fiscal Year												Target Groups
					Japan 2005		Ethiopia 1998		Japan 2006		Ethiopia 1999		Japan 2007		Ethiopia 2000		
					ET 1997	ET 1998	ET 1997	ET 1998	ET 1997	ET 1998	ET 1997	ET 1998	ET 1997	ET 1998	ET 1997	ET 1998	
1. Implementation of Training Courses																	
1.1 Regular Courses																	
1.1.1 Basic Courses																	
1.1.1.1 Groundwater Management (GM)	AA	12 weeks	20	CP/LC/JE	[Gantt chart showing activity from month 10 to 12]												RWB, Zone
1.1.1.2 Drilling Technology (DT)	AA	12 weeks	10	CP/LC	[Gantt chart showing activity from month 10 to 12]												RWB, WWCE
1.1.1.3 Drilling Machinery Maintenance Tech. (DMMT)	AA	12 weeks	10	CP/LC	[Gantt chart showing activity from month 10 to 12]												RWB, WWCE
1.1.1.4 Local Social Development (LSD)	AA	8 weeks	10	CP/LC	[Gantt chart showing activity from month 10 to 12]												Woreda
1.1.1.5 Water Supply Engineering (WSE)	AA	4 weeks	20	CP/LC	[Gantt chart showing activity from month 10 to 12]												RWB, Zone, TWSS
1.1.1.6 Electro-Mechanical Maintenance Tech. (EMMT)	AA	6 weeks	20	CP/LC	[Gantt chart showing activity from month 10 to 12]												Zone, Woreda
1.1.2 Advance Courses																	
1.1.2.1 Groundwater Modeling (GWM)	AA(Hotel)	5 weeks	27	JE	[Gantt chart showing activity from month 10 to 12]												16 African+10 Ethiopian
1.1.2.2 GIS/Information Management (1) (GIS 1)	AA	4 weeks	20	LC	[Gantt chart showing activity from month 10 to 12]												RWB, Federal Agencies
1.1.2.3 GIS/Information Management (2) (GIS 2)	AA	4 weeks	20	JE	[Gantt chart showing activity from month 10 to 12]												16 African+10 Ethiopian
1.1.2.4 WSE: Planning and Designing (PD)	AA	4 weeks	20	JE	[Gantt chart showing activity from month 10 to 12]												RWB, Zone, TWSS
1.1.2.5 WSE: Operation and Maintenance (OM)	AA	4 weeks	20	CP/LC	[Gantt chart showing activity from month 10 to 12]												RWB, Zone, TWSS
1.1.2.6 Remote Sensing (RS)	AA	2-4 weeks	20	JE	[Gantt chart showing activity from month 10 to 12]												16 African+10 Ethiopian
1.2 Supplemental On-Demand Courses																	
1.2.1 Rope Pump Manufacturing (RP)		2-4 weeks	15	LC/FC	[Gantt chart showing activity from month 10 to 12]												Local Artisan, Woreda
1.2.2 Diagnostic Investigation of Well (DI)		2-4 weeks	10	JE	[Gantt chart showing activity from month 10 to 12]												RWB, Zone
1.2.3 Rehabilitation of Well (RW)		2-4 weeks	10	CP/LC	[Gantt chart showing activity from month 10 to 12]												RWB, Zone
1.2.4 Artificial Recharge (AR)		2-4 weeks	20	(FC)	[Gantt chart showing activity from month 10 to 12]												RWB, Federal Agencies
1.2.5 Appropriate Technology (AT)		2-4 weeks	15	(LC)	[Gantt chart showing activity from month 10 to 12]												RWB, Zone
1.2.6 Project Management (PM)		2-4 weeks	20	(LC)	[Gantt chart showing activity from month 10 to 12]												Woreda
1.2.7 Maintenance Workshop Management (MWM)		2-4 weeks	15	(FC/JE)	[Gantt chart showing activity from month 10 to 12]												WWCE
1.2.8 Electro-Mechanical Maintenance Tech. (EMMT)	Region	2 weeks	25	CP	[Gantt chart showing activity from month 10 to 12]												Regional VTC Students
2. Research and Development Activities																	
2.1 Development Study in Butajira-Ziway Areas																	
2.1.1 Groundwater Management																	
2.1.1.1 Hydrogeological Field Investigation					[Gantt chart showing activity from month 10 to 12]												
2.1.1.2 Inventory of Existing Water Point					[Gantt chart showing activity from month 10 to 12]												
2.1.1.3 Geophysical Exploration					[Gantt chart showing activity from month 10 to 12]												
2.1.1.4 Test Drilling					[Gantt chart showing activity from month 10 to 12]												
2.1.1.5 Observation of Various Data					[Gantt chart showing activity from month 10 to 12]												
2.1.1.6 GIS Database					[Gantt chart showing activity from month 10 to 12]												
2.1.1.7 Groundwater Modeling					[Gantt chart showing activity from month 10 to 12]												
2.1.1.8 Groundwater Management Plan					[Gantt chart showing activity from month 10 to 12]												
2.1.2 Appropriate Technology Development																	
2.1.2.1 Socio-Economic, Health Baseline Study					[Gantt chart showing activity from month 10 to 12]												
2.1.2.2 Sites Investigation					[Gantt chart showing activity from month 10 to 12]												
2.1.2.3 Designing Various Facilities					[Gantt chart showing activity from month 10 to 12]												
2.1.2.4 Construction of Experimental Facilities					[Gantt chart showing activity from month 10 to 12]												
2.1.2.5 Observation of Various Data					[Gantt chart showing activity from month 10 to 12]												
2.1.2.6 Dissemination Plan of Appropriate Technology					[Gantt chart showing activity from month 10 to 12]												
2.2 Appropriate Technology Dissemination																	
2.2.1 Distribution of 500 Rope Pumps & Installation Training in Various Regions					[Gantt chart showing activity from month 10 to 12]												
2.3 Diagnostic Investigation/Rehabilitation of Well																	
2.4 Village Impact Study																	
3. Implementation and Implementation Support for RWSS																	
3.1 Implementation of Pilot Project(s)																	
3.2 Implementation Support																	
3.2.1 Japan's Grant Aid & Other Projects in RWSS (Human Resource Development Programs)																	

CP=Ethiopian Counterpart Personnel, JE=Japanese Expert, LC=Ethiopian Local Consultant, FC=Foreign Consultant
 Training Course Line: (Red) = MoWR's responsibility and JICA's budgetary support
 (Pink) = MoWR's full responsibility
 (Blue)=JICA's assistance (Japanese Expert or Foreign Consultant)
 (Yellow)=JICA's assistance(Local Consultant)

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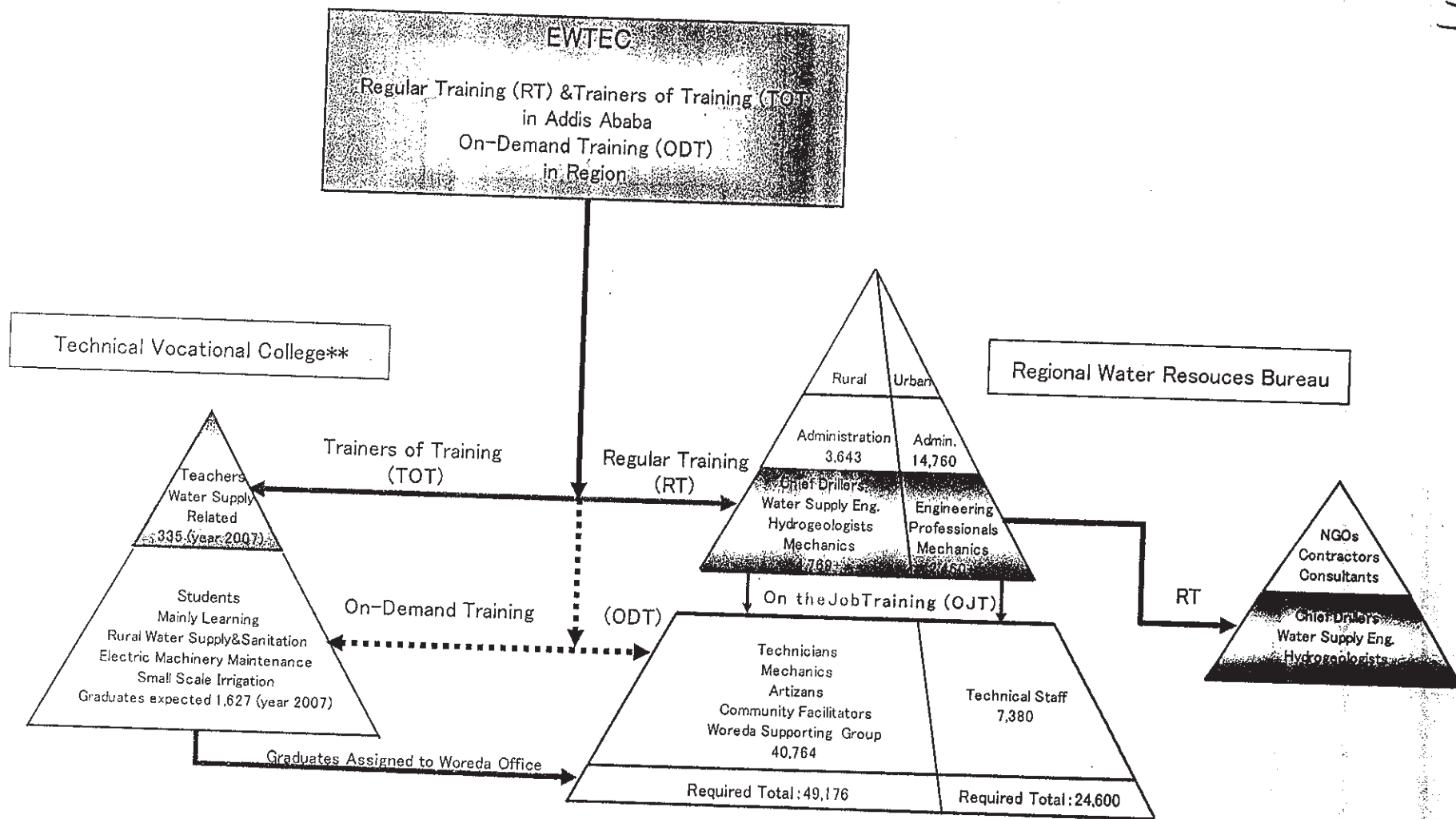


* WASH: Water, Sanitation & Hygiene
 ** WSG: Woreda Supporting Group

Figure 1 POSITION & ROLE OF EWTEC IN UNIVERSAL ACCESS PROGRAM (UAP: 2005-2012)

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* Universal Access Program (2005-2012)
 ** Nine (9) colleges are currently operated in Asela, Assosa, Awasa, Bahir Dar, Jijiga, Komborcha, Lusi, Minchew and Woliso

Figure 2 EWTEC TRAINING APPROACH IN UAP* FOR HUMAN RESOURCES DEVELOPMENT

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Appendix 4

2007/07/2
JICA Ethiopia Office

Formulating Future Plan of EWTEC
Schedule

As the Future Cooperation of EWTEC is not officially approved in JICA HQ yet, formulating the concept of future EWTEC is very important to present MoWR's initiative for managing EWTEC. Therefore, JICA would like to propose MoWR to formulate the concept paper as following schedule to be met on right timing with Evaluation Mission;

Before Approval

(July)

- Collecting Woreda level "Human Resource Gap" and "Needs" Data (At least 4 big regions).
- Clarifying the Problem and Needs of TVTC
- Clarifying the Possibility to collaborate with Addis Ababa University (as instructors)
- Clarifying the vision and procedure to be autonomous organization

(By the First week of August)

- Completing First Draft
- Preliminary Discussion with JICA Ethiopia Office

(Mid August)

- Final Evaluation of EWTEC Phase 2 Project
- Explanation of Future Concept of EWTEC to JICA Evaluation Mission by MoWR

After Approval

Detail Designing of Future EWTEC project

(March 2008)

Termination of EWTEC Phase 2 Project

(After April 2008)

Implementation of NEW EWTEC Project

End



Appendix 5

LIST OF ATTENDEE IN JCC

Ministry of Water Resources

Mr. Abera MEKONEN	Chief Engineer, EWTEC Project Director
Mr. Getachew ABDI	Head, Rural Water Supply & Sanitation Department, EWTEC Project Manager
Ms. Martha SOLOMON	Head, Policy Development Cooperation Department
Mr. Abebe Ayelew	Head, Research & Development Department
Mr. Tasfaye Tadesse	National Coordinator, EGRAP
Mr. Ketama W/Agegnu	Leader, Water Works Technical & Vocational Training Programme Coordination
Mr. Endris Mohammed	Course Coordinator, EWTEC

Japan International Cooperation Agency

Mr. Naoki ANDO	Deputy Resident Representative, JICA Ethiopia Office
Dr. Akira KAMATA	Expert, Chief Advisor, EWTEC Project
Mr. Masahiko IKEMOTO	Expert, Training Course Coordination

MINUTES OF MEETINGS BETWEEN
 JAPAN INTERNATIONAL COOPERATION AGENCY AND
 THE MINISTRY OF WATER RESOURCES OF
 THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA
 ON JAPANESE TECHNICAL COOPERATION
 FOR
 THE ETHIOPIA WATER TECHNOLOGY CENTER PROJECT
 IN THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA

The Japan International Cooperation Agency (hereinafter referred to as "JICA") and the Ethiopian authorities concerned had discussion on evaluation of the Ethiopia Water Technology Center (EWTEC) Project (hereinafter referred to as "the Project") and the future vision of EWTEC as a Joint Coordination Committee (JCC) meeting.

As a result of discussion, both sides came to understanding concerning the matters referred to in the documents attached hereto.

Addis Ababa, August 23, 2007

Akira Kamata

Dr. Akira Kamata
 Chief Advisor
 EWTEC Project
 Japan International Cooperation Agency



Witness

Ato Abera Mekonen

Ato Abera Mekonen
 Chief Engineer
 Ministry of Water Resources
 Federal Democratic Republic of Ethiopia



Kazuo Sudo

Mr. Kazuo Sudo
 Team Leader
 Project Evaluation Team
 Japan International Cooperation Agency

Attached Documents

1. Explanation on Evaluation Results of EWTEC Project**1.1 Summary of Joint Evaluation Results**

Japanese side explained of the summary of the joint evaluation results referring the draft evaluation report which was distributed in the previous day to the people concerned (Appendix 1).

1.2 Thorough read-through of the Joint Evaluation Report by all attendees

The joint evaluation report was read-through by all attendees and all the results were accepted by all with minor revision.

2. Presentation of Concept Paper on Future EWTEC**2.1 Presentation by the Head of EWTEC**

Ethiopian side presented the background and the previous activities of the project followed by the explanation of problems associated with the existing training program and future plan of EWTEC (Appendix 2).

2.2 Institutional Restructure of Future EWTEC

Ethiopian side confirmed that EWTEC will be upgraded to a department level in 4 to 5 months and transferred to a permanent semi-autonomous institution in 2 to 3 years referring the Minister's strong initiative on the issue, and agreed that a clear road map of the institutionalization should be included in the next version of the concept paper of future EWTEC.

Ethiopian side expressed that upgrading EWTEC to a higher level is one of the immediate tasks of the next phase of the project.

2.3 Mandate and Responsibility of Future EWTEC

Both sides recognized that the Ministry will have a detailed road map to clarify mandate and responsibility of future EWTEC.

Ethiopian side committed that an immediate action for a further study will be taken.

2.4 Support from Other Donors for Future EWTEC

Ethiopian side expressed that discussion with the other donors on future EWTEC has already been initiated and a certain consensus has been made to use the Capacity Building Pooled Fund for the operation of EWTEC.

2.5 Research and Development Activity

The Ethiopian side expressed that the research and development activity carried out by EWTEC

should be considered in the same framework of EGRAP+ in the future and Research and Development Coordination Department should be involved in the activity.

2.6 Licensing for Training Course Participants

Ethiopian side explained that discussion has been made with the department dealing with licensing (Water Resources Administration and Urban Water Supply and Sewerage Service Department) to upgrade the graduation certificate provided by EWTEC to a level of license. Currently the basic courses are provided for the period of three months, which cannot issue more than a graduation certificate. In order to upgrade the certificate, the duration of the training courses should be increased and the curricula also need be revised in the future.

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Appendices

Appendix 1: Joint evaluation report

Appendix 2: Concept paper on future EWTEC (Draft version 2.1)

Appendix 3: List of Attendees in JCC



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Appendix 3

List of Attendees in JCC

Ministry of Water Resources

Mr. Abera Mekonnen Chief Engineer, MoWR
Ms. Martha Solomon Head, Policy Development Cooperation and Foreign Relation Department
Mr. Markos Tefera Head of EWTEC
Mr. Endris Mohammed Course coordinator, EWTEC
Mr. Ketama W/Agegenu Team Leader, Water Works Technical & Vocational Training Programme
Coordination
Mr. Tasfaye Tadesse National Coordinator, EGRAP

Japan International Cooperation Agency

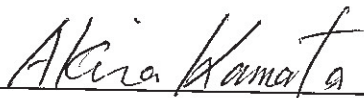
Dr. Akira Kamata Expert, Chief Advisor, EWTEC
Mr. Masahiko Ikemoto Expert, Training Course Management
Mr. Kazuo Sudo Team Leader, Project Evaluation Team
Dr. Yuji Maruo Technical Advisor, Project Evaluation Team
Mr. Masami Moko Cooperation Planning, Project Evaluation Team
Mr. Hiroyuki Yakushi Assistant Resident Representative, JICA Ethiopia Office
Ms. Yoshie Yamamoto Evaluation and Analysis, Project Evaluation Team

**MINUTES OF MEETING BETWEEN
JICA EXPERTS AND THE MINISTRY OF WATER RESOURCES
ON
PROGRESS REPORT 2
OF
ETHIOPIA WATER TECHNOLOGY CENTER PROJECT**

The Japan International Cooperation Agency Experts (hereinafter JICA Expert) and Ministry of Water Resources (hereinafter MoWR) had a meeting on November 7, 2007 on the Progress Report 2 of Ethiopia Water Technology Center (hereinafter EWTEC) Project submitted by JICA experts headed by Dr. Akira Kamata, Chief Advisor of the Project.

As a result of discussion, both sides came to understanding concerning the matters referred to in the document attached hereto.

Addis Ababa, November 7, 2007



Dr. Akira Kamata
Chief Advisor
JICA Expert



Mr. Markos Tefera
Head of Ethiopia Water Technology Center
Ministry of Water Resources

ATTACHED DOCUMENTS

1) Explanation of Progress Report (PR/R 2)

- The JICA Expert explained about the contents of the PR/R 2. The PR/R 2 summarizes the activities of the EWTEC, which were conducted from May to October 2007.
- The PR/R 2 includes the report of JICA experts on the following training course and study.
 - Water Supply Engineering Course (Advance coupled with Basic course)
 - Rope Pump Manufacturing Course at Woliso
 - Butajira-Ziway Development Study (Compilation of Textbooks)
 - Rope Pump Dissemination Activity
- The MoWR basically accepted the PR/R2.

2) Rope Pump Training and Dissemination Activity

- The JICA Expert explained current status of rope pump dissemination activities. The MoWR basically acknowledged it.
- The JICA expert requested the MoWR that monitoring of pilot schemes constructed in Butajira area by dispatching EWTEC's staff to the sites.

3) Well Rehabilitation Course in Afar Region

- Both sides agreed to hold a Well Rehabilitation Course in Mile and Dubti in Afar Region in February 2008 based on the joint survey and discussion with Water Resources Bureau, EWTEC and JICA expert.

LIST OF ATTENDEE

Ethiopian Side

Mr. Markos Tefera

Head of the EWTEC, MoWR



Japanese Side

Dr. Akira Kamata

Chief Advisor, Kokusai Kogyo Co., Ltd

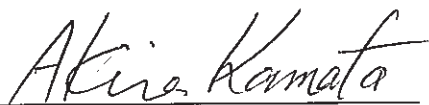
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MINUTES OF MEETINGS BETWEEN
 JAPAN INTERNATIONAL COOPERATION AGENCY AND
 THE MINISTRY OF WATER RESOURCES OF
 THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA
 ON JAPANESE TECHNICAL COOPERATION
 FOR
 THE ETHIOPIA WATER TECHNOLOGY CENTER PROJECT
 IN THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA

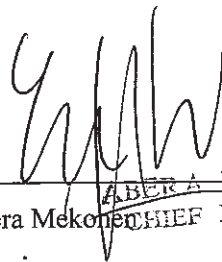
The Japan International Cooperation Agency (hereinafter referred to as “JICA”) and the Ethiopian authorities concerned had discussion on evaluation of the Ethiopia Water Technology Center (EWTEC) Project (hereinafter referred to as “the Project”) and the future vision of EWTEC as a Joint Coordination Committee (JCC) meeting.

As a result of discussion, both sides came to understanding concerning the matters referred to in the documents attached hereto.

Addis Ababa, February 29, 2008



Dr. Akira Kamata
 Chief Advisor
 EWTEC Project
 Japan International Cooperation Agency



Ato Abera Mekonen
 Chief Engineer
 Ministry of Water Resources
 Federal Democratic Republic of Ethiopia

Attached Documents

1. Presentation on EWTEC Activities (Appendix 4)

- 1.1 EWTEC Activities during October 2007 to March 2008 was explanation by Mr. Markos, the Head of EWTEC.
- 1.2 Summary of rope pump dissemination activities EWTEC implemented was explained by Mr. Ikemoto, JICA expert.
- 1.3 Achievement and lessons, learned from Phase 2 of EWTEC Project was explained by Dr. Kamata, JICA Expert, Chief Advisor of EWTEC.

2. Discussion

2.1 Rope pump

- Ethiopian side raised question whether material supply chain has been established. JICA expert answered that all the necessary material for manufacturing rope pump is available at the capital town of each region. But some material for installation such as PVC and piston is only available in Addis Ababa. The dissemination of rope pump is still at the beginning stage and it takes time for building material shops to keep some stock of such material at their store. Currently, all the workshops in each region transport the PVC and piston directly from Addis Ababa.
- Ethiopian side asked if microfinance can be applied to non-business activity like rope pump dissemination. JICA Expert answered that SNNP Regional Bureau is preparing a bylaw for a water committee to get initial investment through microfinance. According to SNNP regional bureau, if the bylaw is registered by the regional government, it is easy to apply for microfinance.
- Ethiopian side raised a question about the quality control for the rope pump and asked if there is a model to keep quality. JICA expert answered that NGO will take an important role to control the quality. In addition, EWTEC has provided a quality tag for the rope pumps which were inspected by the engineer dispatched by EWTEC. A one day workshop on rope pump awareness was also held at each region inviting government officials and NGOs. The qualified workshops were introduced to the concerned people and important points for the maintenance were discussed among the participants. A brochure on the rope pump maintenance is also provided to the concerned people.
- Ethiopian side raised an issue on sanitary aspect and recommended to construct a drainage and a fence to keep the surrounding area of the pump to be clean.
- Ethiopian side asked the possibility of expanding the dissemination activity to the other region. JICA Expert answered that there is no plan for JICA to expand the activity to the other regions at this moment.

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2.2 Project impact

Observation, finding should be shared between JICA and MoWR in the coming study.

Ethiopian side raised a question about indirect impact of the Project. The JICA expert explained that various impacts, such as raising motivation for upgrading of job performance, exchange of knowledge and experiences among the trainees and so on, will indirectly spread to the water supplies in Ethiopia.

2.3 EWTEC project Phase 3

- Recommendations for the next phase of the project were presented based on the observations by JICA expert (Appendix 4).
- JICA Ethiopia office explained the following three key words for the Phase 3, that is, 1. Quality management, 2 Diversity of needs and 3. Becoming independent. JICA Ethiopia office expressed that JICA can support 1 and 2 but 3 has to be responsible by MoWR and asked an opinion how MoWR wants to utilize EWTEC and the current situation of EWTEC under the structural reform being discussed internally in MoWR. Ethiopian side requested JICA to come up with recommendation from JICA based on JICA's experience and answered that the organizational restructure will be finalized within this Ethiopian fiscal year.
- Ethiopian side recognized that the capacity building of trainers is a major issue and the issue of EWTEC's trainers is being discussed in MoWR. MoWR recognizes that some change is necessary to attract trainers in the next phase. As UAP demands a lot of personnel, it is good if JICA comes up with modality and recommendation.

Appendices

Appendix 1: List of Attendees in JCC

Appendix 2: Joint Coordinating Committee Program

Appendix 3: Executive summary of Completion Report

Appendix 4: Presentation material

Appendix 1

List of Attendees in JCC

Ministry of Water Resources

Mr. Abera Mekonnen	Chief Engineer, MoWR
Mr. Abey Girna	Acting Department Head of Rural Water Supply and Sanitation, MoWR
Mr. Abebe Ayenew Bekele	Head, Research & Development Coordination Dept., MoWR
Mr. Yohannes G. Medhin	Head of Water Supply and Sewerage Department
Mr. Markos Tefera	Head of EWTEC
Mr. Mulugeta Kenfu	Course Coordinator, EWTEC

JICA Expert

Dr. Akira Kamata	Expert, Chief Advisor, EWTEC
Mr. Masahiko Ikemoto	Expert, Training Course Management, EWTEC

JICA Ethiopia Office

Mr. Katsuhiro Sasaki	Resident Representative
Mr. Hiroyuki Yakushi	Assistant Resident Representative, JICA Ethiopia Office
Ms. Yoshie Yamamoto	Organization Management Consultant, Global-Link Management

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Appendix 2

**JOINT COORDINATING COMMITTEE (JCC)
PROGRAM
On
Ethiopian Water Technology Center Project (EWTEC) -Phase 2-**

Date: 2008.2.29 (Friday February 29, 2008)

Time: 9:00-11:00 A.M.

Venue: Conference Room, Ministry of Water Resources

1. Opening Remark Mr. Abera Mekkonen, Chief Engineer, MoWR

2. Address Mr. Katsuhiro SASAKI, Resident Representative, JICA Ethiopia Office
3. Presentations by Phase 2 Project Team
 - (1) Phase 2 Activities (Oct. 2007 to Feb. 2008)
 Mr. Markos Tefera Head, EWTEC

 - (2) Rope Pump Dissemination Activities
 Mr. Masahiko IKEMOTO, Expert, EWTEC

 - (3) Achievement and Lessons Learned from Phase 2 Project
 Dr. Akira KAMATA, Chief Advisor, EWTEC

4. AOB / Discussion by all attendee
 - Way forward / Observation from JICA Exerts

5. Closing Remark Mr. Abera Mekkonen, Chief Engineer, MoWR

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Appendix 3

Summary of Completion Report (October 1, 2007 to March 15, 2008)

1. Summary of Progress (October, 2007~March, 2008)

(1) Training Course:

1) Training Course (Basic Course)

① Basic Courses under MoWR's Responsibility. (3 courses)

MoWR conducted the following courses. JICA experts provide suggestions for the course management.

- A) Groundwater Management Course (October 24, 2007~January 15, 2008, 12 weeks, Afar 1, Amhara 3, Benishangulu 1, Oromia 5, SNNP 4, Somali 1, Tigray 2, MoWR 2, Total 19)
- B) Drilling Technology Course (October 24, 2007~January 15, 2008, 12 weeks, Afar 1, Amhara 1, Benishagulu 1, Oromia 2, SNNP 3, Somali 1, Tigray 1, Total 10)
- C) Drilling Machinery Maintenance Course (October 16, 2007~January 23, 2008, 14 weeks, Amhara 2, Benishangulu 1, Oromia 3, SNNP 2, Tigray 1, Somali 1, Total 10)

Remarks and Issues etc.

- Groundwater Management Course : Duration of the field practice is short. Method of water analysis should be incorporated into the course curriculum. The data logger was not used in the field connecting a computer with a resistivity meter. It is necessary to renew the computer and its software. The field practice of pumping test etc should be conducted in cooperation with Drilling Technology Course. Electro-magnetic meter must be repaired or renewed.
- Drilling Technology Course : It is necessary to give training on hydraulic system operation regarding mud water circulation management. It is also necessary to furnish textbooks, teaching materials (video etc) because they are not enough for training.
- Drilling Machinery Maintenance Course : Shortage of equipment and materials such as cut models for practical training is an important issue of the course. In addition, textbooks and teaching materials are running short.
- Generally, grading up of EWTEC instructors is matter of course.

② Basic Courses under MoWR's responsibility from year-2007

- A) Electric Machinery Maintenance Course (February 20~April 3, 2008) (6 weeks, Amhara 5, Oromia 5, SNNP 3, Tigray 2, Dire Dawa, Somali, Afar, Benishangulu, Gambela 1, Total 20)

Remarks and Issues etc.

- MoWR scheduled to manage Electric Machinery Maintenance Course financially from year-2007. However, some expenses for recruiting a lecturer were assisted by JICA.

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Because of superannuation of equipment utilized in the training, it is necessary to investigate those items for renewal. MoWR made a list of equipment to be renewed.

2) Training Course (Advance Course and On-Demand Course)

① Advance Course

- A) Remote Sensing Course (January 14~February 1, 2008) (3 weeks, 13 African countries 16, Ethiopian 9, Total 25)
- B) GIS(2) Course (December 3~21, 2007) (3 weeks, 13 African countries 17, Ethiopian 8, Total 25)

Remarks and Issues etc.

- Remote Sensing (RS) Course is closely related to GIS technology. In addition, GIS is used for groundwater modeling. Therefore, GIS technology should be incorporated into RS Course not only application technologies of RS for groundwater management.
- The trainees must have a certain level of computer operation skills in GIS Course as well as other advance courses. Because of big difference of experience among the trainees, such things, operational difficulty, often happened in the course. Selection criteria of the trainee should be established in the future.

② On-demand Course

- A) Well Diagnosis and Rehabilitation Course (November 7 to 30, 2007) (SNNP 2, Amhara 2, Oromia 3, Total 7) Well diagnosis using a borehole TV camera and rehabilitation of wells were practiced at the sites.
- B) Well Diagnosis and Rehabilitation Course (Afar Region) (February 18 to 23, 2008) (from Afar 12) Well diagnosis using a borehole TV camera and rehabilitation of wells were practiced at the sites.
- C) Electric Machinery Maintenance Course (Region) (February 10 to 21, 2008) Students of Assosa TVET in Benishangulu Gumuz were trained.
- D) Rope Pump Manufacturing Course (Tigray Region)
15 local artisans selected from each zone of Tigray Region were trained for the rope pump manufacturing and installation at the workshop in TVET Meichew (January 21 ~February 21, 2008)

Remarks and Issues etc.

- It is important to control the quality of the rope pump in the early stage of dissemination. Distribution of the rope pump and assistance for installation were conducted in the major 4 regions of large population and area thus far. It is also important to follow up the rope pump manufacturing and installation in the regions except SNNP where JICA has commenced a new technical assistance program.
- As Well Diagnosis and Rehabilitation Course gives a training for planning

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methodology, it is desirable to continue this course in the future. The training should be conducted at the sites where rehabilitation work required. Existing borehole camera is heavy so that lifting and transportation methods should be considered if the training is conducted in the field.

(2) Research and Development

① Butajira-Ziway Development Study

Workshop was held at two places in order to disseminate the results of the study which was completed in year -2006 (Addis Ababa:2008/1/17, Butajira:2008/2/12). In addition, textbooks were compiled based on the results of the study.

② Socio-economic Study (Impact Study) (February, 2008)

An investigation on the impact of pilot water supply facilities was conducted at three sites in Butajira-Ziway area.

③ Dissemination Plan of Appropriate Technology (Rope Pump Dissemination Activity)

This project aims at dissemination of 500 rope pumps (Manufacturing and distribution). Present status of distribution is shown as follows:

Number of Rope Pumps Produced and Distributed			
	Target Number of Distribution	Manufactured and Distributed (March, 2008)	Installed
SNNP	115	115	55
Amhara Region	145	145	45
Oromia Region	200	200	44
Tigray Region	40	40	0
Total	500	500	144

④ Monitoring of Pilot Water Supply Facilities

The pilot facilities installed in Butajira-Ziway area were monitored.

- An animal driven pump installed at a dug well located in Bidara which is nearby TW01(Kechabar) is being operated smoothly.
- An engine driven rope pump installed at TW04(Kuno Kertafa) was often broken down and repaired each time. In order to prevent abrasion of PU belt which is driven by engine, an experiment is being conducted at EWTEC compound.
- A manual pump installed at Dobena Bati was broken once because the rope was cut. However, the rope was replaced and it is being operated smoothly.

⑤ Durability Test of Afridev Spare Parts

The test started December, 2006 and finished December ,2007. The results shows that the spare parts made in Ethiopia are usable.

5) Future Vision of EWTEC

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A recommendation was made regarding future EWTEC's role to achieve the goal of UAP (Universal Access Program) based on review and observations.

6) Participation in Donor Conference and opening of information

- ① JICA expert participated in MSF (Multi Stakeholder Forum) and presented activities of EWTEC at group discussion. (December 5~6, 2007)
- ② Prepared a brochure of EWTEC (December, 2007)
- ③ JICA expert participated in Awareness Creation Workshop on Human Resource and Standardization Requirement for Groundwater Development in Ethiopia (February 16, 2008) and presented EWTEC activity.

2. Output of Technical Cooperation

(1) Achievement of Output

- ① Output 1 "Technical trainings regarding groundwater and water supply management are conducted" was achieved.
- ② Output 2 "The Training Courses are developed and improved through research activities" was achieved.
- ③ Output 3 "Technical trainings materials on groundwater management and water supply are developed" was achieved.

(2) Achievement of Purpose

- ① Overall Goal "Access to improved facilities of water supply increases through water resources development and management": The staff of MoWR and Regional Water Resource Bureau trained through the Project will have roles in implementing UAP and contribute achievement of overall goal.
- ② Project Purpose "Human resources for appropriated groundwater and water supply management increase": Number of trainees graduated EWTEC during Phase 2 is 1,127. Since beginning of phase 1, the number reaches at 1,844 (As of February 1, 2008).

(3) Impact

- ① The project impacted indirectly and directly on "Access to improved facility of water supply".
- ② According to the interview for ex-trainees, their superiors and general managers, the training of this Project impacted on upgrading of job performance and increasing of appropriate management of groundwater and water supply.

3. Issues on the Project and Recommendations

(1) Basic Course

- ① Groundwater Management Course : The curriculum is an across-the-board,

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however, training duration is short. Some of equipment for groundwater investigation are damaged so that they are not utilized properly. It is necessary to repair and improve the equipments.

- ② Drilling Technology Course : Training for mud water circulation on the drilling machine except T300 rig is required as well as increase of training materials and equipment.
- ③ Drilling Machinery Maintenance Course : Various kinds of model and teaching materials are running short. It should be increased and arranged.
- ④ Electric Machinery Maintenance Course : Duration of the course is short. The workshop for the course should be moved to another building. Equipments are superannuated. It should be renewed.
- ⑤ Water Supply Engineering Course : Duration is short and practical training is few. In order to plan and design water supply system, software, such as CAD and SAP etc and computer sets are necessary. Laboratory for water quality analysis is indispensable for training.

(2) Advance Course

- ① Groundwater Model Course : The course is being firmly established and a network among extrainees has been created. It is expected that the modeling needs increases in African countries after this. It is desirable that the follow up course and opening of the modeling course in those countries are discussed.
- ② Remote Sensing Course : Big difference of experience in computer operation exists among the trainees. It is necessary to reconsider the inviting criteria of trainee. In addition, it is necessary to take GIS component in the course and make training duration more longer.
- ③ Water Supply Engineering (Plan & Design) : It is necessary to reconsider the inviting criteria of the trainee. Training of designing by using software should be incorporated into the course as well as increase of field practice.
- ④ GIS Course : As mentioned, reconsideration of entrance criteria for the trainee is necessary. The environment of computers must be properly managed in order to avoid infection of computer virus. It is recommended that the reviewing time in the training course should be arranged so that the training will become more effective

(3) On Demand Course

- ① The rope pump can be made in Ethiopia at a low cost and these pumps are favorably received at the installed sites so far. It is very important to control quality at early stage of dissemination, although the local artisans were trained for manufacturing and installation through the course . Therefore, following up training of rope pump artisans is desirable in four major regions. Development of

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heavy duty type of rope pump for community water supply is an important subject of research in the future.

- ② Well Diagnosis and Rehabilitation Course : It is necessary to consider transportation of borehole TV camera to the field. It is also desirable that the training of rehabilitation in the region is continued after this.

(4) Research & Development

There remains several issues solved in the future in Butajira-Ziway Development Study in terms of geomorphology, hydrogeology, pilot water supply schemes and so on. It is therefore desirable that R&D and monitoring of the existing facilities are continued in order to utilize the area as a training field of the EWTEC.

(5) Water Resources Administration

- ① Reorganization and personnel affairs are main subjects of future EWTEC considering its role in human resource cultivation and R&D for teaching materials development throughout implementation of UAP.
- ② In order to achieve UAP goal, EWTEC's future vision should be discussed in detail from the points of training courses for human resource cultivation, trainee, lecturer, teaching materials, term, research subjects, equipment and materials and so on.
- ③ Graduates of TVET are mostly allocated to Woreda offices. Therefore, training for teachers in TVET is a matter of discussion in EWTEC.
- ④ There is a serious limitation in capacity of EWTEC's lecture rooms and dormitory. It is necessary to consider expansion of these facilities in near future.
- ⑤ Equipments of EWTEC are superannuated since its establishment in 1998 and most of them are lag behind recent IT development. It is desirable that the teaching materials and equipments should be renewed substantially.
- ⑥ The training courses held in EWTEC for the third countries are increasing vital role as a network center in Africa. It is expected that an organization of communication network among trainees is established in the future.

4. Invention and Lesson Learned from Project Implementation and Management,

(1) Issues on R&D

R&D component of the Project was conducted by entrusting the study to local consultants because of lack of organization and human resource in EWTEC. However, EWTEC instructors participated in the field training and proof reading of the draft reports and finally the results of R&D were compiled as teaching materials for training. It is a main issue that suitable human resources are allocated to EWTEC and the EWTEC manages R&D component by its own resources in order to reflect the

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results to improvement of the training courses.

(2) Recommendation and Lesson Learned by Joint Evaluation Team (August 24, 2007)

- ① The EWTEC heavily depends on JICA in budget and lecturers in implementing its tasks and activities. MoWR should take appropriate measures to effectively run the ETEC o its own in view of sustainability as the EWTEC is expected to continue playing a vital role in nurturing groundwater specialists and conducting research and development activities on groundwater and water supply management.
- ② As the EWTEC is run on a project basis, the MoWR should formally establish the EWTEC as a permanent institution with clear long-term mandates to further enhance its capability and responsibility in order that EWTEC continues to play a vital role in training groundwater engineers and technicians and conducting research and development activities on groundwater and water supply management in the future.
- ③ The EWTEC should make more efforts to review the present training courses and to improve training curricula and teaching materials to ensure the needs f various levels of stakeholders in the water sector are met. This enables the EWTEC to continue playing a pivotal role in developing human resources in the water sector to increase the coverage rate in water supply.
- ④ Lesson Learned : EWTEC's role and responsibilities are expected to be more important in human resources development as well as research and development on groundwater and water supply management in the years to come. The project purpose in the project design matrix (PDM) was described as " Human resources for appropriate groundwater and water supply management increases." And the implementation of various training courses and research and development activities were emphasized. However, more emphasis should have been put on capacity development of the EWTEC.

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Appendix 4 Presentation Material

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A handwritten signature in black ink, consisting of several stylized, overlapping letters and lines.

Activities of Phase 2

October 2007 to
March 2008

Mr. Markos Tefera
Head, EWTEC

Plan of Operation -2007-

Activities	Location	Duration	No. of Trainees	Instructor	2007												2008	
					4	5	6	7	8	9	10	11	12	1	2	3		
I. Implementation of Training Courses																		
1.1 Regular Courses																		
1.1.1 Basic Courses																		
1.1.1.1 Groundwater Management (GSM)	AA	12 weeks	20	CPALC														
1.1.1.2 Drilling Technology (DT)	AA	12 weeks	10	CPALC														
1.1.1.3 Drilling Machinery Maintenance Tech. (DMT)	AA	12 weeks	10	CPALC														
1.1.1.4 Local Social Development (LSD)	AA	4 weeks	10	CPALC														
1.1.1.5 Water Supply Engineering (WSE)	AA	4 weeks	20	CPALC														
1.1.1.6 Electrical Mechanical Maintenance Tech. (EMMT)	AA	4 weeks	20	CPALC														
1.1.2 Advance Courses																		
1.1.2.1 Geographical Mapping (GMA)	Afar	4 weeks	20	IE														
1.1.2.2 GIS (Information Management) (IGIS-1)	AA	4 weeks	20	IE														
1.1.2.3 GIS (Information Management) (IGIS-2)	AA	4 weeks	20	IE														
1.1.2.4 Basic Planning and Design (BPD)	AA	4 weeks	20	IE														
1.1.2.5 WSE: Operation and Maintenance (OM)	AA	4 weeks	20	CPALC														
1.1.2.6 Remote Sensing (RS)	AA	2-4 weeks	20	IE														
1.2 Supplemental On-Demand Courses																		
1.2.1 Rope Pump Manufacturing (RP)		2-4 weeks	15	CPALC														
1.2.2 Diagnostic Investigation of Wells (DI)		2-4 weeks	15	IE														
1.2.3 Rehabilitation of Wells (RW)		2-4 weeks	10	CPALC														
1.2.4 Artisanal Recovery (AR)		2-4 weeks	20	CPALC														
1.2.5 Appropriate Technology (AT)		2-4 weeks	15	IE														
1.2.6 Project Management (PM)		2-4 weeks	20	IE														
1.2.7 Maintenance Workshop Management (MWM)		2-4 weeks	15	CPALC														
1.2.8 Electro-Mechanical Maintenance Tech. (EMMT)	region	2 weeks	20	CP														

Basic Course (1)

- Main Issues
 - GI course: Curriculum and duration, some equipments for Investigation damaged.
 - DT course: Training materials and equipment not enough
 - DMMT course: Teaching models and materials is running short



Basic Course (2)

- EMMT Course: Equipments superannuated, necessary to renew.
- WSE Course: Duration short, more practical training, curriculum, software (CAD, SAP etc) necessary, Laboratory for water quality analysis to be built.



Advance and On Demand Training Course

- GIS for Groundwater Management
- Remote Sensing for Groundwater Management
- Rope Pump Manufacturing
- Well Rehabilitation (EWTEC)
- Well Rehabilitation (Afar)



GIS Course (Dec., 2007)

- 13 African Countries : 17 participants
- Ethiopia : 8 participants
- Main Issues:
 - Criteria of Invitation should be reconsidered.
 - Computer environment should be well managed. (Avoid infection of Virus)



Area of GIS



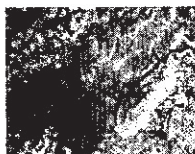
Water Points

A.K

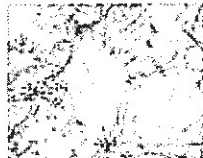
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Remote Sensing Course (Jan., 2008)

- African countries: 13 participants
- Ethiopia: 9 participants
- Main Issues
- > Criteria of Invitation should be reconsidered.
- > GIS component should be incorporated into RS.



Satellite Image



Hydrogeological Map

Well Rehabilitation Course

- EWTEC (2007.10) Participants 7
- Afar Region(2008.2) Participants 12



Rehabilitation Practice at Burayu ,Oromia Region with Japanese Expert & EWTEC Staff as well as Afar Region (Mille, Dubti, Semera)

Rope Pump Manufacturing & Installation Course

□Workshop, Meichew TVET, Tigray (2008.2)

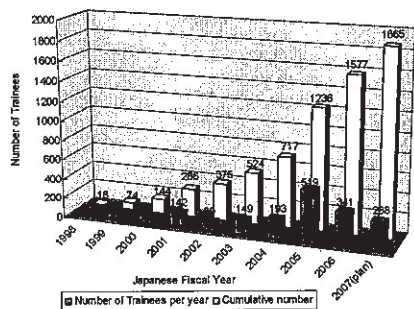


Number of Trainee

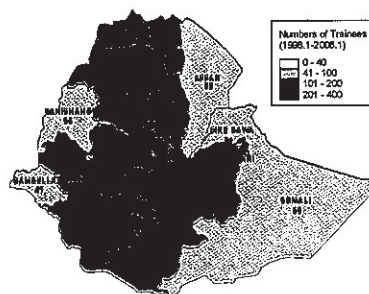
Phase-2 Project (3 years) : 2005.3.15~2008.3.14 (Intermediate counting on 2008.2.1)

Region	GE	DT	DM	LD	WSE	WSE PAB	WSE OBM	EM	QVM	GM	GB	RS	RP	BY	Total
Oromia	24	16	17	2	28	4	12	26	4	6	2	11	5	6	170
SSNP	19	11	12	2	18	2	8	22	2	4	4	7	14	19	146
Amhara	13	10	10	3	17	3	5	15	2	6	3	5	2	4	98
Tigray	12	7	7	0	13	2	6	8	2	3	4	4	0	0	69
Somali	5	5	5	1	3	1	1	6	0	2	0	2	0	0	31
Afar	5	3	2	0	4	1	2	4	0	1	1	1	0	0	23
Benishangul	5	5	5	1	3	1	1	2	0	1	0	2	0	0	25
Gambela	0	0	2	0	4	1	1	5	0	2	0	0	0	0	15
Dire Dawa	0	0	0	1	1	1	1	3	0	0	0	0	0	0	4
Haraar	2	0	0	0	0	0	1	2	0	1	0	0	0	0	6
Addis Ababa	10	2	0	0	0	0	0	9	9	17	16	0	0	0	63
Africa	-	-	-	-	-	-	-	29	-	33	16	-	-	-	78
UNEP/Collage	-	-	-	-	-	-	-	-	-	-	-	-	3	-	3
NGO	-	-	-	-	-	-	-	2	-	-	-	-	8	-	10
RVTC/Bah	-	-	-	-	-	-	-	53	-	-	-	-	2	-	55
RVTC/Ass	-	-	-	-	-	-	-	28	-	-	-	-	2	-	30
RVTC/Wol	-	-	-	-	-	-	-	38	-	-	-	-	2	-	40
RVTC/Ans	-	-	-	-	-	-	-	161	-	-	-	-	-	-	161
RVTC/Als	-	-	-	-	-	-	-	29	-	-	-	-	-	-	29
RVTC/Gen	-	-	-	-	-	-	-	34	-	-	-	-	-	-	34
Private	-	-	-	-	-	-	-	-	-	-	-	-	32	-	32
SSC/SPS Total	99	59	58	10	91	16	17	146	16	33	17	63	16	29	1121

Transition of Number of Trainees (1998.1 - 2008.3)



Trainees from Each Region (1998.1 - 2008.1)



A.K

International Training

- Groundwater Modeling
- GIS/Information Management
- Remote Sensing (Jan, 2008)



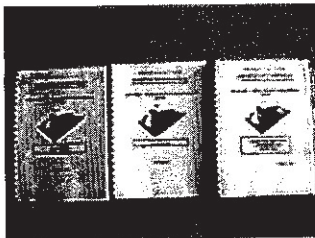
3rd Groundwater Modeling, 2006
 1st GIS, Feb. 2007
 2nd GIS, Dec. 2007
 1st Remote Sensing, Jan. 2008
 Total : 78 Participants in Phase 2
 (16 countries, as of Feb., 2008)

Plan of Operation -2007- (Research & Development Activities)

Activities	2007												2008											
	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
5. Research and Development Activities																								
5.1 Development Study in Butajira-Ziway Area																								
5.1.1 Groundwater Management																								
5.1.1.1 Hydrogeological Field Investigation																								
5.1.1.2 Inventory of Existing Water Point																								
5.1.1.3 Geographical Information																								
5.1.1.4 Test Drilling																								
5.1.1.5 Observation of Various Data																								
5.1.1.6 Risk Diagnosis																								
5.1.1.7 Groundwater Modeling																								
5.1.1.8 Groundwater Management Plan																								
5.1.2 Appropriate Technology Development																								
5.1.2.1 Socio-economic Health Benefit Study																								
5.1.2.2 Site Investigation																								
5.1.2.3 Designing Various Facilities																								
5.1.2.4 Construction of Demonstration Facilities																								
5.1.2.5 Observation of Various Data																								
5.1.2.6 Dissemination Plan of Appropriate Technology																								
5.2 Appropriate Technology Dissemination																								
5.2.1 Dissemination of 500 Rope Pump Distribution Training in Various Regions																								
5.3 Socio-economic Investigation/Installation of Well																								
5.4 Village Impact Study																								

Research & Development (1)

- Butajira-Ziway Development Study



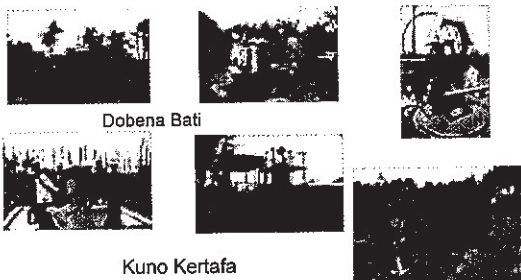
Textbook created based on the results
 Workshop held at Addis Ababa (Jan.17) & Butajira (Feb.12)
 Socio-economic Impact Study conducted

Research & Development (2)

- Dissemination of Rope Pump

Region	Target No. of Distribution	Distributed No.	Installation Assisted
SNNP	115	115	55
Amhara	145	145	45
Oromia	200	200	44
Tigray	40	40	0
Total	500	500	144

Monitoring of Pilot WS



Dobena Bati

Kuno Kertafa

EWTEC Staff Carried out Monitoring

Recommendations

- Recommendations for future EWTEC activities will be presented later by JICA Expert.


AIC

Rope Pump Dissemination Activities


Masahiko Ikemoto
JICA Expert

Rope Pump ~Ideal for Traditional Dug Wells~


- Domestic Production
- Low Cost (USD220/total)
- High Yield (10 – 30L/min)
- Applied up to 35m depth
- Improvement of Water Quality
- Improvement of Health Condition of Users
- Applied to Small Scale Irrigation
- Applied to Household Water Supply System




Low Cost & Easy to Maintain



Rope Pump
*1,000Birr (+Installation)
*Domestic Products
*Easy to maintain (by local people)

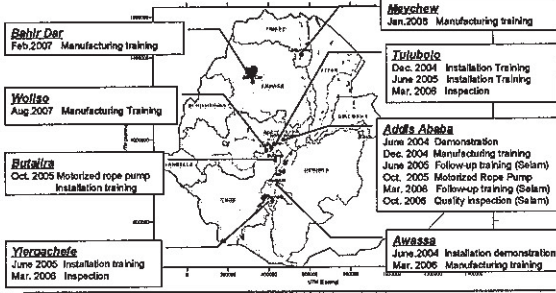


Afridev Pump
*5-6,000Birr (+Installation)
*Imported
*Easy to maintain (difficult to access spare parts)



India Mk II Pump
*10,000Birr (+Installation)
*Imported
*Difficult to maintain (difficult to access spare parts)

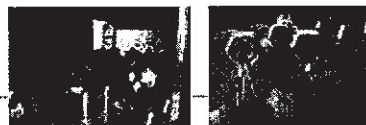
Rope Pump Manufacturing and Installation Training by EWTEC




Bahir Dar Feb. 2007 Manufacturing training	Meqchew Jan. 2008 Manufacturing training
Woliso Aug. 2007 Manufacturing Training	Tuluhoie Dec. 2004 Installation Training June 2005 Installation Training Mar. 2008 Inspection
Butajira Oct. 2005 Motorized rope pump Installation training	Addis Ababa June 2004 Demonstration Dec. 2004 Manufacturing training June 2005 Follow-up training (Selam) Oct. 2005 Motorized Rope Pump Mar. 2006 Follow-up training (Selam) Oct. 2006 Quality inspection (Selam)
Yirgacheffe June 2006 Installation training Mar. 2008 Inspection	Awassa June 2004 Installation demonstration Mar. 2006 Manufacturing training

Rope Pump Training

1. Selection of Local Workshops.
2. Manufacturing and Installation Training (4-5 weeks).
3. Giving an order 5 to 10 rope pumps to each artisan after the training.
4. Inspection of the products.
5. Selection of sites for installation with support from Regional Water Bureau or NGOs.
6. Installation with OJT.



Manufacturing Training at Bahir Dar TVTC (Feb. 2007, Amhara)



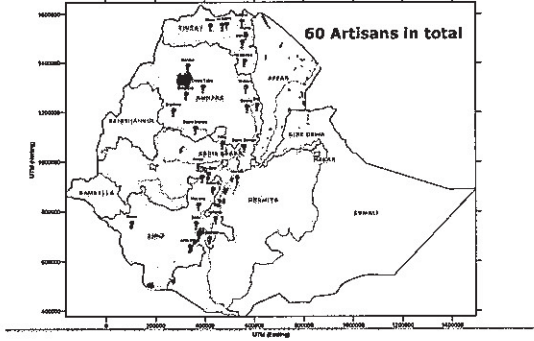
AIC



Manufacturing Training at Woliso TVTC (Aug. 2007, Oromiya)



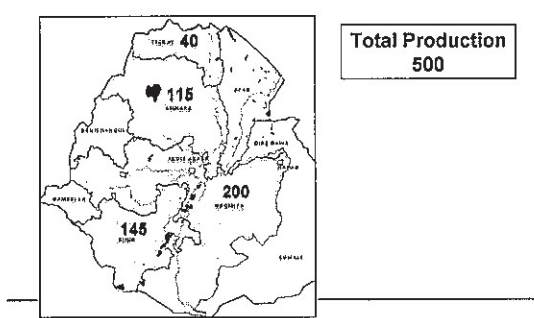
Trained Local Workshops



Follow up Training



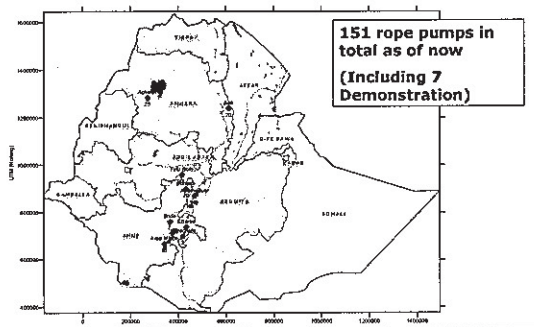
Production and Distribution of Rope Pump



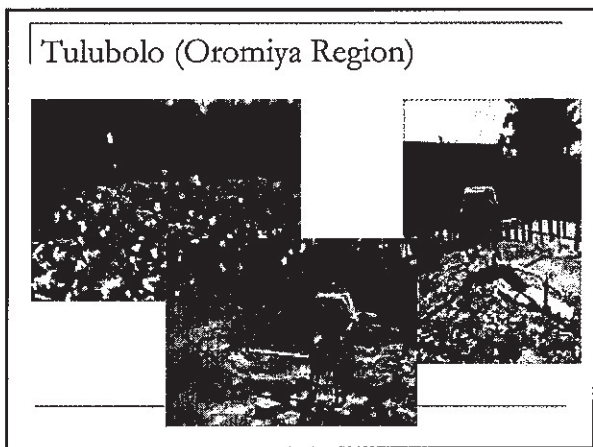
Workshop on RP Awareness at Regions



Rope Pump Installation



A/c



Follow-Up Survey at Tulubolo 1

Pump reliability	Evaluation	No.	Ratio
Working condition	Working	42	100%
	Non-working	0	0%
	Removd	0	0%
Number of breakdown	None	52	73%
	Once	8	11%
	Twice	1	2%
	Three times	2	5%
	Four times	1	2%

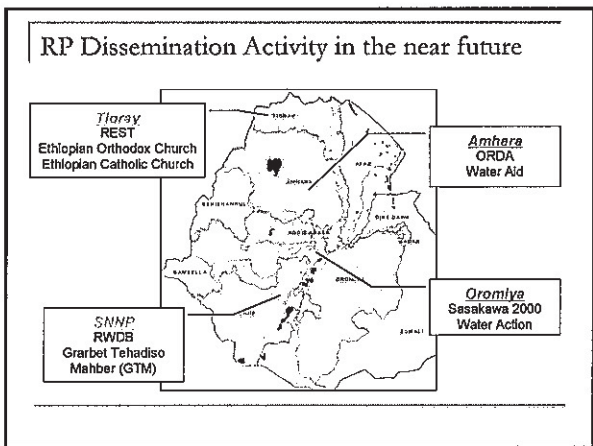
Installation: Dec.2005
Survey: Feb 2007

Benefit from use of rope pump	Evaluation	No.	Ratio
Easiness of drawing	Excellent	13	30%
	Good	31	70%
	Fair	0	0%
	Bad	0	0%
Water Quantity	Excellent	5	11%
	Good	37	84%
	Fair	2	5%
	Bad	0	0%
Water Quality	Excellent	28	64%
	Good	16	36%
	Fair	0	0%
	Bad	0	0%

Follow-Up Survey at Tulubolo 2

	Evaluation	No.	Ratio
Affordability	Excellent	7	16%
	Good	37	86%
	Fair	0	0%
	Bad	0	0%
Use of Rope Pump	Drinking Water	44	100%
	Irrigation	28	64%
	Animal	39	89%
Overall satisfaction	Excellent	13	30%
	Good	31	70%
	Fair	0	0%
	Bad	0	0%

- Important Issues for Dissemination of the Rope Pump
- Quality Control
 - Establishment of material supply chain
 - Application to small scale irrigation
 - Agreement with users for payback of the initial cost
 - Use of revolving fund
 - Monitoring and follow-up for technical problem
 - Support from Water Bureaus, Woreda and NGOs



- Conclusion
- RP Manufacturing and Installation Training was conducted at the major 4 regions (Total Participants: 60).
 - Follow-up Training was conducted.
 - 500 RP were manufactured and handed over to the major 4 regions.
 - Involvement of Regional Water Bureau and NGO is essential for further dissemination of RP

Alc

Project Purpose

- Human resources for appropriate groundwater and water supply management increases.

☆☆☆

Number of trainee in (Phase 2): 1,127 as of Feb., 2008

Project Impact

- The project gave impacts directly and indirectly on "Access to improved water supply" and
- Ex-trainees, their superiors and general managers are telling upgrading of job performance and management according to a survey.

Lesson Learned

- According to Joint Evaluation Team (Aug., 2007)
EWTEC's role and responsibilities are expected to be more important in human resources development as well as research and development on groundwater and water supply management in the years to come. The project purpose in the project design matrix (PDM) was described as "Human resources for appropriate groundwater and water supply management increases." And the implementation of various training courses and research and development activities were emphasized. However, more emphasis should have been put on capacity development of the EWTEC.

Observations by JICA Expert

- Reorganization and personnel affairs of EWTEC is key issues.
- EWTEC Future Vision should be discussed in detail.
- Training for TVET Teachers.
- Capacity and equipments of EWTEC.
Discussion on "Way Forward" at this JCC.

AIC

RECOMMENDATION FOR FUTURE EWTEC

-Further Capacity Building in Water Sector-
Dr. Akira KAMATA, JICA Expert

2008/3/2

1

VISION

-The Prospects along with the UAP-

Proposed Functions Required to EWTEC

- ◆ Human Resource Cultivation (Training)
- ◆ R&D for Groundwater Development, Management and Appropriate Technologies
- ◆ Technical Support on Groundwater Development & Management
- ◆ Center for Africa (Training for Third Countries)
- ◆ Granting National Qualifications

2008/3/2

2

Target & Purpose

- To Increase Number of Competent WS Engineers & Technicians of Gov. Sectors, Private Sectors & NGOs in Quantity and Quality.
- To Assist in Improvement of Water Supply Coverage in Ethiopia.

2008/3/2

3

Present Situation

- Limited Capacity of Training Facilities
- Superannuation of Equipments
- Hackneyed Teaching Materials
- Not Advanced Knowledge and Skills of EWTEC Instructors
- Shortage of Competent or Proficient Instructors
- Lack of Practical Experience of Instructors/Needs of R&D activities with Instructors

2008/3/2

4

Options for Future

- Becoming Independent and Operating the Training Courses on It's Own -
Expand Capacities of Training
- 1. Reorganize the Training Courses and Draw up the New Curriculum
- 2. Raise Knowledge and Skills of the Instructors to Press for Improvement in Training Quality.
- 3. Support to EWTEC for Sustainable Activities

2008/3/2

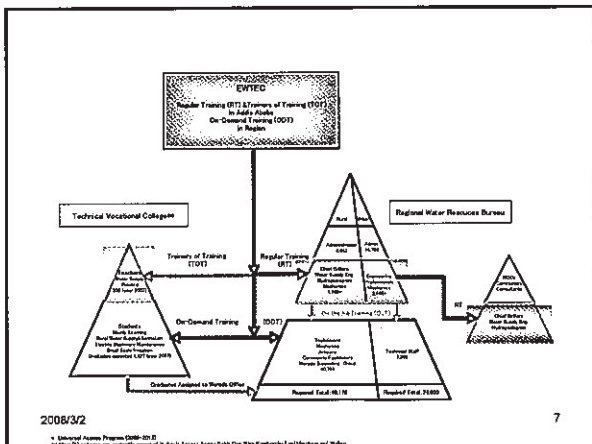
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Options for Future (Continued)

- Center for Africa (Expands the Training Courses for Third Countries)
- Provide Practical Opportunities for Instructors through R&D Activities (Research on Groundwater Development & Management, Appropriate Technologies)
- Support to WS Projects
- Support to Management of EWTEC

2008/3/2

6



Proposed New Course Lineup (But Needs to be Focused)

Regular Course

- Groundwater Investigation (1), (2)
- Drilling Technology (1), (2)
- Drilling Machinery Maintenance
- Electric Machinery Maintenance
- Water Supply Engineering (1), (2)
- Well Rehabilitation

2008/3/2 8

Proposed New Course Lineup

Regular Course (continued)

- Water Quality Management
- Geochemistry
- Hand Pump Maintenance
- Appropriate Technology
- Social Development
- Project Management

2008/3/2 9

Proposed New Course Lineup

Training Course for Third Countries

- Groundwater Modeling
- GIS for Groundwater Management
- Remote Sensing for Groundwater Management

2008/3/2 10

Proposed New Course Lineup

TVET Course

- Groundwater Investigation (1)
- Electric Machinery Maintenance
- Water Supply Engineering (1)
- GIS Introduction
- Appropriate Technology
- Water Quality Management
- Environmental Assessment

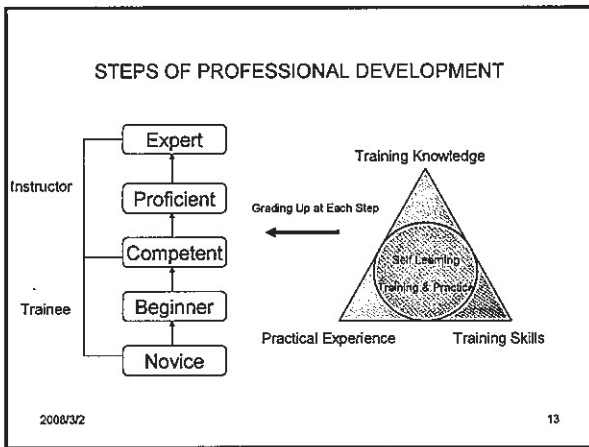
2008/3/2 11

Evaluation of Achievement

- Simple Entrance Examination before Inviting Trainee
- Screening and Grading of Trainee
- Midterm and Final Examination
- Hand out Certificate with Results

2008/3/2 12

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Upgrading Capability of EWTEC Instructors

- OJT & TOT with Japanese and Foreign Experts
- Training in Japan and Third Countries
- Co-operative Training in Groundwater Industries

2008/3/2 14

Research & Development

- To Enhance Capability of EWTEC Instructors throughout R&D Activities
- To Utilize the Research Area as a Training Field
- To Develop Textbooks and Curriculum using R&D Results
- To Disseminate R&D Results to WS of Ethiopia

2008/3/2 15

Conclusion

- Those issues will come up for discussion with JICA Preparatory Survey Team and MoWR regarding Phase 3 of EWTEC.

2008/3/2 16

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付属資料 4

EWTEC 将来像についての提言

EWTEC 将来像についての提言（案）

－ 概要 －

1/30/2007

地下水開発水供給訓練プロジェクト・フェーズ2
(Ethiopia Water Technology Center (EWTEC) Project)

JICA 専門家

1. 背景

- 「エ」国水資源省は2005年にUniversal Access Program (UAP, 2005-2012)を策定した。UAPは、給水計画と衛生計画が一体となっており、2012年の各分野の目標は次のとおりである。
 - 都市給水率100%、農村給水率98%
 - 都市及び農村における衛生施設普及率100%.
 - 都市における下水処理施設の推進。
- 「エ」国では、過去にWater Policy (1998)、Water Supply & Sanitation Master Plan (2000-2015)及びWater Sector Development Program (WSDP, 2002-2016)を策定してきた。しかし、UAPそれ自身は独立した計画ではなく、これらの計画を含むものとされている。
- UAP達成のためには、2012年までに都市分野で24,600人、農村分野で49,176人の管理者、技術者、技工、メカニック、職人等の人材資源が必要とされる。
- UAP達成のため、現在、政府自己予算の他、日本の無償資金協力、EU及び各国ドナー、世銀、アフリカ開発銀行及びNGO等の支援を得て給水・衛生事業を推進しつつあるが、給水・衛生事業の計画、設計、建設、維持管理など全ての分野で人材育成を加速させることが急務となっている。
- UAPは農村給水事業において低価格適正技術の応用を掲げるとともに、大半の給水施設は地下水資源に依存する内容となっている。このため、実施過程においては各種地下水開発・管理技術の応用や地下水資源評価を行うことが課題となっている。

2. 給水事業におけるEWTECの貢献

- JICAは水資源省に協力し、1998年1月から2003年1月まで「地下水開発・水供給訓練計画」フェーズ1を実施し、その後2年間の延長期間を経て、2005年3月から2008年3月までの予定で、同プロジェクト・フェーズ2を実施中である。
- フェーズ2の開始に当たっては、訓練所名称を”Ethiopia Water Technology Center (EWTEC)”とし、プロジェクト・サブタイトルを“ Ethiopia Water Technology Center Project” とした。
- フェーズ1及びフェーズ2のプロジェクト目標はそれぞれ下記のとおりである。
 - フェーズ1：地下水開発と水供給プログラムに関わる州政府スタッフに対して、ジェンダーと開発を強調した能力開発が行われる。

- フェーズ2：適切な地下水管理と水供給管理のための人材が増加する。

- EWTECの地下水開発及び水供給に係る人材訓練人数は、2006年11月末現在、1,373人に達している。またフェーズ1 延長期間からは、アフリカ14ヶ国の訓練生を招聘し、「エ」国訓練生とともに高度な地下水開発・管理に係る第三国研修を実施し、“Center for Africa”の機能を持ちつつある。さらに、フェーズ2からは、人材訓練の他に、調査研究活動及び地方給水支援活動を加え、フィールドにおける実践的な訓練、開発調査、適正技術普及等を実施している。

3. UAPにおけるEWTECの役割と位置付け

- UAP は州政府水資源局が事業推進母体となる。実際の事業は、その下部組織であるタウン・ウォーターボード(Town Water Board)及びウオレダ(郡)事務所(Woreda Office)を中心に、建設業者、コンサルタント、NGO等により推進される。しかし、事業資金はもちろんのこと、州水資源局、タウン・ウォーターボード、ウオレダウォーターデスク(Woreda Water Desk)職員の数やその管理能力、技術能力が甚だしく不足している。
- UAP 推進の末端組織であるウオレダ事務所には給水を担当するウオレダウォーターデスクの設置が進められている。また、世銀やアフリカ開発プロジェクトでは、WASH¹チームが設立されつつあり、給水、衛生、教育を一体とした活動が進められようとしている。また、ウオレダ事務所職員を補足するため、ローカル企業から人員を雇用してWSG²を設立し、農村給水・衛生活動を行う動きもある。
- このように、UAP を達成するためには、州水資源局レベルからタウン及びウオレダレベルまで多様な人材資源の育成や技術開発、その支援や指導をすることが焦眉の課題となっている。従って、EWTEC は今後、「エ」国 UAP 推進における人材訓練、研究開発及び技術支援の中心機関として認定され、活動していく必要がある。
- EWTEC はこれまで活動の主眼を給水事業における人材育成においてきた。しかしながら、UAP は給水だけではなく衛生も含んでいるため、EWTEC の活動を衛生支援にまで広げるかどうか、今後さらに検討を要する。しかしながら、小文ではとりあえず給水事業における支援について提言する。

4. EWTECの機能

EWTEC は以下の機能をもつ政府の人材訓練及び研究開発機関とする。

- TOT(Training of Trainers)による人材育成
- 地下水開発管理及び適正技術に関する研究開発
- 地下水開発管理に関する地方での技術支援
- アフリカ給水技術センター (Center for Africa)
- 国家資格の付与

なお、現在、水資源省は「エ」国地質調査所(Geological Survey of Ethiopia : GSE) (鉱

¹ WASH : Water, Sanitation and Hygiene

² WSG : Woreda Supporting Group

山エネルギー省管轄) と共同で EGRAP+³を推進しようとしている。EGRAP+においては 2011 年を目標とした Groundwater Institute(GI)の設立構想がある。EWTEC と GI との役割及び機能の分担については今後検討が必要である。

4.1 人材育成

UAPにおける膨大な人材需要に鑑み、以下の方針により人材育成訓練に取り組む。

- 人材訓練コースはアディス・アベバにおける常設コースと地方州における特別要請コースに大別する。常設コースは TOT を基本とする。
- 常設コース (TOT) の対象者は、州水資源局及び郡給水事務所職員(主任クラス)及び職業技術訓練校 (Technical Vocational College : TVC) 教師とする。TOT 受講者は各郡給水事務所において技工、メカニック等への On the Job Training (OJT)を行うものとする。
- 常設訓練コース対象分野は、地下水調査・開発・管理、井戸掘削・リハビリ、給水、機械整備の 4 分野とする。
- 特別要請訓練コースは基本的に郡給水事務所職員、職業技術訓練校生徒を対象とし、各州の給水事業状況に応じて実施する。訓練分野は適正技術、機械整備、井戸リハビリ、運転維持管理、社会開発の 5 分野とする。
- エチオピアの他、アフリカ諸国からの訓練生を招聘して、地下水開発・管理技術、適正給水技術の共通課題に関し高度な第三国研修を実施する (Center for Africa) 。
- 上記各訓練コースの内容とレベルに応じて、大学、地質調査所、井戸掘削公社、民間コンサルタント、NGO 等からの訓練生を受け入れる。
- 常設コース受講者の達成度評価と今後の職務に関するカウンセリング・システムを確立する。

4.2 研究開発

UAP 給水事業の水源は都市給水では 80%、農村給水では 100%を地下水・湧水に依存することから、調査研究の主要テーマは地下水調査、開発、管理及び適正技術による地下水・湧水の取水・貯水・利水方法とする。

- 地下水開発管理研究は、リフトバレー地域のみならず「エ」国西部及び東部高地の主要水系において実施し、地下水開発可能量の評価、管理、モニタリングについて実例を示し UAP 推進の基礎資料とする。
- ロープポンプ製造やアフリデブポンプ・スペアパーツの開発等、適正技術の開発研究と、地方における適正技術普及及びスペアパーツ供給チェーン確立を支援する。
- 地下水中のフッ素、マンガン、鉄除去に関する簡易な浄化装置の応用について研究開発を行う。
- 研究開発成果の公表を行う (ホームページ、国際シンポジウム等)
- 研究開発成果により訓練教材やマニュアルを作成する。

³ EGRAP+ : Ethiopian Groundwater Resources Assessment Project+(2006-2015)

4.3 技術支援

UAP 達成に向けて、日本の無償資金協力事業、世銀及びアフリカ開発銀行、EU 及び各ドナー、NGO 等による給水事業が進行中である。EWTEC はこれら給水事業の進捗状況に応じて、要請により技術的な支援を行う。

- 地下水調査（地形、地質、地下水位、水質等）、物理探査、井戸掘削、物理検層、井戸リハビリ等の支援。
- 適正技術（ロープポンプ、湧泉保護工など）の実施支援。
- 給水施設のジェネレーター、電動水中ポンプ、配電盤等の運転・維持管理支援。
- 給配水システム（パイプライン、水槽、給水栓等）、水質浄化システムに関する設置・維持管理支援。
- 給水施設維持管理組織の運営支援。

4.4 Center for Africa

アフリカ各国では地形、地質、地下水賦存状況などの自然条件、社会経済や制度条件、さらには文化的・伝統的背景がそれぞれの国で異なっており、給水事業に関してもそれぞれ固有の問題がある。しかし、水と衛生に関する MDGs 達成へのアプローチにおいては共通する技術課題が多い。

EWTEC はこれまでアフリカ諸国からの訓練生招聘により地下水開発管理に関する高度な課題について第三国研修を実施し、過去の受講生間では情報ネットワークができつつある。従って EWTEC はこれらの成果を活用し、さらに進化・発展させて、アフリカの情報発信・訓練センターとしての機能を確立するものとする。

- アフリカ諸国における高度な地下水開発・管理課題についての第三国研修を実施する（地下水モデリング、GIS、リモートセンシング、同位体水文学等）
- アフリカ諸国における技術開発動向の情報収集及び「エ」国の技術情報を発信できるネットワークを確立・運営する。
- 共通課題について国際シンポジウムを開催する（事例、知識・情報交換、新たな課題の発掘等）。
- 研究開発成果の公表を行う（ホームページ、出版物等）

4.5 国家資格の付与

- EWTEC は現在行っている自己評価や講師評価をさらに改善して、カウンセリングなどを取り入れた評価制度を確立し、可能な分野については国家資格制度を創設する。これにより訓練受講者のモチベーションが一層高まり、結果的に職務遂行能力の向上に資することが期待できる。

5. EWTECの独立

EWTEC は現在、水資源省地方給水衛生局（Rural Water Supply and Sanitation Service Department）の下部機関として位置付けられている。EWTEC は「エ」国水セクターの最上位計画である UAP の中で、人材育成と研究開発という重責を担うことになるた

め、水資源省1部局の下部機関としてではなく、水資源省の1部局（人材訓練・研究開発部）となるか、または水資源省大臣直轄の半独立機関となる道がある。小文では、EWTECは、将来、後者の半独立機関として独自予算、人事により、水セクター全体を見据えた管理運営を目指すことを提言する。

- EWTECの組織体制は、総務・企画調整部、人材育成部、研究開発部、技術支援部、ワークショップ等付帯施設から構成する。
- EWTECは水資源省よりの財政支援を受けつつも、民間人材訓練の受入や技術支援の一部の有償化により、自己財源の増加に努める。
- EWTEC機能拡充に伴う技術者、管理者等を広く水資源省外からも募集し、独自の給与体系を設定して、技術者・職員のモチベーションを向上させ、職務への貢献と定着を計る。
- 半独立化のための法制度、組織体制、予算等については今後検討を行い、UAPゴールの2012年以前の設立を目指す。

6. EWTECの施設及び機材

EWTECの既存訓練所は1999年5月に、宿泊施設（寮）は2003年に建設されたものであるが、現在、4教室があり、寮は40名の収容能力がある。しかし、教室及び寮の容量は常設訓練コース増設や受講生増員の制限要因となっている。また、1998年のフェーズ1開始以来多数の機材が供与されてきたが、全体として機材は老朽化するとともに、コンピュータの発達に伴い時代遅れになっているものもある。従って、今後は施設機材の抜本的な拡充・更新が必要である。

- 管理棟、教室、実験室、宿泊施設、食堂の増改築。
- 掘削機スペアパーツ、サービスリグ、物理探査機、掘削機械整備器具、電気機械整備器具、コンピュータ、水質分析機器、その他工具の更新。

7. EWTEC将来像への今後の取り組み

EWTEC将来像の具体化に当たっては今後以下の検討を行うことが必要である。

- UAPにおける人材ニーズの実態把握
- 地下水開発・水供給訓練計画フェーズ2 (EWTEC プロジェクト)の影響評価 (Impact Assessment)
- フェーズ2 プロジェクト評価
- 「エ」国及びアフリカ諸国訓練ニーズに基づく訓練コース内容検討
- 訓練コース内容に基づく資機材の検討
- 評価制度・カウンセリング制度の検討
- 国家資格の法制的検討
- EWTEC施設増設に関する検討
- 半独立化に伴う制度、組織、予算の検討

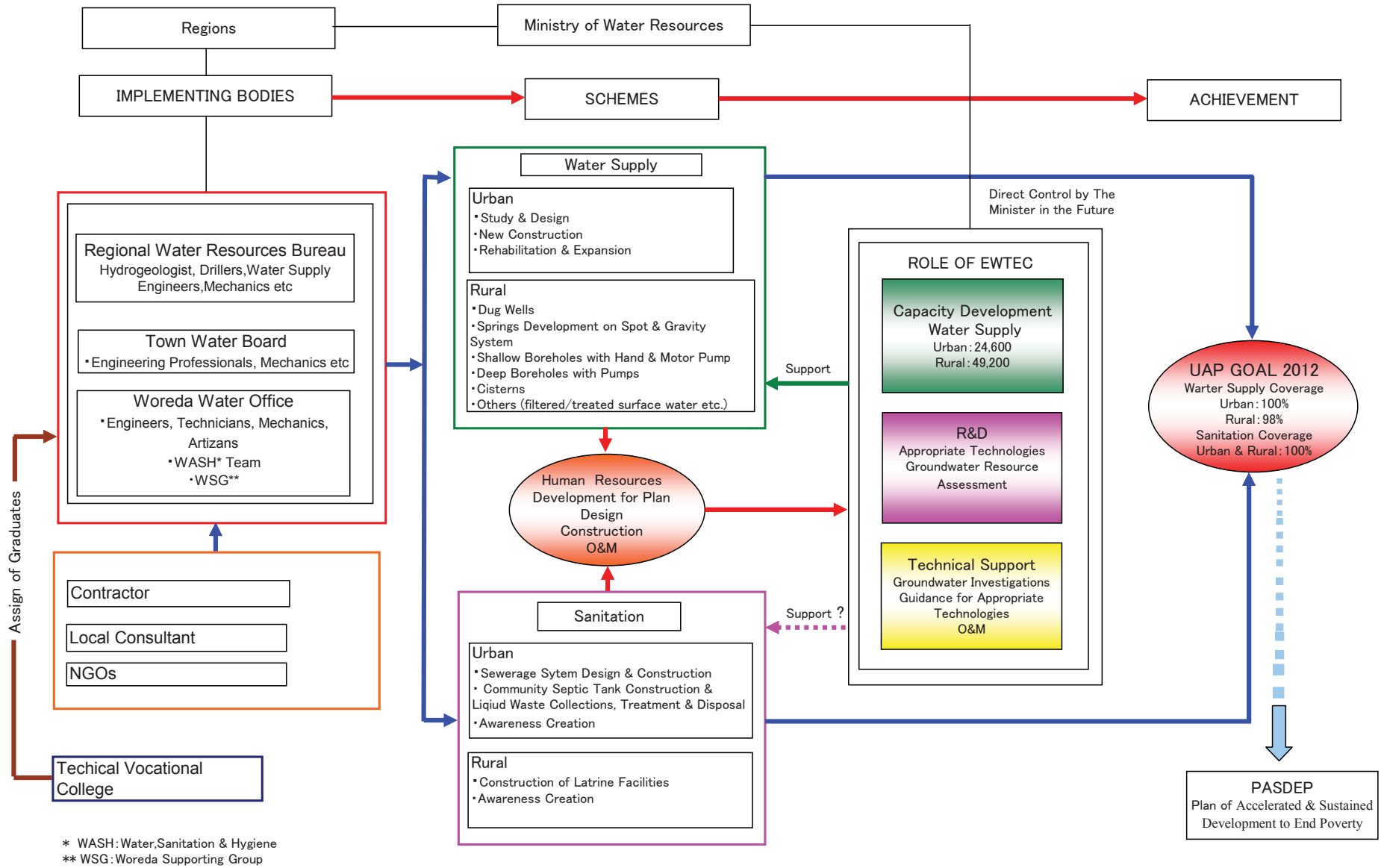
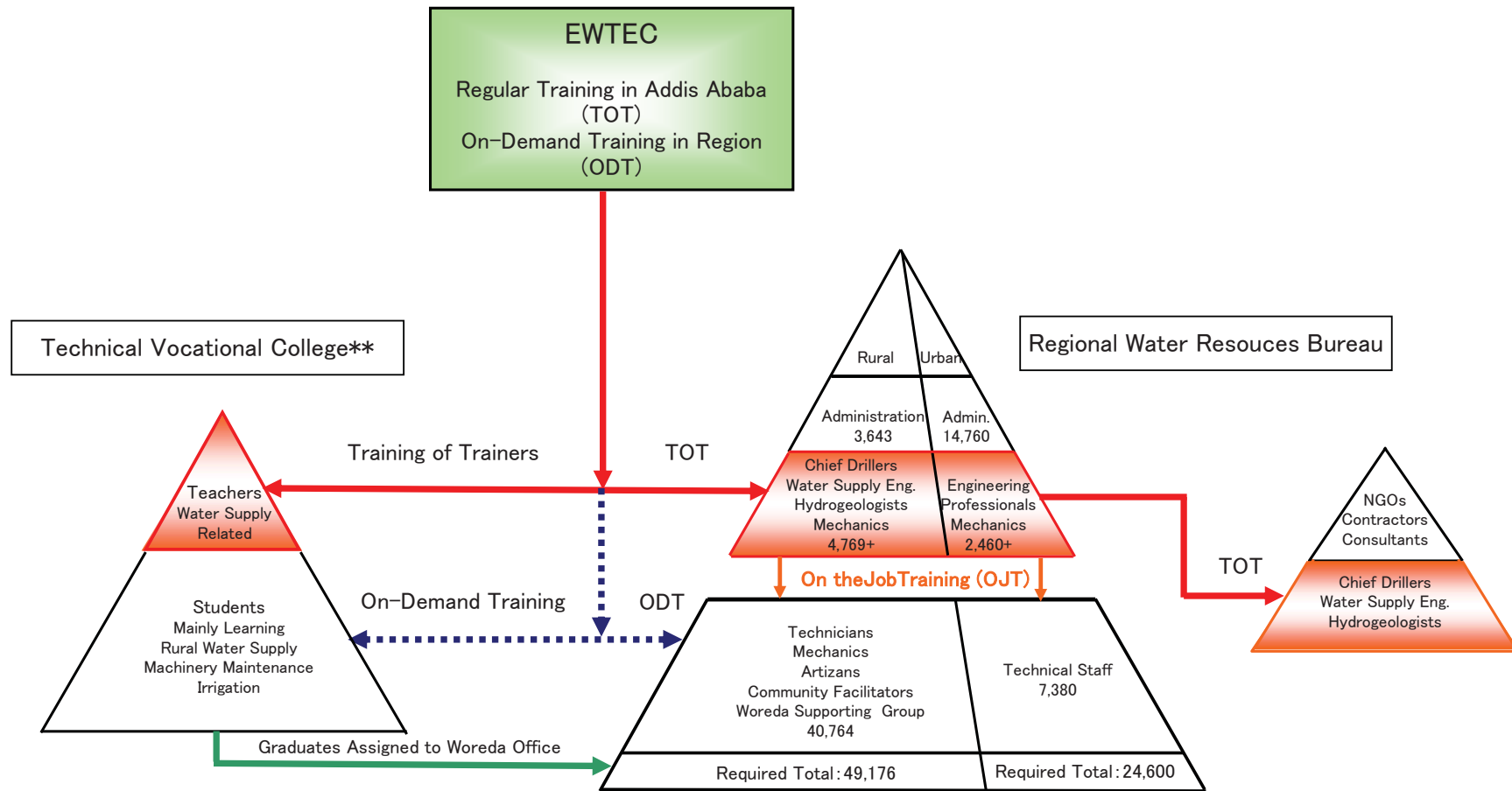


Figure 1 POSITION & ROLE OF EWTEC IN UNIVERSAL ACCESS PROGRAM (UAP: 2005—2012)



* Universal Access Program (2005-2012)

** Nine (9) colleges are currently operated in Asela, Assosa, Awasa, Bahir Dar, Jijiga, Komborcha, Lusi, Minchew and Woliso

Figure 2 EWTEC TRAINING APPROACH IN UAP* FOR HUMAN RESOURCES DEVELOPMENT

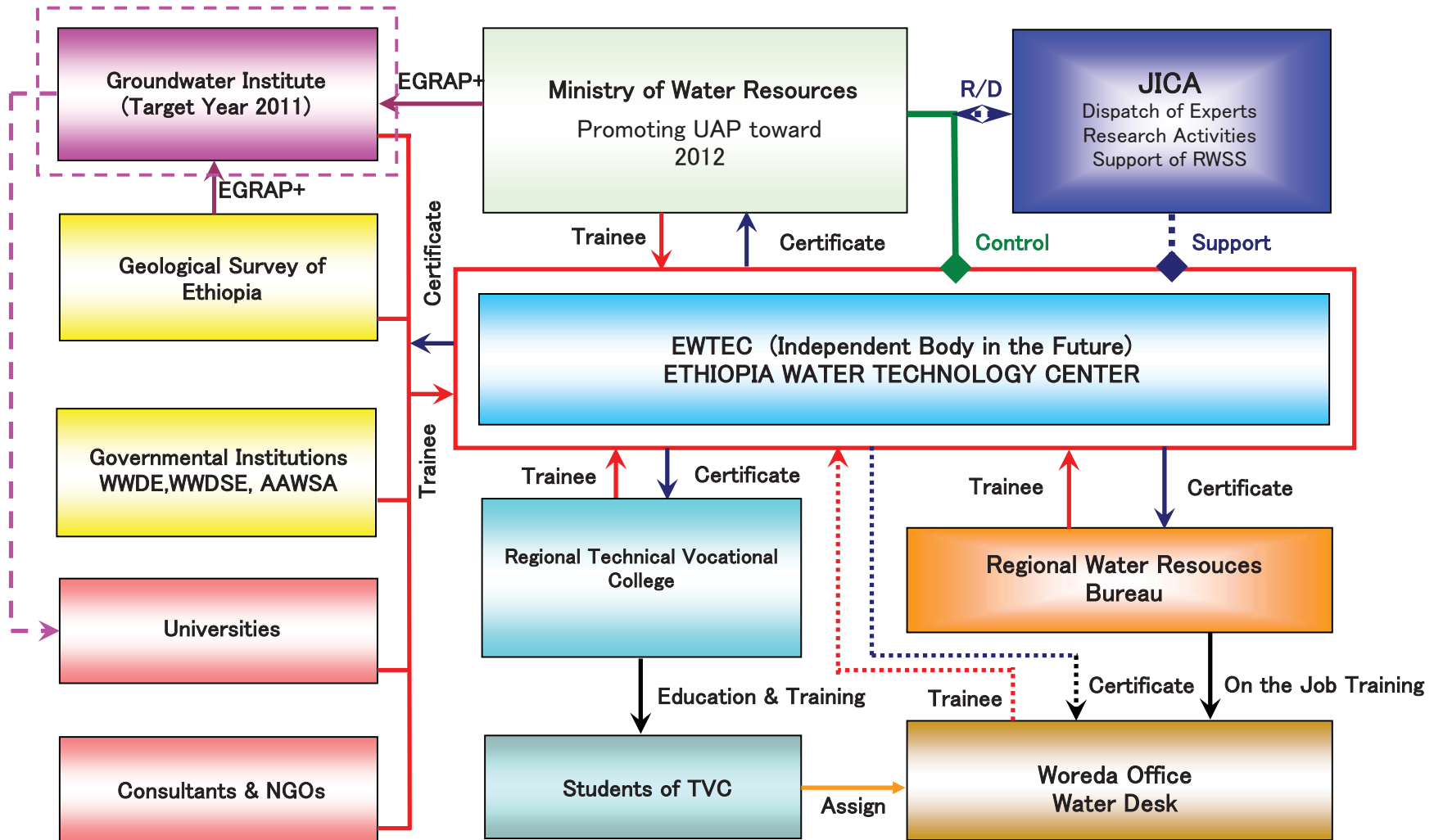


Figure 3 ACCEPTANCE OF TRAINEE IN EWTEC

付属資料 5
収集資料の一覧表

資料収集リスト

番号	名称	形態 図書・ビデオ・地 図・写真等	オリジナル コピー	発行機関	
1	Curriculum Guide Middle Level Technical Vocational Training Program, Course title: Groundwater Hydrology	図書	コピー	MoWR	
2	Curriculum Guide Middle Level Technical Vocational Training Program, Course title: Small Scale Irrigation Systems Design	図書	コピー	MoWR	
3	Curriculum Guide Middle Level Technical Vocational Training Program, Course title: Rural Water Supply Scheme Construction Supervision	図書	コピー	MoWR	
4	Curriculum Guide Middle Level Technical Vocational Training Program, Course title: Small Scale Irrigation and Drainage Construction Construction Supervision	図書	コピー	MoWR	
5	Curriculum Guide Middle Level Technical Vocational Training Program, Course title: Small Scale Irrigation and Drainage Systems Operation and Maintenance	図書	コピー	MoWR	
6	Strategic Planning (1996 to 1998 Eth .Budget Year)	図書	コピー	Oromia, WRB	
7	Ecosystems for water, food and economic development in the Ethiopian central rift valley (BO-10-006-22)	図書	オリジナル	Plant Research International B.V.	
8	Universal Access Program for Water Supply and Sanitation Services	図書	コピー	MoWR	
9	Financing Strategy for the Water Supply and Sanitation Sector, Executive Report (Draft 1.1)	図書	コピー	EUWI	
10	Final Sector Review Report of Water Supply, Sanitation and Hygiene Ethiopia	図書	コピー	EUWI	
11	Assessment of Investment and Financing Needs to Achieve Universal Access to Improved Hygiene and Sanitation by 2012	図書	コピー	EUWI	
12	Assessment, Development and Management of Groundwater in Ethiopia	図書	オリジナル	MoWR	
13	Project Memorandum Ethiopia: Water Supply and Hygiene Project	図書	コピー	DFID	
14	Strategic Plan & Management Document (1998-2002 E.C)	図書	コピー	SNNPR, WRB	
15	Proposal on Need of Co-operation to Improve Training Quality	図書	コピー	TVTC, Woliso	
16	Institutional Strengthening of Water Research in Ethiopia	図書	コピー	Working Group, MoWR	
17	Stock take of capacity building for WASH in Ethiopia	図書	コピー	WEDC, Loughborough University	