The Federal Democratic Republic of Ethiopia
Ministry of Water, Irrigation and Energy (MoWIE)

THE GROUNDWATER DEVELOPMENT AND WATER SUPPLY TRAINING PROJECT PHASE-III IN THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA

Project Completion Report (PC/R)

November 2013

Japan International Cooperation Agency (JICA)
Kokusai Kogyo Co., Ltd.

Location Map of Project Area

Photos of project activities (1)

EWTEC entrance. The center is located about 20 minutes from the center of Addis Ababa city by car.

Dormitory for trainees. Currently 40 people can be accommodated.

EWTEC Phase 3 launching ceremony. Attended by the Japanese ambassador to Ethiopia and state ministers.

EWTEC library.

Training needs assessment survey at Woreda Water Office by EWTEC staff members. Lack of practical experience is the common problem among the staff at Woreda level.

Presentation about EWTEC activity at WEDC international conference.

Photos of project activities (2)

Practical training overhauling an engine taught by a Japanese expert.

Practical training for gas welding taught by a Japanese expert.

Training course at Addis Ababa university (Water Supply Engineering course).

Teaching methodology workshop by an IEC expert for EWTEC staff members and Japanese experts.

Practical exercise in Drilling Technology Course. Constructed wells are used as production wells.

JCC at MoWR on April 13, 2010.

Photos of project activities (3)

Fishing tools manufactured in Ethiopia.

Demonstration for trouble shooting using the locally manufactured fishing tool by a Japanese expert.

Field work during the international course for groundwater modeling. The participants were divided into groups and try to establish a modeling idea observing topography.

Closing ceremony for groundwater modeling course, with members from embassies of the participants from other African countries.

International course on GIS for groundwater management.

International course on GIS for groundwater management. Individual support to finish daily homework assignment was continued until late evening by a JICA expert.

Photos of project activities (4)

Instruction by a Japanese expert for the maintenance of generators (EMMT course)

Closing ceremony held at EWTEC, with the state minister from MoWE in attendance (DT, DMMT and GWI course)

Practical training overhauling an engine for the mechanical engineering instructors.

Practical training overhauling an engine for the mechanical engineering instructors.

Key persons involved in raising the status of EWTEC under MoWR were invited to EWTEC and activities and issues were explained.

Eight British mainstream media journalists visited EWTEC and interviewed staff and students.

Photos of project activities (5)

Provision of training at Hawassa TVETC for students and instructors using equipment provided through Japanese grant aid.

Demonstration of pumping using the equipment provided through Japanese grant aid at Hawassa TVETC.

Field work during groundwater modeling course (international course) separated into groups.

Lecture of groundwater modeling course held at a hotel in Addis Ababa.

Field work during remote sensing course (international course). Obtaining coordinates using a GPS.

Field work during geophysical survey course (advanced course). Electro-magnetic survey.

Photos of project activities (6)

Lecturer answering a question from trainees in practical training (EMMT course).

Interview for impact survey at WWCE (Mekele).

Practical training of geophysical survey in a research program in Bilate river basin.

Lecture with pictures by Japanese expert for safety management at construction site (WSE).

Field work of well rehabilitation course (advanced course) instructed by Japanese experts.

Instruction of operation of borehole camera by a Japanese expert.

Photos of project activities (7)

Instruction for well rehabilitation by a Japanese expert (DT).

Field training at a water treatment plant in a local city (in Harar, EMMT course).

Trainees learning basic operation of the software through exercises (software application on WSE course).

Lecturer giving an explanation about rope pumps (hand pump installation and maintenance course).

EWTEC staff explaining reasons for breakdowns with panel board (Jijiga TVETC).

Lecturer explaining mechanism of hydraulic parts (hydraulic system maintenance).

Photos of project activities (8)

EWTEC's trainees hearing an explanation of pump trouble (training in Japan).

EWTEC staff learning functional inspections by Japanese experts (electro-mechanical course).

EWTEC staff observing geological formations in the field (groundwater management in Japan).

Trainees observing inside the well with a borehole camera (well diagnosis and well rehabilitation course).

Trainees with guests from embassies after closing ceremony (isotope hydrology course).

Seminar to disseminate EWTEC activities and strategic plan of EWTI at Hilton hotel, Addis Ababa.

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Annex

Abbreviations

AAU	Addis Ababa University
AAWSA	Addis Ababa Water & Sewerage Authority
DG	Director General
EOS	Ethiopian Occupational Standards
EWTEC	Ethiopian Water Technology Centre
EWTI	Ethiopian Water Technology Institute
GTP	Growth and Transformation Plan
IAEA	International Atomic Energy Agency
JCC	Joint Coordinating Committee
JICA	Japan International Cooperation Agency
M/M	Minutes of Meetings
MoCS	Ministry of Civil Services
MoE	Ministry of Education
MoFED	Ministry of Finance and Economic Development
MoWR	Ministry of Water Resources
MoWIE	Ministry of Water, Irrigation and Energy
OJT	On the Job Training
OWNP	One WASH National Program
PDM	Project Design Matrix
PIC	Project Implementation Committee
PMO	Prime Minister's Office
PO	Plan of Operation
RWB	Regional Water Bureau
TWSS	Town Water Supply Service
TVETC	Technical Vocational Education & Training College
UAP	Universal Access Program
WSSCBD	Water Sector Service and Capacity Building Directorate
WWO	Woreda Water Office
WWCE	Water Works Construction Enterprise
WWDSE	Water Works Design and Supervision Enterprise
ZWRO	Zonal Water Office

1. Project outline

1.1 Background

In the Federal Democratic Republic of Ethiopia (hereinafter referred to as Ethiopia), only 44% of the total population had access to safe drinking water, which was much lower than the 61% average of other sub-Saharan African countries (UNICEF: 2010). In order to improve this situation and to achieve the Millennium Development Goals (MDG), the government has been working with donor agencies by implementing various water resources development and water supply projects. However, a serious shortage of human resources in the water supply sector has been a long standing issue both in the government agencies, private companies and NGOs. In response to a request by the Ethiopian government, JICA embarked on the technical cooperation project called "Groundwater Development and Water Supply Training Project" in January 1998. The project aimed to strengthen capacities for developing human resources in the sector through the Ethiopian Water Technology Center (EWTEC). Phases 1 and 2 of the project have been completed. A brief history of the project is as follows.

1) Phase 1 + Follow-up (January 1998 - March 2005)

EWTEC was established as the first training organization in the fields of groundwater development and water supply in the country and conducted five basic training courses; groundwater investigation, well drilling technology, drilling machinery maintenance, electrical machinery maintenance and development of local society. A total of 711 engineers from regional governments and drilling institutes were trained through the project period and EWTEC successfully became the sole training institute in the water sector, although the issue of the sustainable operation of EWTEC remained.

2) Phase 2 (March 2005 - March 2008)

EWTEC expanded its activities by developing five basic, five advanced and two on-demand training courses and trained a total of 1,154 engineers in the regional governments including zonal offices and drilling institutes. During this expansion stage, the issue to upgrade EWTEC to become a permanent institute was raised in order to further improve quality of training and strengthen training capacities, as significant training needs remained unchanged not only in the public but also the private and NGO sectors.

Due to the effort made by EWTEC, the Ministry of Water Resources (MoWR, currently MoWIE) intended to upgrade EWTEC from a project to a department level. Furthermore, the Universal Access Program (UAP) for 2006-2012 prioritized human resource development in the water supply sector, with an expectation on EWTEC to play a key role in the sector. In order to achieve the UAP goal, it was recognized that EWTEC needed to;

① strengthen training management
② secure training quality continuously by improving the leadership abilities of EWTEC staff
③ conduct training for Woreda technicians and others, teachers of TVETC water supply departments, the private sector and NGOs, in addition to the engineers in regional and zonal governments and
④ strengthen organizational ability in order to operate independently as a permanent body.

MoWR requested technical cooperation to the Japanese government to solve the above issues when considering upgrading EWTEC into a permanent entity. In response to this request, JICA conducted a preliminary study in March 2008. Based on the results of the study, MoWR and JICA signed the Record of Discussion (R/D) for the implementation of Phase 3 on October 16, 2008.

1.2 Project purpose

This project is implemented according to Project Design Matrix (PDM) as indicated in Table 1. The overall goal and the objectives of the project are as described hereafter. The framework of the project implementation is summarized in Figure 1.

(1) Overall goal

The number of skilled human resources who deal with groundwater/water supply management for sustainable water supply construction and maintenance in Ethiopia is increased.

(2) Project objectives

Capacity of EWTEC as a core training center for water supply technicians and engineers of Ethiopia is strengthened.

(3) Output and activities

Output 1. Mechanisms to sustain constant quality improvements in EWTEC's training activities

are fully established

[Activities]

1-1. Specify points of improvement based on evaluation and monitoring of course content.
1-2. Monitor, evaluate and revise training curriculum and materials in each field.
1-3. Improve management of external training instructors.
1-4. Monitor, evaluate and improve activities and build up technical know-how.
1-5. Conduct impact studies and studies on future of training courses.
1-6. Carry out capacity development for knowledge management (collection of materials, and sharing knowledge and know-how of instructors).

Output 2. Technical knowledge and skills on water supply and management are improved for technicians and engineers from public, private sector, NGOs, TVETC instructors, and other African participants.

[Activities]

2-1. Develop a mid-term training plan.
2-2. Revise training curriculum & modules, hand-outs and materials for the basic course with more emphasis on practical training.
2-3. Prepare materials for new courses and create modules.
2-4. Assist in implementing training courses.
2-5. Carry out technical transfer to course coordinators of the local advanced courses in which income generation is expected when EWTEC is transformed to be a semi-autonomous entity.

Output 3. Capacities are developed to provide technical instruction to course coordinators, instructors, mechanics and drillers who conduct training at EWTEC.

[Activities]

3-1. Provide technical advice including teaching methods throughout the training courses.
3-2. Improve capacity of coordinators and instructors on specialized techniques throughout JICA Experts' assignment period.
3-3. Carry out capacity development for maintenance of equipment used in training.

Output 4. Sustainable institutional management capacity in terms of organizational, financial, accounting, personnel, marketing, and workshop management capacity of EWTEC is

strengthened.

[Activities]

4-1. Hold periodical meetings among C/Ps and JICA Experts to inform the progress of the Project and to discuss issues.

4-2. Develop mid- to long-term EWTEC Strategy which includes vision, mission, role and position, and its operational plan.

4-3. Disseminate the Strategy and operational plan to stakeholders (donors, private sector, NGOs, etc.).

4-4. Develop financial plan based on the EWTEC Strategy.

4-5. Develop marketing strategy and carry out marketing activities accordingly.

4-6. Collaborate with MoWIE for ensuring necessary budget and human resources for enhancing the operation of EWTEC.

4-7 Conduct financial and organizational planning to support activities of Committee on position of EWTEC.

4-8. Conduct activities of public relations to improve capacity of EWTEC.

1.3 Revision of PDM

1.3.1 Change from PDM0 to PDM1

(1) Overall Goal

PDM 0	PDM 1	Reasons
• Indicator Approximately 6,500 technicians among RWB, WWO, TVETC instructors, private sector and NGOs complete EWTEC trainings	Approximately 6,500 technicians among RWB, ZWRO, TWSSO, WWO, Government enterprise, TVETC instructors, private sector(consulting & drilling companies), and NGOs complete EWTEC trainings	To clearly define the expected target groups
• Means of verification -	EWTEC statistic data / Annual Report	Means of verification added in order to collect data on the trainee numbers

(2) Project Purpose

PDM 0	PDM 1	Reasons
• Indicator 3	New indicator “Numbers of visitors	To ascertain how widely EWTEC

	to the center" is added.	is known and its reputation
• Means of verification 1, 2 and 3 1. Interviews, Questionnaire Survey, Project records 2. Interviews, Questionnaire Survey, Project records 3. Nil	1. Interviews, Questionnaire Survey, Project records (Satisfaction & reputation by trainees, related organization, ministries & donors) 2. Interviews, Questionnaire Survey for EWTEC's Officers, Project records 3. Visitor Book	To bring in line with the necessary means and latest project planning
• Important Assumptions 2 & new Assumptions (No. 5) 2. Budget allocation for development of water supply facilities and maintenance will be sustained and the work will be continued. 5. Nil	2. Budget allocation for development of water supply facilities and maintenance including training budget will be sustained and the work will be continued. 5. Donor Funding and other donors' capacity building efforts in the Water Sector will continue.	To be more specific To attain the overall goal, this assumption is a necessary condition (the original concept is derived from Assumption No.3 of Outputs)

(3) Outputs

PDM 0	PDM 1	Reasons
• Indicator 1.1 & 1.4 & 1.5 1.1 Proficiency tests on respective training modules are prepared and conducted. 1.4 Actual result of Training Technical Committee (TTC) and M&E Committee 1.5 Nil	1.1 Final Examination tests on respective training modules are prepared and conducted. 1.4 Actual result of Training Technical Committee (TTC) and EWTEC External Meeting (EEM) 1.5 Products through the Project	To bring in line with the latest project planning The same as above To bring in line with the latest project planning
• Output 2 Technical knowledge and skills on water supply and management are improved for technicians and engineers from the Regional Water Bureaus, Woredas, private sector and NGOs, and TVETC instructors.	Technical knowledge and skills on water supply and management are improved for technicians and engineers from public, private sector, NGOs, TVETC instructors, and other African participants.	To bring in line with the latest project planning
• Indicator 2.1 ~2.4 2.1=> 2.3 2.2=> 2.4 2.3=> 2.1 2.4=> 2.2	Same as PDM 0 (only order changed)	To bring in line with EWTEC activities and time constraints
• Indicator 2.3 2.3 Number of training courses, number of participants	• New Indicator 2.1 2.1 Number of training courses, diversity of training participating organization	"Number of participants" deleted to avoid duplication, and replaced with "diversity…." to reflect the actual situation
• Indicator 2.4 2.4 Proficiency tests at the end of	• New Indicator 2.2 2.2 Final Examination tests at the	Changed according to the actual

PDM 0	PDM 1	Reasons
respective modules reach 80/100 for 80% of trainees.	end of respective modules reach 75/100 as average and also exceed 50% of trainees as 80/100 score.	scoring results and project planning, and also so that the English matches the Japanese version *Once new versions of Examination tests / certification system are introduced, the indicator will be once more revised and be defined if necessary.
• Indicator 2.1 2.1 Approximately 3,500 technicians among RWB, WWO, TVETC instructors, private sector and NGOs complete EWTEC trainings	• New Indicator 2.3 2.3 Approximately 3,000 technicians among RWB, ZWRO, WWO, TVETC instructors, private sector and NGOs complete EWTEC trainings by the end of the project term	The original targeted numbers were unrealistic, so the new numbers are the results of discussions among project members according to the latest project planning. Also, the specific term of the indicator is defined
• Indicator 2.2 2.2 Over 80% of senior officials who evaluate performance of trainees' at respective work place indicate satisfaction	• New Indicator 2.4 2.4 Level of satisfaction among the ex-trainees and their bosses are satisfied with the training courses. (Based on the "Impact survey", scoring/rate of the level will be determined at the time of mid-term evaluation.)	The meaning of the original sentence was not clear, so the new sentence is the result of discussions among project members according to the latest project planning. The target percentage is not determined at this stage, then, it will be decided at the time of mid-term evaluation.
• Means of Verification 2.1~2.4 2.1=> 2.3 2.2=> 2.4 2.3=> 2.1 2.4=> 2.2	Same as PDM 0 (only order changed)	Modify the indicators' order according to the time-bounding and also activity proceedings
• Means of Verification 2 2.1 Project records 2.2 Questionnaire Survey, Interviews 2.3 Project records 2.4 Project records	• New Means of Verification 2 2.1 Training & Project records 2.2 Final Examination tests, Project records 2.3 EWTEC Database sheet on ex-trainees (List of graduates), Project records 2.4 Questionnaire Survey, Interviews (Impact survey)	Means of verification added in accordance with the necessary means and latest project planning
• New Indicator 3.1 3.1 Levels of technical knowledge and skills are improved from the baseline conducted at the inception of the Project. 3.2 Levels of satisfaction among trainees on levels of knowledge and technical expertise, teaching methods, course management and attitudes are high.	• New Indicator 3.1 3.1 Formulation and/or modification of necessary training curriculum & modules, teaching materials & handouts 3.2 The sentence is just same as original 3.3 Same as the above	New sentence of indicator added according to the latest planning Order changed according to new indicator 3.1
• Means of Verification 3 3.1 Project records, Evaluation by	• New Means of Verification 3 3.1 Training Curriculum &	Order changed because new

PDM 0	PDM 1	Reasons
JICA Experts 3.2 Interviews, Questionnaire Survey, Project records	modules, Teaching materials & Handouts produced by EWTEC staff 3.2 Capacity Improvement sheet for Instructor, Project records, Evaluation by JICA Experts 3.3 Inter course Evaluation sheet, Interviews, Questionnaire Survey (Impact survey), Project records	means of verification 3.1 added Means of verification added in accordance with the necessary means and latest project planning
• Indicator 4.4 4.4 Institutional management capacity; i.e. budget and human resources	Institutional management capacity; i.e. secure budget and human resources, and course management ability	Words added and changed in accordance with the necessary indicators and latest project planning
• Means of Verification 4 4.1 Interviews, Questionnaire Survey, Project records 4.2 Project records 4.3 Project records 4.4 Interviews, Questionnaire Survey, Project records 4.5 Project records 4.6 Project records 4.7 Project records	4.1 Meeting record, Interviews, Questionnaire Survey, Project records 4.2 Medium-to-Long-term Plan, Project records 4.3 Budget & Expenditure Reports, Project records 4.4 EWTEC annual report, Interviews, Questionnaire Survey, Project records 4.5 EWTEC Database sheet on ex-trainees, Project records 4.6 EWTEC annual report, Project records 4.7 EWTEC Homepage, EWTEC brochure & Newsletters, Project records	Means of verification added in accordance with the necessary means and latest project planning
• Important Assumptions 2 & Delete Assumptions 3 2. EWTEC's mandate as a training institution is sustained. 3. WASH Pooled Fund and other donors' capacity building efforts in the Water Sector will continue.	2. EWTEC's mandate and function as a training institution is sustained. 3. Delete	Words added to be more specific. The Output Assumption 3 is deleted because it is equivalent to the level of project purpose

(4) Activities

PDM 0	PDM 1	Reasons
• Activity 1~4 1.1 Conduct of monitoring and evaluation for each training course to make necessary improvement 1.1.1 Development and regular implementation of proficiency tests to each training participant	1-1. Specify points of improvement based on evaluation and monitoring of course content 1-2. Monitor, evaluate and revise training curriculum and materials in each field 1-3. Improve training instructor planning	Sentence changed in accordance with the inception report and the latest planning Delete detailed activities, such as 1.1.1~1.1.3, instead describe such detailed activities in Plan of Operation

PDM 0	PDM 1	Reasons
1.1.2 Development and regular implementation of evaluation for each training program and instructor by training participants. 1.1.3 Implementation of assessment of above proficiency tests and evaluations to make necessary improvement. 1.2 Conduct of regular monitoring and evaluation of curriculum and teaching materials 1.2.1 Establishment of training technical committee (TTC) for each training field 1.2.2 Regular (annually) implementation of evaluation of curriculum, modules and teaching materials by TTC. 1.2.3 Making necessary review and modification of training curriculum and teaching materials. 1.2.4 Implementation of training needs assessment by TTC to develop training curriculum, modules and teaching materials. 1.3 Regular (annually) improvement of deployment of instructors. 1.3.1 Renew the next year's deployment plan based on the above evaluation (1.2.2) 1.3.2 Select external instructors suitable for the above deployment plan (1.3.1) based on the above evaluation (1.1) 1.4 Regular (annually) monitoring and evaluation of EWTEC activities, in cooperation with relevant stakeholders. 1.4.1 Establishment of M&E committee composed of representatives of beneficiary organizations (i.e. RWB, Wareda, private sector, NGOs, TVETC) 1.4.2 Conduct of regular (annually) M&E committee meeting to confirm the achievements and make necessary improvement.	1-4. Monitor, evaluate and improve activities through the TTC & external meeting 1-5. Conduct impact study and study on future of training course	
2-1. Conduct training for Regional Water Bureaus 2-2. Conduct training for Woreda Water Office	2-1. Prepare training course and advanced seminar from the following year onwards 2-2. Prepare materials for new	Sentences added and changed in accordance with the inception report and the latest planning

PDM 0	PDM 1	Reasons
2-3. Conduct training for technicians and engineers of the Private Sector 2-4. Conduct training for TVETC instructors	courses and create modules 2-3. Assist in carrying out the training courses 2-4. Hold advanced seminar 2-5. Review content of advanced seminar for following year onward	
3-1. Provide pedagogical training through On the Job Training (OJT) 3-2. Provide instructions on specialized technical subjects through OJT 3-3. Improve practical skills and knowledge through field activities 3-4. Improvement in maintaining training equipment and machineries 3-5. Strengthen advanced knowledge and pedagogical skill through implementation/participation of international training	3-1. Guidance on teaching methods through On the Job Training (OJT) 3-2. Improve teaching capacity on specialized techniques through OJT 3-3. Improve capacity development of EWTEC training instructors and coordinators 3-4. Carry out capacity development for maintenance of equipment used in training 3-5. Conduct advanced training course for African participants	It originally described only the name of the target institution and/or target group, but it is necessary to more clearly define it according to time constraints and the results of Training needs assessment survey
4-1. Support articulation of EWTEC's mandate, vision, mission and strategies to reach a consensus among relevant stakeholders (i.e. RWB, donors, NGOs) 4-2. Support development of Medium-to-Long term Plan 4-3. Support developing capacities in planning budget and diversity funding sources in cooperation with relevant stakeholders (i.e. other donors, RWB, Woreda and private sector). 4-4. Support development of capacities to establish strong collaborations with donors (i.e. WASH pooled fund). 4-5. Develop and manage of database on training participants 4-6. Implement PR and knowledge management activities through publicizing EWTEC annual report, homepage and other necessary activities.	4-1. Confirm and agree the institutional policy, purpose and strategies of EWTEC 4-2. Support regular design and revision of the mid- and long-term training plan 4-3. Assist to secure a source to supply required funds for training 4-4. Establish ties with organizations and funds for personnel capacity building 4-5. Carry out capacity development for knowledge management 4-6. Conduct public relations to improve EWTEC capacity for information communication	Sentences are added and changed according to the inception report and the latest planning
• Important Assumptions 1& 3& 4 1. Appropriate number of EWTEC personnel gets assigned.	1. Appropriate number of EWTEC personnel gets assigned and no drastically changed.	Words added to be more specific

PDM 0	PDM 1	Reasons
3. Appropriate level of budget allocated for training courses. 4. Expansion of EWTEC's facilities gets budget allocated and implemented.	3. Appropriate level of budget allocated for training courses. (secure professional trainers) 4. Expansion of EWTEC's facilities and equipment gets budget allocated and implemented.	

(5) Inputs

PDM 0	PDM 1	Reasons
• Fields of Japanese experts 1. Chief Advisor 2. Training Management 3. Hydro-geology 4. Drilling Technology 5. Drilling Machineries Maintenance 6. Water Supply 7. Electro Mechanic	1. Chief Advisor/Organizational Operation 2. Assessment Program 3. Training Management 4. Hydro-geology/Volcanology 5. Drilling Technology 6. Drilling Machineries Maintenance 7. Water Supply Engineering 8. Machinery/Electric Machinery 9. IEC/Teaching Method 10. Information Management	Specific fields of major experts added and changed according to the latest planning

1.3.2 Change from PDM1 to PDM2

(1) Overall Goal

<Changes to the narrative summary of the Overall Goal>

PDM1	PDM2	Reasons
The number of human resources who deal with ground water/water supply construction and maintenance in Ethiopia.	The number of skilled human resources who deal with ground water /water supply management for sustainable water supply construction and maintenance in Ethiopia is increased.	To express the meaning clearly.

<Changes to the objectively verifiable indicators of the Overall Goal>

PDM1	PDM2	Reasons
1. Approximately 6,500 technicians among RWB, ZWRO, TWSSO, WWO, Government enterprises, TVETC instructors, private sector (consulting & drilling companies), and NGOs complete EWTEC training.	1. Approximately 6,000 technicians and engineers among RWB, ZWRO, TWSSO, WWO, Government enterprises, TVETC instructors, private EWTEC training. 2. Knowledge and skills acquired by trainees are transferred to	1. To make the possible target with the condition that expansion of facilities and EWTEC's transformation to semi-autonomous entity will be achieved in the Project. 2. To develop target of

	other colleagues in training participating organizations.	expansion of impact.

<Changes to the important assumptions to achieve the Overall Goal>

PDM1	PDM2	Reasons
Donor funding and other donors' capacity building efforts in the Water Sector will continue.	1. EWTEC expands its training capacity. 6. Donor funding to support capacity building efforts in the Water Sector will continue.	1. This enables achievement of the Overall Goal 6. To clarify the meaning

(2) Project Purpose

<Changes to the objectively verifiable indicators of the Project Purpose>

PDM1	PDM2	Reasons
1. EWTEC Certificates are acknowledged and treated as occupational certification in the water sector. 3. Numbers of visitors to the center	1. EWTEC Certificates are well acknowledged as a technical certification in the water sector. 3. Mid- to long-term Strategy of EWTEC is approved by MoWIE, and is acknowledged by training participating organizations and donors. 4. Financial plan to implement the operational plan of the Strategy is endorsed by MoWIE.	1. To clarify the meaning 3. and 4. To measure whether the institutional capacity of EWTEC is strengthened.

<Proposed changes to the important assumptions to achieve the Project Purpose>

PDM1	PDM2	Reasons
1. All the trained personnel of EWTEC continue to work at EWTEC. 2. EWTECs mandate and function as a training institution is sustained.	(delete both assumptions)	Both are important assumptions for achieving the Outputs.

(3) Outputs

<Proposed changes to the narrative summary of the Outputs>

PDM1	PDM2	Reasons
4. Sustainable institutional management capacity of EWTEC is strengthened	4. Sustainable institutional management capacity in terms or organizational, financial, accounting, personnel, marketing and workshop management of EWTEC is strengthened.	To give further details of the concept.

<Proposed changes to the objectively verifiable indicators of the Outputs>

PDM1	PDM2	Reasons
1.2 Regular Needs Assessment is institutionalized and its results incorporated into training activities 1.4 Actual result of Training Technical Committee (TTC) and external meeting l.5 Products through the Project	1.2 Needs Assessment, Course Evaluation, Impact survey and questionnaire are institutionalized as regular activities and their results are incorporated into training activities. 1.4 Technical skills, knowledge and know-hows to improve the quality of training are accumulated in EWTEC through Training Technical Committee (TTC), provided that the appropriate number of staffs is available.	1.2 To add regular surveys. 1.4 To clarify the function of TTC.
2.1 Number of training courses, diversity of training participating organization 2.3 Approximately 2,500 technicians among RWB, ZWRO, TWSSO, WWO, TVETC instructors, private sector and NGOs complete EWTEC trainings by the end of the project term 2.4 Level of satisfaction among the ex-trainees and their bosses are satisfied with the training courses. (Based on the “Impact survey," scoring/rate of the level will be determined at the time of mid-term evaluation.)	2.1 Number of training courses is increased to 15 (currently planned) 2.2 Training curriculum & modules, teaching materials & handouts are revised for all the existing courses in order to the increase the proportion of practical training 2.3 Participation from private sector and NGOs is increased up to 10% of total trainees. 2.5 Approximately 1,500 technicians among RWB, ZWRO, TWSSO, WWO, TVETC instructors, private sector and NGOs complete EWTEC trainings by the end of the project term. 2.6 The bosses of ex-trainees are satisfied with the technical capacity and performance of ex-trainees.	2.1 To clarify the target 2.2 To change indicator 3.1 to 2.2. 2.3 To make the private sector and NGOs the target of participation. 2.5 To make the target possible. 2.6 To clarify the meaning.
3.1 Formulation and/o modification of necessary training curriculum & modules, teaching materials & handouts. 3.2 Levels of technical knowledge and skills are improved from the baseline conducted at the inception of the Project. 3.3 Levels of satisfaction among trainees on levels of knowledge and technical expertise, teaching methods, course management and attitudes	3.1 Levels of technical knowledge and skills of course coordinators and instructors are improved. 3.2 Course coordinators and instructors acquire practical knowledge and skills of field work. 3.3 Levels of satisfaction among trainees on levels of knowledge and technical expertise, teaching methods, course management and attitudes are increased.	3.1 To clarify the meaning. 3.2 To add a new indicator. 3.3 To clarify the method of measurement.

are high.		
4.1 Collaboration with the relevant MoWR departments, all the training participating organizations and donors are strengthened and their sense of participation in EWTEC activities improves. 4.2 Development of Medium-to-Long-term Plan 4.3 Budget allocation based on EWTECs strategy and plan 4.4 Institutional management capacity; i.e. secure budget and human resources, and course management ability Frequency of update of database on training participants Frequency of update of EWTEC homepage 4.5 Frequency of update of database on training participants 4.7 Frequency of update of EWTEC homepage	4.1 Development of Medium-to Long-term Strategy and Operational plan. 4.2 Necessary budget and human resources are ensured according to the annual operational plan. 4.3 Marketing activities are enhanced if EWTEC is directed to be semi-autonomous entity. 4.4 Conduct financial and organizational analysis if EWTEC is directed to be semi-autonomous. 4.5 Periodical update of database on training participants 4.7 Periodical update of EWTEC homepage	4.1 To add operational plan. 4.2 To clarify the meaning. 4.3 To add a new indicator. 4.4 To add a new 4.5/ indicator. 4.7 To clarify the target.

<Proposed changes to the important assumptions to achieve the Outputs>

PDM1	PDM2	Reasons
1. Appropriate number of EWTEC personnel gets assigned and 110 drastically changed. 5. Sufficient numbers of trainees enroll in training courses. 6. Knowledge and Skills acquired by trainees get transferred and internalized in training participating organizations.	1. EWTECs mandate and function as a training institution is sustained. 2. Appropriate number of EWTEC personnel gets assigned and continue to work at EWTEC.	1. Move the important assumptions to achieve the Project Purpose in PDM1. 2. To clarify the meaning.

(4) Activities

<Proposed changes to activities>

PDM1	PDM2	Reasons
1-3. Improve training instructor planning	1-3. Improve external training instructor management.	1-3. To clarify the meaning.

1-4. Monitor, evaluate and improve activities through the TTC & external meeting	1-4. Monitor, evaluate and improve activities and stock technical know-how. 1-6. Carry out capacity development for knowledge management (collection of materials, and sharing knowledge and know-hows of instructors)	1-4. Deleted external meeting. 1-6. To add a new indicator.
2-1. Prepare training course and advanced course from the following year onwards 2-4. Hold advanced course 2-5. Review content of advanced course for following year onward	2-1. Develop mid-term training plan 2-2. Revise training curriculum & modules, hand-outs and materials for the basic course with more emphasis on practical training 2-5. Carry out technical transfer to course coordinators of the local advanced courses in which income generation is expected when EWTEC is transformed to be semi-autonomous.	2-1. To move the indicator 4-2 in PDM1 to indicator 2-1. 2-2/ 2-5. To add new indicators.
3-1. Guidance on teaching methods through On the Job Training (OJT) 3-2. Improve teaching capacity on specialized techniques through OJT 3-3. Improve capacity development of EWTEC training instructors and coordinators 3-5. Conduct advanced training course for African participants	3-1. Provide technical advice including teaching methods throughout the training courses. 3-2. Improve capacity of coordinators and instructors on specialized techniques throughout JICA Experts' assignment period.	3-1/ 3-2 To change the concepts
4-1. Confirm and agree the institutional policy, purpose and strategies of EWTEC 4-2. Support regular design and revision of the mid- and long-term training plan 4-3. Assist to secure a source to supply required funds for training 4-4. Establish ties with organizations and funds for personnel capacity building 4-5. Carry out capacity development for knowledge management 4-6. Conduct public relations to improve EWTEC capacity for information communication	4-1. Hold periodical meetings among C/Ps and JICA Experts to inform the progress of the Project and to discuss issues. 4-2. Develop mid- t0 long-term EWTEC Strategy which includes vision、mission, role and position, and its operational plan. 4-3. Disseminate the Strategy and operational plan to stakeholders (donors, private sector, NGOs, etc.). 4-4. Develop financial plan based on the EWTEC Strategy. 4-5. Develop marketing strategy and carry out marketing activities accordingly. 4-6. Collaborate with MoWIE for ensuring necessary budget and human resources for enhancing the operation of EWTEC. Conduct financial and organizational planning to	4-1 / 4-8 To add new indicators.

	support activities of Committee on position of EWTEC. Conduct activities of public relations to improve EWTEC capacity.	

(5) Inputs

<Proposed changes to inputs>

PDM1	PDM2	Reasons
Inputs from Ethiopian side 1) Appointment of Counterparts EWTEC	Appointment of Counterparts as in the organizational structure: EWTEC Centre Head Managers in necessary managerial areas Course coordinators and instructors for following areas: 1.Water Supply Engineering 2.Water Supply Management 3.Drilling Technology 4.Drilling Machines Maintenance 5.Electrical Machines Maintenance 6.Ground Water Investigation	To specify the persons required to be appointed

1.3.3 Change from PDM2 to PDM2.1

PDM 2	PDM 2.1	Reasons
• Indicator of Output 4.3 Marketing activities are enhanced if EWTEC is directed to be semi-autonomous entity. 4.4 Conduct financial and organizational analysis if EWTEC is directed to be semi-autonomous.	4.3 Fundraising activities are enhanced. 4.4 Conduct financial and organizational analysis if EWTEC is transformed into a public institute.	4.3 At the time of the Mid-term of review, EWTEC was considered to become an enterprise and stand by itself through income generation. Therefore, marketing activities were considered important. However, it was finally decided to transform EWTEC into a Public Institute, therefore meaning income generation is not a major activity. 4.4 To change the expression according to the current situation.

Table 1: Project Design Matrix (PDM)

Project Design Matrix 3 (PDM2.1)

Project Title: Ethiopian Water Technology Centre (EWTEC) Project Phase III

Project Period: December 2008 – 2013 (5 years)

Target Group: Water Supply Technicians and Engineers of Ethiopia Final Beneficiaries: General Public of Ethiopia Date Prepared: 27th May. 2013

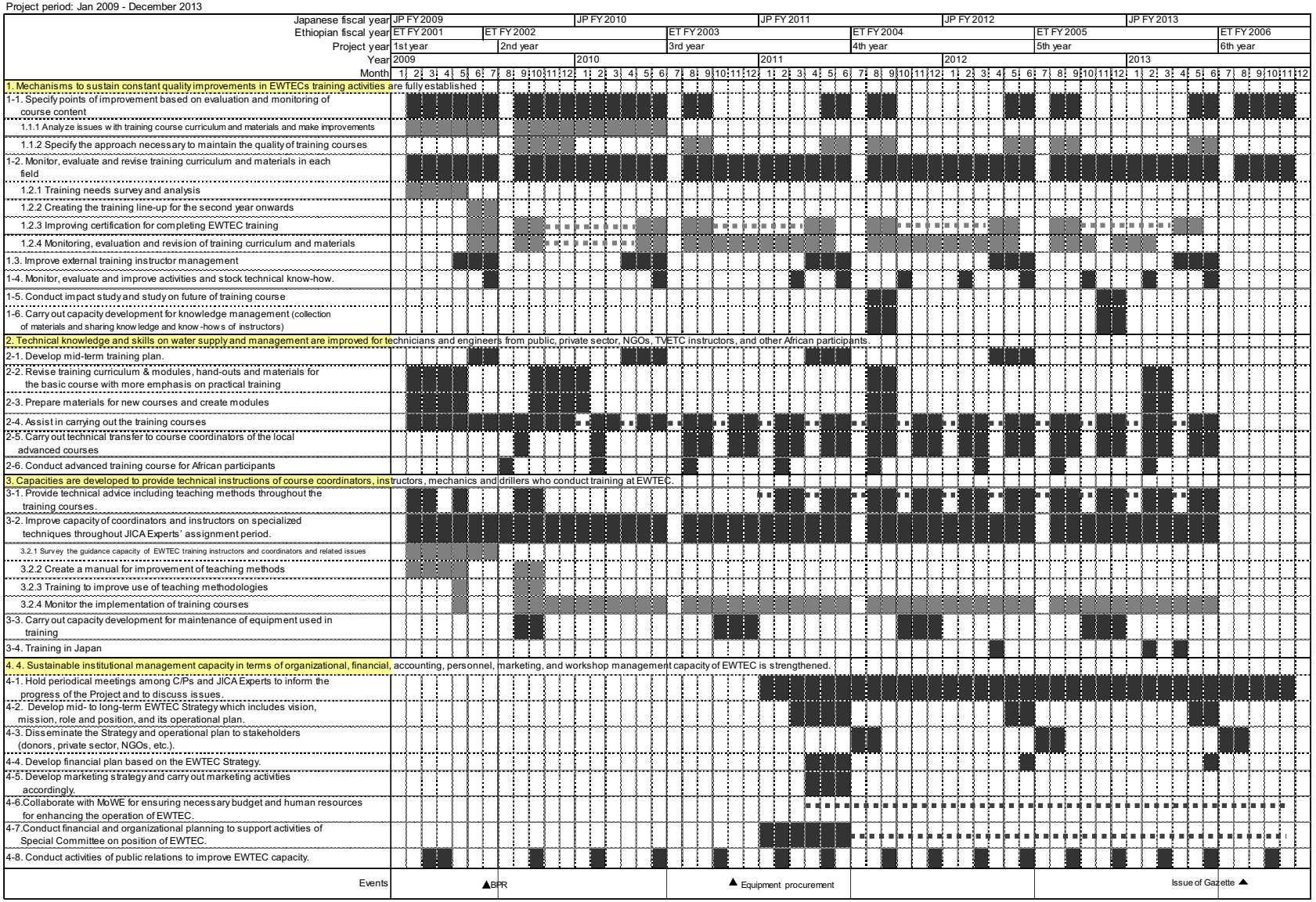
NARRATIVE SUMMARY	OBJECTIVE VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
OVERALL GOAL The number of skilled human resources who deal with groundwater/water supply management for sustainable water supply construction and maintenance in Ethiopia is increased.	1 Approximately 6,000 technicians and engineers among RWB, ZWRO, TWSSO, WWO, Government enterprises, TVETC instructors, private sector (consulting & drilling companies), and NGOs complete EWTEC training 2 Knowledge and skills acquired by trainees are transferred to other colleagues in training participating organizations.	1. GTP , PASDEP Annual Report, MoWIEs Annual Report, Statistical reports published by the Office of the Statistics, Annual reports from international agencies, EWTEC statistic data / Annual Report 2. Interviews, Impact survey	
PROJECT PURPOSE Capacity of EWTEC as a core training center for water supply technicians and engineers of Ethiopia is strengthened.	1. EWTEC Certificates are well acknowledged as a technical certification in the water sector 2. EWTECs Officers have sufficient knowledge to assess needs, plan, coordinate, conduct, and evaluate training activities 3. Mid- to Long-term Strategy of EWTEC is approved by MoWIE, and is acknowledged by training participating organizations and donors. 4. Financial plan to implement the operational plan of the Strategy is endorsed by MoWIE.	1. Interviews, Questionnaire Survey, Project records (satisfaction & reputation by trainees, related organization, ministries & donors) , Number of visitors to the Centre 2. Interviews, Questionnaire Survey for EWTECs Officers, Project records 3. Strategy Paper, Meeting records, Dissemination seminar records 4. Financial plan, Meeting records	1. EWTEC expands its training capacity. 2. EWTEC trainees will continue to work on water supply development and management work. 3. Budget allocation for development of water supply facilities and maintenance including training budget will be sustained and the work will be continued. 4. No serious natural disasters occur that adversely affect water resources in the country. 5. Water sector policy of the Ethiopian government will not drastically change on development and management of water supply services. 6 Donor Funding to support capacity building efforts in the Water Sector will continue.
OUTPUTS 1. Mechanisms to sustain constant quality improvements in EWTECs training activities are fully established	1.1 Final Examination tests on respective training modules are prepared and conducted. 1.2 Needs Assessment, Course Evaluation, Impact survey and questionnaire are institutionalized as regular activities and their results are incorporated into training activities 1.3 Database on external human resources with specific specialization is developed and updated. 1.4 Technical skills, knowledge and know-how to improve the quality of training are accumulated in EWTEC through Training Technical Committee (TTC), provided that the appropriate number of staff are available.	1.1 Final Examination tests, Interviews, Questionnaire Survey, Project records 1.2. Training need assessment survey, Inter Course Evaluation, Impact survey, Interviews, Questionnaire Survey, Project records 1.3 EWTEC Database sheet on external trainers, Interviews, Questionnaire Survey, Project records 1.4 TTC regular meeting record, Interviews, Questionnaire Survey, Project records	

NARRATIVE SUMMARY	OBJECTIVE VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
2. Technical knowledge and skills on water supply and management are improved for technicians and engineers from public, private sector, NGOs, TVETC instructors, and other African participants.	2.1 Number of training courses is increased to 15 (*currently planned). 2.2 Training curriculum & modules, teaching materials & handouts are revised for all the existing courses in order to the increase the proportion of practical training. 2.3 Participation from private sector and NGOs is increased up to 10% of total trainees. 2.4 Final Examination tests at the end of respective modules reach 75/100 as average and also exceed 50% of trainees as 80/100 score. 2.5 Approximately 1,500 technicians among RWB, ZWRO, TWSSO, WWO, TVETC instructors, private sector and NGOs complete EWTEC training by the end of the project term. 2.6 The bosses of ex-trainees are satisfied with the technical capacity and performance of ex-trainees.	2.1 Training & Project records 2.2 Training Curriculum & modules, Teaching materials & Handouts produced by EWTEC staff 2.3 Trainees' database 2.4 Final Examination tests, Project records 2.5 EWTEC Database sheet on ex-trainees (List of graduates), Project records 2.6 Questionnaire Survey, Interviews (Impact survey)	
3. Capacities are developed to provide technical instruction to course coordinators, instructors, mechanics and drillers who conduct training at EWTEC.	3.1 Levels of technical knowledge and skills of course coordinators and instructors are improved. 3.2 Course coordinators and instructors acquire practical knowledge and skills of field work. 3.3 Levels of satisfaction among trainees on levels of knowledge and technical expertise, teaching methods, course management and attitudes are increased.	3.1 Capacity Improvement sheet for Instructor, Project records, Evaluation by JICA Experts 3.2 Interviews, Questionnaire Survey 3.3 Inter course Evaluation sheet, Interviews, Questionnaire Survey (Impact survey), Project records	
4. Sustainable institutional management capacity in terms of organizational, financial, accounting, personnel, marketing, and workshop management capacity of EWTEC is strengthened.	4.1 Development of Mid- to Long-term Strategy and Operational plan. 4.2 Necessary budget and human resources are ensured according to the annual operational plan 4.3 Fundraising activities are enhanced. 4.4 Conduct financial and organizational analysis if EWTEC is transformed into a public institute. 4.5 Periodical update of database on training participants 4.6 Publicizing of EWTEC annual report 4.7 Periodical update of EWTEC homepage	4.1 Mid- to Long-term Strategy and Operational plan 4.2 Budget & Expenditure Reports, Personnel list, Project records 4.3 Marketing strategy, Project records 4.4 Project records, Interviews 4.5 EWTEC Database sheet on ex-trainees, Project records 4.6 EWTEC annual report, Project records 4.7 EWTEC Homepage, EWTEC brochure & Newsletters, Project records	

ACTIVITIES	INPUTS		
ACTIVITIES 1-1. Specify points of improvement based on evaluation and monitoring of course content 1-2. Monitor, evaluate and revise training curriculum and materials in each field 1-3. Improve external training instructor management. 1-4. Monitor, evaluate and improve activities and build up technical know-how. 1-5. Conduct impact study and study on future of training course 1-6. Carry out capacity development for knowledge management (collection of materials, and sharing knowledge and know-how of instructors) 2-1. Develop mid-term training plan 2-2. Revise training curriculum & modules, hand-outs and materials for the basic course with more emphasis on practical training 2-3. Prepare materials for new courses and create modules 2-4. Assist in implementing training courses. 2-5. Carry out technical transfer to course coordinators of the local advanced courses in which income generation is expected when EWTEC is transformed to be semi-autonomous. 3-1. Provide technical advice including teaching methods throughout the training courses. 3-2. Improve capacity of coordinators and instructors on specialized techniques throughout JICA Experts' assignment period. 3-3. Carry out capacity development for maintenance of equipment used in training 4-1. Hold periodical meetings among C/Ps and JICA Experts to inform the progress of the Project and to discuss issues. 4-2. Develop mid- to long-term EWTEC Strategy which includes vision, mission, role and position, and its operational plan. 4-3. Disseminate the Strategy and operational plan to stakeholders (donors, private sector, NGOs, etc.). 4-4. Develop financial plan based on the EWTEC Strategy. 4-5. Develop marketing strategy and carry out marketing activities accordingly. 4-6. Collaborate with MoWIE for ensuring necessary budget and human resources for enhancing the operation of EWTEC. 4-7 Conduct financial and organizational planning to support activities of Committee on position of EWTEC. 4-8. Conduct activities of public relations to improve EWTEC's capacity.	JAPAN 1) Dispatch of Japanese Experts 8. Chief Advisor/Organizational Operation 9. Assessment Program 10.Training Management 11.Hydro-geology/Volcanology 12.Drilling Technology 13.Drilling Machinery Maintenance 14.Water Supply Engineering 15.Machinery/Electric Machinery 16.IEC/Teaching Method 17. Information Management Other experts from different specialties will be dispatched as necessary 2) Acceptance of C/P personnel for training To be conducted when necessary 3) Equipment procurement: training workshop equipment, etc. Needs for equipment will be determined after conducting a detailed needs survey and curriculum development 4) Local operational costs To be determined	ETHIOPIA 1) Appointment of Counterparts as in the organizational structure EWTEC Center Head Managers in necessary managerial areas Course coordinators and instructors for following areas: 1. Water Supply Engineering 2. Water Supply Management 3. Drilling Technology 4. Drilling Machines Maintenance 5. Electrical Machines Maintenance 6. Ground Water Investigation 2) Provision of office space At EWTEC 3) Contribution of local cost MoWIE Administrative management cost of EWTEC Operational cost of basic courses (cost share) Regional Water Bureaus Operational cost of basic courses (cost share)	1. EWTECs mandate and function as a training institution is sustained. 2. Appropriate number of EWTEC personnel gets assigned and continue to work at EWTEC. 3. Salary and incentive schemes of course coordinators and instructors do not get worsened any further. 4. Appropriate level of budget allocated for training courses. (secure professional trainers) 5. Expansion of EWTECs facilities and equipment gets budget allocated and implemented. PRE-CONDITION EWTEC is to be institutionalized in the official structure of the Ministry of Water and Energy

Table 2: Plan of operation (PO)

Plan of Operation (PO) (2.0)
Project title: Ethiopian Water Technology Center Project Phase-III
Project period: Jan 2009 - December 2013



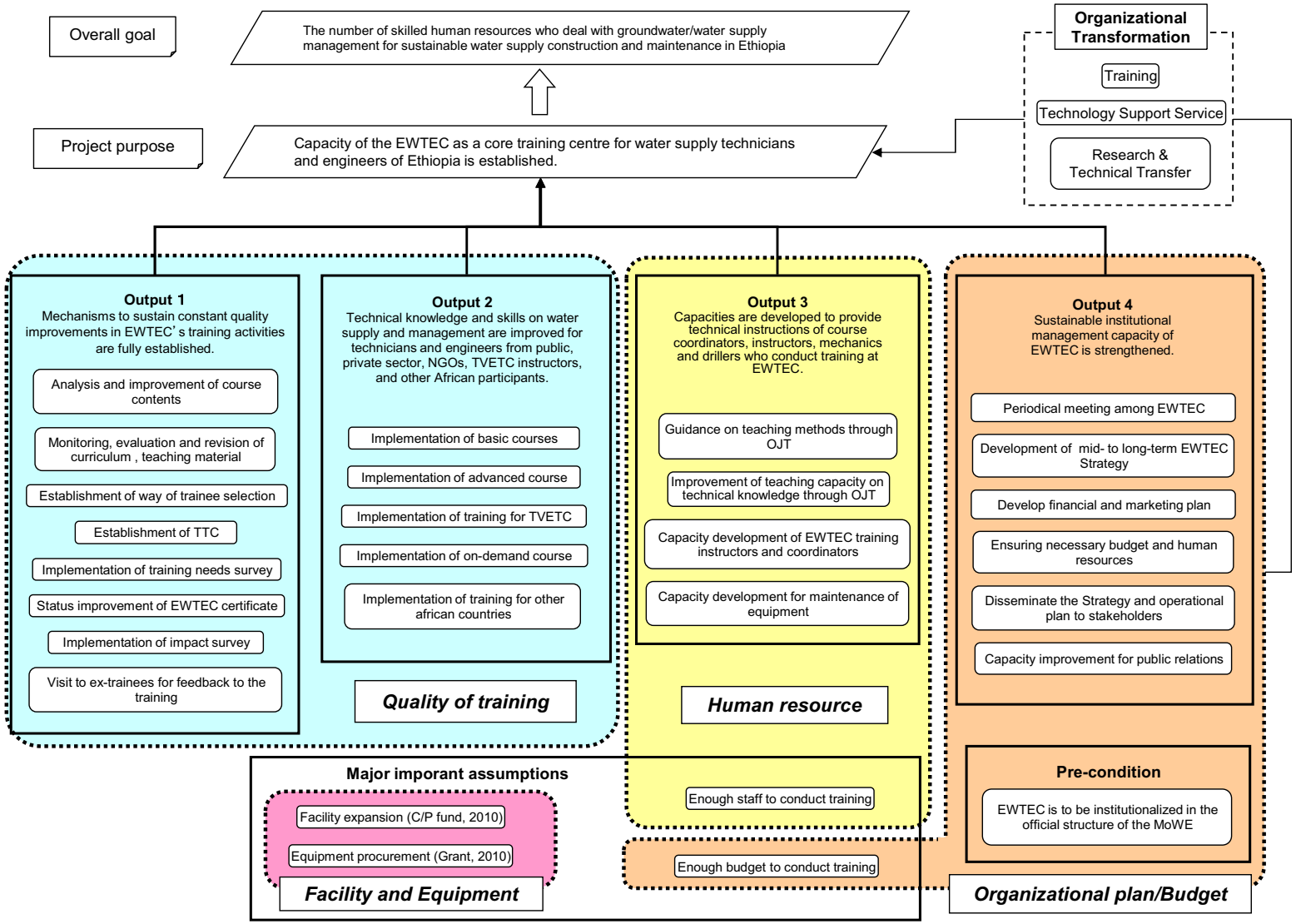


Figure 1: Framework of project implementation

2. Project activities

2.1 Work flow

A chart of the entire work flow is shown in Figure 2.

2.2 Change from the original plan and the reasons

The major changes from the original plan and reasons are described below.

Change from the original plan	Reasons
The target number of trainees within Phase 3 was reduced from 3,000 to 1,500.	The original target was set under the conditions that the facility of EWTEC became 3 times larger and enough staff and budget was secured. However, these conditions were not fulfilled. Therefore, the target was reduced at the Mid-term review.
To strengthen support for organizational transformation of EWTEC into a permanent entity a Japanese expert "Organizational management" was newly dispatched after the 3rd year.	EWTEC was supposed to have been upgraded at least to department level as a permanent organization as a precondition of Phase 3. However, its status remained the same, as a project under MoWR. Later in March 2011, MoWIE confirmed the directive to transform EWTEC into an autonomous entity and then Japanese side decided to further assist the organizational transformation. In the end, PMO directed to establish a public institute (not an enterprise) as an independent national institution.
Originally assignment of technical experts was supposed to be completed by the 3rd year but was extended up to the final year.	MoWIE officially directed to transform EWTEC into an autonomous entity and there was requirement of technical assistance to develop capacity of income generation activities in addition to assistance for implementation of training for EWTEC staff.
"EWTEC External M&E Committee" was canceled.	Since EWTEC stayed as a project under a department of MoWR and was supported by Japan, it was not realistic that the third organizations such as other donors organize a committee to monitor and evaluate EWTEC.
Original plan was to modularize each basic course so that trainees can participate in the modules according to their preference. The curriculum was simply rearranged as modules but the trainees should participate in each module as scheduled.	It was not realistic to introduce the system whereby trainees could select modules according to their interest and convenience for EWTEC basic courses since such a system was not commonly applied in Ethiopia.
Needs assessment survey and impact survey were conducted directly by EWTEC staff, not through	To feedback the study results into actual training courses effectively, it was necessary for EWTEC staff to

subcontracting out as originally planned.	conduct the study by themselves.
International training was conducted in corporation with IAEA.	Originally, an international training course was planned to be conducted by a Japanese expert. However, considering future possibility of cooperation with international organizations, one of the planned international courses was replaced with an Isotope Hydrology course which was implemented by inviting instructors from IAEA.

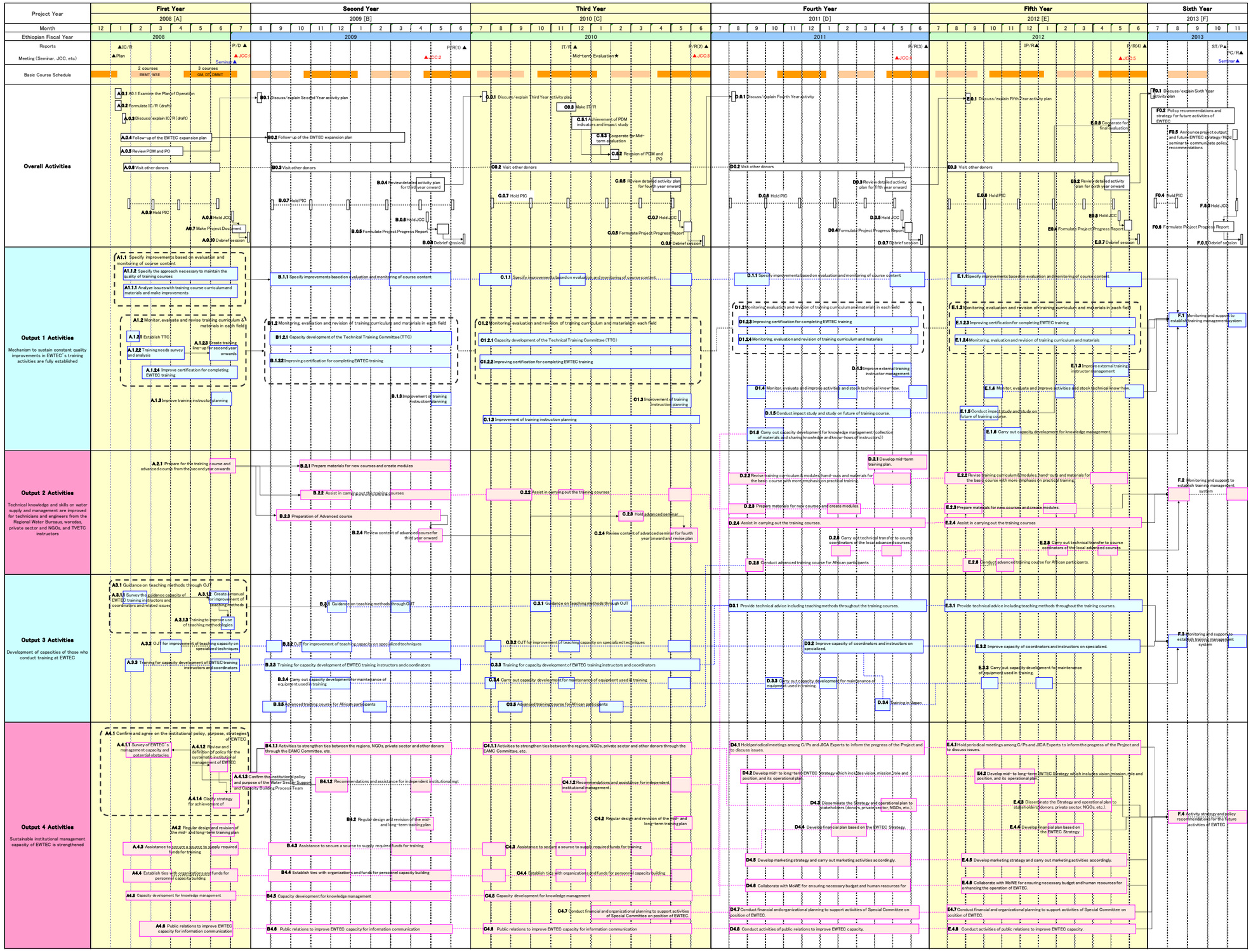


Figure 2: Work flow chart

2.3 Output 1: "Mechanism to sustain constant quality improvements in EWTEC's training activities are fully established"; Related Activities

2.3.1 Specifying points of improvement based on evaluation and monitoring of course content

(1) Specify the approach necessary to maintain the quality of training courses

1) Modularizing the training courses

Until Phase 2 of the project there was insufficient information on the content and goals of each subject prepared, with the only information available to the trainees before the course being a course guide. As a first step in establishing independent modules in the future, a module summary was made, specifying the contents (lecture and practical), goals, and assessment methods of each of the basic courses. This made preparation easier, not only for the trainees, but also for instructors, so the quality of the course can be maintained even if there is a change of instructor. It also made it easier to grasp problems and areas of improvement, leading to improved course quality.

2) Methods of selecting trainees

Until Phase 2, EWTEC was sending invitations to each Regional Water Bureau and only when new trainees cannot be found within the Regional Water Bureau, chances are given to Woreda, Zone and WWCE employees to attend the training. Therefore, the level and educational background among trainees was not uniformed. In Phase 3, EWTEC started sending an invitation to each organization directly to receive appropriate trainees from proper organizations (Figure 3). However, selection of trainees from Zonal and Woreda water offices, and town water supply offices had to be made through the Regional Water Bureau. For this, it was necessary to specify the target agency of the training. As a result of this method, the organizations and the level of trainees have, to a certain extent, become more uniform.

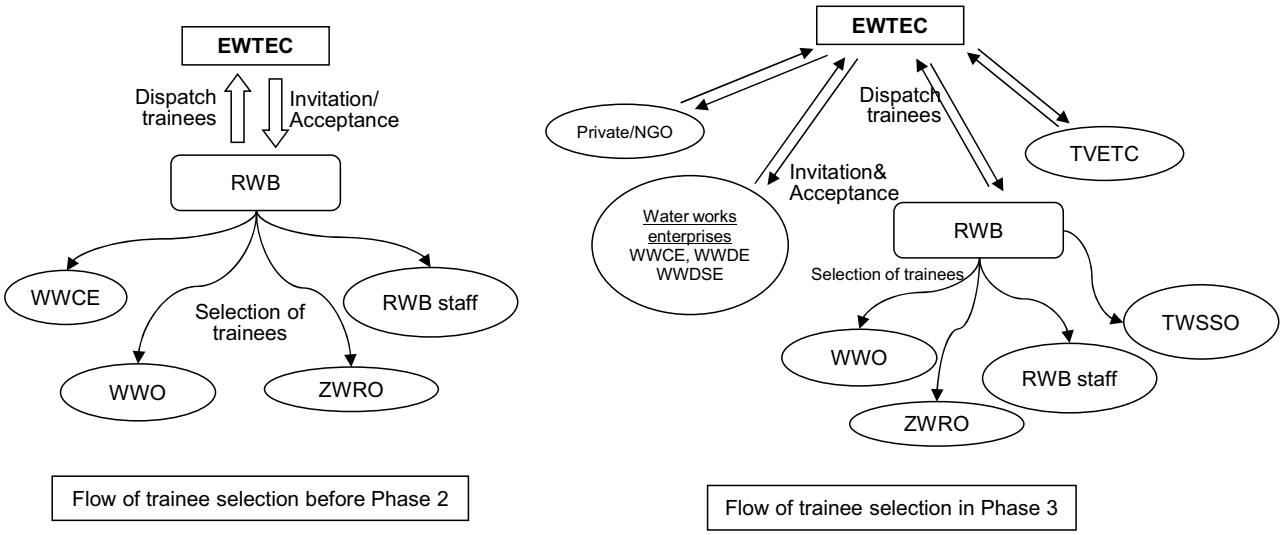


Figure 3: Flow of trainee selection for EWTEC training

The organizations invited for the EWTEC basic courses and requirement for participation to the basic courses are shown below.

Table 3: Requirement for participating in EWTEC basic courses

Training courses	Major target Organizations	Academic Requirement	Experience Requirement
Groundwater Investigation (GWI)	RWB ZWRO, WWO (through RWB) WWCE/WWDSE AAWSA	BSc in Geology or equivalent	2 years and above
Drilling Technology (DT)	WWCE RWB AAWSA Private/NGO	12 grade completed or equivalent	5 years and above
Drilling Machinery Maintenance Technology (DMMT)	WWCE RWB Private/NGO	Diploma from TVETC or equivalent	2 years and above
Electro Mechanical Maintenance Technology (EMMT)	ZWRO, WWO, TWSS (through RWB) RWB AAWSA	Diploma from TVETC in Electro mechanical or General mechanics or equivalent	Experience in maintenance of generator, submersible pump, switch board
Water Supply Engineering (WSE)	ZWRO, WWO, TWSS (through RWB) RWB AAWSA MoWIE WWCE	Diploma in civil engineering, sanitary engineering, Hydraulics engineering or equivalent	Experience in sanitary and water services

RWB: Regional Water Bureau, TWSS: Town Water Supply Services, ZWRO: Zonal Water Resources Office, WWO: Woreda Water Office, WWCE: Water Works Construction Enterprise, WWDSE: Water Works Design and Supervision Enterprise, GSE: Geological Survey of Ethiopia, AAWSA: Addis Ababa Water and Sewerage Authority

The ratio of each organization's participation in EWTEC courses is shown as follows. In the 6th year, all the basic courses except DT were canceled for the preparation of curriculum for long term training under EWTI.

a. Groundwater Investigation Course (GWI)

Many different organizations which have geologists with BSc were invited to this course.

Project Year	RWB	TWSS	WWCE	WWDSE	WWO	ZWRO	Other
1st	26%	0%	11%	0%	16%	42%	5%
2nd	19%	3%	19%	0%	11%	41%	8%
3rd	42%	0%	8%	0%	29%	21%	0%
4th	25%	3%	11%	2.8%	19%	39%	0%
5th	27%	0%	15%	8%	10%	28%	12%

RWB: Regional Water Bureau, TWSS: Town Water Supply Services, ZWRO: Zonal Water Resources Office, WWO: Woreda Water Office, WWCE: Water Works Construction Enterprise, WWDSE: Water Works Design and Supervision Enterprise

b. Drilling Technology Course (DT)

More than half of the trainees were from WWCE, which is the organization that possesses the most drilling rigs.

Project Year	GSE	MoWIE	Private	RWB	WWO	WWCE	AAWSA
1st	11%	0%	0%	33%	56%	0%	0%
2nd	15%	15%	0%	20%	0%	50%	0%
3rd	0%	25%	10%	10%	5%	50%	0%
4th	0%	0%	20%	15%	0%	65%	0%
5th	0%	5%	9%	5%	0%	77%	5%
6th	0%	0%	0%	14%	0%	86%	0%

RWB: Regional Water Bureau, WWCE: Water Works Construction Enterprise, WWO: Woreda Water Offices, GSE: Geological Survey of Ethiopia, MoWIE: Ministry of Water, Irrigation & Energy, AAWSA: Addis Ababa Water and Sewerage Authority

c. Drilling Machinery Maintenance Technology Course (DMMT)

Nearly half of the trainees came from WWCEs, which have a high demand for this course, as is the case with the DT course.

Project Year	GSE	Private/NGO	RWB	WWO	WWCE	ZWRO	Other
1st	0%	0%	10%	40%	40%	10%	0%
2nd	5%	0%	2%	60%	26%	5%	2%
3rd	0%	11%	17%	6%	67%	0%	0%
4th	15%	5%	30%	0%	40%	0%	10%
5th	0%	5%	11%	0%	74%	0%	11%

RWB: Regional Water Bureau, TWSS: Town Water Supply Services, ZWRO: Zonal Water Resources Office, WWCE: Water Works Construction Enterprise, WWO: Woreda Office, GSE: Geological Survey in Ethiopia

d. Electrical Machinery Maintenance Technology Course (EMMT)

In addition to ZWRO and WWO, the number of participants from TWSS has increased. Almost 70 to 80 percent of the total participants were from these three organizations. There are many Woredas which have water supply facilities using electricity but the capacity of Woreda staff in EMMT is very low. Therefore the demand from WWO for this course is high. EWTEC sent invitation letters to RWB describing to select participants from these three organizations and RWB selected the type of participants that was EWTEC targeting.

Project Year	RWB	TWSS	WWO	ZWRO	WWCE	Other
1st	65%	0%	13%	22%	0%	0%
2nd	17%	2%	48%	24%	0%	10%
3rd	20%	3%	58%	20%	0%	0%
4th	11%	29%	21%	32%	3%	5%
5th	13%	20%	45%	18%	0%	5%

RWB: Regional Water Bureau, TWSS: Town Water Supply Services, ZWRO: Zonal Water Resources Office, WWCE: Water Works Construction Enterprise, WWO: Woreda Water Office

e. Water Supply Engineering Course (WSE)

Most trainees came from WWO or ZWRO, as planned.

Project Year	AAWSA	RWB	TWSS	WWO	ZWRO	WWCE	Other
1st	5%	76%	0%	0%	19%	0%	0%
2nd	0%	29%	3%	26%	43%	0%	0%
3rd	0%	14%	0%	46%	40%	0%	0%
4th	0%	8%	0%	53%	31%	6%	3%
5th	13%	9%	9%	38%	18%	9%	4%

RWB: Regional Water Bureau, TWSS: Town Water Supply Services, ZWRO: Zonal Water Resources Office, WWCE: Water Works Construction Enterprise, WWO: Woreda Water Office, AAWSA: Addis Ababa Water & Sewerage Authority

2.3.2 Monitoring, evaluation and revision of training curriculum and materials in each field

(1) Training needs survey and analysis

A local survey was implemented for approximately two months from March 2009 throughout the country in nine regions and two special regions in the first year.

1) Scope of the survey

This training needs assessment survey covered the following sector offices.

1. Core public sector offices
2. Public enterprises
3. TVETCs
3. Private sector
4. NGOs

The government agencies that operate in the water sector (core public sector)

- Regional Water Bureaus (RWB)
- Zonal Water Resource Development Offices (ZWRO)
- Woreda Water Offices/Desks (WWO)
- Town Water Supply Services managed by water boards (TWSS)*

*The number of towns in Ethiopia reached about 900, and most have water services that are managed, depending on their size, either by water committees (for small systems) or water boards (for bigger systems). This study included only those water service offices of bigger towns that are managed by water boards.

Public enterprises that are engaged in water studies, design & construction supervision; drilling and other water works construction activities:

- Water Works Construction Enterprises (WWCE),
- Water Works Design and Supervision Enterprises (WWDSE), and
- Water Well Drilling Enterprises (WWDE).

Other parties engaged in such activities are:

- Instructors of Technical and Vocational Education and Training Colleges (TVETC) that have a Water Technology Department, and
- Private drilling companies, private consulting firms, and NGOs that are currently engaged with water related activities

The administrative set-up of Ethiopia is structured with nine regional states and two city administrations. Under each of the regional states, there are zonal and woreda level administrative offices. The zonal administrative offices are generally responsible to provide coordination support to the woreda administrative offices. In all administrative offices, with the exception of Harar & Addis Ababa city administration, there exist Regional Water Bureau (RWB) and Woreda Water Offices (WWO). And with the exception of Tigray, Afar & Harar regional states, in all other regions there exists Zonal Water Resources Offices (ZWRO).

The training needs survey was conducted of the following parties involved in water related activities from the public private and sectors, TVETCs, and NGOs. Table 4 lists the number of offices and the number of samples surveyed.

Table 4: Summary of sample numbers

Core Public Sector

No.	Region	RWB			ZWRO			WWO			TWSS		
		No. of office	No. of office visited	No. of respondants	No. of office	No. of office visited	No. of respondants	No. of office	No. of office visited	No. of respondants	No. of office	No. of office visited	No. of respondants
1	Oromia	1	1	11	17	4	16	262	4	16	53	3	5
2	Amhara	1	1	25	10	3	12	113	3	14	50	2	12
3	Tigray	1	1	10	0	0	0	34	3	13	17	2	9
4	SNNP	1	1	17	13	2	18	134	2	6	19	1	4
5	Afar	1	1	10	0	0	0	31	1	2	8	1	1
6	Somali	1	1	16	9	1	4	53	1	4	1	1	4
7	Benishangulu	1	1	2	3	1	4	20	1	9	3	1	9
8	Gambella	1	1	10	3	1	1	12	1	6	2	1	7
9	Harari	0	0	0	0	0	0	0	0	0	1	1	9
10	Addis Ababa	0	0	0	0	0	0	0	0	0	1	1	10
11	Dire Dawa	1	1	2	0	0	0	0	0	0	1	1	2
	Total	**9**	**9**	**103**	**55**	**12**	**55**	**659**	**16**	**70**	**156**	**15**	**72**

RWB: Regional Water Bureau, ZWRO: Zonal Water Resource Office, WWO: Woreda Water Office, TWSS: Town Water Supply Service

Public Enterprise

	Region	WWCE			WWDSE			WWDE		
		No. of office	No. of office visited	No. of respondants	No. of office	No. of office visited	No. of respondants	No. of office	No. of office visited	No. of respondants
1	Oromia	1	1	14	1	1	9	0	0	0
2	Amahara	1	1	10	0	0	0	0	0	0
3	Tigray	1	1	10	0	0	0	0	0	0
4	SNNP	1	1	15	0	0	0	0	0	0
5	Afar	1	1	13	0	0	0	0	0	0
6	Somali	1	1	11	0	0	0	0	0	0
7	Benishangul	1	1	5	0	0	0	0	0	0
8	Federal	1	1	2	1	1	1	1	1	3
	Total	**8**	**8**	**80**	**2**	**2**	**10**	**1**	**1**	**3**

WWCE: Water Works Construction Enterprise, WWDSE: Water Works Design and Supervision Enterprise,
WWDE: Water Well Drilling Enterprise

TVETC

	TVETC	Region	No. of sample	No. of respondants
1	Bahir dar	Amahara	1	7
2	Kombolcha	Amahara	1	9
3	Maichew	Tigray	1	9
4	Hawassa	SNNP	1	9
5	Luci	Afar	1	11
6	Jijiga	Somali	1	13
7	Assosa	Benishangul	1	7
8	Woliso	Oromia	1	17
9	Asslea	Oromia	1	10
		Total	**9**	**92**

Private sector- Drilling Companies

	Company	Region	No of Sample
1	HYDRO Construction & Eng.	Addis Ababa	1
2	KLR Ethio Water Well Drilling	Addis Ababa	1
3	Addis Geosystems	Addis Ababa	1
4	Tekeze Deep Water Wells Drilling	Tigray	1
5	Saba Construction*	Addis Ababa	1
6	Nile Drilling & Exploration	Addis Ababa	1
7	Bava Water Well Project	Addis Ababa	1
8	Saba Engineering	Addis Ababa	1
9	Pile Foundation & Water Well Drilling	Addis Ababa	1
10	CGC Overseas Consstruction Eth.Ltd.	Addis Ababa	1
11	AL-Nile Business Group Plc	Addis Ababa	1
12	Hard Rock Drilling & Engineering	Addis Ababa	1
	Total		**12**

* Saba Construction is not at present in the business of drilling works but involves in other water construction works.

Private sector- Consulting Firms

	Consulting Firm	Region	No of Sample
1	Metaferia Consulting Engineers	Addis Ababa	1
2	AG Consult	Addis Ababa	1
3	Accura Engineering Consultancy	Addis Ababa	1
4	MS Consultancy	Addis Ababa	1
5	Zenas Engineering	Addis Ababa	1
6	AWE Consultants	Addis Ababa	1
7	Tropics Consulting Engineers	Addis Ababa	1
8	Tefera Berhe Water Works Consultant	Addis Ababa	1
9	IWMI-Ethiopia*	Addis Ababa	1
10	Karamara Engineering Consultancy	Addis Ababa	1
11	Hywas Engineering Consultants	Addis Ababa	1
12	Core Consulting Engineers	Addis Ababa	1
	Total		**12**

* A research organization of an international NGO

NGOs

	NGO	Region	No of Sample
1	Oxfam America	Addis Ababa	1
2	World Vision Ethiopia	Addis Ababa	1
3	Kana Yelimat Mahiber	Addis Ababa	1
4	Alliance for Dvelopment	Addis Ababa	1
5	Water Action	Addis Ababa	1
6	Coopeazione Intennationale (COOPI)	Addis Ababa	1
7	Society of International Missionaries	Addis Ababa	1
8	Ethio wetlands and natural resources association	Addis Ababa	1
9	Relief Society of Tigray(REST)	Tigray	1
10	Organization of Rehabilitation Dev elopment in Amhara (ORDA)	Amhara	1
11	Intermon Oxfam	Addis Ababa	1
12	Water Aid Ethiopia	Addis Ababa	1
	Total		**12**

There were 659 woredas in Ethiopia at that time and this survey covered 16, which is 2.4% of

the total. The survey includes actual daily activities and their frequency, and staff's ability to accomplish the required tasks. In addition, focus group discussion was made among the staff members in an office. As a result, although there are big and small in their capacity, generally they have almost similar problems such as lack of staff, equipment and budget, and especially lack of practical experience of the staff. It is common that hand dug wells and hand pumps and spring development are the major water supply schemes in rural areas and the results out of 16 woredas are also no exception. Therefore, although the number of samples from Woreda Water Offices is limited, the results are considered to have shown general and actual conditions.

2) Survey methodology

Semi-Structured Questionnaires

Semi-structured questionnaires were used to collect data from Regional Water Bureaus, Zonal and Woreda Water Offices, Town Water Supply Services Offices and Water Works Public Enterprises, as well as from all TVETCs, which have water technology departments. Three teams of experts were organized to collect the data from regional, zonal, and woreda level government water sector offices and the TVETCs.

The semi-structured questionnaires were also used to collect data from private sector/drilling companies & consulting firms/ and NGOs. The questionnaires were distributed to and collected from these offices through postal delivery, in person and by e-mail.

Focus Group Discussions

To get additional information from the selected Woreda Water Offices and all TVETCs, group discussions were conducted with technical staff and college instructors respectively.

Secondary Data

This needs assessment survey also draws on reports and data produced by two earlier related studies that JICA conducted by employing local consulting firms and these are:

- Impact study on EWTEC project, 2007
- Survey on the situation and training needs of TVETC, public enterprise, and private firms/companies engaged in the construction & maintenance of water supply schemes, 2008

Sampling Techniques

Convenient sampling was applied for selection of sample zones and Woreda Water Offices of the public sector; and random sampling was used for selection of sample offices from the private sector engaged in water related activities: consulting firms, drilling companies.

The questionnaires for private drilling companies and consulting firms were distributed using the list obtained from the Ministry of Water Resources.

NGOs related to water activity were identified with the help of WSF (Water and Sanitation Forum) under Christian Relief & Development Association (CRDA), which is the umbrella organization of NGOs working in the country. At that time, over 50 NGOs were registered with WSF. Among them, the questionnaire was distributed to 29 NGOs for which contact details (email and telephone number) could be identified.

3) Summary of the survey results

The survey returned detailed information on personnel numbers in each field of each organization, evaluations of each module of existing courses, new additional module and advanced course subjects, willingness to pay for training, and timing and length of training. Potential number of EWTEC targets under each sector and the number of staff under the public sector by profession are shown in Figure 5. The training contents and targets analyzed from the survey results are in Table 5.

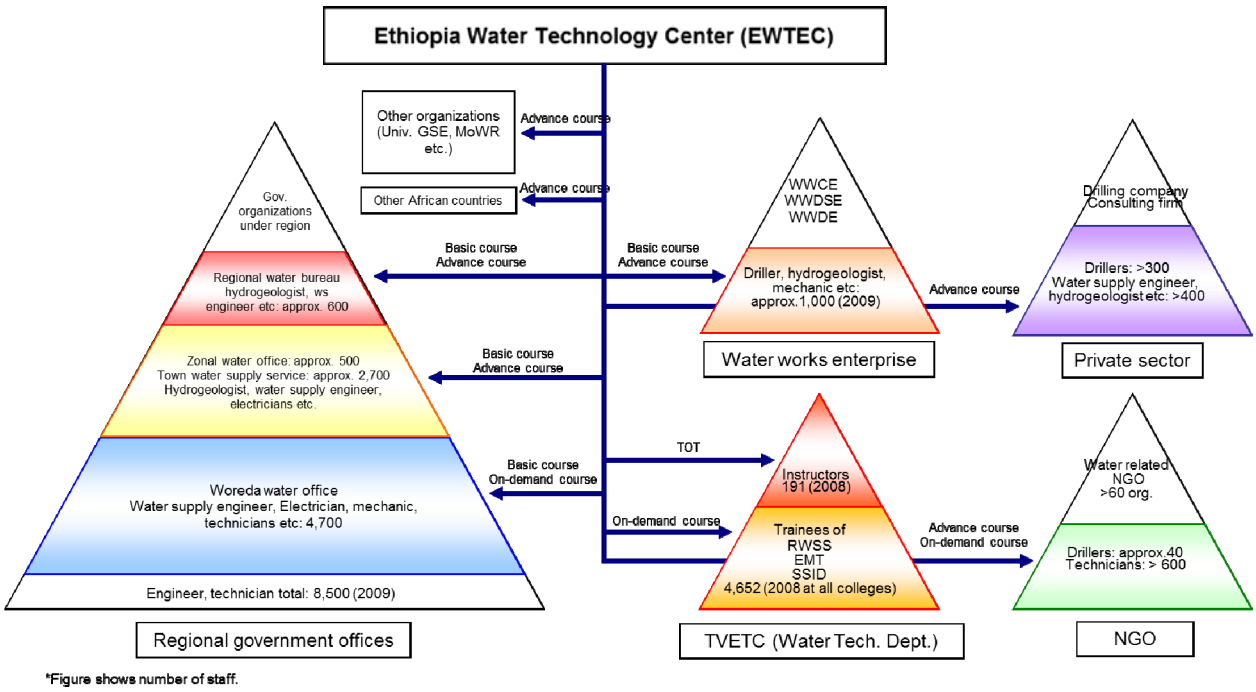


Figure 4: Potential number of EWTEC target under each sector

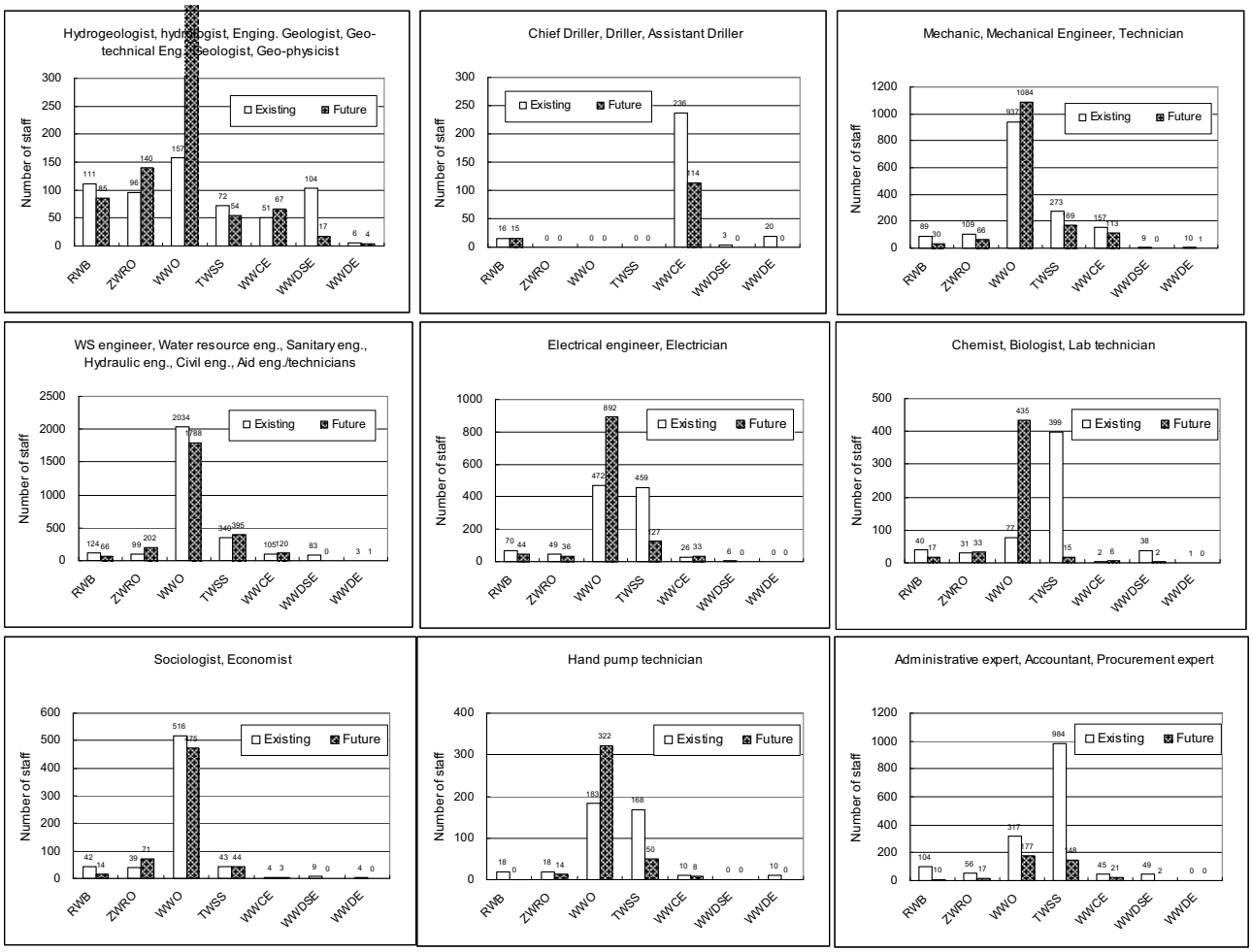


Figure 5: Number of staff under the public sector by profession

Table 5: Recommended training courses for each target group

Technical field area	Level	Course title	Job title	Suggested duration (weeks)	Core public sector				Public enterprise			Private sector		TVETC	NGO	Other govt. org. (GSE, Univ., etc)	Remarks
					RWB	ZWRO	WWO	TWSS	WWCE	WWDSE	WWDE	Drilling company	Consulting firm				
Groundwater investigation /management	Basic	Groundwater investigation/management (1)	Hydrogeologist, water engineer etc.	14-16	◎	◎	○	◎	◎	◎	◎	○		◎	○	○	
		Groundwater investigation/management (2)	Hydrogeologist, water engineer etc.	3-4			◎							◎			For WWO staff and TVETC teachers (RWSS)
	Advanced / Intensive	Geophysical investigation	Hydrogeologist, geologist etc.	3-4	◎	○			○	◎	○	◎	○			○	
		GIS	Hydrogeologist, Water engineer etc.	3-4	◎	◎	○	○	○	◎	○			○	○	○	
		Groundwater modeling	Hydrogeologist, geologist etc.	3-4	◎	○		◎		◎			○			○	
		Remote sensing	Hydrogeologist, geologist etc.	3-4	○	○				○			○			○	
		Water quality management	Hydrogeologist, chemist	3-4	◎	○	○	○		◎				◎	○	○	Sampling, water quality analysis etc.
		Water chemistry	Hydrogeologist, chemist	3-4	◎	○	○			◎			○	○		○	Basic of isotope hydrology etc.
Drilling technology	Basic	Drilling technology	Chief driller, assistant driller	14-16	◎				◎	○	◎	◎			○	○	
	Advanced / Intensive	Drilling administration	Chief driller, office manager	2	○				◎	○	◎	○			○	○	
		Trouble shooting	Chief driller, assistant driller	3-4	◎				◎	○	◎	○			○		
		Well rehabilitation	Chief driller, assistant driller	3-4	◎				◎	○	◎	◎			○		
		Well diagnosis with a borehole TV	Chief driller, assistant driller, geologist	2	◎				◎	○	◎	◎			○		
		Deep well drilling	Chief driller, assistant driller	6-8	○				◎	○	○	○					
Drilling machinery maintenance technology	Basic	Drilling machinery maintenance	Mechanical engineer, mechanic etc.	14-16	○				◎	○	◎	○				○	
	Advanced / Intensive	Top head rotary type drilling rig	Mechanical engineer, mechanic etc.	3-4	○				◎	○	◎	○				○	
		Air compressor	Mechanical engineer, mechanic etc.	3-4	○				◎	○	◎	○				○	
		Diesel Engine	Mechanical engineer, mechanic etc.	3-4	○				◎	○	◎	○				○	
		Maintenance management	Mechanical engineer, mechanic etc.	3-4	○				◎	○	◎	○				○	
Water supply engineering	Basic	Water supply engineering (1)	Water supply engineer, civil engineer	10-12	◎	◎		◎	◎	◎				◎			Town water supply
		Water supply engineering (2)	Water supply technician etc.	4-6			◎							◎			For WWO staff and TVETC teachers (RWSS/SSID)
	Advanced / Intensive	Water quality management	Water supply engineer, chemist, biologist, lab technician etc.	3-4	◎	○		◎	◎	○							Treatment plant etc.
		Leakage control system	Water supply engineer, plumbing technicians etc.	3-4	◎			◎	○	○							
		Water CAD, Epanet	Water supply engineer, civil engineer	3-4	◎	○		◎	◎	◎							
Electric machinery maintenance technology	Basic	Electric machinery maintenance technology (1)	Electrical engineer, electrician	10-12	◎	◎	◎	◎	○	○	○			◎			
		Electric machinery maintenance technology (2)	Electrical engineer, electrician	3-4			◎							◎			For WWO staff and TVETC teachers (EMT)
	Advanced / Intensive	Electrical motor and generator	Electrical engineer, electrician	3-4	◎	◎	○	◎	◎	○				○			
		Submersible pump	Electrical engineer, electrician	3-4	◎	◎	○	◎	◎	○				○			
		Sequence control	Electrical engineer, electrician	3-4	◎	◎	○	◎	◎	○				○			
Others	Basic	Rope pump manufacturing & installation	Artisan, technician	4-5	○	○	◎							○	◎		
	Basic	Hand pump maintenance	Water supply technician etc.	2-3	○	○	◎							◎	◎		
	Basic	Dug well construction/spring protection	Artisan, water supply technician etc.	2-3	○	○	◎							◎	◎		
	Basic	Appropriate technology	Water supply engineer, technician etc.	2-3	○	○	◎							◎	◎		
	Basic	Environmental assessment	Water supply engineer, geologist etc.	2-3	○	○	◎							◎	○		
	Basic	Social development	Water supply engineer, economist etc.	2-3	○	○	◎							◎	◎		
	Basic	Project management	Water supply engineer, economist etc.	2-3	◎	◎	◎							◎	◎		

◎: Very high priority ○: High priority

(2) Creating the training line-up

Based on the results of the training needs survey, various training courses were planned through discussions with EWTEC staff and Japanese experts targeting 2,500 participants within Phase 3 (actually original target under PDM0 was 3,000, but it was too ambitious and therefore reduced to 2,500 in the plan at the end of the 1st year). However, this initial training plan had to be modified again due to lack of budget and personnel, and delay of facility expansion. Finally the target was reduced into 1,500 during the Mid-term review and the training was conducted according to the training schedule shown in Figure 6 (page 47).

(3) Monitoring, evaluation and revision of training curriculum and materials

1) Groundwater Investigation (GWI)

GWI course conventionally had more theoretical part, however, more practical training on geological survey and geophysical survey were included in Phase 3. The field work site was selected from the area where course coordinators have worked before and available GIS data was efficiently utilized. Geophysical survey (vertical electric sounding) was conducted in the field as practical training. Until Phase 3, the field exercise was conducted in an area where there are no plans for drilling in the near future. But to make it more effective, this field work has been conducted in cooperation with the DT course. A geophysical survey was conducted prior to drilling work of DT course at the drilling site to select exact drilling points. Moreover, as for geophysical logging, trainees visited the drilling site and practiced with the actual drilling well and at the same time, they observed how drilling cutting samples were taken and how to operate the drilling rig. Locally available materials and equipment, as well as a modern logging machine owned by EWTEC, which has not been widely introduced in Ethiopia, were used for the logging exercise.

In the classroom, the number of practical training hours was increased as much as possible through PC work using various types of software. Different types of maps such as water level contour maps were prepared after collecting field data. Common software such as MS Excel was used for logging analysis in addition to software which requires licenses. As for pumping tests, software and manual graph analysis using the standard curve were introduced to understand the theory. Trainees visit an actual water quality laboratory and observe analysis method to understand the value of each data. Some contents of the international training courses such as GIS, remote sensing and groundwater modeling were also utilized in the basic courses.

2) Drilling Technology (DT)

Drilling work has many variations because the equipment and drilling methods depend on the type of geological features. Therefore, originally, it is ideal to conduct field training under various conditions. However, because there is often no accommodation near the drilling sites, field training was conducted in limited locations. To overcome this issue, camping equipment for sleeping out near the drilling sites was purchased, so as to select appropriate fields, including distant sites, which has also improved working efficiency.

EWTEC has provided on-site drilling exercises to allow trainees to gain experience practically in basic courses. The training has included lectures in class and exercises on site to practice drilling middle-depth wells (less than 150 m). In each round of basic courses, trainees have different capacities and experiences so that the course coordinator has to consider their skills in each training course. Safety was made a first priority on every site exercise.

Down the hole drilling method was mainly introduced in the training. But recent Ethiopian drilling market has been trending toward deeper wells. For instance, wells of 500 m depth are being drilled at groundwater development project sites in Awash and Akaki areas. In those sites, the rotary drilling method, which requires heavier drilling machinery, was selected. Although such heavy machinery and accessories are particular kind that cannot be equipped instantaneously in EWTEC, it is true that there are demands from trainees for the training on drilling technology capable of reaching deeper depths. In response to the demand and for developing the breadth of knowledge, EWTEC planned and prepared the field training whereby trainees visited a drilling site employing the rotary drilling method. Trainees experienced setup and operation of machineries at the site and compared the differences of drilling rig's capacities and scales between methods installed. Those field trips were good opportunities for trainees to compare machineries and capacities between those for wells of medium depth and those for wells of deeper depth, to know the selection of drilling method based on the depth and so on.

3) Drilling Machinery Maintenance Technology (DMMT) / Electro-Mechanical Maintenance Technology (EMMT)

The curriculum and modules of DMMT and EMMT were drastically revised after the arrival of the machinery procured through Japan's grant aid scheme. In addition, the equipment produced by EWTEC staff with the instruction of Japanese experts as part of practical training such as change-over switches and generator load testers was also included in the curriculum. The textbooks used in both courses explain the structural principles of relevant machinery clearly, but

do not take actual repairing work into consideration. Therefore, efforts were made to revise the curriculum and teaching materials to be practical as much as possible. Renovation of the EMMT workshop was completed in the 4th year, which secured a sufficient space for practical training, which made actual assembling and disassembling exercise for a submersible pump possible, for example. Before, the training about the submersible pump was provided only by showing cut models and video pictures. Now trainees gain hands-on experience through assembling and disassembling the pumps, which helps them to better understand the skills. Furthermore, actual examples of failures and its countermeasures were explained more concretely.

4) Water Supply Engineering (WSE)

The course was conducted with the specialized contents for water supply facility design that were requested by many ex-trainees. In the past 10 years, decentralization from the central government to the regional governments, from the regional governments to Woreda has been implemented and now most budgets for new construction of water supply facilities have been allocated to Woreda offices. Woreda Water Offices are responsible for designing and supervising spring capping, well drilling, pipe line installation, water point and reservoir construction, etc. WSE course targeted these Woreda staff and included contents for designing of small scale water supply systems. Some advanced parts using software were separated from the basic course and made into an advanced course. Furthermore, the course coordinator sought to include in the curriculum as much time as possible for field trips visit sites and to observe facilities. As a result, the proportion of practical training hours improved to a large extent.

(4) Improving certification for completing EWTEC training

Until Phase 3, generic certificates of EWTEC were issued anyone who participated in the training. However, in an effort to increase the esteem in which the certificates are held, a Certificate of Achievement that shows the level of attainment has been provided to training participants since the 2nd year of the project.

1. Certificate of Achievement: Issued upon completion of the course along with a transcript of final results, which are ranked from A to D (with A being the highest rank). If the trainee fails to pass 3 or more modules, then a Certificate of Participation will be issued instead.

2. Certificate of Participation: Issued upon completion of the course when a trainee has failed to pass 3 or more of the modules, even if the total of their average final result is above 50%. Trainees who receive a Certificate of Participation and would be evaluated as having achieved Level P.
3. Incomplete: Not a certificate, but issued as a letter to the trainee's home organization or enterprise informing the responsible person that the trainee was unable to complete the training upon failing to fulfill the minimum requirements for attendance, which is at least 80% of the course.

Ministry of Water Resources & Japan International Cooperation Agency
Ethiopian Water Technology Center

EWTEC

CERTIFICATE OF ACHIEVEMENT

This is to certify the result achieved by

Mr/Ms _____

upon successful completion of the

22nd Round of the Drilling Technology Course
(November 24, 2009 – March 05, 2010)

	Modules	Training hours Theoretical	Practical	Weight Distribution	Marks
1	Geology & hydrogeology				
2	Drilling Administration				
3	Unit of measurement				
4	Drilling Machines				
5	Drilling Technology				
6	Function of Machines				
7	Data collection & reporting				
8	Trouble shooting				
9	Field work				
	Total			100	

The result is ranked as: GRADE A Date: March 5, 2010

Muluqeta Kinfu
Course Coordinator
Drilling Technology Course

Endris Mohammed
Head of EWTEC
Ministry of Water Resources

Certificate of Achievement (total mark) : Grade A, 90 or above, Grade B, 75-84 above, Grade C 60 or above
Certificate of Participation : Grade P, Below 60

P.O.Box: 5744, Tel: 0114-451129, Fax: 0114-451128, Addis Ababa - Ethiopia

In August 2013, EWTEC was transformed into a new institute, EWTI and the relationship with the Ministry of Education (MoE) has become stronger. It has been requested to provide training courses based on the Ethiopian Occupational Standards (EOS) established by MoE. In addition, EWTI will act as an Assessment Center to manage assessment of candidates for certification and issue totally new certificates based on EOS.

2.3.3 Improvement of training instructor planning

EWTEC depended on the Japanese assistance for employment of guest lecturers until the 4th year, however in the later project years, Ethiopian C/Ps prepared an annual plan and recruited lecturers by themselves with its own budget except for urgent occasions. The number of guest lecturers and their training hours in the recent basic courses (5th year) are as below.

Table 6: Portion of guest lecturers in the basic courses

Course	Number of instructors Guest lecturers/EWTEC staff	Teaching hours Guest lecturers/EWTEC staff	Percentage covered by guest lecturers
GWI	2 / 4	100 hours / 116 hours	46%
DT	2 / 5	66 hours / 280 hours	19%
DMMT	2 / 3	128 hours / 190 hours	40%
EMMT	1 / 3	24 hours / 84 hours	22%
WSE	5 / 2	96 hours / 64 hours	60%

2.3.4 Monitoring, evaluation and improvement activities and building technical know-how

In the recommendation on the final evaluation, preparation of hand over notes and videos to pass on the technical skills and knowledge of resigning staff to his successors was recommended. Japanese experts instructed how to record videos efficiently in the class and at the sites for course coordinators and workshops for basic utilization of the editing software were organized several times. The editing software was installed in a shared PC which allows EWTEC staff to operate freely. For the future, EWTEC staff is expected to shoot and edit the video for accumulation of technical know-how by themselves.

Teaching materials utilized in the EWTEC training so far have been stored under the responsibility of each course coordinator. As a part of improvement of information management available teaching materials kept as hard copies were digitalized by scanners. It is easy to exchange information among different course coordinators if it is digital data and it also helps to avoid losing them.

2.3.5 Impact survey and expected training in future (for Ethiopia)

The impact survey by EWTEC staff was expected to ascertain the achievement such as effectiveness of EWTEC training and trainee's performance in their field and to feed back what was observed in this survey into future training in EWTEC. Furthermore, it was expected to figure out the needs of training, request and recommendation for EWTEC and to feed back to EWTEC management.

At first, Japanese experts showed method of interview for the impact survey and provided an explanation to EWTEC staff in workshops as technology transfer. Then, survey teams were formed and the staff interviewed ex-trainees and bosses of their organizations in each region. After field survey, they compiled and analyzed the results of the field survey, summarized as written reports with respect to each area, course and organization, and finally compiled as an impact assessment study report. At the same time, EWTEC staff tried to collect information about needs of training, and to explain the future plan of EWTEC (transformation into a Public Institute).

(1) Interview with ex-trainees and their bosses: evaluation of training and needs assessment

In this survey, EWTEC staff visited organizations directly and conducted interviews using a questionnaire under the guidance of Japanese experts. The target group in this survey was

ex-trainees who participated in the training conducted by EWTEC in Phase 3 and their bosses. EWTEC staff visited their offices and interviewed them about efficiency and problems of training, demand for the future and so on. In the interviews, direct question by EWTEC staff to his own ex-trainees was avoided to ensure the fairness of the survey. More than 100 responses from ex-trainees have been collected in this survey.

Table 7: Outline of impact survey

The number of ex-trainees of EWTEC (from the beginning of Phase 3 to Aug, 2011)	756 (including 65 of international participants)
Targeted sample number	70 ~ 120
Category	Courses / Organization / Region, Country
Objective	♦ Impact assessment for ex-trainees and their organizations ♦ Collect information for identification of needs for EWTEC
Method	Questionnaire/interview/visiting
Response	Ex-trainees: 118 (including 12 of international participants)

(2) Impact on ex-trainees, organizations and water sectors in each country

- Almost all ex-trainees, irrespective of the training courses they took at EWTEC, stated that the training was beneficial and useful.
- The practical skills and technical knowledge gained through the EWTEC training courses have made a positive impact to the ex-trainees' working practices and their individual performance.
- The impact study revealed that there were positive impacts, such as more confidence and independence when completing assignments and tasks, improvement of technical progress, reducing the work time (greater efficiency), significant changes in their motivation, and moreover led them to demonstrate and share their newly gained skills and techniques they had gained to others.
- The results of impact study shows the positive impact towards team/ section/ organization through the ex-trainees' efforts and behavior. One ex-trainee was promoted to section head, and he shared and transferred his skills and knowledge gained through the EWTEC training, which led to the performance of his team improving with better teamwork. TVETC instructors shared and transferred their skills and knowledge not only to their course students, but also to their colleagues. GWI, WSE, DT course

participants returned back to their offices and engaged into new or ongoing projects in the fields of groundwater development, management and water supply activities. Those projects were completed successfully with good leading/supervising/managing roles by the ex-trainees.

- The impact study revealed some unexpected results, namely that ex-trainees, without any support from EWTEC had started their own training as hands-on workshop to woreda officers and village representatives. The above trainees also utilized the new techniques and skills in their contracting jobs, and their clients were more satisfied with their work. For instance, WWCE engineers/hydro-geologists did a good job of fixing and repairing their clients' machines, and also designed the proper plan using new software. Their clients were happy with the quality and speed of the work.
- Usually it is difficult to demonstrate a direct link between training and any long-term results such as increased water coverage (groundwater and sewerage supply expansion) because many factors other than training are involved. However, some of the impacts of training on ex-trainees' skills and performance are given below. One impact was efficiency, namely by reducing the time taken for work as well as the cost (by increasing the independency of the organization so that they no longer have to outsource). As for better performance and effectiveness, there is no statistical data available in Ethiopia. However, it is certain that the success rate of drilling in water-related projects (groundwater and rural water supply development) has increased, and it can be judged that one of the reasons for this success rate is thanks to the greater efficiency of EWTEC ex-trainees' performance.
- Together with these positive results there were some negative ones such as bad working environment, high transfer and turnover rate of staff, mismatch between trainee's career and course module, and trainees' level of understanding and capacity of trainees.

Many suggestions were given for EWTEC at each site in this survey. This shows high expectation to EWTEC. Therefore these results will be fed back to improve the training in future.

(3) New awareness gained by EWTEC staff as a result of this survey

Course coordinators were motivated through this survey visiting the ex-trainees. For example, new on-demand course called "Hand pump Installation and Maintenance course" was planned at the end of this survey. A course coordinator saw a hand pump demonstration facility installed in

the compound of TVETC and he thought that a similar facility was required for the new training course and constructed hand pump platforms in the EWTEC compound. Finally the new on-demand course was completed successfully thanks to this proposal by EWTEC staff.

It was also expected to collect training needs, recommendations and suggestions for future training plan of EWTEC through this survey. Another important fact was that each course coordinator and instructor understood the impact of their training and actual needs through these survey activities and compiled the findings as a report by themselves.

2.3.6 Impact survey and expected training in future (for African countries)

(1) Outline of the international training courses in Phase 3

In addition to the impact survey conducted in Ethiopia, the impact of the international training courses for African countries was studied. There were seven international training courses held during the Phase 3 of the project and the total number of participants from the other countries is 118 from 17 countries as shown in the following tables.

Table 8: List of the international training courses for African countries in EWTEC Phase 3

Course	Round	Project Year	Starting date	Finishing date	Number of participants from other countries
Groundwater Modeling (GWM)	4th	2	2009/08/31	2009/09/18	16
GIS	3rd	2	2010/02/08	2010/02/25	17
Groundwater Modeling (GWM)	5th	3	2010/08/30	2010/09/22	16
Remote Sensing (RS)	2nd	3	2011/04/04	2011/04/21	16
Groundwater Modeling (GWM)	6th	4	2011/08/31	2011/09/21	16
Groundwater Modeling (GWM)	7th	5	2012/09/03	2012/09/26	16
Isotope Hydrology (IH)	1st	5	2012/10/15	2012/11/02	21
Total					**118**

Table 9: List of the countries that participated in the international training for African countries in EWTEC Phase 3

Country	Number of participants
Botswana	8
Cameroon	2
Ghana	8
Kenya	6
Lesotho	7
Malawi	8
Mozambique	5
Namibia	4
Nigeria	12
Rwanda	3
South Sudan	5
Sudan	7
Swaziland	6
Tanzania	12
Uganda	11
Zambia	7
Zimbabwe	7
Total	**118**

(2) Selection of sample countries

For a field study of African countries, Uganda and Sudan were selected as targets. The selection criteria were: 1) relatively large numbers of participants during Phase 2 and Phase 3 of the Project, 2) smooth communication with ex-trainees and their organizations, and 3) distance from Ethiopia and budget constraints.

(3) Scope

a. Number of samples

The number of ex-trainees and supervisors/bosses in organizations who participated in the impact assessment sample survey is shown in the following table.

Table 10: Number of sample data for the impact study for the international training

No.	Visiting Country	Number of Interviewees (Ex-trainees)	Number of Interviewees (Supervisors /bosses)	Number of Ex-trainees by e-mail	Number of Supervisor/boss by e-mail
1	Uganda	6	3	3	2
2	Sudan	6	4	1	1
Total		12	7	4	3

b. Study schedule

The field study was conducted in Uganda from September 18 to 21, 2012 and in Sudan from September 23 to 26, 2012. Before visiting these countries, questionnaires for ex-trainees and supervisors/bosses were distributed and collected when the study team visited each country. At the time of the study team's visit, interviews and observation of their offices and field visits to actual water supply sites were conducted. Two staff members from EWTEC also participated in the trip to Uganda.

(4) General view

In general, the study reflects an overall positive opinion in regard to the potential and realized impact of the training course. One of the most valuable and widely acknowledged effects of the training courses as a whole is that both countries have recognized the training as a unique and beneficial opportunity that JICA has been providing for African countries.

The study revealed that all participants have high motivation with improved knowledge and techniques, and they have started to utilize the skills in their daily work and also to disseminate the skills and knowledge to the other staff in the same organization.

According to the results of face-to-face interviews with the ex-trainees, the training by EWTEC is vital to their job and it has increased their confidence.

The ex-trainees and their bosses/supervisors expressed that EWTEC training was very useful and beneficial not only for individuals by filling gaps in their knowledge, but also for their organizations, such as improving their visual presentation, reporting and groundwater exploration skills.

(5) Impact

Apart from the interview and questionnaire results, visible impact of the international course was summarized as follows.

- After joining an international course, some participants studied further about the subject in universities and one of them has become an associate lecturer to teach software skills acquired from the training and another person is taking a PhD course.
- After the training, due to their upgraded skills, some trainees have been promoted to be a higher or managerial post, and their responsibility has been expanded.

- Ex-trainees are sharing the obtained knowledge and acquired software skills on GIS with their colleagues through OJT training.
- By using GIS techniques, ex-trainees and other department staff prepared and completed a detailed water supply atlas which includes all water points and water supply facilities in each district and groundwater potential maps, and also assisted to complete annual reports.
- After a trainee came back to his office, a GIS unit was established under the organization he belonged to.
- Human network and friendship have been established among some training participants to share their experiences after the training.

(6) Demand and future prospect

The study results in the two countries indicate that there still remains very high demand of EWTEC international training in the field of groundwater management such as groundwater modeling, GIS and remote sensing. Although application of the acquired skills and knowledge in the actual field is still limited due to lack of available field data and budget constraints in the trainees' home countries, the EWTEC international training has certainly improved the motivation of ex-trainees for the application and further development and also raised awareness of the importance of groundwater management in the respective organizations. Moreover, there are neither training institutions like EWTEC in most of the invited countries nor opportunities to learn the knowledge and skills which EWTEC has been providing through the international training. In this sense, the study revealed the uniqueness of the EWTEC international training courses in the African countries. During the study, every organization expressed their wish to continue having this training opportunity.

In addition, there are demands of refreshment courses for previous trainees and other training courses related to groundwater management.

2.3.7 Development of knowledge management capacity (collection of materials, and sharing knowledge and know-how of instructors)

Japanese experts supported in the collection of teaching materials through purchasing technical reference books and downloading teaching videos from the internet. These books can be accessed freely in the library by trainees. Moreover, the important parts of these books were utilized as text

books. Those downloaded videos were well accepted by trainees in the class. For instance, the video which illustrates inner structure of a machine with an animation helped trainees to gain a deeper understanding of the inside of the machinery. However, because there was no internet connection in EWTEC, the C/Ps could not freely access the internet to search teaching materials. To improve the situation, Japanese side provided a USB modem when they required one.

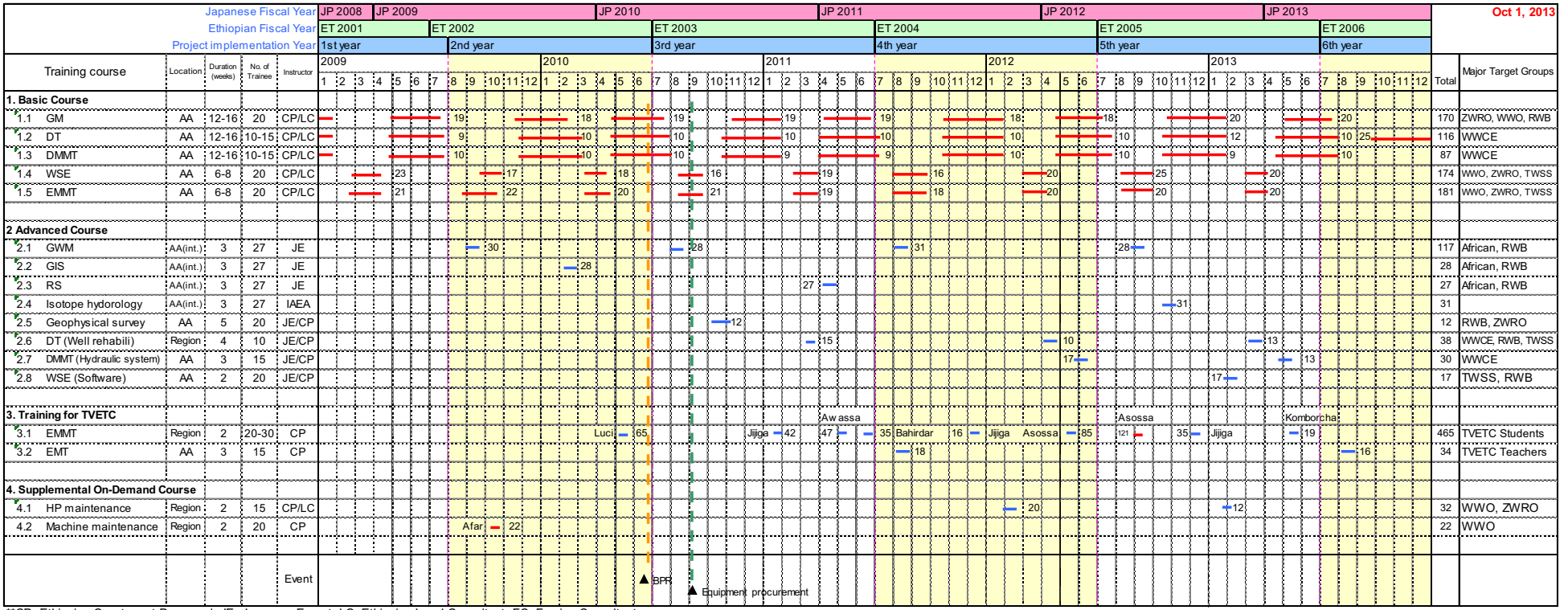
When a staff member leaves or is transferred, necessary teaching materials such as course guides, module summaries and textbooks etc. have been handed over to new or existing staff and there has been no serious trouble during staff changes so far. However, the level of technical experience differed from instructor to instructor. Although the responsibility of particular modules in the training was handed over to the other staff members, all the technical knowledge could not be transferred.

When guest lecturers were invited for some parts of a training course, they often didn't leave teaching materials for EWTEC. It is because they were not willing to share the materials or EWTEC staff was not good at filing and keeping the teaching materials. But now, the guest lecturers are obliged to supply the text books and the reference materials used in the training.

2.4 Output 2: "Technical knowledge and skills on water supply and management are improved for technicians and engineers from the Regional Water Bureaus, woredas, private sector and NGOs, and TVETC instructors"; Related Activities

2.4.1 Design and revision of the mid- to long-term training plan

The number of trainees who had received training from EWTEC reached 1,581 at the end of Phase 3. Therefore, EWTEC achieved the target number of trainees in Phase 3, which was set at 1,500 in the PDM.



**CP=Ethiopian Counterpart Personnel, JE=Japanese Expert, LC=Ethiopian Local Consultant, FC=Foreign Consultant

**Training Course Line:

(Red) = MoWR's full responsibility

(Blue)=JICA's assistance (Japanese Expert or local Consultant)

Figure 6: EWTEC Training Schedule

2.4.2 Revision of training curriculum & modules, hand-outs and materials for the basic course with more emphasis on practical training

Japanese experts have consulted on improvement of training provided by EWTEC for cultivating capable technical engineers who are notably scarce in the country and for providing more practical training that cannot be found in other organization in the country. The proportion of practical training hours in each course is shown below.

Table 11: Percentage of Practical Training in Basic Training Courses *

Groundwater Investigation (GWI)

Project Year	Round	Theoretical (hrs.)	Practical (hrs.)	Total (hrs.)	Rate of Practical (%)
2nd	22nd	-	-	-	-
	23rd	126	102	228	44.7%
3rd	24th	130	98	228	43.0%
	25th	130	102	232	44.0%
4th	26th	130	102	232	44.0%
	27th	108	116	224	51.8%
5th	28th	96	136	232	58.6%
	29th	68	164	232	70.7%

Drilling Technology (DT)

Project Year	Round	Theoretical (hrs.)	Practical (hrs.)	Total (hrs.)	Rate of Practical (%)
2nd	21st	168	340	508	66.9%
	22nd	140	156	296	52.7%
3rd	23rd	148	180	328	54.9%
	24th	146	166	312	53.2%
4th	25th	156	176	332	53.0%
	26th	158	176	334	52.7%
5th	27th	156	170	326	52.1%
	28th	168	178	346	51.4%

Drilling Machinery Maintenance Technology (DMMT)

Project Year	Round	Theoretical (hrs.)	Practical (hrs.)	Total (hrs.)	Rate of Practical (%)
2nd	22nd	166	93	259	35.9%
	23rd	165.5	86	251.5	34.2%
3rd	24th	161	83	244	34.0%
	25th	161.5	95.5	257	37.2%
4th	26th	153	69	222	31.1%
	27th	158	84	242	34.7%
5th	28th	145	112	257	43.6%
	29th	145	106	251	42.2%

Electro-Mechanical Maintenance Technology (EMMT)

Project Year	Round	Theoretical (hrs.)	Practical (hrs.)	Total (hrs.)	Rate of Practical (%)
2nd	13th	-	-	-	-
	14th	54	90	144	62.5%
3rd	15th	66	78	144	54.2%
	16th	48	84	132	63.6%
4th	17th	40	92	132	69.7%
	18th	39	89	128	69.5%
5th	19th	39	89	128	69.5%
	20th	38	88	126	69.8%

Water Supply Engineering (WSE)

Project Year	Round	Theoretical (hrs.)	Practical (hrs.)	Total (hrs.)	Rate of Practical (%)
2nd	9th	-	-	-	-
	10th	-	-	-	-
3rd	11th	-	-	-	-
	12th	78	82	160	51.3%
4th	13th	47	53	100	53.0%
	14th	58	74	132	56.1%
5th	15th	32	103	135	76.3%
	16th	35	128	163	78.5%

* There is no report for the training in the 1st year and no basic course was conducted in the 6th year except Drilling Technology course which is not completed during the project period.

Regarding Drilling Technology course, a course coordinator resigned in the 3rd year and new staff was employed in the 4th year. The new course coordinator has tried to keep at least the same quality of training following the same training contents as before. Therefore, the proportion of practical training hours is constant. Because the participants for this course are usually very new to drilling with limited knowledge, theoretical lectures are also important. However, the current course coordinator has intention to further increase the proportion of practical training.

In Drilling Machinery Maintenance Technology, however, hours of practical training occupied less than 50%; its hours were slightly increased from around 30% until the 4th year to more than 40% in the 5th year.

Hours of practical training on Electro-Mechanical Maintenance Technology have been steadily increased to more than 60% of total hours.

Water Supply Engineering course covers a very broad range of disciplines compared to other training. For this reason, there was often only time to cover introductory parts of each discipline. The course coordinator has tried to incorporate as many practical aspects into the training and to improve the lectures in the 5th year. For instance, group discussions and mini-examinations that

replicate practical situations. Moreover, steps were taken to make the training more practical by including many field exercises.

In advanced courses and on-demand courses including international workshops for African countries, practical training hours remained at a high percentage because the content of the courses was clearer than that of the basic courses. The proportion of practical training in each course conducted in the 5th year is; Hand pump Installation and Maintenance: about 70%, Software Application on Water Supply Engineering: about 80%, Well Diagnosis and Well Rehabilitation: about 70%, Hydraulic System Maintenance: about 70%. These courses were provided as highly practical training. These courses were conducted by Japanese experts or local experts. EWTEC staff, however, was also involved in the planning and preparation phases, and spent as much time as possible on reflecting requests from ex-trainees into the course curriculums.

2.4.3 Preparation of materials for new courses and creation of modules

In addition to the five basic courses, the following new courses were conducted.

Table 12: New courses other than basic courses

Classification	Course title	Duration	Major target
Advanced	Geophysical survey	4 weeks	RWB, ZWRO, WWCE
	Well diagnosis/Well rehabilitation	2 weeks	WWCE, AAWSA
	Hydraulic system maintenance	2 weeks	WWCE
	Water supply engineering (software)	2 weeks	RWB, ZWRO, WWO
	Groundwater modeling	3.5 weeks	African countries, RWB, WWDSE, Private, University
	GIS	3 weeks	African countries, RWB, WWDSE, Private, University
	Remote sensing	3 weeks	African countries, RWB, WWDSE, Private, University
	Isotope hydrology	3 weeks	African countries, RWB, WWDSE, University
Training for TVETC	Electromechanical maintenance technology (EMMT) for instructors	2 weeks	TVETC instructor
	Electromechanical maintenance technology (EMMT) at each TVETC	2 weeks	TVETC student, instructor
On-demand	Hand pump installation and maintenance	2 weeks	WWO, ZWRO
	Machine maintenance	2 weeks	WWO

2.4.4 Assistance in carrying out the training courses

(1) Training courses in Phase 3

The courses conducted during Phase 3 are summarized in the table below.

Table 13: Training courses in the 5th year of the project

Project Year	Division	Course	Round	Start	Finish	No. of Trainees	Remarks
1	Basic	EMMT	12th	2009/02/20	2009/04/09	23	
	Basic	WSE	8th	2009/02/26	2009/04/10	21	
	Basic	DMMT	21st	2009/04/28	2009/07/31	10	
	Basic	DT	20th	2009/04/28	2009/07/27	9	
	Basic	GWI	21th	2009/04/28	2009/07/17	19	
2	Basic	EMMT	13th	2009/08//25	2009/10/22	22	
	Basic	EMMT	14th	2010/03/09	2010/04/23	20	
	Basic	WSE	9th	2009/09/21	2009/10/29	17	
	Basic	WSE	10th	2010/03/09	2010/04/23	18	
	Basic	DMMT	22nd	2009/11/24	2010/03/04	10	
	Basic	DMMT	23th	2010/04/27	2010/07/30	10	
	Basic	DT	21st	2009/11/24	2010/03/04	10	
	Basic	DT	22nd	2010/04/27	2010/07/30	10	
	Basic	GWI	22nd	2009/11/23	2010/02/12	18	
	Basic	GWI	23th	2010/04/27	2010/07/23	19	
	Advanced	GWM	4th	2009/8/31	2009/09/18	30	International
	Advanced	GIS	3rd	2010/02/08	2010/02/25	28	International
	TVETC	EMMT	-	2010/05/03	2010/05/15	65	Luci (Afar)
	On-demand	DMMT	-	2009/10/05	2009/10/20	22	Machine maintenance, Afar
3	Basic	DMMT	24th	2010/10/25	2011/01/28	9	
	Basic	DMMT	25th	2011/04/26	2011/07/27	9	
	Basic	DT	23rd	2010/10/25	2011/02/04	10	
	Basic	DT	24th	2011/04/26	2011/07/27	10	
	Basic	EMMT	15th	2010/08/10	2010/09/23	21	
	Basic	EMMT	16th	2011/02/22	2011/04/07	19	
	Basic	WSE	11th	2010/08/10	2010/09/23	16	
	Basic	WSE	12th	2011/02/22	2011/04/07	19	
	Basic	GWI	24th	2010/11/09	2011/01/28	19	
	Basic	GWI	25th	2011/05/03	2011/07/27	18	
	Advanced	GPS	1st	2010/10/05	2010/11/05	12	
	Advanced	GWM	5th	2010/08/30	2010/09/22	28	International
	Advanced	RS	2nd	2011/04/04	2011/04/21	26	International
	Advanced	WD/WR	6th	2011/03/21	2011/04/01	15	
	TVETC	EMMT	-	2011/01/14	2011/01/30	42	Jijiga (Somali)
	TVETC	EMMT	-	2011/05/07	2011/05/21	47	Awasa (SNNP)
	TVETC	EMMT	-	2011/05/13	2011/05/24	37	Bahir Dar (Amhara)
4	Basic	DMMT	26th	2012/10/26	2012/01/27	10	
	Basic	DMMT	27th	2012/04/23	2012/07/25	10	
	Basic	DT	25th	2011/10/26	2012/01/27	10	
	Basic	DT	26th	2012/04/23	2012/07/25	10	
	Basic	EMMT	17th	2011/08/22	2011/10/07	18	
	Basic	EMMT	18th	2012/02/14	2012/03/30	20	
	Basic	WSE	13th	2011/08/22	2011/10/07	16	

Project Year	Division	Course	Round	Start	Finish	No. of Trainees	Remarks
	Basic	WSE	14th	2012/02/14	2012/03/30	20	
	Basic	GWI	26th	2011/11/09	2012/01/27	18	
	Basic	GWI	27th	2012/04/30	2012/07/25	18	
	Advanced	GWM	6th	2011/08/31	2011/09/21	31	
	Advanced	WD/WR	2nd	2012/04/02	2012/04/12	10	
	Advanced	HSM	1st	2012/05/21	2012/06/01	17	
	On-demand	HP	1st	2012/01/30	2012/02/11	20	
	TVETC	EMMT	1st	2011/07/27	2011/08/12	18	For instructors
	TVETC	EMMT	-	2011/12/17	2012/01/05	16	Jijiga (Somali)
	TVETC	EMMT	-	2012/05/28	2012/06/8	85	Assosa (Benishangle)
5	Basic	DMMT	28th	2012/10/29	2013/01/22	9	
	Basic	DMMT	29th	2013/05/06	2013/08/08	10	
	Basic	DT	27th	2012/10/29	2013/01/22	12	
	Basic	DT	28th	2013/05/06	2013/08/08	10	
	Basic	EMMT	19th	2012/09/17	2012/11/02	20	
	Basic	EMMT	20th	2013/02/18	2013/04/02	20	
	Basic	WSE	15th	2012/09/17	2012/11/02	25	
	Basic	WSE	16th	2013/02/18	2013/04/02	20	
	Basic	GWI	28th	2012/10/29	2013/01/22	20	
	Basic	GWI	29th	2013/05/06	2013/08/08	20	
	Advanced	GWM	7th	2013/09/03	2013/09/26	28	International
	Advanced	IH	1st	2012/10/15	2012/11/02	31	International with IAEA
	On-demand	HP	2nd	2013/01/28	2013/02/08	12	
	Advanced	WSE (SA)	1st	2013/01/28	2013/02/08	17	
	Advanced	WD/WR	3rd	2013/02/18	2013/04/02	13	
	Advanced	HSM	2nd	2013/04/22	2013/05/02	13	
	TVETC	EMMT	-	2012/08/31	2012/09/28	121	Assosa (Benishangle)
	TVETC	EMMT	-	2012/11/30	2012/12/16	35	Jijiga (Somali)
	TVETC	EMMT	-	2013/05/20	2013/05/31	19	Komborcha (Amhara)
6	TVETC	EMMT	2nd	2013/08/19	2013/09/06	16	
	Basic	DT	29th	2013/08/22	2014/02/13	25	
					Total	**1,581**	

Organizations which participants belong to are summarized in the following table. In Phase 3, the number of engineers and technicians from Zonal Water Offices and Woreda Water Offices and Town Water Supply Services Offices has increased according to the national policy of decentralization of water works construction and supervision.

Table 14: Organizations of EWTEC training participants in Phase 3

Organization	Number of participants
Region Water Bureau (RWB)	219
Zonal Water Office (ZWRO)	170
Woreda Water Office (WWO)	233
Town Water Supply Service (TWSS)	34
Water Works Construction Enterprise (WWCE)	177
Water Works Design & Supervision Enterprise (WWDSE)	16
TVETC	503
MoWIE	22
Geological Survey of Ethiopia (GSE)	12
Addis Ababa Water and Sewerage Authority (AAWSA)	23
University	15
Private companies	14
NGOs	1
EWTEC	22
African Countries	118
Others	2
Total	**1,581**

On the other hand, private sector and NGOs were accepted on a trial basis. Because the training was conducted with a government budget, the number of participants from the private sector and NGOs was limited and governmental organizations had more priority. Since training courses on drilling technology and drilling machinery maintenance technology were more demanded by private sector and NGOs, two to three organizations showing high willingness to participate in EWTEC training were invited for those basic courses at the recommendation of MoWIE. However, there were many cases that those organizations could not dispatch trainees due to engagement with their own work. Especially, NGOs had difficulty in joining EWTEC training and only one person participated during Phase 3. The number of participants from private sector and NGOs is summarized in Table 15. In addition, two trainees from private consultant firms were accepted for groundwater modeling course.

Table 15: Training participants from private sector and NGOs

Training course	Items	1st year	2nd year	3rd year	4th year	5th year
Drilling Technology (DT)	Total number of participants	9	20	20	20	22
	Number of participants from private sector, NGOs	0	0	2	4	2
	Rate	0.0%	0.0%	10.0%	20.0%	9.1%
Drilling Machinery Maintenance Technology (DMMT)	Total number of participants	10	20	20	20	19
	Number of participants from private sector, NGOs	0	0	2	2	1
	Rate	0.0%	0.0%	10.0%	10.0%	5.3%

(2) Transition of training courses and number of participants from Phase 1 to Phase 3

Trend of the number of trainees throughout the EWTEC project from Phase 1 to Phase 3 is shown in Table 16 and Figure 7.

Table 16: Training courses and number of trainees in each phase of the EWTEC project

Project Phase and Period	Total number of participants	Basic course						Advanced course										For TVETC		On-demand course						
		Groundwater Investigation (GWI)	Drilling Technology (DT)	Drilling Machinery Maintenance Technology (DMMT)	Electro Mechanical Maintenance Technology (EMMT)	Water Supply Engineering (WSE)	Local Social Development (LSD)	Groundwater Modeling (GWM)	GIS	Remote Sensing (RS)	Isotope Hydrology (IH)	Geophysical Survey (GPS)	Hydraulic System Maintenance (HSM)	Well Diagnosis/Well Rehabilitation (WD/WR)	WSE-Operation & Maintenance (WSE-OM)	WSE-Planning & Designing (WSE-PD)	WSE-Software (WSE-Software)	EMMT for TVETC (EMMT-T)	EMMTy for TVETC Instructors (EMMT-TI)	Rope Pump Manufacturing and Installation (RP)	Volcanology	Water Supply Management (WSM)	Gender & Development (GAD)	Groundwater Investigation and Water Supply (GIWS)	Hand pump Maintenance and Installation (HP)	Machinery Maintenance (DMMT-R)
Phase 1 (1998.1 - 2003.1)	**372**	77	70	80	10	19	69															15	14	18		
Phase 1 Follow-up (2003.1 - 2005.3)	**339**	50	36	40	56	10	40	45	40					9						13						
Phase 2 (2005.3 - 2008.3)	**1,154**	66	58	60	95	71	10	56	109	62				45	37	17		396		61	11					
Transition (2008.4 - 2009.1)	**117**	57	20	20	20																					
Phase 3 (2009.1 - 2013.11)	**1,581**	170	116	87	183	172		117	28	27	31	12	30	38			17	465	34						32	22
Total	**3,563**	**420**	**300**	**287**	**364**	**272**	**119**	**218**	**177**	**89**	**31**	**12**	**30**	**92**	**37**	**17**	**17**	**861**	**34**	**74**	**11**	**15**	**14**	**18**	**32**	**22**

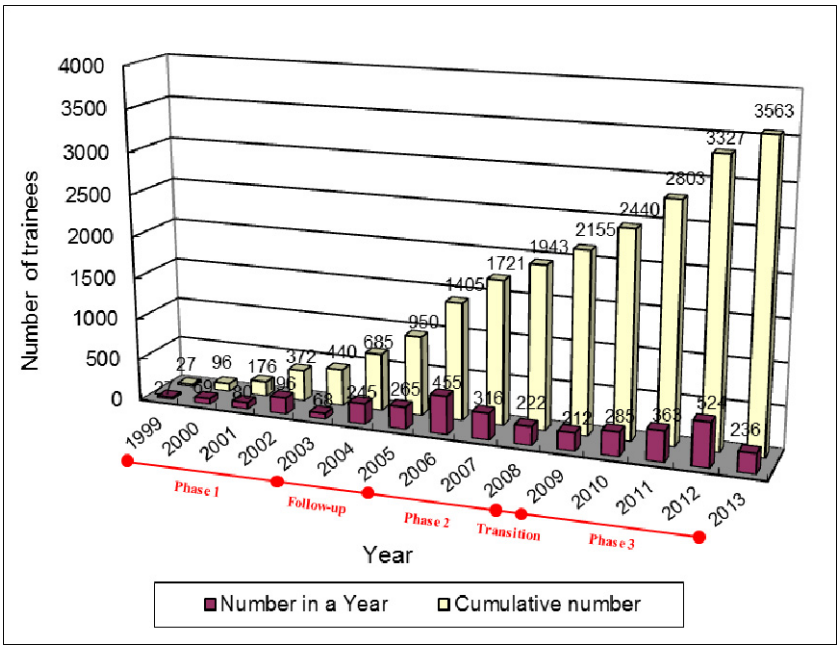


Figure 7: Trend of the number of EWTEC trainees (1999-2013)

Number of trainees in each region (1999-2013) is shown in Figure 8.

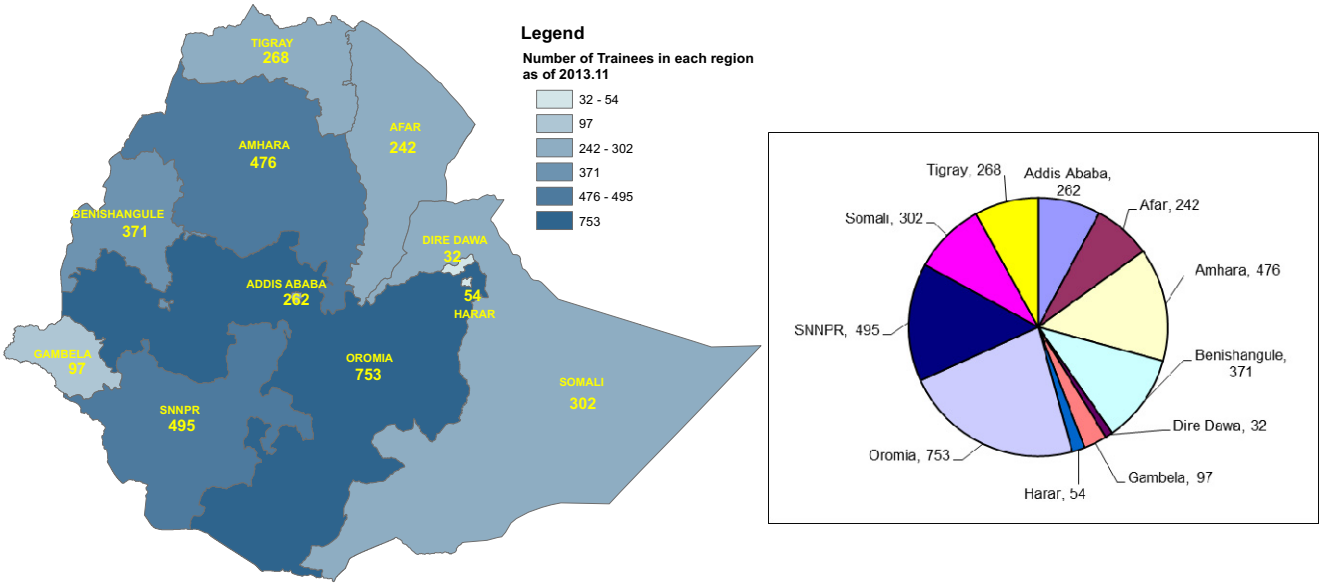


Figure 8: Number of trainees in each region (1999-2013)

Number of participants from other African countries (1999-2013) is shown in Figure 9.

Country	No. of participants
Botswana	12
Cameroon	2
Ghana	18
Kenya	13
Lesotho	13
Malawi	14
Mozambique	10
Namibia	5
Nigeria	18
Rwanda	9
South Africa	1
South Sudan	8
Sudan	12
Swaziland	10
Tanzania	22
Uganda	18
Zambia	14
Zimbabwe	12
Total (except Ethiopia)	**211**

Figure 9: Number of participants from other African countries (1999-2013)

2.4.5 Technical transfer to course coordinators of the local advanced courses in which income generation is expected when EWTEC is transformed to be semi-autonomous.

Advanced courses were mainly provided by Japanese experts for Ethiopian engineers. Engineers from other African countries were also invited for international courses. At the same time, these courses were expected to be a part of training for EWTEC staff. At first, advanced training courses were just conducted as technical seminars provided by Japanese experts, but in the mid-term review, it was recommended that the knowledge and skills to conduct advanced courses be transferred to C/Ps by conducting the same training repeatedly considering income generation activities in the future.

An advanced course, Well Diagnosis/Well Rehabilitation (WD/WR) was conducted three times in Phase 3. The course coordinator in charge of DT course participated in the course and was finally able to take all responsibilities for the training such as course preparation, management and practical instruction at sites. The course required coordination with external institutions such as Addis Ababa Water and Sewerage Authority (AAWSA) and Mojo Town Water Supply in addition to providing training. Improvement of course coordinator's capacity not only on technical but also from a management perspective was observed through the experience of working under the instruction of Japanese experts.

The course coordinators and instructors in charge of DMMT/EMMT conducted Hydraulic System Maintenance course (HSM) with the help of experience and teaching materials acquired from the training in Japan, which was implemented in the 4th and 5th project years. In the training, for instance, capacity of a compressor was tested with a device prepared with only locally available materials. Such testing devices are usually very expensive and/or difficult to be purchased in Ethiopian local markets. In a similar way of WD/WR course, they were finally able to take all responsibilities from planning to implementation of the advanced courses by themselves.

Advanced courses conducted during Phase 3 are shown in the following table.

Table 17: List of advanced courses

Project year	Course	Round	Period	Number of Trainees	Lecturer	Contents	Participation of EWTEC staff
2nd	Groundwater Modeling (GWM) (International)	4th	18 days	30	Naoaki Shibasaki (Fukushima Univ.)	Basic knowledge of groundwater modeling, methods, exercises (case study at Akaki well field)	As an assistant of Japanese expert
	GIS (International)	3rd	17 days	28	Lei Peifeng (Kokusai Kogyo)	Basic of GIS, data preparation, utilization of DEM data, operation of raster data	As an assistant of Japanese expert
3rd	Groundwater Modeling (GWM) (International)	5th	23 days	28	Naoaki Shibasaki (Fukushima Univ.)	Basic knowledge of groundwater modeling, methods, exercises (case study at Akaki well field)	As an assistant of Japanese expert
	Geophysical survey (GPS)	1st	31 days	12	Mitsuyoshi Saito (Mindeco)	Lecture of principle of each method and measurement & analysis method, operation of measuring instrument	As an assistant of Japanese expert
	Well Diagnosis &Well Rehabilitation (WD/WR)	6th	11 days	15	Takashi Suzuki	Lecture with case studies about WD/WR, practical training on site	As an assistant of Japanese expert
	Remote sensing (RS) (International)	2nd	17 days	26	Kazutoshi Masuda (Kokusai Kogyou)	Basic and advanced knowledge of remote sensing, geometric correction, image category	As an assistant of Japanese expert
4th	Groundwater Modeling (GWM) (International)	6th	21 days	31	Naoaki Shibasaki (Fukushima Univ.)	Basic knowledge of groundwater modeling, methods, exercises (case study at Akaki well field)	As an assistant of Japanese expert
	Well Diagnosis &Well Rehabilitation (WD/WR)	7th	10 days	10	Takashi Suzuki	Lecture with case studies about WD/WR, practical training on site	As an assistant of Japanese expert
	Hydraulic system maintenance (HSM)	1st	11 days	17	EWTEC staff	Practical training with each machine based on the lecture, maintenance training using hydraulic system	As a main lecturer supported by Japanese expert
5th	Groundwater Modeling (GWM) (International)	7th	23 days	28	Naoaki Shibasaki (Fukushima Univ.)	Basic knowledge of groundwater modeling, methods, exercises (case study at Akaki well field)	As an assistant for Japanese expert
	Isotope hydrology (IH) (International)	1st	18 days	31	5 instructors from IAEA, 2 from AAU	Basic knowledge of isotope technology, sampling at sites, analysis technology, practice of groundwater dating	As a participant
	Software application for Water Supply Engineering	1st	11 days	17	Addis Ababa University lecturers	Basic operation of software related facility designing and piping designing on water supply	As a participant
	Well Diagnosis &Well Rehabilitation (WD/WR)	8th	11 days	13	EWTEC staff	Lecture with case studies about WD/WR, practical training on site	As a main lecturer supported by Japanese expert
	Hydraulic system maintenance (HSM)	2nd	10 days	13	EWTEC staff	Practical training with each machine based on the lecture, maintenance training using hydraulic system	As a main lecturer supported by Japanese expert

2.4.6 Advanced training course for African participants (international training course)

International training courses for African countries were managed mainly by the Japanese side in terms of dispatch of instructors, preparation of venues, sending out invitations to participants from other African countries, etc. A manual for implementation of international training courses were prepared (Manual for Implementation of International Training). The results of each international course are described below.

(1) Groundwater modeling course (GWM)

1) Course outline

a. Course duration

GWM-2009: August 31 to September 18, 2009
GWM-2010: August 30 to September 22, 2010
GWM-2011: August 31, 2011 ~ September 21, 2011
GWM-2012: September 3, 2012 - September 26, 2012

b. Venue

Dreamliner Hotel (Addis Ababa) for GWM 2009, 2010, 2011)
Hotel Siyonat (Addis Ababa) for GWM 2012

c. Instructor

Prof. Naoaki Shibasaki (Fukushima University, Japan)

d. Participants

GWM-2009: 16 people from 14 African countries, 14 from Ethiopia. Total of 30 participants.
GWM-2010: 16 people from 13 African countries, 12 from Ethiopia. Total of 28 participants.
GWM-2011: 17 people from 13 African countries, 14 from Ethiopia. Total of 31 participants.
GWM-2012: 16 people from 13 African countries, 12 from Ethiopia. Total of 28 participants.

e. Training contents

Module 1: Outline of groundwater modeling
Module 2: Methodology of groundwater modeling
Module 3: Practice of groundwater modeling (a case study of Akaki well field)

f. Software and data used

Software: Surfer 8, Global Mapper 7, PMWin Pro, 3D-Master and others

Data: SRTM-3-V4, LANDSAT-7 and others

2) Characteristics and evaluation of the course

a. Utilization of GIS data

Up-to-date Digital Terrain Elevation Data (SRTM-3 Version 4) was used. In addition to the Landsat imagery, country-by-country data was provided and utilized in the groundwater modeling training. The supply of these sets of GIS data was well-received by the participants, because it is very difficult to download them in areas with poor Internet connections. Although it is commonplace for recent software programs to make a groundwater model using various kinds of GIS data, participants who were not used to handling GIS software and data had difficulty handling related software and processing data. Software and data were updated every time.

b. Group activities

In Module 3, trainees were actually taken to the Akaki Wells field to observe producing wells and, after climbing a hill, had a group discussion on how to set model boundary conditions. This group discussion, allowing trainees to make use of the knowledge that they acquired on groundwater models so far, was very useful and highly evaluated by the trainees.

c. Enhancement of data on the Akaki Wells model

Regarding the Akaki Wells model used in Module 3 training, up-to-date well drilling information, monitoring records, and pumpage records was collected in collaboration with AAWSA and the information of aquifers and the drilling status of new wells near Addis Ababa also provided by AAWSA, which helped to conduct more realistic case study.

d. Enhancement of GWM network and exchange of experiences and information

The number of trainees who have so far participated in GWM course of EWTEC has reached 108 in African countries, and exceeding 218 when combined with the number of trainees in Ethiopia. It is advisable to make and continue to expand a network of trainees who have participated in the training courses. There are cases whereby the Japanese instructor has personally received technical inquiries from the past trainees. There is a case of a participant completing a PhD degree on groundwater modeling after attending an EWTEC international course. Since many

countries and organizations now have a number of trainees, it seems worthwhile to examine holding symposiums or other events to pursue exchange of information and experiences of actual cases of implementing groundwater modeling and to improve the groundwater model techniques.

e. Holding of GWM training courses in other countries

There are several requests to hold GWM courses in other countries. This also seems worthwhile to be examined.

f. Participation of trainees from Western African countries.

The trainees who participated in GWM training so far are mainly from English-speaking countries in the East to South Africa. However, it seems better to target the groundwater model training "for African countries" in the Sub-Saharan region including those in West Africa (French-speaking area). Although there may be a problem of language barrier, there is expected to be English-speaking professional engineers in the French-speaking area. Therefore, inviting trainees from West African countries (French-speaking area) should be further examined.

(2) GIS course

1) Course outline

a. Course duration

February 8 (Mon) to February 26 (Fri), 2010

b. Venue

Dreamliner Hotel (Addis Ababa)

a. Instructor

Dr. Lei Peifeng (Kokusai Kogyo Co., Ltd.)

c. Participants

17 people from 13 African countries (Botswana 1, Ghana 1, Kenya 1, Lesotho 1, Malawi 1, Mozambique 2, Nigeria 1, Rwanda 1, Sudan (North) 3, Tanzania (Mainland) 2, Uganda 1, Zambia 1, Zimbabwe 1) and 11 from Ethiopia. Total of 29 participants.

d. Course contents

This training course curriculum was prepared to cover the application of GIS to groundwater development and management. It is impossible for all participants to master all of the GIS functions in this short time, but the curriculum was organized for them to acquire the most important and practical skills. The curriculum is divided into the following five modules.

Module 1: Fundamentals of GIS
Module 2: Basics of ArcGIS
Module 3: GIS Data Preparation
Module 4: DEM (Digital Elevation Model) Data Utilities
Module 5: Raster Data Processing
Module 6: Data Preparation for Groundwater Modeling (optional)

e. Software and data used

- ArcGIS9.3 (ArcEditor and all other extensions; rental from ESRI local agent), Global Mapper 7, Surfer8, DivaGIS (free software)
- GIS data for each country (administrative boundary, river, lakes, road, settlement area, topography, etc.)
- Contour line and survey points (from Geocommunity, GIS Website)
- Land cover data (from DivaGIS website)
- DEM (Digital Elevation Model) data (SRTM 90 m mesh DEM for the whole of the African continent, GTOP-30 930 m mesh DEM for the whole world); from USNASA and USGS
- MrSID (Landsat image with resolution of 14.5 m, 1 scene is about 600 km×600 km, whole of the African continent, from USGS website)
- Monthly rainfall data: data for 2,332 weather stations which cover the whole of the African continent, from the WMO (World Metrological Organization) website.
- Data of Butajira Ziway Development Study results conducted by EWTEC (Administrative boundary, Geological map, water quality data)

2) Characteristics and evaluations of the course

This training course is mainly aimed at applying GIS to water resource management, particularly development and management of groundwater resources. However, Module 1 explained the concepts, configuration, data classifications, and characteristics of GIS because understanding of GIS itself is required to apply GIS. In particular, the applications of GIS in the

groundwater sector was explained using the past survey results as an example, allowing trainees to gain overall understanding on how GIS can be used to implement water resource management efficiently and accurately. After acquiring the above knowledge, trainees carried out hands-on training on converting almost all of the existing data including paper maps, table data, and aerial photographs into GIS data and storing the data in a database and making new geographical data using GIS.

All the participants, while referring to their textbooks, eagerly worked on exercises using the supplied data. Although the quality of data varies from person to person, all the trainees successfully acquired a certain level of skills.

In the same way as for the last three times during Phase 2 (one course for Ethiopian trainees and two international courses), the difference of levels between the trainees gave a significant impact on the progress of training. A few trainees who used GIS and performed mapping to a certain degree before participating in this course mastered the points taught in the lecture and worked on many exercises provided as options. For most of the trainees, on the other hand, the understanding of the points taught in the lecture was all they could do, and they did not get to read the optional exercises. To diminish the difference of levels between trainees and to ensure that more points can be taught more smoothly within the training period, it is necessary to emphasize the importance of the selection criteria for trainees and make arrangements for selecting at least those who are familiar with operating a computer.

(3) Remote Sensing Course

1) Course outline

a. Course duration

Monday, April 4 to Thursday, April 21, 2011

b. Venue

Dreamliner Hotel (Addis Ababa)

c. Instructor

Kazutoshi Masuda (Kokusai Kogyo Co., Ltd.)

d. Participants

16 people from 14 African countries (Botswana 2, Ghana 1, Kenya 1, Lesotho 1, Malawi 1, Mozambique 1, Namibia 1, Nigeria 1, Sudan (North) 1, Swaziland 1, Tanzania (Main land) 2, Uganda 1, Zambia 1, Zimbabwe 1) and 11 from Ethiopia. Total of 27 participants.

e. Training contents

- Basics of remote sensing
- Characteristics of wave length
- Application of remote sensing
- Geometric correction
- Image classification
- Vegetation index
- Three-dimensional analysis
- Space analysis
- Integration of remote sensing and GIS
- Application of remote sensing to groundwater management

f. Software and data used

The software used in this training for remote sensing and GIS are as listed below. Free or inexpensive software was used in general, but ArcGIS, which is widely used in the world, was also used in the practical training.

- ILWIS 3.4 open (free software developed in ITC in the Netherlands)
- Global Mapper 7 (Good at analysis utilizing elevation data. Price is about US$300)
- Quantum GIS (free GIS software)
- ArcGIS 9.3 (expensive GIS software with a wide range of functions)

The following free satellite data and elevation data were used in this training so that the benefits obtained by the training would be sustainable. Moreover, these data were prepared for all of the countries of origin of the trainees, and given to them.

- LANDSAT ETM (resolution of 30m)
- SRTM elevation data (resolution of 90m)

2) Characteristics and evaluations of the course

The participants have acquired various skills, and found out some technical challenges of their own through this training. The following are some ideas gained from the training:

- All trainees acquired basics of remote sensing technology and knowledge and techniques

for its application.

- They learnt methods and techniques of analysis in terms of application of remote sensing to groundwater management.
- However, the mere completion of this training will be insufficient and they will need to make daily efforts to develop their techniques by utilizing the distributed software and data.
- It is strongly recommended to participate in other international training courses such as groundwater modeling and GIS, which are implemented under the Project, so that the remote sensing techniques acquired in this training will also be improved.
- It was very challenging to teach 30 trainees with only one instructor. The reason is the wide disparity in the levels of trainees. The contents of a course and the speed at which it can be conducted are highly dependent on the suitable level of trainees.
- If a couple of assistants could be fostered in EWTEC and they could take care of some parts that the instructor could not deal with, the training courses will be more effective.

(4) Isotope hydrology

This course was planned and implemented in collaboration with IAEA (International Atomic Energy Agency). Seven instructors participated from IAEA and EWTEC handled the management of the training course.

1) Course outline

a. Term

October 15, 2012 - November 2, 2012

b. Place

Lecture & exercises using computers: Hotel Siyonat

Field training: Akaki Well Field, Debra Zeit, Laboratory at Addis Ababa University and spring point at Addis Ababa

c. Instructors

1. Dr. Seifu Kebede
   School of Earth Sciences, Addis Ababa University, Addis Ababa, Ethiopia

2. Prof. Tenalem Ayenew
   School of Earth Sciences, Addis Ababa University, Addis Ababa, Ethiopia
3. Prof. Piotr Maloszewski
   Deputy Director, Institute of Groundwater Ecology, Neuherberg, Germany
4. Prof. Robert M. Kalin
   Professor of Environmental Engineering for Sustainability, Scotland
5. Dr. Bhishm Kumar
   Isotope Hydrologist, Isotope Hydrology Section IAEA, Physical and Chemical Sciences Division, Vienna, Austria
6. Dr. Matsumoto Takuya
   Isotope Hydrologist, Physical and Chemical Sciences Division, IAEA, Vienna, Austria
7. Dr. Pradeep Aggarwal
   Head, Isotope Hydrology Section, Physical and Chemical Sciences Division, IAEA, Austria

d. Participants

21 people from 15 African countries (Botswana 1, Cameroon 2, Ghana 2, Kenya 1, Lesotho 1, Malawi 2, Mozambique 1, Nigeria 2, South-Sudan 1, Sudan 1, Swaziland 2, Tanzania 1, Uganda 2, Zambia 1, Zimbabwe 1), and 10 from Ethiopia, total of 31 participants.

2) Training contents

Module 1: Basic concepts of isotopes
Field work for sampling (Akaki Well Field, Debra Zeit)
Laboratory work and sample analysis (Addis Ababa University)
Isotope applications in lakes and rivers
Hands-on training

Module 2: Young groundwater dating & applications
Basic concept of young groundwater age dating
Groundwater age date with Flow PC modeling
Sample collection exercise in field (backyard of the hotel)
Hands-on training
Country presentations

Module 3: Old groundwater dating & applications
Basic concept of old groundwater age dating
Demonstration of sample collection & chemical treatment

Geochemical modeling with NETPATH in C-14 dating

Hands-on training

Project work and discussion

3) Characteristics and evaluations of the course

- How to share the responsibility for the preparation of the training course was discussed and decided between EWTEC and IAEA through JICA headquarters as shown in the table below. IAEA was responsible for the selection of instructors and preparation of training contents, and EWTEC was responsible for the whole management of the training including making venue arrangements and communicating with invited trainees.

Table 18: Responsibility sharing between EWTEC and IAEA for the implementation of Isotope Hydrology course

	Items	EWTEC	IAEA	Remarks
1	Instructor			
	Payment for the main instructor		O	
	Payment for other instructors (ex. Addis Ababa University professors)		O	If necessary
	Payment for assistants		O	If necessary
2	Venue			
	Hotel conference room (including lunch)	O		Within Addis Ababa
3	Transportation fee			
	For instructor		O	
	For trainees	O		
4	Allowance (accommodation and food)			
	For instructor		O	
	For trainees	O		
5	Invitation of participants	O		
6	Teaching material preparation			
	General Information (outline, purpose, schedule etc.)		O	II. Summary of the training course (Outline, purpose, schedule etc.)
	General information (introduction of EWTEC, application guideline etc.)	O		I. Introduction of the project III. Guideline for application IV. Experiences & allowances V. Miscellaneous
	Teaching material (text, presentation material etc.)		O	
7	Equipment for analysis			

	Items	EWTEC	IAEA	Remarks
	Charge for equipment usage, sample analysis cost	O		Including consumables
	Arrangement for equipment usage with Addis Ababa University	(O)	O	It is preferable that the instructor directly communicates with Addis Ababa University and shares information with EWTEC.
	Arrangement for purchasing material for water sampling	(O)	O	Whether the necessary materials are available in Addis Ababa or not. Whether there are any materials brought by the instructor and if he needs to clear the bill later with EWTEC.
	Cost for sampling material	O		
8	General equipment			
	Desktop computer, network setting in the conference room	O		Computer will be set up in the conference room throughout the training course
	Projector, screen, microphone	O		
9	Consumables			
	Stationery	O		
10	Others			
	Vehicles and fuel for field work	O		

- In the other international courses for African countries, EWTEC had accepted maximum 17 participants out of Ethiopia, but in this course Cameroon was added based on the request from IAEA. In addition, Malawi University was also invited due to a strong request from IAEA. As a result, EWTEC accepted 21 participants from other African countries, which is more than usual. From Ethiopia there were 10 participants including university students from Arba Minch and Mekele universities.
- 5 instructors were dispatched from IAEA and 2 instructors were from Addis Ababa University. 2 to 7 days were allocated to each instructor and they took part in the course alternately. The instructors were dispatched according to the originally planned schedule without any problems. Close communication between EWTEC and instructors were made in advance through email and telephone so as not to cause any problems for the entry to Ethiopia including obtaining visas.
- Preparation of the training course was conducted without any serious problems. However, it took time for customs clearance for the equipment of noble gas sampling sent from IAEA and it could not be received before the practical training which was scheduled in the second

week of the course. Therefore, an IAEA instructor was asked to bring necessary equipment with him and the rest was borrowed from Addis Ababa University and finally the demonstration was successfully conducted.

- Participants were highly satisfied with the training course. In addition, instructors, teaching materials, classroom environment and field exercises were positively evaluated by the participants. However, the level of understanding varied among participants depending on the experience and educational background of each participant. Many participants requested that the duration of the course be extended and many also responded that they would recommend the course to their colleagues if the course was held again, which indicates their high satisfaction.

- The following are comments from instructors.

<Dr. Bhishm Kumar, Isotope Hydrology Section, IAEA>

The training workshop was very well organized by EWTEC, the arrangements made for the field sampling demonstration and laboratory visit were excellent. The cooperation and help extended by both local experts, Prof. Tenalem Ayenew and Dr. Seifu Kebede from Addis Ababa University was also commendable. They also discharged their duties excellently.

<Prof. Piotr Maloszewski, Institute of Groundwater Ecology, Germany>

The workshop was perfectly organized and was surely very successful. I am sure that the workshop will give to participating country representatives important impulse for considering the necessity of applying the environmental tracers for solving different problems in hydrology.

In my opinion, the number of participants was a little too large. I think that maximum number should not exceed 20-22 persons. The level of knowledge on tracer hydrology was very different by participants. Some participants have obtained information on isotope methods first time during that workshop. Generally, I think that the effectiveness of such workshops could be strongly increased by organizing two different courses, two-weeks each. First one should be for beginners, and could show a width spectrum of isotope and tracer methods and their possible applications in the hydrology / hydrogeology, while the second one could be for those who are already familiar with tracers.

<Prof. Tenalem Ayenew, School of Earth Sciences, Addis Ababa University>

In general the training was conducted very smoothly. The participants were active. Most of them seemed to have good background knowledge of hydrogeology. With regard to the lecturing, the only limitation was time. The topic assigned and the time allocated were not appropriate (in my case). The time allocated was too short. The conference organizers performance was excellent.

<Dr. Seifu Kebede, School of Earth Sciences, Addis Ababa University>

Overall the time allotted was sufficient to cover basic isotopes hydrology. The trainees were receptive. The logistics was well organized.

2.5 Output 3 "Development of capacities of those who conduct training at EWTEC"; Related Activities

2.5.1 Provision of technical advice including teaching methods throughout the training courses

(1) Survey of the guidance capacity of EWTEC training instructors and coordinators and related issues

After observing all of the five basic courses and indicating any areas for improvement concerning teaching methodology, feedback was given to the coordinator or instructor on their classes. The primary points of improvements are summarized below.

- More consideration needs to be given to the placement of computers, the projector, where the instructor stands, to improve the ability of the trainees to concentrate in class. Even when the computers are not used, they are placed on the desktops so that there is no space for the trainees to take notes in class.
- Presentations using PowerPoint and other such software often include long paragraphs of text. This requires improvements in slide preparation techniques concerning the amount of text, insertion of images, use of colors and so on.
- It is important to provide feedback through the use of short quizzes to assess the trainees on a regular basis.
- Issues concerning field training: When conducting field training, it is necessary for the instructor to assign trainees with particular issues or questions in order to make them think

deeply about the purpose of the training. As an activity during training, the trainees can be divided into small groups to discuss what they are doing, interview facility managers and so forth.

- Issues concerning classroom training: In the classroom, although the instructors allow discussion to a great extent, other teaching methods are scarcely used. Since it is already common in Ethiopia that fellow trainees will discuss and collaborate during learning, this opportunity should be used by guiding and controlling the discussion. For example, it would be effective to hold discussions in small groups and assign roles such as time-keeper, recorder of what was said, and so on.
- Issues concerning course preparations: Course Guides require better preparation. The module summary sheets made during the 1st project year were not effectively being put to use in the course in progress during the expert's assignment period. In some courses, these materials were completely omitted from the Course Guide provided to trainees. The reason given was that since there are not enough instructors, it is not possible to guarantee to the trainees that all the materials given in the summaries will be covered, therefore causing discontent. However, the module summaries clarify the objective and content of the training so they not only serve to assist the instructors, but from the perspective of IEC, they are highly beneficial to the trainees. The module summary sheets should be revised to reflect actual course content and every effort made to ensure the trainees receive this information.

(2) Training to improve teaching abilities

1) October – November 2009

Three teaching methodology workshops were held. The participants were five instructors from EWTEC and a young staff member of the Ministry of Water Resources who was on temporary assignment.

Workshop 1: After explaining the IEC/Teaching Methodology Manual that had been prepared in the 1st year, three topics (1. preparation of teaching materials, 2. relationship between theory and practical training, and 3. evaluating practical training) were discussed in small groups. Each group then gave a short presentation on each topic. The instructors showed a high level of interest in the concepts presented and were motivated to put the teaching methods to use.

Workshop 2: After presenting the "Teaching Tips" included in the IEC/Teaching

Methodology Manual, a demonstration teaching the Japanese language was given. Afterwards, participants were divided into small groups to demonstrate the teaching tips by performing a demo class on Amharic. Finally, all participants discussed the results of the demos. Through the experience of conducting the demonstration class, the instructors were able to deepen their understanding of the teaching methods.

Workshop 3: Video of the demonstration classes of the previous workshop were recorded, so participants were given pointers for improvement or other areas to pay attention to while viewing the recording. Afterwards, keeping these remarks in mind, each participant was given about 20 minutes to conduct another demonstration class in Amharic individually. Participants were able to evaluate each other on teaching ability. In particular, after watching the video of themselves, participants could confirm their own teaching ability and come up with improvements for themselves, which will greatly serve to improve their instructional performance.

2) January 2010

There were four workshops held on teaching methodology. A total of seven instructors and three Japanese experts participated.

Workshop 1: The concept of Active Learning was introduced and participants practiced and drilled the method of Exploration through Inquiry. With this method, the instructor gives the trainees a series of questions on a given topic, starting with simple to more complex questions, to encourage the trainees to gradually deepen their understanding of the topic.

Workshop 2: Participants practiced the Active Learning method called “think-pair-share”. This method has trainees take notes of the important points during a lecture. The trainees then summarize their notes (this should take about 1 minute) and, in pairs, compare them with a partner (about 2-3 minutes). To complete the exercise, the instructor calls upon the class as a whole and organizes some of the major points.

Workshop 3: Participants practiced the Active Learning method called “peer writing and editing”. When a report or short essay is assigned for homework, trainees will create outlines in pairs. This is done, first by student-A telling student-B about their idea, and student-B writing an outline. Roles are then reversed and

student-A creates an outline from the explanation given by student-B. Based on these outlines, they each then write their report individually. Lastly, the students read their reports to each other and offer corrections or suggestions. The revised draft is then submitted to the instructor.

Workshop 4: Participants practiced the Active Learning method called "predict-observe-explain". Before performing a demonstration for practical training, the students are asked to predict the functions of the said machine or equipment based on their knowledge of theory alone. After the demonstration, they then discuss what took place based on what they actually observed.

(3) Creating a manual for IEC/teaching methodology improvements

A manual to improve measures for IEC (information, education and communication) and teaching methodology was created based on the results of the interviews with course coordinators and classroom observations. In order to improve the teaching ability of the instructors and coordinators at EWTEC, the manual contains information on methodology, modularization, grading and evaluation of trainees, etc. as shown in the table below. After making a draft manual, the content was discussed with other Japanese experts, the head of the center and course coordinators. The manual has been updated.

Table 19: Summary of IEC/Teaching Methodology Manual

Section	Content Summary
1. Introduction	■ How to use the manual
2. Course Preparation	■ Making module summaries ■ Procedural checklist for course preparations
3. Preparing Exams	■ Guidance on preparing both written and practical exams according to the tasks shown in the modules
4. Assessment of Trainees	■ Standards and policy concerning assessment of trainee participation, practical training, and written and practical exams.
5. Course Achievement Report	■ How to organize the results of instructor, class and administration evaluations based on a review of EWTEC's evaluation system during Phase 3.
6. Suggestions on Teaching Methods	■ Effective teaching methods when conducting classes.

2.5.2 Improve capacity of coordinators and instructors on specialized techniques throughout JICA Experts' assignment period

(1) Groundwater investigation (GWI)

The hydrogeological survey in the Bilate River sub-basin of the Rift Valley Lakes Basin has been carried out as a practical training of groundwater investigation for the enhancement of ability of coordinators in collaboration with Addis Ababa University (AAU) during the period from third year to fifth year. The Bilate sub-basin has been selected as a target area of groundwater modeling analysis through discussions with a professor of AAU, because the parameters of the basin could be easily estimated as it is a closed basin. Since the Bilate sub-basin has been included in the area of a previous JICA development study (The Study on Groundwater Resources Assessment in the Rift Valley Lakes Basin, 2012), the results of study mentioned above were applied in the Bilate sub-basin analysis and also a more detailed survey was executed in the Bilate sub-basin.

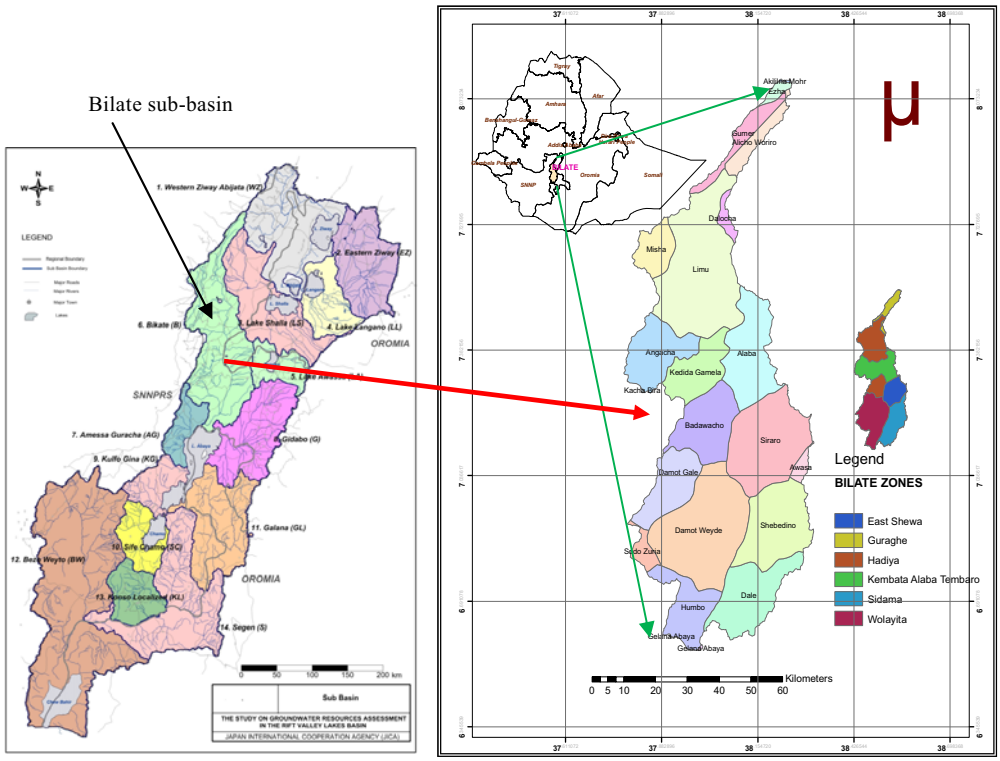
The main objectives of training are as follows:

- Activities will aim at improving the capacity of the participating EWTEC (Ethiopia Water Technology Center) instructors and coordinators through the collaborative works between EWTEC staff specialized in hydrogeology and with the researchers of Addis Ababa University, utilizing the machinery which EWTEC owns.
- The final products of the hydrogeological survey will be used as course materials and utilized in planning of water use in the targeted area.

The training contents include the following topics:

Table 20: Contents of Specialized Techniques

Project Year	Contents of activities	Remarks
Third Year	Hydrometeorological data collection and analysis	Approx. 1 month for field survey
	Geological structure analysis using satellite image	
	Creation of base maps using GIS	
	Data collection and inventory	
Fourth Year	Sampling of water quality testing	Approx. 2 months for field survey
	Geophysical survey, geological survey, etc.	
	Creation of geological and hydrogeological maps	
Fifth Year	Isotope and geochemical analyses	Approx. 10 days for field survey
	Groundwater recharge analysis and groundwater modeling	
	Reporting	



Rift valley lakes basin Bilate sub-basin

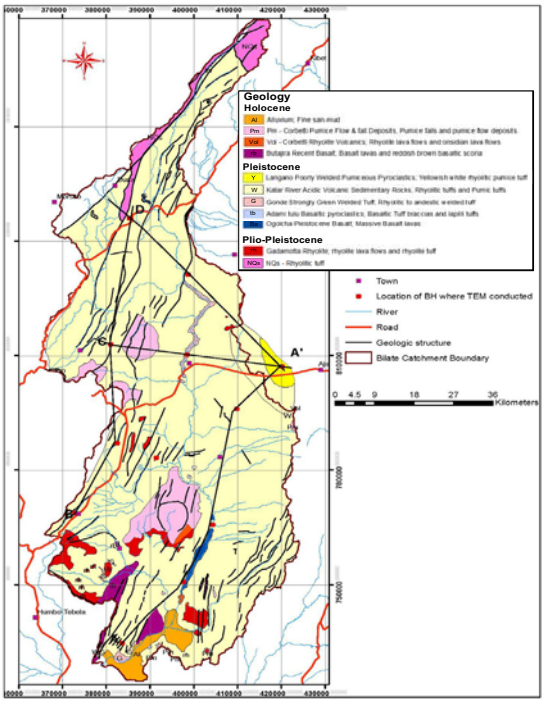
Figure 10: Training area of specialized techniques

As mentioned in Table 20 above, not only classroom-based survey work, but also field surveys were conducted in the Bilate sub-basin. In particular, the geophysical survey was carried out using 2D resistivity imaging and electro-magnetic survey (TEM method), and correlation with the existing drilling data and analyses were also conducted. Geochemical analysis was carried out using isotopes and tritium. Furthermore, the geochemical survey and groundwater modeling was mainly executed in collaboration with AAU.

A course coordinator of groundwater management course has achieved the ability to perform isotope analysis as a result of attending the isotope hydrology training course with IAEA. Also the same coordinator's practical ability of water quality analysis has been enhanced by gaining knowledge of groundwater flow analysis concepts and by applying the distribution of key ions based on the results of water quality analysis of AAU. The coordinator of the geophysical survey course has also been able to strengthen the exploration technology and analysis ability through the field survey of geophysical exploration carried out in this project based on the experience of the geophysical exploration training course conducted as an advanced training of EWTEC. Moreover, the coordinators have been able to deepen their understanding of groundwater modeling through the discussions with a master's course student and professor of AAU.

As a result, the training area for the field survey of groundwater management course was secured near Addis Ababa, and the survey reports of Bilate sub-basin will be utilized as training materials of new curriculum for EWTEC in the future.

Map samples through the Bilate practical training are shown in the figures below:



The main geology in Bilate sub-basin is that the lower part consists of strongly welded tuff layers and rhyolite lava deposits, also old basalt lava deposits are partly interspersed. All of these strata above are covered by the strata which consist of acidic volcanic sediments and pumice flow deposits. Alluvial deposits are distributed in the area surrounding Lake Abaya.

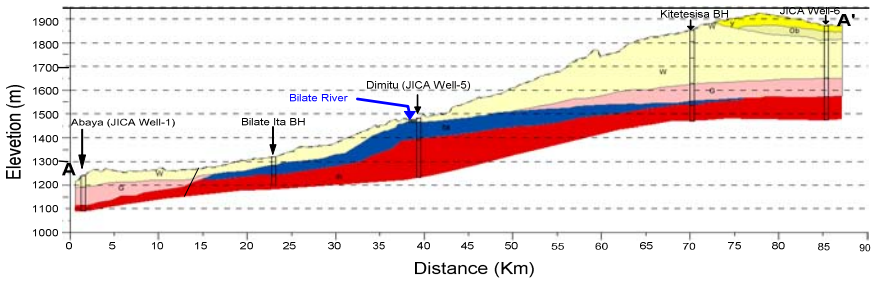
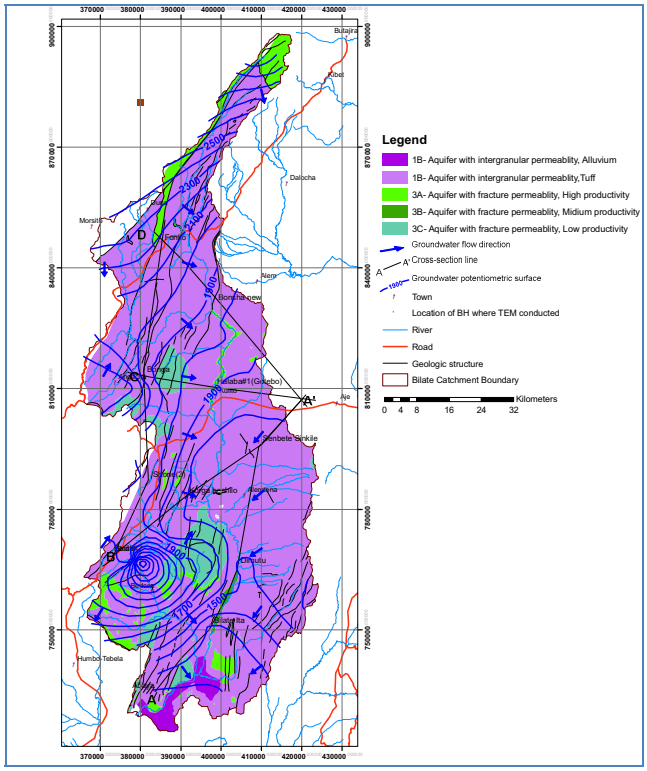


Figure 11: Geological Map (above) and Profile (below) in Bilate Sub Basin



Hydrogeological aspects were categorized in Bilate sub-basin based on the legend of a scale of 1:2,000,000 hydrogeological map of the whole of Ethiopia. This found that Bilate sub-basin has middle to high groundwater potential.

Figure 12: Hydrogeological Map of Bilate Sub-Basin

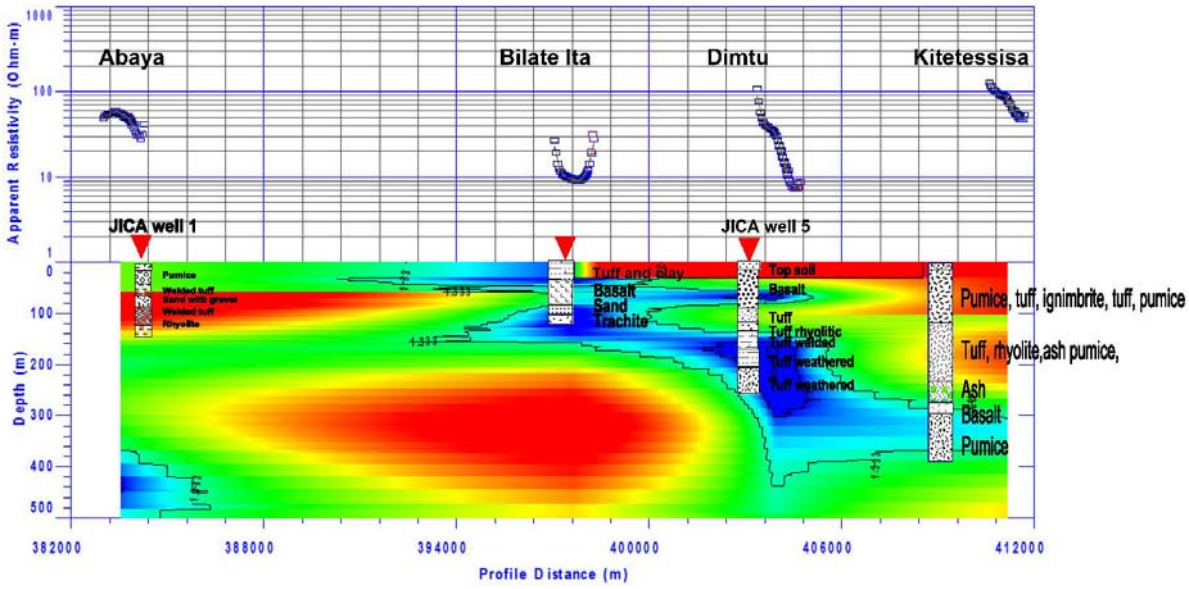


Figure 13: Sample of Geomagnetic Survey Results in Bilate Sub-basin

The elecromagnetic survey was carried out at twelve points in the Bilate sub-basin. In addition, 2D vertical resistivity imaging was also conducted. Figure 13 shows the geomagnetic profile from south to north direction in the Bilate sub-basin. This found that the permeability of strata relatively correlates with the resistivity of strata.

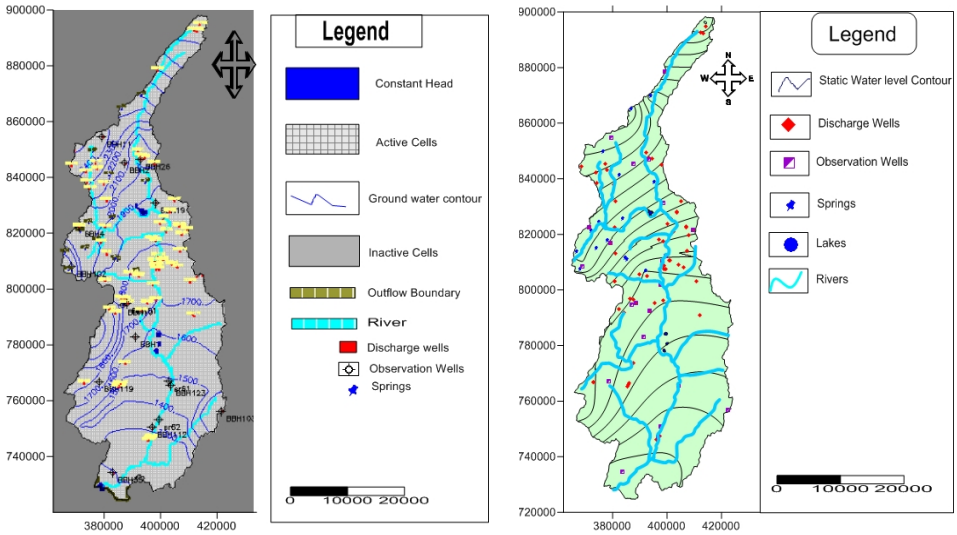


Figure 14: Simulation results of groundwater modeling (calculated (left), observed (right))

The calculated and observed groundwater contour maps are shown in Figure 14. The contour map calculated by groundwater modeling corresponds well to the contour map observed using the analysis of existing wells. It means that the groundwater model generally fits with the reality of Bilate sub-basin.

(2) Drilling Technology (DT)

As a part of troubleshooting of drilling, fishing tools which can be manufactured with locally available materials were designed. Manufacturing was requested to a screw cutting workshop in Addis Ababa. These tools are used when drilling bits or pipes are dropped down into the borehole during drilling. This was the first time fishing tools had been manufactured in Ethiopia, therefore there were mistakes and failures during the process, but as a result of trial and error two prototypes were produced. A Japanese expert gave a demonstration with these tools in the DT course.

Moreover, Japanese experts conducted Well Diagnosis and Well Rehabilitation course (advanced) as a part of capacity development for course coordinators. Borehole observation with borehole camera was conducted by the course coordinator and rehabilitation works with rig and crane track was conducted by chief driller under Japanese experts' instruction. The course was conducted three times in Phase 3 and its contents became more advanced technically each time.

During rehabilitation, there is a risk to make the well unproductive, therefore, the target well used to be selected from those which were not in use for the training. However, the rehabilitation was conducted with a production well at last, which required more care and attention. Regarding management of the training, the course coordinator needed to collaborate with people from other organizations or a private company which owned the well. The C/Ps in charge of WD/WR

improved their technical and management skills through all of the tasks involved and with the advice of Japanese experts.

In order to maintain the machine in proper condition, ensuring sufficient spare parts is crucial. Maintenance of the machine has so far relied solely on the spare parts provided by JICA. However, it is necessary for EWTEC to procure spare parts by itself after the project. Through the above advanced course, C/Ps learnt a series of essential steps in the procurement flow such as determining necessary parts, obtaining a cost estimate, price negotiation, making a contract, etc.

(3) Drilling Machinery Maintenance Technology (DMMT) / Electro-mechanical Maintenance Technology (EMMT)

Capacity development for C/Ps in charge of DMMT and EMMT was focused on improvement of practical skill since the beginning of Phase 3. A Japanese expert continuously provided training for machinery maintenance through repairing of used vehicles and generators. Under the Japanese expert's instruction, C/Ps acquired various skills needed on site through repeated maintenance and repair assignments. Major exercises conducted are shown below.

1) Disassembling & assembling of engine generator and performance test

An engine generator of EWTEC was used as a training material. It was beneficial for EWTEC because the engine was checked in detail and maintained through this training. The purpose of the training was:

- To get an actual feeling and see with their own eyes an efficient setup.
- To learn subjects normally learnt separately--diesel engine, generator, control device and accessories--all together.
- To gain an awareness of the differences between theory and practice.

One can see that an actual machine is not manufactured according to theory, but is a product based on many concrete rules and its focus is on cost efficiency. This is the result of many years of experience that is not included in any textbooks. They should learn how to play it by ear through repetitive training in such parts that are not in textbooks.

After disassembling and assembling the generator, C/Ps manufactured a simple load tester under the instruction of the Japanese expert and conducted an actual test. The C/Ps, including course coordinators, could not use the conversion formula for the testing, which made them recognize that only having knowledge from a textbook didn't work at an actual work site.

2) Repairing of engines on vehicles (overhaul)

As capacity building for C/Ps, repair work of a pickup truck that had been disused for years was conducted. The purpose of the training was to experience methods that cannot be learnt in a lecture, to recognize what skills they are lacking and to understand the importance of such methods and skills. The overhaul work mostly involved repairing engine, clutch and chassis, and sheet-metal painting. All of the spare parts for the training were listed up by the C/Ps and purchased from local suppliers with the project budget. Although the training continued for around two years, it led them to build their confidence and improve the basic course contents utilizing the acquired experiences. Furthermore, the instructors had changed to undertake aggressively the task of repairing works for other EWTEC vehicles by themselves.

Before maintenance | After maintenance

Figure 15: Practical training of overhaul of used vehicles

To experience different types of actual work, opportunities of field visits were provided for C/Ps as much as possible during the basic courses and training in TVETC. The C/Ps had opportunities to understand problems of local organizations and regional characteristics. Trainees come from all regions of the country. C/Ps will accumulate such experiences and use them in the actual training course they provide, then, the training is expected to become more practical and realistic. Furthermore, visiting sites helped to establish a network between EWTEC staff and regional

offices and other organizations.

Recently most machinery used in the field is controlled by electric devices according to improvement of its functionality. Therefore, even mechanics have to have knowledge of electricity. For this reason, the Japanese expert has emphasized to have experience and knowledge of both electricity and machinery as a qualification of those who work in this field. To this end, an advanced course that combines both fields, "Hydraulic system maintenance" was conducted.

(4) Water Supply Engineering (WSE)

It was difficult to transfer knowledge and skills of this field from a Japanese expert to C/Ps because of high turnover and absence of C/Ps, as well as the wide range of content the course covers. WSE covers: groundwater investigation, water pumping management, water quality control, water supply planning, facilities design, construction and so on. The training also requires many lecturers with different fields of experience. The course coordinator is required to have a broad knowledge to control the training and lecturers even if he doesn't have a complete knowledge of every subject. At last, one course coordinator was assigned in the 4th year of the project. Even though he had a limited chance to learn from Japanese experts directly, he was provided chances to attend training such as on Groundwater Modeling (international workshop), Software Application on Water Supply Engineering (advanced course) and training in Japan (Groundwater Management) for his technical capacity development during the absence of the Japanese expert. The training in Japan consisted of site visits to a medium-sized water treatment plant in an urban area to widen his knowledge of surface water utilization. Furthermore, he visited a city where public water supply was covered by only groundwater and learnt the case study of monitoring for groundwater management and groundwater resource protection by collaborative activities among local administration, private sector and academic organizations.

2.5.3 Capacity development for maintenance of equipment used in training

(1) Environmental arrangement for storage of electronics (EMMT)

It is important to protect electronics and its accessories used for practical training on EMMT from humidity and dust. It has remained a serious issue especially in Ethiopia where it is so dusty in the dry season. Repair works for EMMT workshop was completed in the 4th year and included a small room for storage of electronics and its accessories like components of switch boards. It provided proper management of those materials and was very helpful with respect to maintenance

of machinery and its apparatus. Furthermore, for training purposes, trainees could take a look at the storage condition that it must be stored in, as it is in EWTEC and could gain some ideas for improvements at their workshops.

(2) Storage arrangement for spare parts of drilling rigs (DMMT)

The storage system was improved so that the C/Ps can themselves manage the equipment and tools supplied through this project. EWTEC engineers had relied solely on store keeper before, but now, engineers and the store keeper work together for better storage management. Some frequently used tools are kept in the engineers' rooms under their responsibility. There has been a change in their attitudes. Therefore, engineers give instructions on how to lay out the equipment in the store room. The equipment for drilling rigs purchased from Japan was stored in container storage because of the size and the quantities. When those were stored, engineers and the store keeper worked together to store the spare parts smoothly.

2.5.4 Counterpart training in Japan

During Phase 3, three training courses were conducted in Japan. Eleven staff members from EWTEC attended at the training. The details are as follows.

(1) Electro-mechanical/workshop management course (1st)

1) Period

April 7 (Sat), 2012 ~ April 29 (Sun), 2012 (with moving day)

2) Place

Lecture and practical training: Machinery manufacturing and maintenance factories
(Denyo Co., Ltd., MARUMA Technica Co., Ltd. and Technica Co., Ltd.)

3) Participants

Mr. Endris Mohammed (Instructor of DMMT)
Mr. Getachew Lemlem (Mechanic of DMMT)
Mr. Tsegaye Endale (Course coordinator of EMMT)

4) Objectives

- To understand practical workshop management in Japanese renowned manufacturing and

maintenance companies.

- To gain knowledge how to construct maintenance systems in EMMT/DMMT through the comparison between EWTEC and the factories.
- To gain experience in use of up-to-date testing instruments, machines and tools.

5) Contents

The training was provided to improve their understanding of operation management for activities of income generation through the practical training in those factories of Japan.

- Repair and maintenance work on generators and compressors.
- Repair and maintenance work on hydraulic systems.
- Experience of workshop management.

6) Achievement

- Although the term of training was comparatively short at three weeks, trainees were satisfied very much. All of the trainees participated in the training with high motivation and the question and answer session often went over the allotted time because they asked the lecturers so many questions. The trainees were satisfied with the training due to the lecturers who provided the training flexibly according to the needs of the trainees.
- The trainees gained knowledge of the workshop management, especially about safety policy and daily checks that can be utilized without any additional facilities.
- The trainees are expected to share this experience with their colleagues at EWTEC and other engineers in Ethiopia through their lectures.
- The textbooks and ideas of practical training equipment obtained through this training will be utilized in the actual training in EWTEC.

(2) Electro-mechanical/workshop management course (2^{nd})

1) Period

February 2 (Sat), 2013 – February 24 (Sun), 2013 (with moving day)

2) Place

Lecture and practical training: machinery manufacturing and maintenance factories
(Denyo Co., Ltd., MARUMA Technica Co., Ltd. and Technica Co., Ltd.)

3) Participants

Mr. Abebe Mekonnen (Course coordinator of DMMT, center head)

Mr. Getachew W/Michael (Mechanic of DMMT)

Mr. Makonnen Aweke (Chief driller of DT)

Ms. Woinshet Damtew (Mechanic of DMMT)

4) Objectives

- To understand practical workshop management in Japanese renowned manufacturing and maintenance companies.
- To gain knowledge how to construct maintenance systems in EMMT/DMMT through the comparison between EWTEC and the factories.
- To gain experience in use of up-to-date testing instruments, machines and tools.

5) Contents

The training was provided to improve their understanding of operation management through the practical training in those factories of Japan.

- Repair and maintenance work on generators and compressors.
- Repair and maintenance work on hydraulic systems.
- Experience of workshop management.

6) Achievement

- Trainees gained knowledge of the workshop management, especially about safety policy and daily checks that can be utilized without any additional facilities.
- Trainees gained a wide range of experience in maintenance work through explanations with actual damaged components.
- The trainees could see how much particular attention the Japanese engineers paid when they were at their working places.

(3) Groundwater management course

1) Period

April 10 (Wed), 2013 – April 28 (Sun), 2013 (with moving day)

2) Place

- Kitakata City, Fukushima Prefecture
- Ono City, Fukui Prefecture
- Water department, Akishima city, Tokyo metropolitan area
- Waterworks department (Sakai water treatment plant, Water control center, Water quality control center and Misono water treatment plant), Tokyo metropolitan area
- Environmental agency, water and sewerage agency, Kumamoto City, Kumamoto Prefecture

3) Participants

Mr. Tamiru Fekadu (Course coordinator of GWI)
Mr. Geremew Game (Course coordinator of DT)
Mr. Hailemichael Agdew (Course coordinator of WSE)
Mr. Fussen Endre (Course coordinator of GWI)

4) Objectives

- To acquire practical skills regarding groundwater utilization and management through case studies in Japan.
- To learn the attitudes of Japanese experts at work (management, security and efficiency)
- To use Japanese case studies efficiently for improving the level of training in EWTEC.

5) Contents

- The training was provided to learn utilization, monitoring and protection of groundwater resources through case studies in Japan and to learn a wider range of water utilization through comparison with surface water utilization in an urban setting.
- Site visits to local water supply and monitoring facilities to understand utilization and management of groundwater from medium to large scale cities in Japan.
- Introduction of former cases of ground subsidence, pollution and depletion of groundwater caused by over-pumping in Japan.
- Learning geological formations, geological conditions, hydrogeological conditions and groundwater utilization in the classroom in each city, visiting sites such as the control systems for groundwater and well-conserved spring areas.
- Visit to a Japanese paddy field recharged artificially and featuring a monitoring system for observing the groundwater level.

6) Achievement

- Trainees gained knowledge and means for groundwater utilization through actual case studies in Japan.
- Trainees learnt how to maintain and protect water resources and the harmful effects if any measures were not applied from Japanese history by visiting sites.
- The importance of observing actual phenomena at sites for the design of groundwater modeling and simulation. Trainees learnt monitoring system for collecting such data and its analysis methods through explanation by Japanese experts.
- Trainees gained ideas about the merits to utilize surface water at a water treatment plant. By understanding surface water utilization, trainees gained a wider knowledge of total water utilization.

2.6 Output 4: "Sustainable institutional management capacity in terms of organizational, financial, accounting, personnel, marketing, and workshop management capacity of EWTEC is strengthened"; Related Activities

2.6.1 Holding periodical meetings among C/Ps and JICA Experts to inform the progress of the Project and to discuss issues

In addition to the daily meeting with individual C/Ps, an EWTEC general meeting was held periodically (once every 3 to 4 months) together with Japanese experts and EWTEC staff (course coordinators, instructors, training management staff etc.) to discuss progress of EWTEC transformation, training schedule, Japanese expert dispatch schedule, problems and other activities etc.

2.6.2 Developing mid- to long-term EWTEC Strategy which includes vision, mission, role and position, and its operational plan

(1) Movement towards a Public Institute

In the latter half of the 3rd year of the Project (March 2011), the direction towards a public institution of EWTEC has been formally indicated by MoWIE, and the Task Force toward EWTEC transformation, which consists of the Ethiopian side and the Japanese experts, was formed.

Necessary documents such as 1) transformation plan to a public institution and 2) business plan (5 years) with regard to the public institution of EWTEC were prepared and submitted upon the request of and in the name of the Minister of Water and Energy to the Prime Minister's Office (PMO) officially in December 2011. In January 2012, PMO responded with positive attitude for the requested transformation of EWTEC towards a public institute by giving instruction to undertake further study jointly with the Ministry of Education (MoE). In response to this, MoWIE and the officials of MoE held a meeting, and established Joint Study Committee consisting of representatives from each ministry, and began a study on the future direction of EWTEC. As a result, it was decided that EWTEC would become a public institute. The Joint Study Committee was composed of six people in total; 2 from the MoWIE, 2 from MoE, and 2 from EWTEC, and prepared a study report and submitted it to PMO, with the signature of the ministers of the two ministries in May 2012. Discussion and amendment of draft regulation were continued and establishment of a new public institute, Ethiopian Water Technology Institute (EWTI) was basically approved. Finally, the regulation was officially published on Negarite Gazette in August 2013.

The following table summarizes detailed activities for the transformation of EWTEC into a public institute in chronological order.

Table 21: Activities for the transformation of EWTEC

Date	Major Activity (of Working Group)
December 2010	On 1st December 2010, the new Minister of MoWIE (H. E. Alemayehu Tegenu) issued a letter within the ministry which stated to officially set up a special committee to investigate the current situation of EWTEC and the possibility of making it semi-autonomous. The committee was composed of five members, including the head of EWTEC, one course coordinator, and heads of relevant departments.
March 30, 2011	The State Minister of MoWIE submitted a letter addressed to JICA Ethiopia office, stating that the direction was set to make EWTEC semi-autonomous. The letter was attached with the report by the special committee.
June 8, 2011	Japanese experts, WSSCBD director (Dr. Markos) and EWTEC head discussed working process for transformation of EWTEC into a semi-autonomous entity and members of the taskforce. It was confirmed that MoFED has agreed that EWTEC would start income generation activities from September 2011. (Actually, income generation activities were not realized.)
June 11, 2011	MoWIE State Minister, EWTEC, JICA Ethiopia Office and Japanese experts confirmed the necessary activities and documents for EWTEC transformation plan. The activity of the taskforce was officially started.
September 2, 2011	State Minister of MoWIE (Mr. Kebede Gerba, in charge of water) and JICA Ethiopia Office, checked the progress of transformation of EWTEC towards a public institution. As a form of future organization of EWTEC, there are two choices, Public Institute and Public Enterprise. Working Group summarized the advantages and disadvantages of these choices, and submitted its findings. State Minister expressed his ministry’s decision that EWTEC shall become a Public Institute. In looking at the two alternatives, whereas the former choice is financed from the government budget, while the latter is almost financially independent.

Date	Major Activity (of Working Group)
October 26, 2011	Meeting at MoWIE together with Mr. Wondimu Tekle and JICA Ethiopia Office. Discussion based on the transformation plan (draft) prepared by the working group.
November 17, 2011	MoWIE wrote a letter addressed to MoFED requesting the need for establishment of EWTEC as an autonomous public institution.
December 15, 2011	Draft letter to PMO and final draft of both transformation plan and business plan were submitted to MoWIE. Discussion held at MoWIE with State Minister /Water Sector/ on sending the proposal of EWTEC establishment as an autonomous organization to PMO.
December 28, 2011	Letter signed by Minister of MoWIE was sent to PMO along with study documents of EWTEC requesting permission for reorganization of EWTEC as an autonomous organization.
January 10, 2012	PMO responded to MoWIE in a letter addressing positive opinion on EWTEC transformation and necessity of joint study on the issue by MoWIE & MoE.
January 30, 2012	Higher officials of MoWIE & MoE met and discussed on how to proceed with the joint assignment as instructed by PMO. State Minister advised to make EWTEC into "Fully autonomous public institute" not "semi-autonomous". It was decided that the details of future plan shall be discussed by committee meetings
February 2, 2012	A joint study committee was established with members from both ministries to conduct a thorough study of EWTEC's future role and organization set-up
February 20, 2012	The letter titled "Notification of EWTEC's Transformation Progress Status" was issued to JICA from MoWIE
February 22, 2012	2 members of the committee from MoE visited EWTEC facilities and had simple discussion about committee's assignment and schedule of meeting with members from MoWIE.
March 8-12, 2012	Committee meeting took place with all of the members at Debre Zeit Management Institute (2 from MoWIE, 2 from MoE, 1 from EWTEC and 1 consultant). In this meeting, they had discussed about framework of EWTEC in the future.
March 26, 2012	The Committee finalized its assignment and submitted its study report to the MoWIE and MoE ("Proposed Role & Organization Set-up of EWTEC", Joint Study Committee Report). Direction to make EWTEC a public institute was decided.
May 03, 2012	Memorandum of Understanding signed by the cosignatory (Minister of MoE) and it was sent along with the joint study committee report to PMO with the covering Letter which was earlier signed by Minister of MoWIE.
December 18, 2012	MoWIE submitted a draft Regulation for establishment of Ethiopian Water Technology Institute (EWTI) to PMO.
January 29, 2013	Council of Ministers was held and EWTEC transformation was discussed. The Prime Minister basically accepted that EWTEC becomes a Public Institute as a National Center of Excellence. However, he directed to modify the submitted regulation in the following points. ■ Description about any services that aim for income generation such as well drilling and hydro geological study should be deleted and new EWTEC should focus more on training and technical transfer. ■ Establishment of water quality and soil testing laboratory. ■ Other issues are suggested to be dealt in similar with the already established institutions under Ministry of Industry
February 5 2013	Legal Directorate of MoWIE notified with memo that MoWIE sent an acceptance letter with revised Regulation in accordance with the three comments to PMO after internal discussions with the Minister, the State Minister, Legal Department and all relevant personnel.
March 1, 2013	Council of Ministers was held and EWTEC transformation was discussed. The Prime Minister basically accepted that EWTEC becomes a Public Institute as a National Center of Excellence. However, he directed to modify the submitted regulation in the following points. ■ Description about any services that aim for income generation such as well drilling and hydrogeological study should be deleted and new EWTEC should focus more on training and technical transfer. ■ Own salary scale can be set based on the scale of existing similar organizations. ■ Establishment of water quality and soil testing laboratory.

Date	Major Activity (of Working Group)
April 30, 2013	The final Draft Regulation was submitted to the PMO.
June 5, 2013	Based on the comment from PMO, draft regulation was amended. Amendment for the salary scale of administrative staff.
June 21, 2013	Draft regulation was approved by the cabinet meeting.
August 6, 2013	Negarit Gasette on the establishment of Ethiopian Water Technology Institute (EWTI) was issued.

(2) Changes after EWTEC becomes a Public Institute (EWTI)

The comparison of the situation between EWTEC and after becoming a public institute (EWTI) is summarized in the following table.

Table 22: Changes after EWTEC becomes a Public Institute (EWTI)

Item	EWTEC	EWTI
Position	Project	Public institute
Planning and budget	Plan and budget proposal are submitted to MoFED through MoWIE.	Plan and budget proposal are first approved by MoWIE and then submitted directly to MoFED.
Staff employment	Through MoWIE (as MoWIE staff)	Direct employment
Salary	Based on the government standard (with project allowance)	Own special salary scale but first it has to be approved by PM Office. Promotion and dismissal are based on the civil service law.
Income generation	None	Through water quality and soil testing by the new laboratory. Investigation and drilling works for regional support will continue. (Income generation is not the purpose of these activities but as by product of these and training activities)
Procurement	Through MoWIE	Direct procurement based on the approved budget is possible
Relationship with the third parties	Through MoWIE	Direct contact is possible
Support for regions	Order from MoWIE	To the extent possible based on the request from MoWIE
Research and development	As training for EWTEC staff members	One of its main duties
Training course	Only short term courses (max. 3 months) Certificate of EWTEC	Short term and long term courses (about 1 year) Based on EOS except some courses
Training cost, registration, accommodation, transportation, food, pocket money	MoWIE covers all	For short term course - EWTI budget covers all (the same as current situation) For long term course – Training cost is covered by EWTI but other costs are covered by trainees (the same as current TVETC)
Water sector policy making	Not involved	Not one of its main duties but possible to forward policy improvement ideas

With more autonomy of management especially technical and administrative aspects, EWTI is expected to strengthen its activities including human resource development, research and technology transfer and TVTEC support. EWTI has to be a hub institution in the water sector in Ethiopia by linking existing needs in TVETCs, local governments, industry and community, domestic and international human resources as instructors and available budget sources. The concept is illustrated in Figure 16.

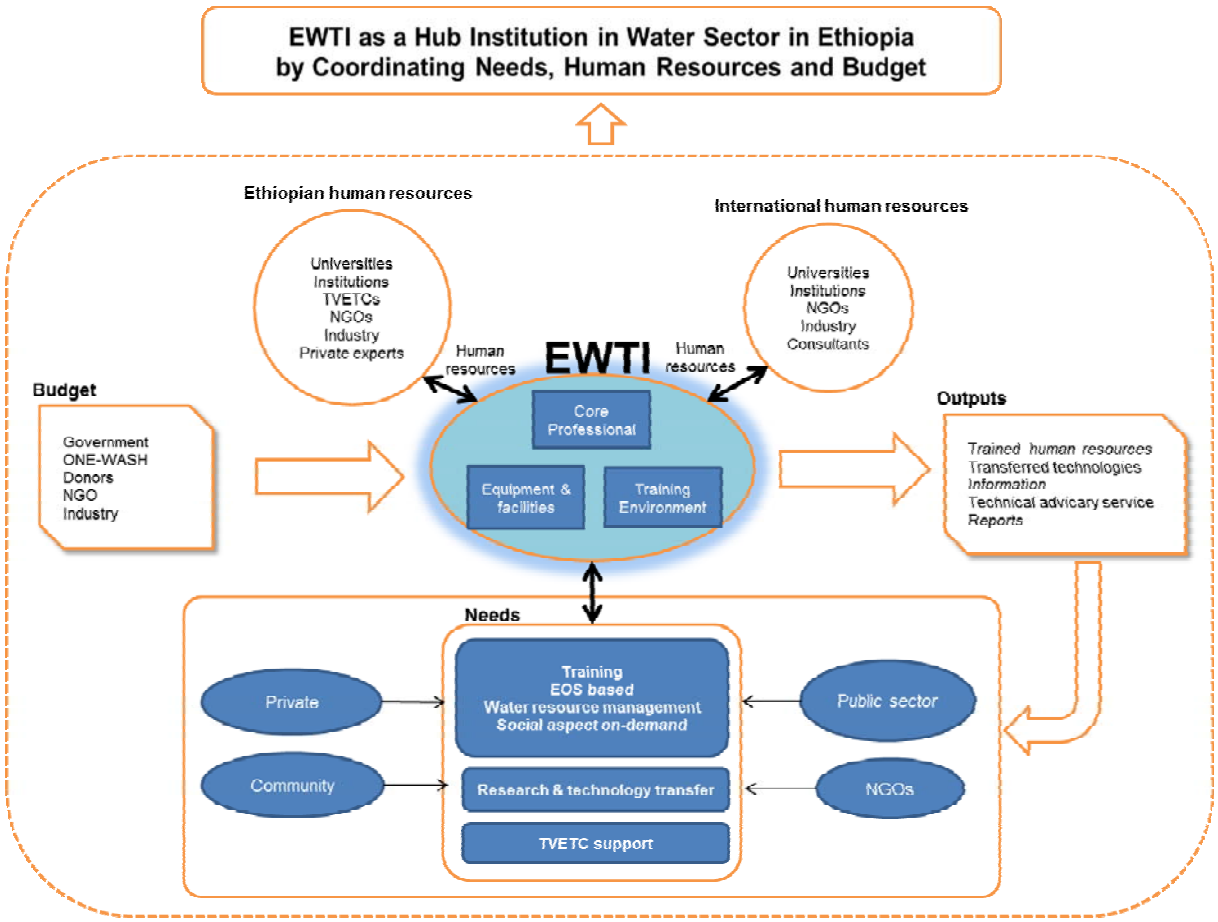


Figure 16: Schematic Overview of the Future EWTI

(3) EOS-based training by new EWTI

MoE has developed the National Technical Qualification Framework (NTQF) for all TVET sectors, based on Competency Based Training (CBT) which has been widely introduced in many other countries. NTQF defines occupational standards by Levels 1 to 5 and units of competency under each level. Each unit of competency describes a unit descriptor, element and its performance criteria and evidence guide.

MoE has also developed model curriculum for each occupational standard. Based on this model

curriculum, training providers such as TVETCs and EWTI are expected to prepare their own curriculum, develop training materials, assessment tools and arrange necessary training equipment. According to the information from MoE focal person, Australian CBT system was used as a model for the EOS of the water sector in Ethiopia.

One of the most important missions for the new EWTI is to deliver long-term training courses for Level 1 to 5 under the Ethiopian Occupational Standards (EOS) set by MoE. In the water sector, there are 16 occupational standards as shown in Table 23. In the short term, in addition to on-demand tailor made short-term courses that EWTEC has provided in the past, EWTI is expected to deliver Level 1 to 5 for "Water Well Drilling and Construction" and "Electro Mechanical Equipment and Machinery Maintenance" and Level 4 and 5 for all occupational standards in the water sector, as shown in the shaded areas in Table 23.

Table 23: Ethiopian Occupational Standards in the Water Sector and Number of Unit of Competency

(Number of unit of competence)

No	Occupational Standard	Level 1	Level 2	Level 3	Level 4	Level 5	Total
1	Water Well Drilling & Construction (WWDC)	10	8	9	12	15	54
2	Irrigation & Drainage Designing & Construction (IDDC)	-	10	10	12	15	47
3	Water Supply System Structue Construction & Maintenance (WSSSCM)	10	7	9	12	15	53
4	Electro Mechanical & Machinery Maintenance (EMMM)	8	7	6	4	-	25
5	Irrigation & Drainage System Operation & Maintenance (IDSOM)	-	5	4	4	-	13
6	Water Supply Distribution	-	6	6	6	-	18
7	Water Treatment	-	5	5	5	-	15
8	Wastewater Collection & Treatment	-	6	5	5	-	16
9	Geothechnical Well Drilling	9	10	5	3	-	27
10	Groundwater Utilization	-	7	6	6	-	19
11	Hydrometric Monitoring	-	7	6	6	-	19
12	Catchment Operation	6	5	12	6	-	29
13	Dam Operation & Source Protection	-	5	9	7	-	21
14	Meteorological Observation	-	14	-	-	-	14
15	Meteorological Technical Assistance	-	-	14	-	-	14
16	Meteorological Forecasting	-	-	-	16	-	16
	Total	**43**	**102**	**106**	**104**	**45**	**400**

Training to be delivered by EWTI
Training to be delivered by TVETC

The number of units of competence that EWTI has to cover: **197**

In the future, based on EWTEC's training experiences, EWTI will expand its training areas, particularly covering the sanitation area. In addition, EWTI will strengthen EOS based long and short-term training courses, as well as non-EOS based on-demand tailor made short-term training courses. Consequently, EWTI, as a center of excellence for water related human resource development, will cover the water supply and sanitation areas of the WASH sector and the water resource management sector. The expansion of training areas of EWTI is illustrated in Figure 17.

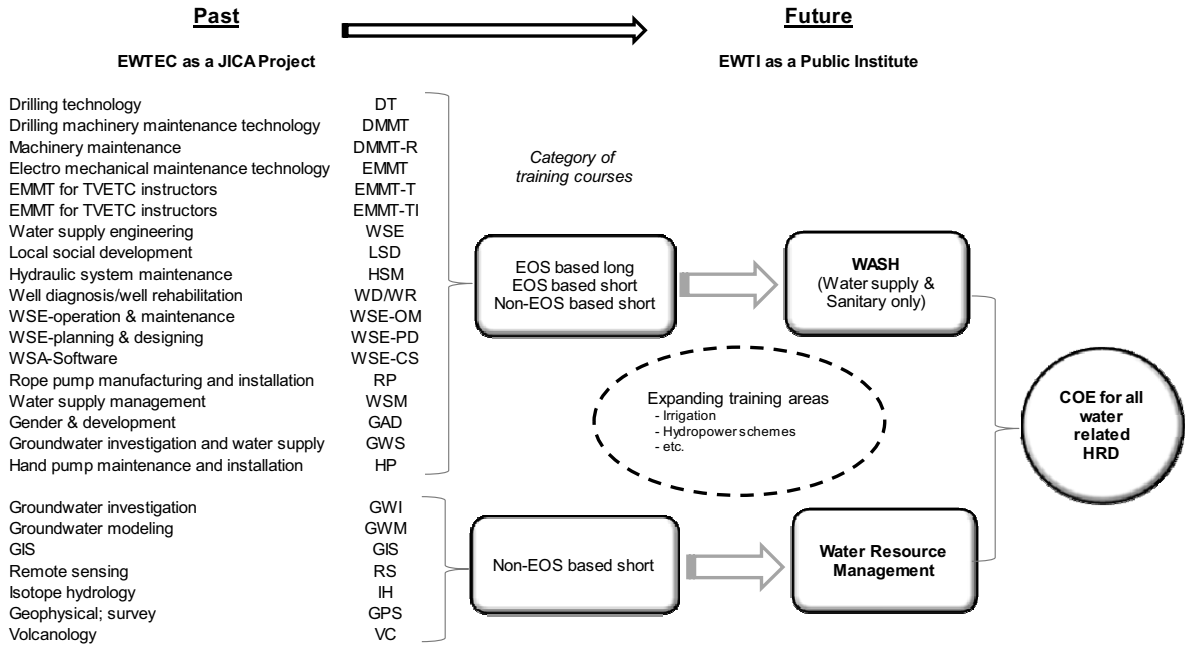


Figure 17: Expansion of Training Areas of EWTI

(4) Growth Scenario

Three cases were examined to identify the most plausible growth scenario, that is, low, middle and high growth depending on the amount of capital investment for three years. The definition of three scenarios is described in Table 24 and the estimated capital investment is shown in Table 25.

The maximum numbers of trainees were estimated in Table 26, Table 27 and Table 28 for low, middle and high growth scenarios, respectively.

Table 24: Definition of three growth scenarios

Growth Scenario	Definition
Low	Minimum investment to maintain EWTI's activities and as a result no long term training courses possible
Middle	Sufficient level of investment to provide long term training courses for four occupational standards in the water development sector.
High	Sufficient level of investment to provide long term training courses for occupational standards in the water development and sanitation sectors.

Table 25: Comparison of capital investment among three scenarios

Investment items	Unit cost (Birr)	No	Cost (Birr)	Scenario		
				Low	Middle	High
1. Building						
Dormitory 1	11,053,600	1	11,053,600		x	x
Dormitory 2	11,053,600	1	11,053,600		x	x
Dormitory 3	11,053,600	1	11,053,600			x
Central block	20,600,568	1	20,600,568		x	x
Hall	3,678,734	1	3,678,734		x	x
Toilet	651,892	1	651,892		x	x
Guard house	296,061	1	296,061		x	x
Car shade	119,694	1	119,694		x	x
Fountain	313,733	1	313,733		x	x
Site sanitary	2,674,276	1	2,674,276		x	x
Site electrical	1,004,437	1	1,004,437		x	x
Site work	5,396,678	1	5,396,678		x	x
Interior/desk/chair/bed	2,500,000	1	2,500,000		x	x
Interior/desk/chair/bed	2,500,000	1	2,500,000		x	x
2. Machine/equipment						
Major maintenance of 3 existing rigs and vehicles						
Schramm (300m)	12,000,000	1	12,000,000	x	x	x
YBM (300m)	3,500,000	1	3,500,000	x	x	x
Vehicles (6 cars)	2,500,000	1	2,500,000	x	x	x
Workshop equipment for electric shop	.					
Bench vice	4,000	1	4,000	x	x	x
Hand drill machine	3,000	1	3,000	x	x	x
Grinder (pedestal)	3,500	1	3,500	x	x	x
Mechanical/electrical tools set 1	10,000	1	10,000	x	x	x
Mechanical/electrical tools set 2	10,000	1	10,000	x	x	x
Workshop equipment for mechanical shop						
Universal hydraulic tester	4,000,000	1	4,000,000	x	x	x
Lathe machine	500,000	1	500,000	x	x	x
Milling machine	500,000	1	500,000	x	x	x
Fuel inj. pump test bench for heavy equip.	4,000,000	1	4,000,000	x	x	x
Cylinder boring machine	600,000	1	600,000	x	x	x
Welding machine	15,000	1	15,000	x	x	x
300m drilling rig set (Schramm)						
Rig with drilling tools	15,000,000	1	15,000,000		x	x
Crain truck	1,500,000	1	1,500,000		x	x
Compressor	1,000,000	1	1,000,000		x	x
Compressor carel truck	1,000,000	1	1,000,000		x	x
600m drilling rig set (with air compressor/truck)						
Rig with drilling tools	20,000,000	1	20,000,000		x	x
Crain truck	2,000,000	1	2,000,000		x	x
Compressor	1,800,000	1	1,800,000		x	x
Compressor carel truck	1,500,000	1	1,500,000		x	x
Laboratory middle scale	20,000,000	1	20,000,000		x	
Laboratory large scale more sanitation focus like toxics	40,000,000	1	40,000,000			x
Database and network system	5,000,000	1	5,000,000		x	x
3. Transportation						
Pick-up double cabin						
Cabin 1	600,000	1	600,000	x	x	x
Cabin 2	600,000	4	2,400,000		x	x
Station wagon(long base:14 seats) 1	1,500,000	1	1,500,000	x	x	x
Station wagon(long base:14 seats) 2	1,500,000	2	3,000,000		x	x
Coaster bus (25 seats) 1	750,000	3	2,250,000		x	x
Sedan 1	500,000	1	500,000	x	x	x
Sedan 2	500,000	1	500,000		x	x
Sedan 3	500,000	1	500,000			x
Sedan 4	500,000	1	500,000			x
			Total (Million Birr)	**30.2**	**169.0**	**201.1**

Table 26: Numbers of Trainees for Low Growth Scenario

Low growth scenario					Base year			Target								
					2011/2012			2012/2013			2013/2014			2014/2015		
Training Category	Target	Course title	EOS Level	Period (month)	Actual (No. of person)	Boading (MM)	Total (No. of person)	Plan (No. of person)	Boading (MM)	Target (No. of person)	Plan (No. of person)	Boading (MM)	Target (No. of person)	Plan (No. of person)	Boading (MM)	Target (No. of person)
Short	Sector professional	Basic	-	1	150	150		0	0		100	100		100	100	
		Advanced	-	1	61	61	251	0	0	52	51	51	255	51	51	255
		On-demand	-	1	40	40		52	52		104	104		104	104	
	Water TVET trainee	EMMT	-	1	129	129	129	120	120	120	100	100	100	100	100	100
	Water TVET instructor	EMMT	-	1	18	18	18	18	18	18	54	54	54	54	54	54
Long	Sector professional	WWDC	1	17	0	0		0	0		0	0		0	0	
			2*	12	0	0		0	0		0	0		0	0	
			3	6	0	0		0	0		0	0		0	0	
			4 (WWCSM)	3	0	0		0	0		0	0		0	0	
			5 (CM)	3	0	0		0	0		0	0		0	0	
		IDDC	4 (WWCSM)	3	0	0		0	0		0	0		0	0	
			5 (CM)	3	0	0	0	0	0	0	0	0	0	0	0	0
		WSSSCM	4 (WWCSM)	3	0	0		0	0		0	0		0	0	
			5 (CM)	3	0	0		0	0		0	0		0	0	
		EMMM	1	12	0	0		0	0		0	0		0	0	
			2	12	0	0		0	0		0	0		0	0	
			3	6	0	0		0	0		0	0		0	0	
			4 (WWCSM)	4	0	0		0	0		0	0		0	0	
	Level B trainers**	WWDC	4 (WWCSM)	4	0	0		0	0		0	0		0	0	
			5 (CM)	4	0	0		0	0		0	0		0	0	
		IDDC	4 (WWCSM)	4	0	0	0	0	0	0	0	0	0	0	0	0
			5 (CM)	4	0	0		0	0		0	0		0	0	
		WSSSCM	4 (WWCSM)	4	0	0		0	0		0	0		0	0	
			5 (CM)	4	0	0		0	0		0	0		0	0	
		Required boarding capacity (MM)				398			190			409			409	
		Current and planned capacity (MM)				480			480			480			480	
	Current and planned capacity at a time (Person)					40			40			40			40	

WWDC: Water Well Drilling & Construction
IDDC: Irrigation & Drainage Designing & Construction
WSSSCM: Water Supply System Structue Construction & Maintenance
EMMM: Electro Mechanical & Machinery Maintenance
WWCSM: Water Works Construction Site Management (Level 4)
CM: Construction Management (Level 5)

Note
* In 2015/2016, the first course will be delivered for graduates of Level 1.
** One from each TVETC

Boarding capacity:
The current boarding capacity is 40 persons.
The planned additonal boarding capacity is 100 person.
Therefore, the total boarding capacity will be 140 person.
The participants for short term training courses require the boarding facility.

Training length:
1 semester is 4 months.
EWTI provides 2 semesters a year.
So, 12-month courses need 1.5 years.

Table 27: Numbers of Trainees for Middle Growth Scenario

Middle growth scenario					Base year			Target								
					2011/2012			2012/2013			2013/2014			2014/2015		
Training Category	Target	Course title	EOS Level	Period (month)	Actual (No. of person)	Boading (MM)	Total (No. of person)	Plan (No. of person)	Boading (MM)	Target (No. of person)	Plan (No. of person)	Boading (MM)	Target (No. of person)	Plan (No. of person)	Boading (MM)	Target (No. of person)
Short	Sector professional	Basic	-	1	150	150		0	0		150	150		300	300	
		Advanced	-	1	61	61	251	0	0	52	51	51	305	102	102	610
		On-demand	-	1	40	40		52	52		104	104		208	208	
	Water TVET trainee	EMMT	-	1	129	129	129	120	120	120	200	200	200	320	320	320
	Water TVET instructor	EMMT	-	1	18	18	18	18	18	18	54	54	54	108	108	108
Long	Sector professional	WWDC	1	17	0	0		0	0		25	425		25	425	
			2*	12	0	0		0	0		0	0		0	0	
			3	6	0	0		0	0		0	0		0	0	
			4 (WWCSM)	3	0	0		0	0		0	0		0	0	
			5 (CM)	3	0	0		0	0		0	0		0	0	
		IDDC	4 (WWCSM)	3	0	0		0	0		25	75		25	75	
			5 (CM)	3	0	0	0	0	0	0	0	0	100	25	75	150
		WSSSCM	4 (WWCSM)	3	0	0		0	0		25	75		25	75	
			5 (CM)	3	0	0		0	0		0	0		25	75	
		EMMM	1	12	0	0		0	0		25	300		25	300	
			2	12	0	0		0	0		0	0		0	0	
			3	6	0	0		0	0		0	0		0	0	
			4 (WWCSM)	4	0	0		0	0		0	0		0	0	
	Level B trainers**	WWDC	4 (WWCSM)	4	0	0		0	0		0	0		0	0	
			5 (CM)	4	0	0		0	0		0	0		0	0	
		IDDC	4 (WWCSM)	4	0	0	0	0	0	0	9	36	18	9	36	36
			5 (CM)	4	0	0		0	0		0	0		9	36	
		WSSSCM	4 (WWCSM)	4	0	0		0	0		9	36		9	36	
			5 (CM)	4	0	0		0	0		0	0		9	36	
		Required boarding capacity (MM)				398			190			559			1038	
		Current and planned capacity (MM)				480			480			1680			1680	
	Current and planned capacity at a time (Person)					40			40			140			140	

WWDC: Water Well Drilling & Construction
IDDC: Irrigation & Drainage Designing & Construction
WSSSCM: Water Supply System Structue Construction & Maintenance
EMMM: Electro Mechanical & Machinery Maintenance
WWCSM: Water Works Construction Site Management (Level 4)
CM: Construction Management (Level 5)

Note
* In 2015/2016, the first course will be delivered for graduates of Level 1.
** One from each TVETC

Boarding capacity:
The current boarding capacity is 40 persons.
The planned additonal boarding capacity is 100 person.
Therefore, the total boarding capacity will be 140 person.
The participants for short term training courses require the boarding facility.

Training length:
1 semester is 4 months.
EWTI provides 2 semesters a year.
So, 12-month courses need 1.5 years.

Table 28: Numbers of Trainees for High Growth Scenario

High growth scenario					Base year			Target								
					2011/2012			2012/2013			2013/2014			2014/2015		
Training Category	Target	Course title	EOS Level	Period (month)	Actual (No. of person)	Boading (MM)	Total (No. of person)	Plan (No. of person)	Boading (MM)	Target (No. of person)	Plan (No. of person)	Boading (MM)	Target (No. of person)	Plan (No. of person)	Boading (MM)	Target (No. of person)
Short	Sector professional	Basic	-	1	150	150		0	0		200	200		600	600	
		Advanced	-	1	61	61	251	0	0	52	100	100	500	300	300	1400
		On-demand	-	1	40	40		52	52		200	300		500	500	
	Water TVET trainee	EMMT	-	1	129	129	129	120	120	120	200	200	200	320	320	320
	Water TVET instructor	EMMT	-	1	18	18	18	18	18	18	54	54	54	108	108	108
Long	Sector professional	WWDC	1	17	0	0		0	0		25	425		25	425	
			2*	12	0	0		0	0		0	0		0	0	
			3	6	0	0		0	0		0	0		0	0	
			4 (WWCSM)	3	0	0		0	0		0	0		0	0	
			5 (CM)	3	0	0		0	0		0	0		0	0	
		IDDC	4 (WWCSM)	3	0	0		0	0		25	75		25	75	
			5 (CM)	3	0	0	0	0	0	0	0	0	100	25	75	150
		WSSSCM	4 (WWCSM)	3	0	0		0	0		25	75		25	75	
			5 (CM)	3	0	0		0	0		0	0		25	75	
		EMMM	1	12	0	0		0	0		25	300		25	300	
			2	12	0	0		0	0		0	0		0	0	
			3	6	0	0		0	0		0	0		0	0	
			4 (WWCSM)	4	0	0		0	0		0	0		0	0	
		WT	2	12	0	0		0	0		25	300		25	300	
			3	6	0	0		0	0		0	0		25	150	
			4 (WWCSM)	4	0	0	0	0	0	0	0	0	50	0	0	100
		WCT	2	12	0	0		0	0		25	300		25	300	
			3	6	0	0		0	0		0	0		25	150	
			4 (WWCSM)	4	0	0		0	0		0	0		0	0	
	Level B trainers**	WWDC	4 (WWCSM)	4	0	0		0	0		0	0		0	0	
			5 (CM)	4	0	0		0	0		0	0		0	0	
		IDDC	4 (WWCSM)	4	0	0	0	0	0	0	9	36	18	9	36	36
			5 (CM)	4	0	0		0	0		0	0		9	36	
		WSSSCM	4 (WWCSM)	4	0	0		0	0		9	36		9	36	
			5 (CM)	4	0	0		0	0		0	0		9	36	
		Required boarding capacity (MM)				398			190			854			1828	
		Current and planned capacity (MM)				480			480			1680			2280	
	Current and planned capacity at a time (Person)					40			40			140			190	

WWDC: Water Well Drilling & Construction
IDDC: Irrigation & Drainage Designing & Construction
WSSSCM: Water Supply System Structue Construction & Maintenance
EMMM: Electro Mechanical & Machinery Maintenance
WWCSM: Water Works Construction Site Management (Level 4)
CM: Construction Management (Level 5)
WT: Water Treatment
WCT: Wastewater Collection & Treatment

Boarding capacity:
The current boarding capacity is 40 persons.
The planned additonal boarding capacity is 100 person.
Therefore, the total boarding capacity will be 140 person.
The participants for short term training courses require the boarding facility.

Training length:
1 semester is 4 months.
EWTI provides 2 semesters a year.
So, 12-month courses need 1.5 years.

Note
* In 2015/2016, the first course will be delivered for graduates of Level 1.
** One from each TVETC

The estimated numbers of participants in short and long training courses were compared by three growth scenarios, as shown in Table 29.

Table 29: Summary of comparison among three growth scenarios

Growth scenario	Unit	Low	Middle	High
Capital investment	Million Birr	30.2	169.0	201.1
	Million USD	1.6	9.0	10.7
Participants of short courses	Persons for 3 years	1,008	1,787	2,772
Participants of long courses	Persons for 3 years	0	304	454
Exchange rate	(Birr/USD)	18.81		

In case of the low scenario, EWTI cannot provide long term training courses, which is against the most critical mission. In case of the high scenario, it is optimistic for EWTI to commence long term training courses in the sanitation sector, as it is still in the very infant stage. As a result, it was

decided to prepare the strategic plan based on the middle growth scenario.

(5) Strategic Plan

EWTI as an autonomous public institute was legally established on August 06, 2013 by Council of Ministers' Regulation No 293/2013. Then, the joint study committee[1] prepared the strategic plan of EWTI for the period of three consecutive fiscal years: 2013/14 to 2015/16. The strategic plan was developed by a method called Balanced Score Card (BSC), which is commonly used in Ethiopia and was recommended by Ministry of Education. This section gives brief overview of the strategic plan. (See Annex 3 for the full strategic plan)

1) Objectives

EWTI shall have the objectives to:

1. facilitate the transfer of technology to those engaged in water development and related activities;
2. provide practical training to capacitate the existing and potentially joining manpower of the sector in cooperation with other technical and vocational education and training institutions and higher education institution and higher education institutions; and
3. produce and build capacity of instructors required by technical and vocational education and training institutions.

2) Mission

The mission is to be the leading institute of human resource capacity development and technology transfer center in the fields of ground & surface water development and scheme management by providing updated practical training and technical & advisory services for public, private and non-governmental organizations already engaged or planning to be involved in water related activities.

3) Vision

The vision is to be the "Center of Excellence" of water sector in Ethiopia.

The capacity development of engineers and technicians engaged in the water sector is one of the most important issues to improve drinking water supply coverage and ensure food security through

[1] The joint study committee consists of representatives from MoWIE, MoE and EWTI.

expansion of irrigation development not only in Ethiopia but also in other African countries. EWTI has a vision to be a successful model to solve this critical and challenging issue in Ethiopia as well as other African countries.

4) Strategic themes

The following four strategic themes were set out:

Strategic Theme I: Adequate and quality training provisions in selected water technology courses

Strategic Theme II: Providing adequate and quality technical, professional advisory and information services

Strategic Theme III: Appropriate and affordable technology selection through study and research

Strategic Theme IV: High participation of development partners and stakeholders

5) Strategic Goals, Measurement & Targets

In order to satisfy the four strategic themes, various strategic goals were set out with measures and targets. Among others, the strategic goals for the supply of manpower were set out based on capacities of training rooms and boarding, as shown in Table 30.

Table 30: Planned Participants in Short and Long Term courses

Strategic Goals	Measures	Base Year 2012/ 2013	Targets			
			2013 /2014	2014/ 2015	2015/ 2016	Total for 3 years
Increased supply of qualified manpower in adequate number	Number of sector professionals participated in short term training	251	52	305	610	967
	Number of water TVET trainees participated in short term training (at regional TVETs)	129	120	200	320	640
	Number of water TVET instructors participated in short term trainings	18	18	54	108	180
	Number of trainees participated in long term trainings (WWDC, EMMM, WWSCM, CM)	0	0	100	150	250
	Number of Level B* trainers participated in long term trainings (WWCSM)	0	0	18	36	54
	Number of persons took competency assessment exam in the institute	0	0	0	100	100

Note: The TVET college lecturers are divided into three levels, namely Level A, B and C. Level B instructors can deliver training courses of Certificate 1 to 4.

The Long-Term Training Courses:

Out of the 16 occupational standards in the water sector, the following four long term training courses were selected:

- Water Well Drilling & Construction (WWDC, starting from Level I to Level III)
- Electro Mechanical & Machinery Maintenance (EMMM, starting from Level I to Level III)
- Water Works Site Construction Management (WWSCM, Level IV)[2]
- Construction Management (CM, Level V)[3]

Short-term training courses:

The short-term training courses will be given after curriculum revision in line with the unit of competences categorized under the above-mentioned four selected long-term courses. The average duration of the short-term training courses will not exceed one month.

6) Implementation strategies

Immediate strategies

Since the year 2013/2014 is a transitional and preparation period of EWTI. The most important challenge is to prepare and deliver the above-mentioned four long term training courses, based on EOS. Although model curriculum is available for the former EOS, EWTI has to update this curriculum, as EOS has been modified recently. In addition, EWTI has to develop instructional materials based on the updated curriculum by July 2014.

Short term strategies

EWTI is expected to play an important role for human resource development in One WASH National Program (OWNP), by offering higher-level training to graduates from TVETCs, teachers of TVETCs and other institutions as well as the private sector. EWTI is also expected to provide tailor made and short term training courses for WASH staff, micro and small scale enterprises and all personnel that contribute to the OWNP. In order to provide these training courses, 3.7 million

[2] This course is Level IV of Water Well Drilling & Construction (WWDC), Water Supply System Structure Construction & Maintenance (WSSSCM), and Irrigation & Drainage Designing & Construction (IDDC).

[3] This course is Level V of Water Well Drilling & Construction (WWDC), Water Supply System Structure Construction & Maintenance (WSSSCM), and Irrigation & Drainage Designing & Construction (IDDC).

USD is allocated for EWTI in 2014 and 2015. EWTI will make a full use of this precious opportunity to strengthen its training capability.

Middle and long term strategies

EWTI has an intention to be a Center of Excellence in the water and sanitation sectors covering all 16 EOSs in cooperation with TVETCs and other relevant institutions. Furthermore, EWTI will provide engineers with tailor made short term courses for the water resource management sector in collaboration with relevant domestic and international universities.

7) Necessary conditions

In order to achieve targets set for the next three years, the major necessary conditions are listed below:

- Completion and approval of organization structure, staffing plan and salary scale
- Recruitment of management staff and senior experts as per approved man power plan of the institute
- Development of curriculum and learning resource for the four selected long term TVET programs of the institute
- Development of curriculum and learning resources for the short-term training courses in line with the unit of competences of the four selected long term TVET programs of the institute as well as the revising of the groundwater development study & management short-term courses thus far given by the center
- Completion of the building construction
- Preparation of urgently needed technical, academic and administrative manuals of the institute
- Conduct study for establishment of the specialized laboratory service of the institute
- Conduct study for establishment of a database management system of the institute
- Procurement of vehicles, and workshop and laboratory equipment

The targets of the strategic plan are shown in Table 31 and the summary table is shown in Table 32.

Table 31: Summary of strategic themes/outcomes and strategic goals

		Strategic Theme I	Strategic Theme II	Strategic Theme III	Strategic Theme IV
Themes		Adequate and quality training provisions in selected water technology courses	Providing adequate and quality technical, professional advisory, and information services	Appropriate and affordable technology selection through study and research	High participations of development partners and stakeholders
		Strategic Goals	**Strategic Goals**	**Strategic Goals**	**Strategic Goals**
Perspectives	Customer/ Citizen	▪ Increased supply of qualified manpower ▪ Increased customer satisfaction	▪ Increased customer satisfaction ▪ Improved supply of information ▪ Improved provision of specialized laboratory & other technical and professional advisory services	▪ Increased customer satisfaction ▪ Increased supply/transfer of technology	▪ Enhanced participation of partners and stakeholders ▪ Increased customer satisfaction
	Finance	▪ Increased source of resources ▪ Improved resource utilization effectiveness	▪ Increased source of resources ▪ Improved resource utilization effectiveness	▪ Increased source of resources ▪ Improved resource utilization effectiveness	▪ Increased source of resources
	Internal Working System	▪ Establish result based training delivery system ▪ Establish quality assurance system	▪ Establish specialized laboratory & other technical and professional advisory services provision system ▪ Establish information management & delivery system	▪ Establish technology accumulation & transfer system	▪ Establish system that promotes high participation of development partners and stakeholders ▪ Establish customer relations/ communication system
	Learning & Development	▪ Enhance competency of the management and other staff /knowledge, skill and attitude/ ▪ Enhance technological capacity of the institute ▪ Enhance supply of manpower for the institute	▪ Enhance competency of the management and other staff /knowledge, skill and attitude/ ▪ Enhance technological capacity of the institute ▪ Enhance supply of manpower for the institute	▪ Enhance competency of the management and other staff /knowledge, skill and attitude/ ▪ Enhance technological capacity of the institute ▪ Enhance supply of manpower for the institute	▪ Enhance competency of the management and other staff /knowledge, skill and attitude/ ▪ Enhance technological capacity of the institute ▪ Enhance supply of manpower for the institute

Table 32: Summary of the Strategic Plan

Perspective	Strategic Goals	Strategic Theme				Measures	Unit	Base year	Target			
		T1 Training	T2 Advisory	T3 Study	T4 Participation			2012/13	2013/14	2014/15	2015/16	Summary
Customer	**Customer satisfaction**	**x**	**x**	**x**	**x**	Training	Growth %	23	1	5	14	43
						Technical advisory	Growth %	25	25	25	25	100
						Transfer tech	Growth %	0	0	0	25	25
						Information supply	Growth %	0	0	15	25	40
						Partner participation	Growth %	10	40	20	10	80
	Manpower supply	x				Sector professional in short course	No. of participants	251	52	305	610	967
						Water TVET trainees on short course	No. of participants	129	120	200	320	640
						Water TVET instructor in short course	No. of participants	18	18	54	108	180
						Trainees in long course	No. of participants	0	0	100	150	250
						Level B trainer in long course	No. of participants	0	0	18	36	54
						Competency assessment exam	No. of participants	0	0	0	100	100
	Information supply		x			Establish database	No.	0	0	1	0	1
						Topics in database	No.	0	0	0	4	4
						Water well inventory	%	0	0	0	20	20
						Data collection, compilation & analysis	No. of region	0	0	0	4	4
	Advisory services		x			Gap analysis study of existing labo.	No. of studies	0	1	0	0	1
						Procurement of labo equipment	%	0	0	50	50	100
						Groundwater study in sites	No.	8	10	12	16	38
						Capacity gap assessment of TVETCs	No. of studies	0	1	0	0	1
	Technology supply			x		Types of technology adopted	No.	0	0	1	1	2
						Types of technology transfer	No.	0	0	0	1	1
						Job created in the process of transfering technology	No.	0	0	0	200	200
						Beneficiaries of transferred technologies	No.	0	0	0	40,000	40,000
	Participation of partners				x	Development partners	No.	3	3	4	4	4
						Growth of stakeholders' participation	%	0	0	20	30	50
						Training needs assessment study reports	No.	0	0	1	0	1
Finance	**Revenue source**	**x**	**x**	**x**	**x**	Proposals submitted to financial partners	No.	3	3	6	6	15
						Amount of fund secured from proposal	million birr	40	84	60	60	204
						Amount of resource from income generation	million birr	0	0	1	5	6
						Government budget	million birr	4	2	60	80	143
	Effective use	x	x	x		Use budget to allocated budget	%	67	100	100	100	100
Internal working process	Short and long term training provision system	x				Develop curriculum and instructional materials (Long 14+ Short 6)	No.	0	15	5	0	20
	Quality assurance system	x				Develop quality assurance system and document	No.	0	0	1	0	1
	Laboratory and advisory delivery system		x			Develop laboratory and advisory service system and document	No.	0	0	2	0	2
	Information system		x			Develop information system and document	No.	0	0	1	0	1
	Technology accumulation and transfer system			x		Prepare and implement technology accumulation and transfer system and document	No.	0	0	1	0	1
	Partners' participation system				x	Partner participation document	No.	0	0	1	0	1
						Consultative forum with stakeholders	No.	0	1	1	1	3
						Signed MOU with stakeholders	No.	0	2	3	3	8
	Customer relation system				x	Promotion brochures to customers and partners	No.	0	1	1	1	1
						Semi-annual and annual bulletins	No.	0	1	2	2	2
	Plan/performance report system				x	Medium-short term plan submitted	No.	0	1	1	1	1
						Performance report submitted	No.	0	4	4	4	4
Learning & institutional development	**Capacity dev. of staff**	**x**	**x**	**x**	**x**	Management staff enhance competency	%	0	25	50	25	100
						Management staff attain high performance	%	90	90	100	100	100
						Non-management staff enhance competency	%	100	0	25	50	75
						Non-management staff attain high performance	%	96	97	98	100	100
	Technological capacity dev.	x	x	x	x	IT coverage to perform duties	%	71	85	95	100	100
						Information network establish	No.	0	0	1	0	1
	Supply of manpower	x	x	x	x	Occupied support staff by manpower plan	%	0	35	75	100	100
						Occupied position of trainers/technologist	%	0	50	75	100	100

(6) Organization and staffing plan

In order to satisfy duties and responsibilities described in the GAZETTA, job content, required professionals and responsible organizational units and required number of staff were analyzed and identified by the joint study committee members. Based on this analysis, "EWTI Organizational Structure & Staffing Plan" was prepared (Annex 4).

The overall organizational structure of EWTI is illustrated in Figure 18 and the staffing plan is shown in Table 33.

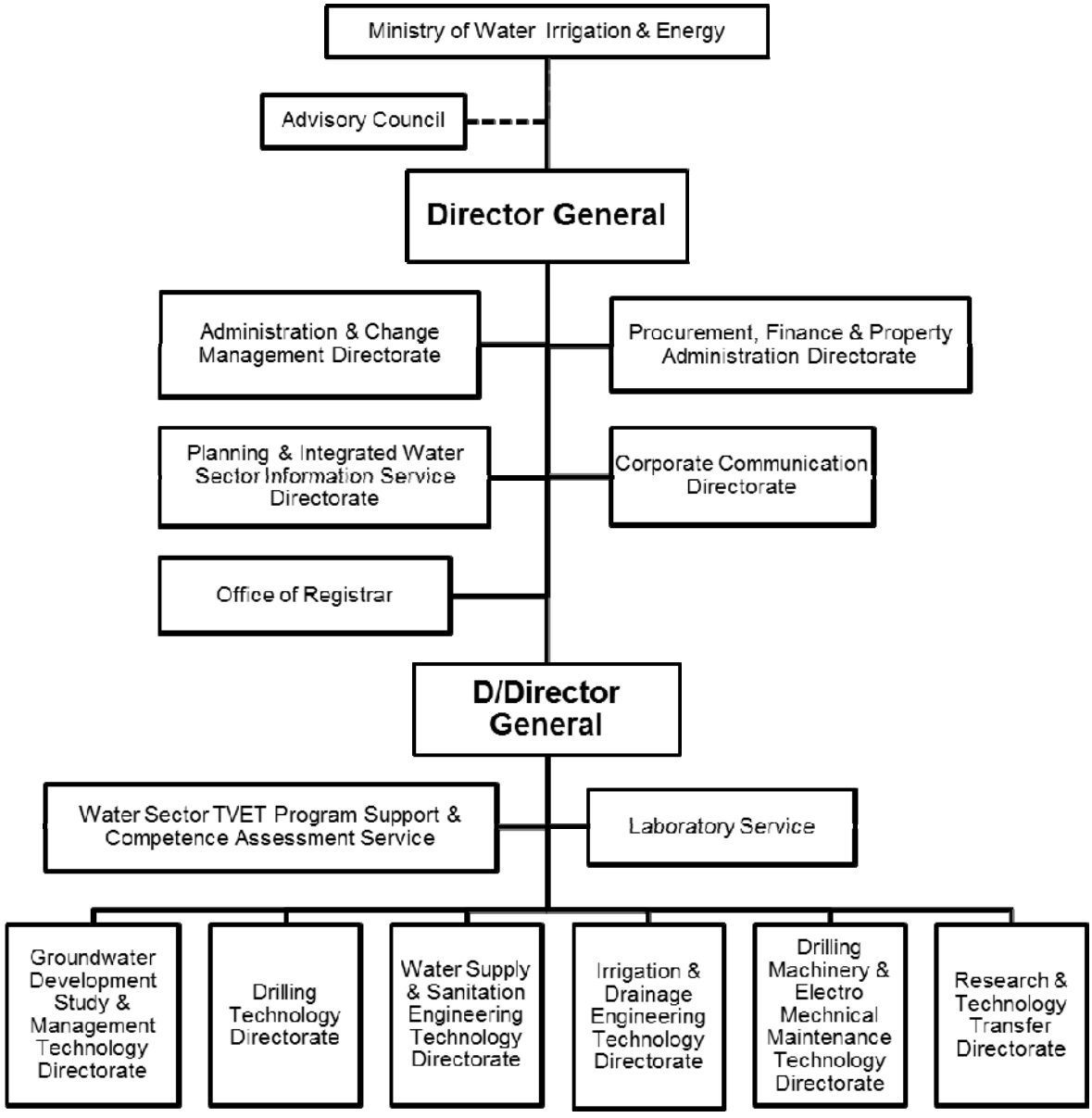


Figure 18: Proposed Organizational Structure

Based on the proposed organizational structure, the major duties of individual units are identified. The details are described in Annex 4.

Table 33: Staffing Plan

No.	Organizational Unit	Required Number of Staff
1	Office of the Director General	7
2	Office of Deputy Director General	2
3	Administration & Change Management Directorate	90
4	Procurement, Finance & Property Administration Directorate	17
5	Planning & Integrated Water Sector Information Service Directorate	14
6	Corporate Communication Directorate	5
7	Office Of the Registrar	5
8	Water Sector TVET Support & Competence Assessment Service	4
9	Laboratory Service Directorate	11
10	Groundwater Development Study & Management Technology Directorate	7
11	Drilling Technology Directorate	14
12	Water Supply & Sanitation Engineering Technology Directorate	6
13	Irrigation & Drainage Engineering Technology Directorate	6
14	Drilling Machinery & Electro Mechanical Maintenance Technology Directorate	18
15	Research & Technology Transfer Directorate	12
	Total	218

(7) Salary scale

Based on the staffing plan and job description, a salary scale has been developed and submitted to MoCS through PMO for approval. This salary scale was prepared taking into account the labor market so as to be attractive enough to retain existing staff and also to attract necessary professionals from the market for both technical and administrative functions.

(8) Implementation plan

Based on the strategic plan, the implementation plan was developed by the end of fiscal year 2015/1016, as shown in Figure 19, Figure 20. The implementation plan includes only actual activities described in the strategic plan.

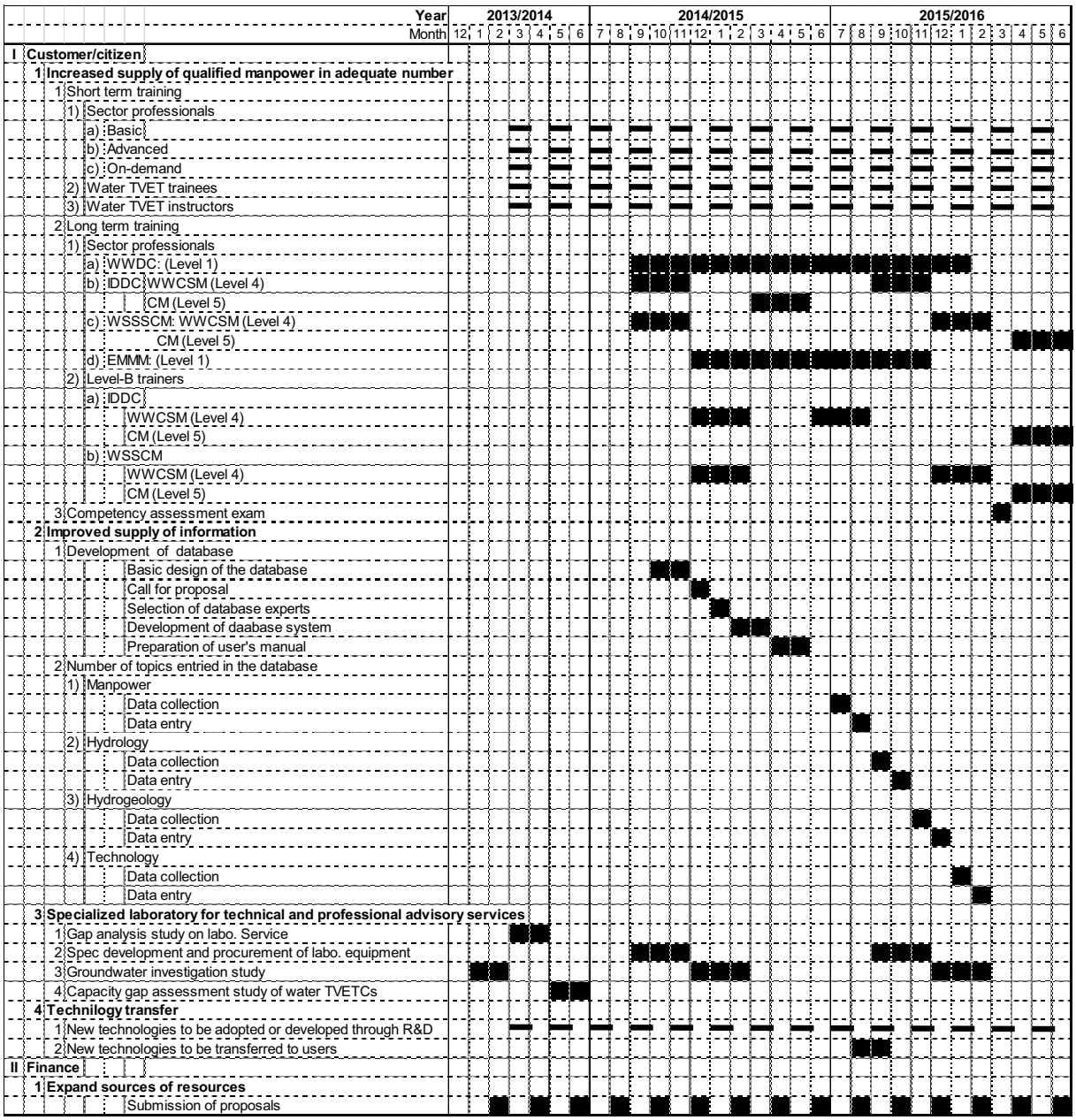


Figure 19: Implementation plan (2013/14 - 2015/16) (1)

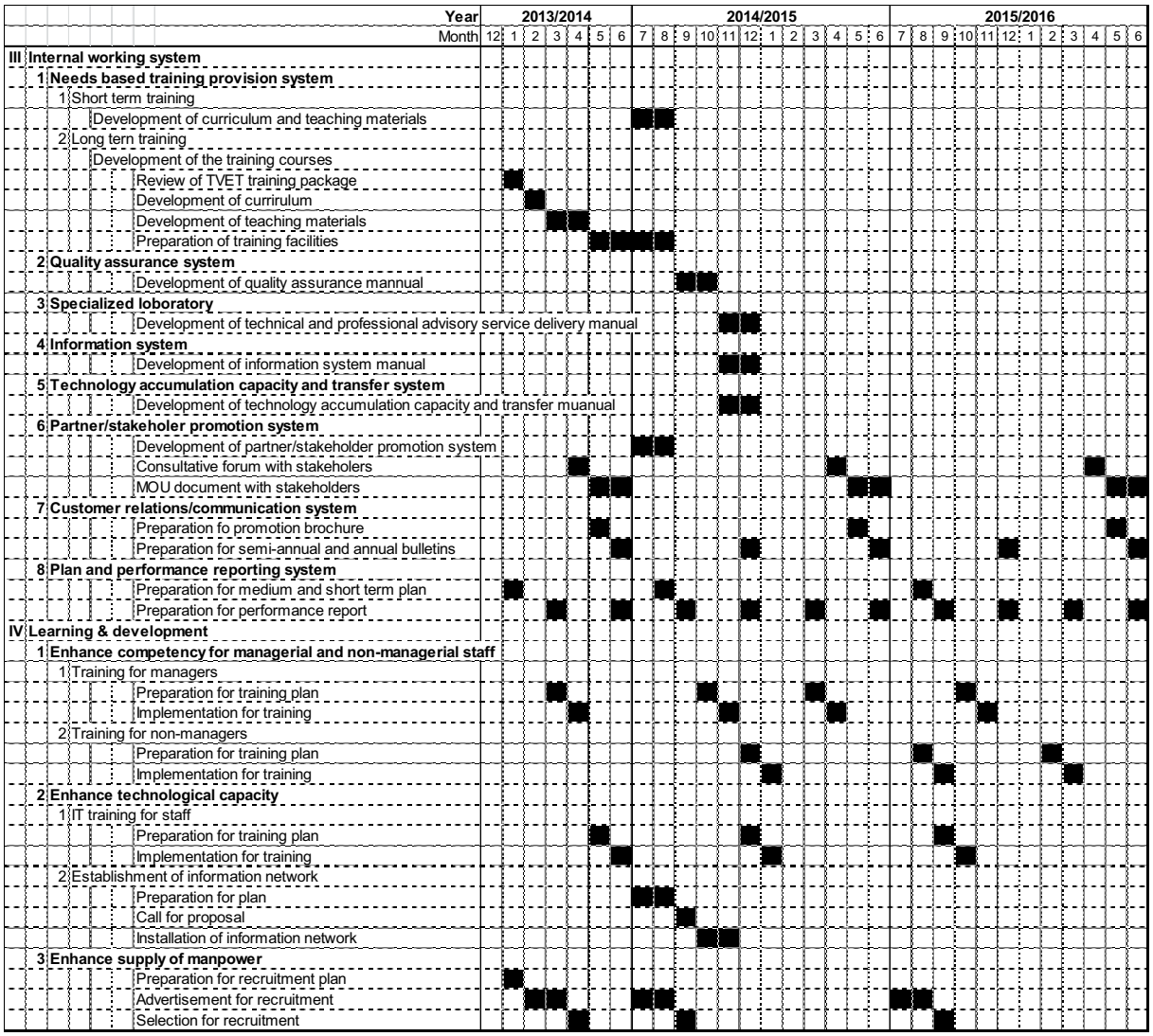


Figure 20: Implementation plan (2013/14 - 2015/16) (2)

2.6.3 Dissemination of the strategy and operational plan to stakeholders (donors, private sector, NGOs, etc.)

Until the last quarter of the 5th year of the project, the final decision on EWTEC transformation through the legislative process was unclear and transformation itself had not been officially approved. Therefore, strategy and operational plan of future EWTEC were not finalized and not actively disseminated to the other stakeholders such as donors, private sector and NGOs. However, the status on progress of EWTEC transformation had been informed to donor agencies individually when paying visits to submit proposal for funding for training activities and building construction. Especially, EWTEC tried to have connection with UNICEF through inviting the WASH chief of UNICEF to EWTEC and sharing experiences of mutual interest, and visiting them to discuss a

possible future cooperation. The cooperative relationship with UNICEF is being developed and EWTEC conducted drilling in UNICEF project sites.

However, once after EWTEC's transformation into a public institute was officially approved by PMO in the last quarter of the 5th year of the project, the status on progress of transformation process was shared with steering committee members of One WASH National Program (OWNP) and a UNICEF coordinator in addition to MoFED, MoE and MoCS. (OWNP is a national program to implement effective activities and uniform account management to achieve GTP target in the water sector in the coming 7 years from 2014 to 2021 in collaboration with MoWIE, MoH and MoE. This program was launched in September 2013 as a succeeding program of WASH 1, which was completed in October 2013.) Currently all the activities related to water and sanitation sector are implemented based on OWNP.

In the Final Program Document of OWNP, EWTI is described as a WASH Training Center of Excellence together with TVETC and Health Science College (HSC) and expected to play an important role for human resources development in the water and sanitation sector.

EWTI launching seminar (November 25, 2013)

A seminar to disseminate EWTI's strategic plan was held at a hotel in Addis Ababa inviting important stakeholders from all regions. The past EWTEC activities were also reported in the seminar by staff members of EWTI. Participants raised many questions and suggestions, which indicated high expectation for EWTI's future activities. A list of participants in the seminar is shown in Table 34.

Table 34: Organizations participated in the seminar

Organization	Number of participants
Water Works Design and Supervision Enterprise (WWDSE)	8
Water Works Construction Enterprise (WWCE)	2
TVETC	10
Regional Water Bureau	4
Private	4
NGO	2
MoWIE	23
International organization	5
Ethiopian Power Agency (EPA) & Power corporation (EEPCO)	5
Ethiopian Institute of Water Resource	1
EWTI	9
House of People's Representative	2
JICA	3
Embassy of Japan	2
Total	80

2.6.4 Development of financial plan based on the EWTEC Strategy

The financial plan is developed based on the middle growth scenario for the three fiscal years. The annual capital investment plan was developed, as shown in Table 35. The annual training cost is estimated, as shown on Table 36. The total annual cost excluding operation cost such as personal, utility and consumables is Birr 73.5 million, Birr 60.9 million and Birr 59.2 million in 2013/2014, 2014/2015 and 2015/2016, respectively, as shown in Table 37.

Table 35: Capital investment cost

Items	Unit cost (Birr)	Qty	Cost (Birr)	Annual investment		
				13/14	14/15	15/16
Building						
Dormitory 1	11,053,600	1	11,053,600	x		
Dormitory 2	11,053,600	1	11,053,600	x		
Dormitory 3	11,053,600	1	11,053,600			
Central block	20,600,568	1	20,600,568	x		
Hall	3,678,734	1	3,678,734	x		
Toilet	651,892	1	651,892	x		
Guard house	296,061	1	296,061	x		
Car shade	119,694	1	119,694	x		
Fountain	313,733	1	313,733	x		
Site sanitary	2,674,276	1	2,674,276	x		
Site electrical	1,004,437	1	1,004,437	x		
Site work	5,396,678	1	5,396,678	x		
Interior/desk/chair/bed	2,500,000	1	2,500,000		x	
Interior/desk/chair/bed	2,500,000	1	2,500,000		x	
Machine/equipment						
Major maintenance of 3 existing rigs and vehicles						
Schramm (300m)	12,000,000	1	12,000,000	x		
YBM (300m)	3,500,000	1	3,500,000	x		
Vehicles (6 cars)	2,500,000	1	2,500,000		x	
Workshop equipment for electric shop	.					
Bench vice	4,000	1	4,000		x	
Hand drill machine	3,000	1	3,000		x	
Grinder (pedestal)	3,500	1	3,500		x	
Mechanical/electrical tools set 1	10,000	1	10,000		x	
Mechanical/electrical tools set 2	10,000	1	10,000		x	
Workshop equipment for mechanical shop						
Universal hydraulic tester	4,000,000	1	4,000,000		x	
Lathe machine	500,000	1	500,000		x	
Milling machine	500,000	1	500,000		x	
Fuel inj. pump test bench for heavy equip.	4,000,000	1	4,000,000		x	
Cylinder boring machine	600,000	1	600,000		x	
Welding machine	15,000	1	15,000		x	
300m drilling rig set (Schramm)						
Rig with drilling tools	15,000,000	1	15,000,000		x	
Crain truck	1,500,000	1	1,500,000		x	
Compressor	1,000,000	1	1,000,000		x	
Compressor carel truck	1,000,000	1	1,000,000		x	
600m drilling rig set (with air compressor/truck)						
Rig with drilling tools	20,000,000	1	20,000,000			x
Crain truck	2,000,000	1	2,000,000			x
Compressor	1,800,000	1	1,800,000			x
Compressor carel truck	1,500,000	1	1,500,000			x
Laboratory middle scale	20,000,000	1	20,000,000			x
Laboratory large scale more sanitation focus like toxics	40,000,000	1	40,000,000			
Database and network system	5,000,000	1	5,000,000		x	
Transportation						
Pick-up double cabin						
Cabin 1	600,000	1	600,000		x	
Cabin 2	600,000	4	2,400,000		x	
Station wagon(long base:14 seats) 1	1,500,000	1	1,500,000		x	
Station wagon(long base:14 seats) 2	1,500,000	2	3,000,000		x	
Coaster bus (25 seats) 1	750,000	3	2,250,000		x	
Automobile 1	500,000	1	500,000		x	
Automobile 2	500,000	1	500,000		x	
Automobile 3	500,000	1	500,000			
Automobile 4	500,000	1	500,000			
			Sub Total	**72.3**	**51.4**	**45.3**
			Grand Total		**169.0**	

Table 36: Training cost

Training Category	Target	Course title	EOS Level	Period (month)	2013/2014		2014/2015		2015/2016	
					Plan (No. of person)	Cost (Thousand birr)	Plan (No. of person)	Cost (Thousand birr)	Plan (No. of person)	Cost (Thousand birr)
Short	Sector professional	Basic	-	1	0	0	150	945	300	1,890
		Advanced	-	1	0	0	51	321	102	643
		On-demand	-	1	52	328	104	655	208	1,310
	Water TVET trainee	EMMT	-	1	120	756	200	1,260	320	2,016
	Water TVET instructor	EMMT	-	1	18	113	54	340	108	680
Long	Sector professional	WWDC	1	17	0	0	25	2,678	25	2,678
			2	12	0	0	0	0	0	0
			3	6	0	0	0	0	0	0
			4 (WWCSM)	3	0	0	0	0	0	0
			5 (CM)	3	0	0	0	0	0	0
		IDDC	4 (WWCSM)	3	0	0	25	473	25	473
			5 (CM)	3	0	0	0	0	25	473
		WSSSCM	4 (WWCSM)	3	0	0	25	473	25	473
			5 (CM)	3	0	0	0	0	25	473
		EMMM	1	12	0	0	25	1,890	25	1,890
			2	12	0	0	0	0	0	0
			3	6	0	0	0	0	0	0
			4 (WWCSM)	4	0	0	0	0	0	0
	Level B trainers	WWDC	4 (WWCSM)	4	0	0	0	0	0	0
			5 (CM)	4	0	0	0	0	0	0
		IDDC	4 (WWCSM)	4	0	0	9	227	9	227
			5 (CM)	4	0	0	0	0	9	227
		WSSSCM	4 (WWCSM)	4	0	0	9	227	9	227
			5 (CM)	4	0	0	0	0	9	227
Total annual cost (million birr)						**1.2**		**9.5**		**13.9**

Note: Average training cost = 210 Birr/person/month

Table 37: Total cost for three fiscal years

(Million Birr)

	2013/2014	2014/2015	2015/2016
Capital investment	72.3	51.4	45.3
Training cost	1.2	9.5	13.9
Total	73.5	60.9	59.2

2.6.5 Development of marketing strategy and carry out marketing activities accordingly

In the 3rd year of the project, MoWIE officially announced to upgrade EWTEC into a semi-autonomous entity and to make it financially independent without government support through income generation activities. After this decision was made, activity for marketing support was added in the PDM during the Mid-term review. In the 4th year of the project, a market analysis survey was conducted in order to commence income generation (mainly for drilling works). Then, five-year business plan was prepared (submitted to PMO) and necessary activities were sorted out to realize potential service provided by EWTEC. However, income generation activities were not realized during the project period due to two reasons: firstly, it was not approved by MoFED and secondly there were not enough personnel to conduct such additional activities under EWTEC. In the end, PMO also rejected to state income generation activity as a core function of EWTI after

transformation. Therefore, marketing activities such as advertisement to secure income (which was the primary idea of the activity) was not conducted. However, as mentioned in "6 Recommendations for future EWTI", it is considered essential to generate income in the future for the organizational sustainability. Potential income generation service items of EWTI are examined as follows.

(1) Potential income generation service items of EWTI

Table 38: Potential income generation service items of EWTI

	Potential service items	Description
1	Training courses	EWTEC ran its operations with the governmental budget and did not receive tuition fee for all the training courses so far. Tuition fee can be set for regular courses and the private sector and NGOs can also participate. Donor agencies can fund for scholarship. Then, number of participants can be increased without increasing the governmental budget. EWTI can provide custom made training as on-demand training courses with certain price and request budget to donor agencies and private companies. Delivery training at site or at regions can also be possible. However, since the purpose of EWTI activity is human resources development and the major budget source is the government, tuition fee should cover only training cost without including profit.
2	Construction of new wells	In the past years, the drilling rigs and drillers of EWTEC were utilized for regional support when there was no training course according to the order from MoWIE. In future, well drilling and related construction works can be executed based on cost recovery arrangement (including machinery maintenance) with the regional offices.
3	Well rehabilitation	Well rehabilitation may extend the life of a well. EWTI has rehabilitation equipment and has been providing well rehabilitation course. Therefore, this activity also can be performed on cost recovery principles.
4	Repairing equipment	EWTEC staff has been trained for machinery maintenance through the project. Maintenance service provision on water service equipment is one of a potential area to be exercised by EWTI on cost recovery principles. The equipment includes generators, compressors, vehicles and drilling rigs, which have high market demand.
5	Research/ Study/ Professional Advisory service	Collection and analysis of well data, preparation of well inventory, geophysical survey, water demand survey, O&M planning of water supply system etc.
6	Water quality and soil testing	Water quality and soil testing laboratory is supposed to be furnished in the near future.
7	Implementation of groundwater projects	Preparation and implementation of projects on well database preparation, groundwater development and water supply etc.

(2) Potential customers

Potential customers of the above mentioned service items could be the governmental organizations (MoWIE, Regional Water Bureau, Zone and Woreda Water Office, Town Water Supply Service Office, etc.), donor agencies, UN agencies, World Bank, international NGOs, private companies, individuals etc. Almost all the customers are applicable for all the service items.

(3) Required input for success

If EWTI starts performing income generation activities, it has to carry out cost estimation, financial management, service contract administration etc., which has not been done by EWTEC so far and the following technical assistance will be required additionally.

- Upgrading contractual service delivery capacity (cost estimation, preparation of proposals, negotiation, contracting)
- Upgrading the financial control (cost control, income control, profit control)
- Performance auditing (monthly meeting, annual meeting, auditing, PDCA cycle)

In addition, the practical capacity, which is the key to success in business, has to be developed. The following table indicates required inputs or activities for the successful implementation of each potential service item.

Table 39: Required inputs or activities for the successful implementation of each potential service item

	Potential service items	Required inputs for success
1	Training courses	• Upgrading the operation capacity of advanced training courses and delivery training. • Reliable cost estimation of training courses and determining the proper fees • Preparation of leaflet for EWTI • Preparation of leaflet for training courses • Promotion via its website • Post-training evaluation
2	Construction of new wells	• Upgrading the deep well drilling capacity • Preparation of leaflet for service • Cost estimation, quotation • Negotiation, contracting
3	Well rehabilitation	• Upgrading the well rehabilitation capacity • Preparation of leaflets to promote service • Cost estimation, quotation • Negotiation, contracting
4	Repairing equipment	• Upgrading the repairing capacity • Cost estimation, quotation

	Potential service items	Required inputs for success
		• Negotiation, contracting
5	Research/Study/Professional advisory service	• Upgrading technical capacity • Upgrading the reporting capacity
6	Water quality and soil testing	• Establishment of laboratory • Procurement & installation of lab equipment • Employment of experts and upgrading their capacity
7	Implementation of groundwater projects	• Upgrading the capacity of preparation of work plans, cost estimation and proposals. • Negotiation, contracting • Project management

2.6.6 Collaboration with MoWIE to ensure necessary budget and human resources for enhancing the operation of EWTEC

(1) Budget

Budget and expenditure of EWTEC in Phase 3 are shown in Table 40 and Table 41. The expenditure from EFY2001 to 2003 exceeds the budget. This is because MoFED approved additional budget during each fiscal year. Although MoWIE approved the entire amount submitted by EWTEC which was more than double of the previous year, MoFED reduced it drastically in the first 3 years. In the 4th year, more than two times of the budget of the previous year was secured, which allowed additional staff members to be employed so as to be ready to become an autonomous institute (6113 Wages to contract employees). However, in spite of repeated newspaper advertisement, low government salary scale hampered efforts to attract new technical staff with sufficient experience to meet the requirements and as a result, the allocated budget was not used up. The same was true for the 5th year. For reference, a comparison of EWTEC staff salaries with those of staff in other public institutions is shown in Table 42.

Table 40: EWTEC approved budget (2008-2014)

(Unit: Thousand Birr)

Code	Description	EFY2006 2013.7-2014.6 (6th year)	EFY2005 2012.7-2013.6 (5th year)	EFY2004 2011.7-2012.6 (4th year)	EFY2003 2010.7-2011.6 (3rd year)	EFY2002 2009.7-2010.6 (2nd year)	EFY2001 2008.7-2009.6 (1st year)
6000	**Items of Expenditure**	**2,400.00**	**2,490.00**	**3,718.00**	**1,499.87**	**1,443.74**	**1,481.40**
6100	**Personnel Service**	**930.00**	**980.00**	**2,060.00**	**761.37**	**724.44**	**503.50**
6110	**Emolument**	**930.00**	**975.00**	**2,060.00**	**760.97**	**724.04**	**503.10**
6113	Wages to contract employees	900.00	970.00	2,050.00	757.97	724.04	502.00
6114	Wages to daily employees	30.00	5.00	10.00	3.00	0.00	1.10
6120	**Allowances / Benefits**	**0.00**	**5.00**	**0.00**	**0.40**	**0.40**	**0.40**
6123	Allowances to contract employees	0.00	5.00	0.00	0.40	0.40	0.40
6200	**Good and services**	**1,470.00**	**1,510.00**	**1,658.00**	**738.50**	**719.30**	**957.90**
6210	**Consumable Goods and Materials**	**446.00**	**600.00**	**707.00**	**510.80**	**404.60**	**436.10**
6211	Uniforms, clothing, mattresses and bed clothes	36.00	35.00	25.00	24.20	4.20	5.30
6212	Office supplies	50.00	80.00	72.00	66.00	26.20	32.70
6213	Printing	10.00	10.00	10.00	4.00	0.00	4.00
6214	Medical supplies	0.00	0.00	0.00	0.00	0.00	7.00
6215	Learning material supplies	0.00	0.00	25.00	25.00	0.00	0.00
6216	Food	200.00	100.00	275.00	207.60	253.80	295.20
6217	Fuel and lubricants	150.00	375.00	300.00	180.00	116.50	82.80
6218	Other materials and supplies	0.00	0.00	0.00	4.00	3.90	9.10
6219	Materials and books	0.00	0.00	0.00	0.00	0.00	0.00
6230	**Traveling & official services**	**190.00**	**250.00**	**200.00**	**79.00**	**195.40**	**214.70**
6231	Per diem	150.00	250.00	200.00	70.00	195.40	207.70
6232	Traveling allowance	40.00	0.00	0.00	9.00	0.00	7.00
6240	**Maintenance and repairs**	**94.00**	**100.00**	**390.00**	**95.00**	**38.90**	**19.00**
6241	Maintenance and repair of vehicles	94.00	100.00	300.00	50.00	28.90	5.80
6243	Maintenance and repair of plan, machinery & tools	0.00	0.00	50.00	20.00	10.00	10.00
6244	Maintenance and repair of building	0.00	0.00	40.00	25.00	0.00	3.20
6250	**Contracted service supplies**	**620.00**	**560.00**	**361.00**	**53.70**	**80.40**	**84.10**
6251	Contracted professional services	220.00	80.00	56.00	0.00	33.80	30.50
6253	Advertisement	40.00	0.00	0.00	0.00	0.00	0.00
6254	Insurance	150.00	150.00	150.00	0.00	0.00	0.00
6256	Fees and charges	40.00	200.00	20.00	10.70	3.00	2.00
6257	Electricity charges	55.00	45.00	70.00	21.00	21.60	30.00
6258	Telecommunication charge	70.00	55.00	40.00	12.00	12.00	9.60
6259	Water and other services	45.00	30.00	25.00	10.00	10.00	12.00
6270	**Training service**	**120.00**	**0.00**	**0.00**	**0.00**	**0.00**	**204.00**
6271	Local training	120.00	0.00	0.00	0.00	0.00	204.00
6300	**Fixed assets and construction**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**20.00**
6310	**Fixed assets**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**20.00**
6311	Fixed asset	0.00	0.00	0.00	0.00	0.00	20.00
6320	**Construction**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
6322	Construction of residential buildings	0.00	0.00	0.00	0.00	0.00	0.00

Table 41: EWTEC expenditure (2008-2013*)

(Unit: Thousand Birr)

Code	Description	EFY2005 2012.7-2013.6 (5th year)	EFY2004 2011.7-2012.6 (4th year)	EFY2003 2010.7-2011.6 (3rd year)	EFY2002 2009.7-2010.6 (2nd year)	EFY2001 2008.7-2009.6 (1st year)
6000	**Items of Expenditure**	**1,651.59**	**2,269.23**	**1,400.17**	**1,287.69**	**1,315.71**
6100	**Personnel Service**	**763.13**	**870.19**	**749.83**	**601.85**	**486.03**
6110	**Emolument**	**762.09**	**869.95**	**749.47**	**601.55**	**485.67**
6113	Wages to contract employees	761.34	864.90	746.94	601.55	484.59
6114	Wages to daily employees	0.75	5.05	2.53	0.00	1.08
6120	**Allowances / Benefits**	**1.04**	**0.24**	**0.36**	**0.30**	**0.36**
6123	Allowances to contract employees	1.04	0.24	0.36	0.30	0.36
6200	**Good and services**	**888.46**	**1,399.04**	**650.34**	**685.84**	**809.90**
6210	**Consumable Goods and Materials**	**314.44**	**608.52**	**442.86**	**400.61**	**388.23**
6211	Uniforms, clothing, mattresses and bed clothes	35.00	25.00	24.20	1.70	4.60
6212	Office supplies	2.76	59.28	65.79	26.20	32.61
6213	Printing	0.00	2.12	1.54	0.00	2.57
6214	Medical supplies	0.00	0.00	0.00	0.00	0.00
6215	Learning material supplies	0.00	18.65	0.00	0.00	6.79
6216	Food	99.99	274.62	197.35	252.31	249.96
6217	Fuel and lubricants	176.69	228.85	150.24	116.50	82.99
6218	Other materials and supplies	0.00	0.00	3.74	3.90	8.71
6219	Materials and books	0.00	0.00	0.00	0.00	0.00
6230	**Traveling & official services**	**199.94**	**194.85**	**79.00**	**195.40**	**214.39**
6231	Per diem	199.94	194.85	70.00	195.40	207.68
6232	Traveling allowance	0.00	0.00	9.00	0.00	6.71
6240	**Maintenance and repairs**	**68.04**	**300.00**	**75.60**	**26.93**	**16.70**
6241	Maintenance and repair of vehicles	68.04	300.00	50.00	26.93	3.57
6243	Maintenance and repair of plan, machinery, tools	0.00	0.00	0.60	0.00	10.00
6244	Maintenance and repair of building	0.00	0.00	25.00	0.00	3.13
6250	**Contracted service supplies**	**306.04**	**295.67**	**52.88**	**62.90**	**51.74**
6251	Contracted professional services	50.77	56.00	0.00	28.50	15.50
6253	Advertisement	0.00	0.00	0.00	0.00	0.00
6254	Insurance	150.00	150.00	0.00	0.00	0.00
6256	Fees and charges	9.01	9.89	10.70	2.80	2.00
6257	Electricity charges	13.77	42.17	21.00	21.60	22.50
6258	Telecommunication charge	52.54	0.00	11.18	0.00	0.00
6259	Water and other services	29.95	37.61	10.00	10.00	11.74
6270	**Training service**	**0.00**	**0.00**	**0.00**	**0.00**	**138.84**
6271	Local training	0.00	0.00	0.00	0.00	138.84
6300	**Fixed assets and construction**	**0.00**	**0.00**	**0.00**	**0.00**	**19.78**
6310	**Fixed assets**	**0.00**	**0.00**	**0.00**	**0.00**	**19.78**
6311	Fixed asset	0.00	0.00	0.00	0.00	19.78
6320	**Construction**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
6322	Construction of residential buildings	0.00	0.00	0.00	0.00	0.00

*EFY2006 (6th year) is not included because the activity of EFY2006 had not been completed when this report was prepared.

Table 42: Comparison of Staff Salaries (as of 2012)

(Birr/month)

Kaizen Institute			Water Works Design & Supervision Enterprise			EWTEC		
Position	Work experience (Years after BSc)	Salary	Position	Work experience (Years after BSc)	Salary	Position	Work experience (Years after BSc)	Salary
Director General	-	Unknown	Director General	-	9,900	Center Head	-	5,553
Director	7	6,708	Senior Geologist	10	7,415	Course Coordinator	7	4,933
Senior Consultant	4	4,845	Geologist	6	6,599	Instructor	6	4,343
Consultant	2	4,056	Associate Geologist	4	4,576	Training Coordination Officer	7	3,348

The daily allowance (pocket money) that had been provided to trainees (15 birr/day) from Phase 2 up to the 1st year of Phase 3 was stopped by MoFED after the 2nd year (6271 local training). In addition, the budget for guest lecturers with the budget code (6251 Contracted professional services) was drastically reduced in the 2nd and 3rd years. It was difficult to continue training with only the government budget at that time, so EWTEC started looking for other budget funding sources such as WASH fund and UNICEF. The project supported preparation of proposals for fund raising from other organizations and EWTEC has been steadily receiving funds from external budget sources. Almost 40 % of the annual budget funding of EWTEC was sourced externally in the 5th year (Table 43).

Proposals for facility expansion were prepared and submitted to the World Bank, UNICEF and Embassy of Finland which seemed to be possible sources for funding (unfortunately there were no positive responses). Through these activities, preparation of proposals for fund-raising has become a common practice under EWTEC operations.

Table 43: EWTEC expenditure (EY2001-2005)

(Unit: Birr)

Source of budget funding	EFY2005 2012.7-2013.6	EFY2004 2011.7-2012.6	EFY2003 2010.7-2011.6	EFY2002 2009.7-2010.6	EFY2001 2008.7-2009.6
Government budget	1,651.59	2,269.23	1,400.17	1,287.69	1,315.71
External sources	1,122.67	285.43	777.75	115.27	0.00
Total	**2,774.26**	**2,554.66**	**2,177.92**	**1,402.96**	**1,315.71**

WASH fund (WASH 1) was terminated in October 2013 and replaced with a new program for the whole water and sanitation sector of Ethiopia, the One WASH National Program (OWNP), which was launched in September 2013. EWTEC was in close communication with the OWNP steering committee and provided necessary data. In the Final Program Document of OWNP distributed in September 2013, EWTI is described as a core training institute for human resources development in the water and sanitation sector and based on the information provided by EWTEC the program indicates a plan to allocate 3.7 million USD for the activities of EWTI in the two consecutive years from 2014 to 2015.

(2) Human resources

Throughout Phase 3, securing enough EWTEC staff members was a big challenge. At the beginning of Phase 3, there was no project director and the center head was also dismissed soon after, which made the operation of the project difficult. After BPR (Business Process Reengineering), structural reform of MoWIE was completed in the middle of the 2nd year. Major C/P positions, including that of project director, were assigned except the water supply engineering position. Throughout the project, turnover of EWTEC staff, including the center head, was unavoidable. In particular, the C/P position in the water supply engineering field was not filled for more than a year, and was finally filled in the 4th year. Fortunately, each technical staff member has been capable and competent enough to execute training courses and there has been at least one core staff member assigned in each respective field throughout the project and, therefore, there has been no critical problem in handing over when someone resigns and in implementing the project. Assignment of C/P is shown in the bar chart in Figure 21.

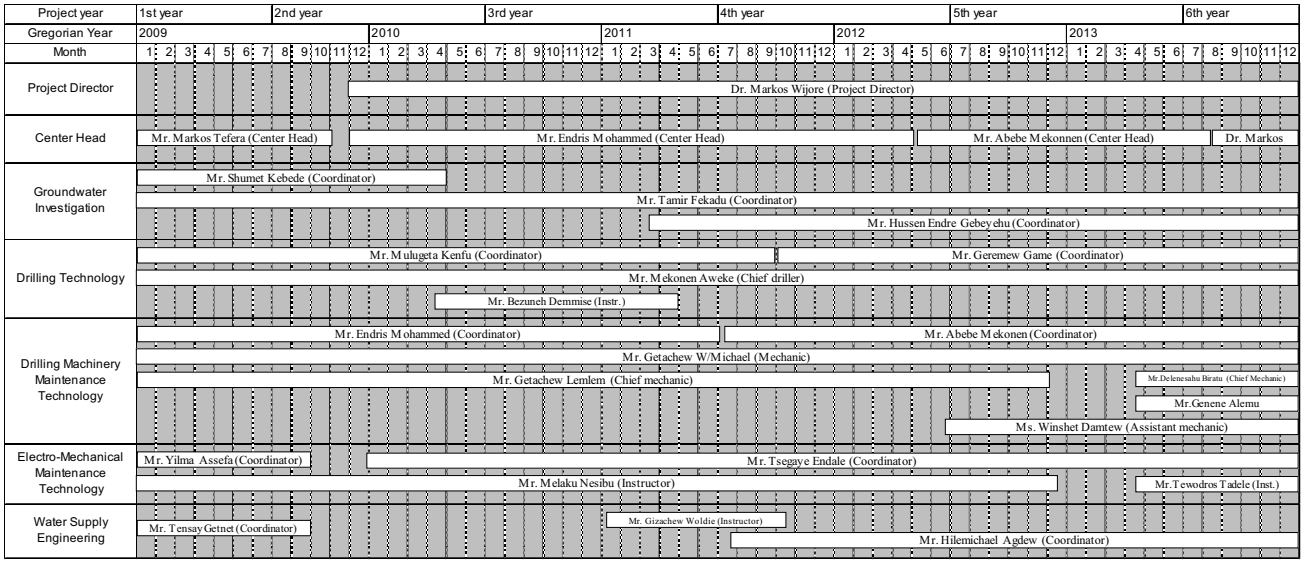


Figure 21: Ethiopian Counterpart Assignment

With regard to the number of technical staff, only about half of the number originally planned were secured throughout Phase 3. Because of the very low civil service salary scale, it was difficult to employ engineers with enough knowledge and experience, despite repeated advertisement in the newspapers. However, EWTI with its new organizational structure is expected to have its own special salary scale which will be much better than that of the civil service and consequently, EWTI will be capable to attract and recruit the necessary experienced professional staff in the near future as mentioned in 2.6.2 (7). For the record, the final number of EWTEC staff (before the transformation of EWTEC into a public institute was approved) is shown in Table 44.

Table 44: Number of EWTEC staff (as of May 2013)

It. No	Job title	Approved total No of Staff	No of Existing Staff	No of Vacant Positions
Technical Staff				
1	Head of EWTEC Center	1	1	-
2	GW investigation Course Coordinator	1	1	-
3	GW investigation Instructor	1	-	1
4	DT Course Coordinator	1	-	1
5	DT Instructor	1	1	-
6	Chief Driller	2	2	-
7	DMMT Course Coordinator	1	-	1
8	DMMT Instructor	1	-	1
9	Chief Mechanic	2	2	-
10	Mechanic	1	1	-
11	EMMT Course Coordinator	1	1	-
12	EMMT Instructor	1	1	-
13	Electrician	1	-	1
14	WSE Course Coordinator	1	1	-
15	WSE Instructor	1	-	1
16	GW/ Modeling, GIS & RS Course Coordinator	1	1	-
17	GW/ Modeling Instructor	1	-	1
18	GIS & Remote Sensing Instructor	1	-	1
	Sub-Total (Technical Staff)	**20**	**11**	**9**
Administrative/ Support Staff				
19	Administration Head	1	1	-
20	Training Program Coordinator	1	1	-
21	Ass./ Training Program Coordinator	1	1	-
22	Executive Secretary	1	1	-
23	Secretary	2	1	1
24	Archive & Record Officer	1	-	1
25	Staff Nurse	1	1	-
26	Health Assistant	1	-	1
27	Librarian	1	-	1
28	Personnel Clerk	1	-	1
29	Accountant IV	1	-	1
30	Clerk	1	-	1
31	Cashier	1	1	-
32	Personnel Clerk	1	-	1
33	Store Keeper	1	1	-
34	General Service Head	1	1	-
35	Procurement Specialist	1	-	1

It. No	Job title	Approved total No of Staff	No of Existing Staff	No of Vacant Positions
36	Printing Worker	1	1	-
37	Telephone Operator	2	-	2
38	Messenger	2	1	1
39	Janitor	2	-	2
40	Truck Driver	4	4	-
41	Light Vehicle Driver	9	9	-
42	Maintenance Worker	1	1	-
Sub-Total (Support Staff)		**39**	**25**	**14**
Grand Total		**59**	**36**	**23**

2.6.7 Conducting study to strengthen financial and organizational arrangement to support activities of EWTEC

A special committee was organized under the MoWIE in order to investigate the current situation relating to EWTEC and the proposed future organizational setup. The committee visited three relevant public training institutions which have become semi-autonomous: the training center under the Ethiopian Road Authority, Ethiopian Management Institute (EMI), and Telecommunication Information Technology College, and summarized their processes towards becoming semi-autonomous, income generating activities, and their government subsidies. Based on the study results, three possible options were examined as future directions for EWTEC to take such as: 1) to continue as a project; 2) to promote the project to department level; or 3) to make it semi-autonomous. It was concluded that option 1 and 2) would not solve the fundamental issues of shortages in human resources and budget, and, therefore, it was concluded that option 3, to become semi-autonomous, would be the most favorable direction. During preparation of the study report, a Japanese expert provided support by examining different financial scenarios. Based on the report, a direction to transform EWTEC into a semi-autonomous organization which could generate income was supported by MoWIE and the Japanese expert continued supporting preparation of a strategic plan and a business plan, which included a financial and organizational plan. However, after the submission of transformation and business plan documents by MoWIE, PMO directed to work jointly with MoE for the transformation of EWTEC, and accordingly, another new special committee was organized to further discuss the transformation. Finally, based on the joint study committee report PMO agreed to transform EWTEC into a public institute. The financial and organizational plan is summarized in the strategic plan.

2.6.8 Public relations to improve EWTEC capacity for information communication

The EWTEC website (http://www.ewtec.org.et/) was updated periodically. The site can be accessed from the top page of the MoWIE website.

Newsletters were issued 3 to 4 times a year, 17 times in total. An annual report was prepared from the 3rd year and issued 4 times in total. These publications were distributed to MoWIE, UNICEF and visitors.

3. Input

3.1 Japanese expert dispatch

Japanese expert dispatch record and schedule table is shown in Table 45and Table 46.

Table 45: Japanese expert dispatch record

Assignment	Name	Project Year	Duration	M/M	Work contents
Chief Advisor/ Organizational Management	Akira Kamata	1	1/12 – 1/27	0.53	To lead the project and advise on organizational management
			4/3 – 4/30	0.93	
		2	8/25 – 9/23	1.00	
			12/6 – 12/30	0.83	
			4/1 – 4/30	1.00	
		3	8/1 – 8/25	0.83	
			12/17 – 1/30	1.50	
		Subtotal		7.29	
Chief Advisor	Akira Doi	3	5/14 – 6/4	0.73	To lead the project after Kamata
		4	8/7 – 8/27	0.70	
			1/8 – 1/28	0.70	
			5/27 – 6/16	0.70	
		5	11/19 – 12/8	0.67	
			5/24 – 6/12	0.67	
		6	8/19 – 9/8	0.70	
			11/12 – 11/30	0.63	
		Subtotal		6.62	
Organizational Management	Toru Ishibashi	3	5/31 – 6/24	0.83	To advise for organizational management and support preparation of strategic plan for future EWTEC
		4	9/19 – 10/26	1.27	
			4/3 – 5/9	1.23	
		5	10/22 – 11/20	1.00	
			1/9 – 3/4	1.83	
		6	10/13 – 12/1	1.67	
		Subtotal		7.83	
Assessment Program 1	Misa Oishi	1	1/14 – 2/12	1.00	To monitor and evaluate project output
		Subtotal		1.00	
	Akira Matsumoto	1	6/8 – 7/7	1.00	
		2	12/13 – 12/30	0.60	
			4/5 – 5/16	1.40	
		3	12/11 – 12/30	0.67	
			4/3 – 5/12	1.33	
		4	9/28 – 11/11	1.50	
			1/3 – 1/17	0.50	
		5	9/1 – 10/7	1.23	
		Subtotal		8.23	
Assessment Program 2/ Training Management 2	Masahko Ikemoto	1	1/27 – 4/6	2.33	To manage project activities including training
			6/7 – 7/15	1.30	
		2	8/25 – 10/18	1.83	
			1/5 – 3/8	2.10	
			5/8 – 6/23	1.57	
		3	8/25 – 9/24	1.03	
			12/16 – 2/12	1.97	
			5/4 – 6/24	1.73	
		4	8/22 – 10/6	1.53	

Assignment	Name	Project Year	Duration	M/M	Work contents
			11/27 – 1/12	1.57	
			5/6 – 6/16	1.40	
		5	8/30 – 10/16	1.60	
			1/5 – 2/3	1.00	
			4/20 – 5/31	1.40	
		6	9/3 – 10/2	1.00	
			11/2 – 12/1	1.00	
		Subtotal		24.36	
Hydrogeology/ Volcanology	Toshiyuki Matsumoto	1	3/25 – 4/18	0.84	To instruct technical C/P in groundwater investigation
			6/19 – 7/19	1.03	
		2	11/11 – 12/10	1.00	
			3/14 – 6/26	3.50	
		3	9/29 – 11/12	1.50	
			3/10 – 4/8	1.00	
		4	1/24 –2/7	0.50	
			4/30 – 6/13	1.50	
		5	11/27 – 1/25	2.00	
		6	9/1 – 9/30	1.00	
		Subtotal		13.87	
Drilling Technology	Takashi Suzuki	1	1/14 – 2/12	1.00	To instruct technical C/P in drilling technology
			4/21 – 5/26	1.20	
		2	12/23 – 3/7	2.50	
		3	10/18 – 12/26	2.33	
			3/6 – 4/4	1.00	
		4	12/21 – 2/18	2.00	
			3/20 – 5/18	2.00	
		5	10/24 – 12/12	1.67	
			2/20 – 4/5	1.50	
		6	9/7 – 10/6	1.00	
		Subtotal		16.20	
Water Supply Engineering	Hiroshi Takashima	1	3/17 – 3/27	0.37	To instruct technical C/P in water supply engineering
			6/1 – 6/19	0.63	
		2	9/23 – 10/11	0.63	
			1/7 – 2/16	1.37	
		3	9/2 – 9/23	0.74	
			2/15 – 2/21	0.23	
			2/24 – 3/11	0.53	
		4	2/13 – 3/13	1.00	
		Subtotal		5.50	
Machinery/ Electric Machinery	Tamotsu Ishii	1	1/14 – 2/12	1.00	To instruct technical C/P of drilling machinery maintenance technology and electro-mechanical maintenance technology
			6/14 – 7/19	1.20	
		2	9/15 – 11/28	2.50	
			3/14 – 4/12	1.00	
		3	8/1 – 9/29	2.00	
			4/18 – 6/16	2.00	
		4	1/9 – 3/18	2.33	
			4/28 – 6/16	1.67	
		5	9/9 – 11/7	2.00	
			4/28 – 6/16	1.67	
		6	11/2 – 12/1	1.00	
		Subtotal		18.37	
IEC/Teaching Methodology	Steven Sandstrome	1	2/9 – 3/20	1.33	To instruct technical C/P in IEC/ teaching methodology
			4/26 – 5/22	0.90	
		2	10/11 – 11/9	1.00	

Assignment	Name	Project Year	Duration	M/M	Work contents
			1/4 – 2/2	1.00	
		3	8/8 – 9/21	1.50	
		Subtotal		5.73	
Information Management	Ryohei Matsumoto	1	3/4 – 4/2	1.00	To support website creation, database management and public relations
		2	8/20 – 9/18	1.00	
		Subtotal		2.00	
Information Management/ Training Management 2	Shingo Arai	4	10/16 – 12/14	2.00	To support training management, website and database management and public relations
			1/31 – 4/15	2.50	
		5	8/22 – 10/1	1.37	
			10/9 – 12/6	1.96	
			2/4 – 4/9	2.17	
			4/30 – 6/16	1.60	
		6	8/10 – 9/18	1.33	
			10/13 – 12/1	1.67	
		Subtotal		14.60	
Groundwater Modeling	Naoaki Shibasaki	2	8/25 – 9/23	1.00	To give groundwater modeling course
		3	8/26 – 9/24	1.00	
		4	8/25 – 9/23	1.00	
		5	8/30 – 9/28	1.00	
		Subtotal		4.00	
Remote Sensing	Kazutoshi Masuda	3	3/28 – 4/26	1.00	To give remote sensing course
		Subtotal		1.00	
GIS	Lei Peifeng	2	1/30 – 2/28	1.00	To give GIS course
		Subtotal		1.00	
Geophysical Survey	Mistsuyoshi Saito	3	9/29 – 11/7	1.33	To give geophysical survey course
		Subtotal		1.33	

Table 46: Japanese expert dispatch table

Title	Name	1st year		2nd year		3rd year		4th year		5th year		6th year		Total	
		Ethiopia	Japan	Ethiopia	Japan	Ethiopia	Japan	Ethiopia	Japan	Ethiopia	Japan	Ethiopia	Japan	Ethiopia	Japan
Chief Advisor/Organizational management	Akira Kamata	1.46	0.20	2.83		2.33								6.62	0.20
Chief Advisor	Akira Doi					0.73		2.10		1.33		1.33		5.49	0.00
Organizational management	Toru Ishibashi					0.83		2.50		2.83		1.67		7.83	0.00
Assessment Program 1	Misa Oishi	1.00	0.20											1.00	0.20
	Akira Matsumoto	1.00		2.00		2.00		2.00		1.23				8.23	0.00
Assessment Program2 /Training management2	Masahko Ikemoto	3.63	0.20	5.50		4.73		4.50		4.00	0.17	2.00		24.36	0.37
Hydrogeology/volcanology	Toshiyuki Matsumoto	1.87	0.10	4.50		2.50		2.00		2.00		1.00		13.87	0.10
Drilling technology	Takashi Suzuki	2.20	0.10	2.50		3.33		4.00		3.17		1.00		16.20	0.10
Water Supply Engineering	Hiroshi Takashima	1.00		2.00		1.50		1.00						5.50	0.00
Machinery/Electric Machinery	Tamotsu Ishii	2.20	0.10	3.50		4.00		4.00	0.33	3.67	0.17	1.00		18.37	0.60
IEC/Teaching methodology	Steven Sandstrome	2.23		2.00		1.50								5.73	0.00
Information Management	Ryohei Matsumoto	1.00		1.00										2.00	0.00
Information Management/ Training Management2	Shingo Arai							4.50		7.10		3.00		14.60	0.00
Groundwater modeling	Naoaki Shibasaki			1.00		1.00		1.00		1.00				4.00	0.00
Remote Sensing	Kazutoshi Masuda					1.00								1.00	0.00
GIS	Lei Peifeng			1.00		0.00								1.00	0.00
Geophysical Survey	Mistsuyoshi Saito					1.33	0.17							1.33	0.17
Total		17.59	0.90	27.83	0.00	26.78	0.17	27.60	0.33	26.33	0.34	11.00	0.00	137.13	1.74

3.2 Training in Japan

Training in Japan was provided three times during the project period as summarized below.

(1) 1st training in Japan (April 2012)

Items	Description
Area of training	Electro-mechanical /workshop management
Number of participants	3
Duration	2012/04/07 – 2012/04/29
Training place	Denyo Co., Ltd. MARUMA Technica Co., Ltd. Technica Co., Ltd.

(2) 2nd Training in Japan (February 2013)

Items	Description
Area of training	Electro-mechanical /workshop management
Number of participants	4
Duration	2013/02/02 – 2013/02/24
Training place	Denyo Co., Ltd. MARUMA Technica Co., Ltd. Technica Co., Ltd.

(3) 3rd Training in Japan (April 2013)

Items	Description
Area of training	Groundwater management and water supply
Number of participants	4
Duration	2013/04/10 – 2013/04/28
Training place	■ Kitakata City, Fukushima Prefecture ■ Ono City, Fukui Prefecture ■ Water department, Akishima city, Tokyo metropolitan area ■ Waterworks department (Sakai water treatment plant, Water control center, Water quality control center and Misono water treatment plant), Tokyo metropolitan area. ■ Environmental agency, water and sewerage agency, Kumamoto City, Kumamoto Prefecture.

3.3 Equipment procurement

A list of procured equipment is shown below. All the equipment has been handed over to C/P.

Table 47: List of equipment

Project Year	Equipment	Qty	Date of purchase
1st year	Photocopy machine	2	2009.03, 2009.06
1st year	Printer (black & white)	5	2009.06
1st year	Printer (color)	1	2009.04
1st year	Printer (black & white)	3	2009.04
1st year	Projector	2	2009.01
1st year	Laptop PC	3	2009.06
1st year	Desktop PC	4	2009.06
2nd year	GPS	10	2009.09
2nd year	Borehole camera	1	2010.04
2nd year	Walkie-talkie	6	2010.05
3rd year	Laptop PC	2	2010.08
3rd year	Desktop PC	4	2010.08
3rd year	UPS	2	2010.08
3rd year	Printer (black & white)	2	2010.08
3rd year	ORP meter	1	2010.09
3rd year	Laptop PC	3	2011.06
3rd year	Projector	2	2011.06
4th year	Desktop PC	3	2012.06
4th year	Laptop PC	3	2012.06
4th year	Projector	2	2012.06
5th year	Scanner	3	2013.04
5th year	Fax machine	1	2013.04
6th year	Laptop PC	2	2013.08
6th year	Video camera	2	2013.08

3.4 Local expenditure (Japanese side)

Local expenditure for each project year is summarized in the following table.

Table 48: Local expenditure (Japanese side)

(Unit: Thousand yen)

Item	1st year	2nd year	3rd year	4th year	5th year	6th year
Employment of local staff	1,174	833	1,195	2,980	4,127	2,003
Equipment maintenance	0	10	146	220	164	649
Consumables	988	1,721	2,377	2,531	3,254	825
Transportation	1,107	3,336	2,862	2,028	3,595	649
Telecommunication	81	118	114	182	194	64
Printing	164	178	163	93	181	364
Renting	58	0	0	0	0	402
Facility maintenance	562	1,117	885	5,821	3,721	600
Local training	314	13,400	17,095	10,498	17,913	1,120
Total	4,448	20,713	24,837	24,353	33,149	6,676

4. Output

4.1 Achievement

4.1.1 Achievement of Project Purpose

After approval of the draft regulation by Council of Ministers, the transformation of EWTEC into EWTI was officially announced through the Federal Negarit Gazette in August 2013; and which assured the position of EWTI as a core training center of the water and sanitation sector in Ethiopia. By securing the institutional sustainability of EWTEC through its successful transformation into EWTI, the biggest objective of the project was achieved. Following is a description of the achievement for each indicator under PDM.

Project Purpose:	Capacity of EWTEC as a core training center for water supply technicians and engineers of Ethiopia is strengthened
Verifiable Indicators	Achievement Level
1 Achieved EWTEC Certificates are well acknowledged as a technical certification in the water sector	The certificate issued by EWTEC has been well-acknowledged in the water sector. In particular, the certificate of the Drilling Technology course is highly acknowledged. EWTEC has become the public institute as EWTI. The certificate issued by EWTI will be compliant with Ethiopian Occupational Standards (EOS). In addition, EWTI will act as Assessment Center to manage assessment of candidates for certification.
2 Almost Achieved EWTEC's officers have sufficient knowledge to assess needs, plan, coordinate, conduct, and evaluate training activities	EWTEC has sufficient capacity to plan, coordinate and evaluate the courses. However, in conducting training, there is a need to develop the capacity of staff in certain courses.
3 Achieved Mid-to long-term strategy of EWTEC is approved by MoWIE, and is acknowledged by training participating organizations and donors	EWTI is described as a WASH Training Center of Excellence in the final program document of the One WASH National Program launched in September 2013, together with TVETC and Health Science College. In addition, a seminar to disseminate the role and strategic plan of EWTI was organized for the participating related organizations and donors in November 2013.
4 In progress Financial plan to implement the operational plan of the Strategy is endorsed by MoWIE	Under the provisionally appointed director general (DG), an operational plan was prepared and based on this a lump sum budget for 2014/15 fiscal year was notified to MoFED as of November 2013. The very rough financial estimate includes a budget for procuring some office and training equipment.

4.1.2 Achievement of Output

The achievement of each indicator for four outputs under PDM is described below.

Output 1 : Mechanisms to sustain constant quality improvements in EWTECs training activities are fully established

Verifiable Indicators	Achievement Level
1 Almost Achieved Final examination tests on respective training modules are prepared and conducted.	Final examination tests have been implemented for each basic course. However, Advanced and On-demand courses did not have final examinations because the duration of these courses was short (only 2 weeks) and spending time on practical training was more important than conducting a final examination test. In the international courses, the level of understanding was measured by the results of group presentations and assignments instead of examination tests.
2 Achieved Needs assessment, course evaluations, impact surveys and questionnaires are institutionalized as regular activities and the results are incorporated into training activities.	**Needs Assessment** A needs assessment survey was conducted in the 1st year by C/P. Results of the assessment were integrated into and reflected in the training plan. Results were compiled in the report "Training Needs Assessment Survey" in June 2009 which revealed that there were about 15,000 potential engineers and technicians suitable for EWTEC training. **Course Evaluation** Course evaluation was conducted at the end of each course. Instructors and coordinators reflected suggestions in the training plan as much as possible. However, many of the requests such as extension to the training duration were rejected due to budget limitation and lack of staff availability. **Impact survey** Since the 2nd year, course coordinators and instructors have visited ex-trainees and their bosses to evaluate and assess the Project's impacts periodically. An additional survey of other African countries (Uganda and Sudan) was conducted in the 5th year and the results of overall impact survey were compiled as a report in December 2012.
3 Partially Achieved Database of external human resources with specific specialization is developed and updated.	Although the database of external human resources with specific specialization was developed and updated, the database was not utilized to hire external instructors because EWTEC did not have flexibility to employ them directly (it had to follow the government procurement procedure).
4 Partially Achieved Technical skills, knowledge and know-how to improve the quality of training are accumulated in EWTEC through the Training Technical Committee (TTC), provided that the appropriate number of staffs are available	TTC which was supposed to be established with the external members from other institutes and universities at the beginning of the Project has not been established due to a lack of staff. In spite of this, EWTEC staff tried to develop the implementation manuals and held internal meetings to accumulate technical skills, knowledge and know-how to improve the quality of training in EWTEC as an organization.

Output 2 : Technical knowledge and skills on water supply and management are improved for technicians and engineers from public sector, private sector, NGOs, TVETC instructors, and other African participants

<table>
<tr><th>Verifiable Indicators</th><th>Achievement Level</th></tr>
<tr><td>1 Achieved
Number of training courses is increased to 15 (*currently planned).</td><td>17 courses were conducted in Phase 3.
<table>
<tr><td>Basic course</td><td>1. Groundwater Investigation (GWI)
2. Drilling Technology (DT)
3. Drilling Machinery Maintenance (DMMT)
4. Electro-Mechanical Maintenance Technology (EMMT)
5. Water Supply Engineer (WSE)</td></tr>
<tr><td>Advanced course</td><td>6. Groundwater Modeling (GWM)
7. Remote Sensing (RS)
8. Geographic Information System (GIS)
9. Isotope Hydrology (IH)
10. Geophysical survey (GPS)
11. Well Diagnosis and Well Rehabilitation (WD/WR)
12. Hydraulic System Maintenance (HSM)
13. Water Supply Engineering Software (WSE-software)</td></tr>
<tr><td>Training for TVETC</td><td>14. Electro-Mechanical Maintenance Technology
15. EMMT Course for instructors</td></tr>
<tr><td>On-demand course</td><td>16. Hand Pump Maintenance and Installation
17. Machine Maintenance</td></tr>
</table></td></tr>
<tr><td>2 Partially Achieved
Training curriculum & modules, teaching materials & handouts are revised for all the existing courses in order to increase the proportion of practical training.</td><td>Training curriculum & modules, teaching materials & handouts are revised by instructors and coordinators.
The proportion of practical training hours to the total hours in each basic course generally increased throughout the project except for DT. Among the five basic courses, GWI, EMMT and WSE show relatively high percentages of practical training hours, which are at an almost ideal proportion. As for DT and DMMT, there is still room for improvement.
Advanced course secured necessary hours for practical training (more than 70%).</td></tr>
<tr><td>3 Partially Achieved
Participation from private sector and NGOs is increased up to 10% of total trainees.</td><td>The training courses in which the private sector and NGOs are more interested are DT and DMMT. The proportion of participants from the private sector and NGOs to the total trainees in DT and DMMT courses has been almost 10% since the mid-term review (3rd year). It was often difficult for private companies and NGOs to send staff to EWTEC for a long period due to their own work commitments.</td></tr>
<tr><td>4 Achieved
Final Examination test results at the end of respective modules reach 75/100 on average and also exceed 50% of trainees at 80/100 score</td><td>The scores in the final examination tests average more than 75% in each course. The proportion of trainees who achieve more than 80% also exceeds 50%.
<table>
<tr><th>Basic course</th><th>Average score</th><th>The proportion of trainees who acquired more than 80%</th></tr>
<tr><td>GWI</td><td>81.0</td><td>51.7%</td></tr>
<tr><td>DT</td><td>82.5</td><td>58.1%</td></tr>
<tr><td>DMMT</td><td>85.3</td><td>85.3%</td></tr>
<tr><td>EMMT</td><td>82.2</td><td>62.3%</td></tr>
<tr><td>WSE</td><td>80.2</td><td>50.8%</td></tr>
</table></td></tr>
</table>

5 Achieved

Approximately 1,500 technicians among RWB, ZWRO, TWSSO, WWO, TVETC instructors, private sector and NGOs complete EWTEC training by the end of the project term

1,581 engineers and technicians participated for EWTEC training during Phase 3. Detailed numbers are as follows.

Organization	No. of participants
Region Water Bureau (RWB)	219
Zonal Water Office (ZWRO)	170
Woreda Water Office (WWO)	233
Town Water Supply Service (TWSS)	34
Water Works Construction Enterprise (WWCE)	177
Water Works Design & Supervision Enterprise (WWDSE)	16
TVETC	503
African Countries	118
MoWIE	22
Geological Survey of Ethiopia (GSE)	12
Addis Ababa Water and Sewerage Authority (AAWSA)	23
University	15
Private Sectors	14
NGOs	1
EWTEC	22
Others	2
Total	**1581**

6 Achieved

The bosses of ex-trainees are satisfied with the technical capacity and performance of ex-trainees.

According to the results of the impact survey, bosses of ex-trainees have identified that ex-trainees have improved technical skills after the training. The knowledge and experience they acquired during the training has been reflected in their practical work. Furthermore, some ex-trainees have conducted internal training with handouts and materials provided in the EWTEC training.

Output 3 : Capacities are developed to provide technical instructions of course coordinators, instructors, mechanics and drillers who conduct training at EWTEC.

Verifiable Indicators	Achievement Level
1 Achieved Levels of technical knowledge and skills of course coordinators and instructors are improved	Coordinators and instructors have acquired capacity to conduct the basic course by themselves. Furthermore, they are confident in conducting training and take enough time for training preparation. In order to accumulate the technical knowledge and skills from course coordinators and instructors in EWTEC, discussions among staff members have frequently been held, mutually enhancing their knowledge and skills. Through training in Japan, coordinators and instructors of EWTEC have experienced technology which has not yet been introduced in Ethiopia, and observed the way Japanese experts work in their work place, which has encourage them to work in a similar way.

2 Almost Achieved
Course coordinators and instructors acquire practical knowledge and skills of field work.

Activities for instructors and coordinators to acquire knowledge and skills of field work are the following.

Course title	Activities
Groundwater Investigation (GWI)	A development study was conducted through the assessment of groundwater resources in the Rift Valley (Bilate basin) as a practical exercise. The study was conducted in cooperation with Addis Ababa university and included various study components such as a geological field survey, water quality testing, isotope analysis, geophysical survey, GIS and groundwater modeling. The activity enhanced the capability of trainees to work through the process of obtaining, analyzing, and interpreting data.
Drilling Technology (DT)	Through the practical training in the basic course, OJT training on drilling was provided using DTH and the mud rotary method. In addition, fishing tools which can be produced with locally available materials were introduced. Training on well rehabilitation was conducted through the implementation of the advanced course as OJT. The borehole camera was also introduced during the well rehabilitation training. In addition, activities relating to rig maintenance were conducted in cooperation with DMMT staff.
Drilling Machinery Maintenance Technology (DMMT) / Electro Mechanical Maintenance Technology (EMMT)	Through repeating the overhaul of old vehicles and repair of generators and hydraulic parts, coordinators and instructors have experienced different kinds of malfunctions and have acquired repairing skills. In addition, by producing engine load tester equipment utilizing locally available material, the possibility and importance of generating income by EWTEC workshop was highlighted. Workshop management capacity was developed throughout the project.
Water Supply Engineering (WSE)	Only one coordinator was assigned after the 4th year, so training to improve his capability was not effectively conducted.

3 Almost Achieved
Levels of satisfaction among trainees on levels of knowledge and technical expertise, teaching methods, course management and attitudes are increased.

The impact assessment revealed that most trainees evaluated the training at EWTEC as effective, productive and highly appreciated. Furthermore, they well-evaluated the contents of the training and the level of instructors (excellent 59%, good 33%, fair 4% and of little importance 4%).
However, some ex-trainees were not satisfied with the accommodation facilities such as cafeteria and dormitory. Furthermore, some ex-trainees requested an extension to the training period, but this request has not been fulfilled due to budgetary and human resources constraints.

Output 4 : Sustainable institutional management capacity in terms of organizational, financial, accounting, personnel, marketing, and workshop management capacity of EWTEC is strengthened.

	Verifiable Indicators	Achievement Level
1	Achieved Development of Medium-to Long-term Strategy and Operational Plan.	For the transformation of EWTEC, a special committee was established and prepared necessary documents such as a strategic plan, transformation plan, business plan etc. with Japanese support. The documents were submitted to PMO and revised several times. Finally, establishment of EWTI was approved. After official approval of establishment of EWTI, a three-year strategic plan and an action plan were prepared under a provisional DG. Then a seminar to disseminate the strategy to all stakeholders was held in the 6th year of the project.
2	In progress Necessary budget and human resources are confirmed according to the annual operational plan	After establishment of EWTI in the 6th year, organizational structure and staff plan and salary scale were prepared and submitted to PMO and MoCS for approval. Based on a three-year strategic plan and action plan, recruitment of new staff is expected to start from December 2013.
3	Almost Achieved Fundraising activities are enhanced	To secure the EWTEC operation fund, EWTEC actively approached fund donors such as WASH fund and UNICEF fund. About 40% of the annual budget funding was from other than government budget in the 5th year. In addition, EWTEC submitted proposals for facility expansion to the World Bank, UNICEF and the Embassy of Finland. Through taking these actions for fund-raising, the mind of EWTEC staff has changed not to depend only on the Ethiopian government or Japanese government.
4	In progress Conduct financial and organizational analysis if EWTEC is transformed into a public institute	After EWTEC was directed to be transformed into an autonomous entity by MoWIE, a five-year financial plan was prepared including income generation and organizational analysis using the SWAT method. Later in the 6th year, EWTEC was finally transformed into a public institute, and then a three-year financial plan for the activity was prepared.
5	Achieved Periodical update of database on training participants	All the previous data on trainees from 1998 onwards was collected and a new database for EWTEC participants was created by using MS Access. The database was updated every time there were new training courses.
6	Achieved Publicizing of EWTEC annual report	Annual reports were issued every year from the 3rd year of the project, a total 4 times, and project newsletters were published 17 times from the 1st year of the project.
7	Achieved Periodical update of EWTEC homepage	EWTEC homepage was updated every 3 to 4 months.

4.2 Output materials

Table 49: List of output materials

No.	Title	Form	Produced project year
1	Inception Report (IC/R)	Document	1st year
2	Project Document (P/D)	Document	1st year
3	Progress Report 1 (P/R1)	Document	2nd year
4	Interim Report (IT/R)	Document	3rd year
5	Progress Report 2 (P/R2)	Document	3rd year
6	Progress Report 3 (P/R3)	Document	4th year
7	Progress Report 4 (P/R4)	Document	5th year
8	Project Completion Report (PC/R)	Document	6th year
9	Training Needs Assessment Survey	Document	1st year
10	Impact Survey Report (IP/R)	Document	5th year
11	Information, Education and Communication (IEC) & Teaching Methodology Manual	Document	2nd year
12	Manual for Implementation of International Training	Document	5th year
13	Federal Negarit Gazette	Document	6th year
14	EWTI Strategic Plan (ST/P)	Document	6th year
15	EWTI Organizational Structure & Staffing Plan	Document	6th year
16	EWTI Salary Scale	Document	6th year
17	EWTI Job Description	Document	6th year
18	Training course implementation report	MS Excel	2nd year
19	EWTEC Database	MS Access	2nd year
20	EWTEC homepage	Website	1st year
21	Newsletter (Vol.1)	Document	1st year
22	Newsletter (Vol.2)	Document	2nd year
23	Newsletter (Vol.3)	Document	2nd year
24	Newsletter (Vol.4)	Document	2nd year
25	Newsletter (Vol.5)	Document	3rd year
26	Newsletter (Vol.6)	Document	3rd year
27	Newsletter (Vol.7)	Document	3rd year
28	Newsletter (Vol.8)	Document	3rd year
29	Newsletter (Vol.9)	Document	4th year
30	Newsletter (Vol.10)	Document	4th year
31	Newsletter (Vol.11)	Document	4th year
32	Newsletter (Vol.12)	Document	4th year
33	Newsletter (Vol.13)	Document	5th year
34	Newsletter (Vol.14)	Document	5th year
35	Newsletter (Vol.15)	Document	5th year
36	Newsletter (Vol.16)	Document	5th year
37	Newsletter (EWTI, Vol.1)	Document	6th year
38	Annual Report (EFY2002)	Document	3rd year
39	Annual Report (EFY2003)	Document	4th year
40	Annual Report (EFY2004)	Document	5th year
41	Annual Report (EFY2005)	Document	6th year
42	Course Module Summary (GWI)	Document	1st year
43	Course Module Summary (DT)	Document	1st year
44	Course Module Summary (DMMT)	Document	1st year
45	Course Module Summary (EMMT)	Document	1st year
46	Course Module Summary (WSE)	Document	1st year
47	Generator load tester	Equipment	1st year
48	Overhauled vehicle (Land cruiser)	Equipment	2nd year
49	Workshop equipment (different types of worktables, foothold, stand carrier for gas welding, casing stand, safety plug, working lump, shower facility, sink stand etc.)	Equipment	2nd year

No.	Title	Form	Produced project year
50	Fishing tools for drilling	Equipment	2nd year
51	Bilate sub-basin integrated groundwater resources evaluation	Document	6th year
52	EWTI brochure (for seminar)	Document	6th year
53	History of EWTEC (English/Amharic)	Video	6th year
54	Manual for video editing (Video Studio X6)	Document	6th year

4.3 Collected materials

Table 50: List of collected materials

No.	Title	Document/ Video/ Map /Photo etc.	Original/ copy	Publisher	Published year
1	Growth and Transformation Plan (GTP)	Document	Copy	MoFED	2010
2	Inception report for revision of National WASH Programme Implementation Manual (PIM)	Document	Copy	UNICEF	2010
3	Water, Sanitation and Hygiene Sector Capacity Building Project Technical Update	Document	Copy	UNICEF	2010
4	Ethiopian Civil Service College, Information Bulletin, A brief profile of the college	Document	Original	ECSC	2010
5	Ethiopian Occupational Standards (EOS) Building Metal Work Level4	Document	Copy	Ministry of Education, ECBP TVET Reform	2007
6	Water supply and sanitation in Ethiopia: turning finance into services for 2015 and beyond.	Document	Copy	AMCOW	2010
7	Negarit Gazeta (public enterprise proclamation)	Document	Copy	Transitional government of Ethiopia	1992
8	Ethiopian Water Sector Policy 2001	Document	Copy	MoWR	2001
9	Ethiopian Water Sector Strategy 2001	Document	Copy	MoWR	2001
10	Water Sector Development Program Main Report I	Document	Copy	MoWR	2002
11	Water Sector Development Program Main Report II	Document	Copy	MoWR	2002
12	PASDEP 2007-2008 Water Report	Document	Copy	MoWR	2008
13	GLAAS2010, UN-Water Global Annual Assessment of Sanitation and Drinking-Water	Document	Copy	WHO	2010
14	Progress on Sanitation and Drinking-Water 2010 update	Document	Copy	WHO, UNICEF	2010
15	TVETC Capacity Mapping and Benchmarking Project, Phase II: Capacity Assessment and Development of Support Plan, Report No. 4.2, Asosa TVTC	Document	Copy	Water Aid	2011
16	Revised UAP (Rural Water Supply) Final Report	Document	Copy	MoWIE	2011
17	Welfare Monitoring Survey 2011 Volume II, Statistical Report Indicators on Living Standard, Accessibility, Household Assets	Document	Copy	Central Statistical Agency	2011
18	Evaluation of WASH capacity building interventions in Ethiopia: Draft Final Report	Document	Copy	DFID	2013
19	One WASH national program preparation, Inception report	Document	Copy	MoWIE	2013

5. Lessons learned through implementation of the project

(1) Changing the attitude of staff members

At the beginning of Phase 3, on the whole the staff members of EWTEC lacked motivation for the work because of the low wages and lack of other incentives. Technical staff members were very interested in advanced technologies using expensive test equipment and sophisticated software; and especially the course coordinators, who are senior staff members, had not shown not much the expected level of interest in the on-the-job training provided in Ethiopia by the Japanese experts, but rather strongly desired the opportunity to take short- and long-term training courses in Japan and other foreign countries. This is mainly due to lack of motivational factors as well as an undesired trend prevailing in the work culture. Meanwhile, there was a huge gap between the evaluation made by the Japanese experts and that made by the C/Ps, of the level of the C/Ps' capacity to perform the basic practical work they were supposed to be able to perform, including repairs of equipment and the elucidation of succession of strata and so on. Therefore, the Japanese experts had to demonstrate their own developed technical skills and wealth of experience to the C/Ps, in order to make them realize their actual gap of practical skill, before the technologies considered necessary by the Japanese experts could be transferred.

For example, the Japanese expert specializing in the electro-mechanical maintenance began his work by procuring the minimum maintenance tools needed for the EWTEC workshop and doing what he could with these procured tools and the machine tools that the workshop had. Under his instruction, the staff members of EWTEC, who were mainly at the level of assistant and technician, first practiced dismantling and reassembling generators and later designed and manufactured a testing machine to measure generator performance using locally-available materials. By demonstrating during this process his welding techniques, ability to use a variety of tools and machine tools, and practical knowledge of electricity and machinery, the Japanese expert managed to excite interest in the training among the C/Ps, who had been somewhat doubtful of the technical superiority of the expert, and allowed them to realize the extent of the gap between his technical capacity and theirs, without hurting their self-respect. They may be able in the future to generate income from carrying out performance tests and maintenance of generators of external clients. The recognition of this possibility of their technical capacity potentially helping them gain a reliable source of income improved their motivation to learn the technologies. Technical staff members at the level of assistant were relatively more interested to learn practical techniques than the higher level staff and due to this fact, the Japanese experts first tried to change the attitude of the assistant level technical staff members. After seeing the change in attitude of the assistant level staff, the higher level staff members and staff from other areas began to change their attitude, and later they showed a positive attitude toward learning technologies from the Japanese experts. This strategy of targeting lower level staff members to effect a change in attitude has resulted in bringing a positive impact on the entire organization.

In the public sector of developing countries where too much importance is placed on educational

background and there is little information or competition, people tend to be more interested in having the opportunity to use more sophisticated technologies, even if those technologies are not practical in that particular country, than in making a persistent effort to learn basic technologies. This attitude often makes the transfer of essential basic technologies difficult in developing countries. However, the attitude of the C/Ps changed gradually and the organization as a whole began to move forward as the Japanese experts gave practical demonstrations of their high technical capacity and repeatedly explained to the C/Ps that Japan had achieved technological advancement through the creative use of basic practical technologies. Therefore, the most important lesson learned through the implementation of this project is that changing the attitude of the C/Ps is the first and most important step for the effective implementation of technology transfer.

(2) Effective use of training in Japan

Training in Japan for key C/Ps was implemented three times in the fourth and fifth years of Phase 3, after the Ethiopian side had in the third year officially announced the policy direction for the future organization set-up of EWTEC. Although the training courses were each only approximately three weeks long, they were designed to include not only experience sharing visits to workshops, but also as many opportunities as possible for the participants to practice the same work as Japanese professionals do at the workshops they visited, so that the participants could learn the attitude of Japanese engineers at work and their outlook on their work. Repeated explanations by the Japanese experts in Ethiopia had failed to make the C/Ps fully aware of the importance of practices such as safety management, cleanliness and orderliness in the workshop, maintenance of tools and the recording of basic monitoring data – simple practices, but currently the ones still most necessary in Ethiopia. The training made the participants even more aware of the importance of these practices by providing them with opportunities to observe with their own eyes Japanese engineers following those practices at work. The experience of seeing cutting-edge technologies also had a huge impact on the participants. The training offered them the experience to understand first-hand the technological gap between Japan and their own country. In fact, the participants assumed overall a more modest attitude after returning from Japan.

It is true that the C/P training in Japan was implemented slightly later than expected, after mid-way through the project period. However, in retrospect, the timing of the implementation of the training, following clarification of the policy for the future of EWTEC, is considered to have been appropriate. The training in Japan contributed not only to upgrade the skills of the C/Ps but also to the successful implementation of the project. Therefore, deliberate planning of the timing of the implementation of training in Japan is necessary for making the most effective use of this opportunity.

(3) Implementation of the needs survey and the impact survey by the C/Ps, instead of by a local subcontractor

The original plan was to employ a local consulting company as a subcontractor to implement the

needs survey and the impact survey. However, outsourcing this work would have made it practically impossible to achieve the intended objectives of preparing a training plan appropriate to the needs on the ground and of providing the training with feedback from the outputs and impact of the training confirmed on the ground. By carrying out the surveys themselves, the C/Ps were able to be directly and deeply involved in the planning and evaluation processes, and this direct and deep involvement helped reinforce their motivation towards the training and their sense of responsibility. The implementation of the surveys by the C/Ps had the additional benefit of significantly reducing project costs.

(4) Costs of the practical training in drilling borne by the regional governments

EWTEC and/or MoWIE held negotiations with the regional governments and, based on the agreement reached with them, EWTEC performed drilling of boreholes at planned drilling sites of the regional governments on their behalf, in exchange the regional governments covering the actual costs of fuel and consumables, including casings. In this way, expenditure on the most expensive part of the practical training was reduced.

(5) Use of a local private consultant for the survey of the legal system, organizational structures and financial affairs in Ethiopia

After the official policy direction on transformation of EWTEC into a public institute given by MoWIE in the 3rd year of the project, an additional Japanese expert specializing in the organizational management was dispatched to Ethiopia. In addition, the project employed a local private consultant versed in the legal system, organizational structures and financial affairs of Ethiopia. In the beginning, JICA suggested the dispatch of three Japanese experts to conduct this survey. However, in reality, it is difficult for Japanese experts to obtain information on the relevant Ethiopian institutions and to learn what documentation and procedures are required for organizational transformation. Therefore, the project had to utilize a human resource with a good local network. The availability to the project of a person able to contact and discuss policy issues with senior officials of MoWIE, MoE, MoFED and PMO contributed significantly to the successful transformation into EWTI.

(6) Importance of continuation

EWTEC is a long-term project that has been in operation for approximately 16 years since its launch in January 1998. As self-reliance and sustainability were required for the project, the organizational transformation of EWTEC into a permanent organization was a precondition for the implementation of Phase 3. However, in reality Phase 3 began as a continuation of Phase 2. In addition, it was uncertain at the beginning of Phase 3 whether the implementation of the project could be continued, because there were not enough C/Ps for the project.

Nonetheless, because of the high demand for training in the water sector and the strong awareness of the importance of EWTEC by some C/Ps from the previous phases, the training program focused on

basic training courses has been implemented continuously. Since the project has continued to have a positive impact on the steady improvement of the water supply in Ethiopia by producing trained personnel through the implementation of the training program, the continued implementation of the project itself has been very meaningful. Persistent efforts to continue the training have produced tangible outcomes, which have made people aware of the reason for the existence of EWTEC.

In many cases, the establishment of a permanent organization from a project like EWTEC requires political support and good timing. Therefore, the process did not progress as much as either the Japanese side or the C/P had anticipated. Although, in fact, the concept of transforming EWTEC into a permanent organization had been discussed since Phase 1, and for a long time the concept did not materialize, that is, until the final year of Phase 3. The organizational transformation was achieved partly because of the lucky coincidence that the MoE was making efforts to establish a federal training institution that provides support to other TVETCs in the water sector while EWTEC was striving to establish itself as a permanent organization. EWTEC was able to take advantage of this opportune moment for organizational transformation and finally managed to transform itself into a permanent organization as EWTI, and which was realized due to continuation of the implementation of the EWTEC project for 16 years.

6. Recommendations for future EWTI

(1) Establishment and strengthening of procurement and human resources management function

Because EWTEC has not had the capacity for equipment procurement, all the materials and equipment it required have been supplied through external support, except for fuel for vehicles, stationery and cleaning materials for trainees, which have been supplied by MoWIE. In particular, with regard to drilling equipment, EWTEC could not procure genuine spare parts direct from manufacturers or agencies and, therefore, depended on JICA's follow-up projects. From now on, it is strongly recommended that EWTI secure budget funding for equipment maintenance and conduct procurement flexibly following the basic regulations of Ethiopia. For the procurement of spare parts for drilling equipment, EWTI should practice preparation of order lists, communication with agencies in and out of Ethiopia, securing procurement routes, shipment, customs clearance and inventory management. It is essential to establish a section for procurement immediately and strengthen its capacity. Similarly, EWTI needs to recruit and fill its manpower requirement as per its staffing plan immediately in order to start operation as an institution.

(2) Conducting income generation activities and cost sharing

At the beginning of the discussions about EWTEC's transformation into an autonomous entity, income generation was considered a key factor. In the end, however, income generation activity was excluded from the core objectives of EWTI in accordance with a directive given by PMO (however, this does not prohibit it from generating income). Therefore, the current strategic plan indicates that the budget funding source for EWTI is basically the government and external support (including OWNP budget), and the income generated through part of the activities of EWTI such as drilling and water quality analysis etc. is not considered as a major source of budget funding. However, it might be difficult to continue depending on the governmental budget and donors' financial support in the future. For sound and sustainable operation of the institution, it is important to secure its own income by effectively utilizing existing human resources and facilities. Some of the TVETCs are generating income by selling their products such as furniture and have secured a stable budget by utilizing the profits for the operation of the organization (a part of the profit is distributed among the trainees who are engaged in the production of goods). This activity becomes a good incentive for trainees as well as a good practical training for themselves. EWTI can also conduct maintenance works for drilling equipment, generators, pumps etc. as income generation services to secure its own budget. This activity also develops the practical skills of EWTEC staff and actual damaged machines can be ideal training material. Moreover, a busy workshop will create an active atmosphere in the compound.

In Phase 3, the actual cost of drilling field work was covered by RWB or MoWIE which owns the drilled well. EWTI will basically follow the same method to reduce the training cost but should claim at least the cost of maintenance and spare parts as well. It is ideal to combine income generation activities and practical training.

It is also important to consider collecting tuition fees from trainees (or their organizations). For the time being, the Ethiopian Government plans to cover the training cost for governmental staff but EWTI can collect fees from the participants of private companies and NGOs. By increasing the proportion of participating from private companies and NGOs in relation to all participants, EWTI can increase the income in the future. In addition, water quality and soil testing by the laboratory (which is planned to be constructed) can also be major income sources.

In this regard, it is essential that EWTI discusses the issue with MoFED to find any available means or procedures to use the income it has generated to reduce its budgetary constraints. Potential service items, potential customers and required inputs are described in "2.6.5 Development of marketing strategy and carry out marketing activities accordingly".

(3) Promotion and seeking partnerships with international organizations and donors

EWTEC has been widely known in the water sector of Ethiopia through its past activities. It has been receiving funding from international organizations such as UNICEF and EWTI is now recognized as a WASH Training Center of Excellence in the OWNP. Since external financial support is needed to keep operating EWTI for the time being, a more active approach to those international organizations and donors is required and relationships with them should be strengthened. For this reason, public relations activities such as publishing annual reports and newsletters, operation of the website shall be actively carried out by EWTI. During Phase 3, due to the lack of appropriate C/P to handle these activities, public relations were basically supported by the Japanese side. However, EWTI should assign a skilled person to take charge of public relations and continue disseminating information to all related organizations.

(4) Utilization of facilities of universities and private companies

It may be difficult for EWTI to own all necessary facilities and equipment immediately due to cost of procurement and operational and maintenance costs. As exercised in Phase 3, it is recommended that the facility at Addis Ababa university be utilized for the various civil engineering and water quality testing required until the establishment of EWTI's specialized water and soil laboratory. Recently, a private consulting company (AG Consult) has started training on water supply including well drilling and machinery maintenance. According to the circumstances and needs a package of training might be subcontracted out to such a private firm. Therefore, it is necessary to look into the possibility of partnership with private sector.

(5) Flexibility to hire guest lecturers

Although EWTI plans to employ a much larger number of personnel than are currently employed, it will be difficult to cover all the necessary technical fields with only EWTI staff and it will be necessary to hire guest lecturers from the private sector or universities for a short period from time to time. EWTI may be required to have its own flexible employment system for short-term employment

to make it possible to provide timely and appropriate employment.

(6) Employing TVETC fresh graduates as assistants for EWTI

Currently, many TVETC fresh graduates do not have places to work or are directly employed at Woreda water office with little practical experience in Ethiopia. In the long term, if EWTI starts expanded service provision, it can employ these fresh TVETC graduates as assistants to EWTI instructors for a certain period on a relatively low salary and provide on-the-job training such as machinery maintenance. Making this a routine option will help EWTI to secure manpower and also improve the capability of TVETC graduates.

(7) Training opportunities as incentive for EWTI staff

Securing good staff is the most important factor in providing good service. For this it is necessary to offer an attractive salary but it is not realistic for EWTI as a public institute to increase the salary scale up to the same level as that of the private sector in Ethiopia. Instead, providing periodic training opportunities can be one of the attractive incentives to work under EWTI. In Ethiopia there are few chances for engineers to upgrade their capability by themselves and gain experience in new technology. EWTI should try to offer training opportunities for the staff as much as possible by securing its own budget. Donor countries and international organizations also offer training opportunities within and outside of Ethiopia. These opportunities should be effectively utilized to keep the motivation of EWTI staff high and create attractive working conditions.

EWTI also should develop relationships with foreign universities and institutions in the water sector to upgrade its staff with updated technologies and to share experiences.

(8) Curriculum development and teaching material preparation

EWTI should prepare short and long term training curriculums as per the identified sixteen occupational standards by MoE. Due to resource limitation it should embark on preparing curriculum and teaching materials in four prioritized EOS. EWTI should try to secure necessary budget for the preparation since this is the immediate task that EWTI has to perform.

(9) Safety measures

In Phase 3, gloves, safety shoes, and working clothes for drilling or machinery maintenance works were provided by the Japanese side for the safety of trainees. Upon termination of the project, EWTI shall continue taking care of safety issues for training. The cost for safety equipment may often be cut in a limited budget. EWTI, however, should always secure the necessary budget for safety aspects.

Annex 1

Minutes of Meeting of JCC

MINUTES OF MEETINGS BETWEEN
THE TEAM OF THE JICA EXPERTS
AND
THE AUTHORITIES CONCERNED OF THE GOVERNMNT OF THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA ON
THE ETHIOPIAN WATER TECHOLOGY CENTRE PROJECT PHASE - III
IN THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA

(Joint Coordination Committee)

The Japanese experts (hereinafter referred to as "the JICA experts") for the Ethiopian Water Technology Center Project Phase-III (hereinafter referred to as "the Project") dispatched by the Japan International Cooperation Agency (JICA) to the Federal Democratic Republic of Ethiopia (hereinafter referred to as "Ethiopia") had discussion on BPR results and activities in the first year of the project as a Joint Coordination Committee (JCC) meeting.

As a result of discussion, both sides confirmed the matters refereed to in the document attached hereto.

Addis Ababa, July 15, 2009

Mr. Toshiyuki Matsumoto
For Chief Advisor
EWTEC Project
Japan International Cooperation Agency

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

Witness

Mr. Katsuhiro Sasaki
Chief Representative
JICA Ethiopia Office

ATTACHED DOCUMENT

1. Status of EWTEC under BPR

The Ethiopian side explained that two options have been discussed regarding EWTEC status under MoWR in the BPR. The first option is that EWTEC is to be a semiautonomous body as first priority; the second option is to be a department level as a permanent structure. The decision has been already made in the Ministry, however, the details of the result shall be explained by the Minister directly the other day (next Monday). The Japanese side requested an official document which mentions the status of EWTEC under the MoWR. The Ethiopian side explained the number of employee in the Ministry will be increased after the BPR, however, employment of competent staff is a challenge because there will be no upgrading in the salary scale in the Ministry (not only in the MoWR but also in other government organizations). The BPR will be finalized within this month with written documents.

New budget year has already started and the activity will be conducted based on the already allocated budget, however, it should be revised based on the actual requirement.

2. Activity in the first year

The activities in the first year of the project were explained by the JICA expert according to the Project Document. Discussion was made regarding the following issues.

2.1 Introduction of ranking system for EWTEC training

New section for licensing under the MoWR has started its function. The Ministry considers the EWTEC's certificate as an important license especially for the drilling technology course. The license is issued based on personal documents not by applying practical examination. There are ranks in the licenses for different professions such as geologists, mechanical engineers etc. The EWTEC's ranking system has to be authorized by the Ministry in the future step.

2-2 Request of financial support for basic courses from Japanese side

The Ethiopian side requested support for basic courses to the Japanese side. According to the future training plan, additional basic courses are scheduled. The policy of the Japanese side is that the basic courses have been already transferred to the Ethiopian side. The critical issues are employment of guest lecturers and material procurement. Ethiopian side will try the best but if enough budget is not secured, support form Japanese side is required. Japanese side takes notes on this issue.

2-3 Training on rope pump

Ethiopian side explained that rope pump is a low cost technology and useful for water supply coverage improvement. The Ministry wants to continue this activity in EWTEC. The

rope pump dissemination activity has to be implemented not only in SNNPRs but also in other regions. In future, the quality has to be certified by EWTEC or the Ministry in future.

2-4 Training needs survey

Federal ministry has not done a research regarding the number of professional staff at regional level.

2-5 Willingness to pay

Willingness to pay shows a good result for future EWTEC to be autonomous institution.

2-6 Capacity building for EWTEC

The project document mentions about only on the job training in Ethiopia but originally counter part training in Japan was planned during phase 3. The Japanese side answered the key is the result of BPR, which is expected to show concrete staff plan.

3. Revision of PDM and PO

The revision of PDM and PO had been formerly discussed between the JICA experts and EWTEC staff and already agreed. The important parts for revision were explained by the JICA expert in the meeting and officially agreed. Discussion was made regarding the following issues.

3-1 Changing number of target trainees

The target number of trainees as 3,500 does not have linkage with on the requirement of UAP when it was initially stipulated in the PDM, which does not affect the original project plan.

3-2 EWTEC annual report

Although an organizational annual report of the Ministry is issued quarterly, there is no problem to publish the annual report of EWTEC separately, even to upload in the website.

4. Others

4-1 Securing additional staff

The Japanese side requested to secure enough staff under EWTEC. The Ethiopian side answered that recruitment was announced in the newspaper but there has been no application so far. Ethiopian side will continue recruiting the staff but low salary scale is a problem. The Ethiopian side requested financial support for incentive for staff. The Japanese side answered that it is quite difficult cover additional salary for the local staff. The Japanese side will raise this issue in a meeting with the Minister.

Annex 1: List of Participants

The MoWR side

Mr. Abera Mekonnen:	Chief Engineer
Mr. Markos Tefera:	Head of EWTEC
Mr. Endris Mohammed	Course coordinator, Drilling Machinery Maintenance Technology

The Japanese side

Dr. Akira Kamata	Chief advisor/ Organizational Operation
Mr. Toshiyuki Matsumoto	Hydrogeology/ Volcanology
Mr. Tamotsu Ishii	Machinery/ Electric Machinery
Mr. Masahiko Ikemoto	Assessment Program 2/ Training Management

The JICA Ethiopia Office

Mr. Katsuhiro Sasaki	Resident representative, JICA Ethiopia Office
Mr. Shinichiro Futami	Assistant Resident representative, JICA Ethiopia Office

Annex 2: Agenda

JOINT COORDINATING COMMITTEE (JCC)
AGENDA
On
Ethiopian Water Technology Center Project (EWTEC) -Phase 3-

Chairperson: Ato. Abera Mekonnen, Chief Engineer, MoWR
Date: July 15, 2009 (Wednesday)
Time: 10:00-12:00 a.m.
Venue: Conference Room, Ministry of Water Resources

1. Opening Remark	Mr. Abera Mekonnen, Chief Engineer, MoWR
2. Status of EWTEC under BPR	Mr. Markos Tefera
3. Activity in the first year	Mr. Masahiko Ikemoto, JICA Expert
4. Revision of PDM and PO	Mr. Masahiko Ikemoto, JICA Expert
5. Others	
6. Closing Remark	Mr. Abera Mekonnen, Chief Engineer, MoWR

MINUTES OF MEETINGS BETWEEN
THE TEAM OF THE JICA EXPERTS
AND
THE AUTHORITIES CONCERNED OF THE GOVERNMNT OF THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA ON
THE ETHIOPIAN WATER TECHOLOGY CENTRE PROJECT PHASE - III
IN THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA

(Joint Coordination Committee)

The Japanese experts (hereinafter referred to as "the JICA experts") for the Ethiopian Water Technology Center Project Phase-III (hereinafter referred to as "the Project") dispatched by the Japan International Cooperation Agency (JICA) to the Federal Democratic Republic of Ethiopia (hereinafter referred to as "Ethiopia") had discussion on the activities in the second year of the project and a future plan of EWTEC as a Joint Coordination Committee (JCC) meeting.

As a result of discussion, both sides confirmed the matters refereed to in the document attached hereto.

Addis Ababa, April 13, 2010

Akira Kamata

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

Dr.Markos Wijore
Director
Water Sector Support and Capacity Building Directorate
Ministry of Water Resources

Witness

二見 伸一郎

Mr. Shinichiro Futami
Senior Representative
JICA Ethiopia Office

ATTACHED DOCUMENT

1. Brief Explanation for EWTEC Activities

The Ethiopian side explained activities of the Ethiopian Water Technology Center (EWTEC) project from phase I to III. The attendees of the JCC gave several questions and comments for the following points.

(1) Potential trainees and capacity of the EWTEC

A large number of potential trainees for capacity building exist in the water sector in Ethiopia according to the needs survey conducted by the EWTEC in the first year of the project. The EWTEC is planning to expand its capacity in near future; however, at present, acceptable number of trainees is restricted to 220 in maximum per year due to physical capacity of existing facilities (dormitory, classroom, instructors etc).

(2) Training of drillers and mechanics in the private sector

Shortage of skilled and experienced drillers and mechanics is a serious problem facing in the private drilling companies in Ethiopia. It is expected that the participants from the drilling companies be invited to the EWTEC to train drilling technology and machinery maintenance. A new machine, which is capable of drilling up to the depth of 300 meters, will arrive at the EWTEC in August 2010. The EWTEC will hold several drilling related courses from October 2010 and accept trainees from the private sector in the existing basic drilling technology and drilling machinery maintenance course.

(3) Rope pump

Rope pump is made up of appropriate technologies and manufactured at low cost. JICA is currently conducting a rope pump dissemination activity in the Was-Cap project in SNNPR, Amhara, Oromia and Tigray regions. According to the recent report of the Was-Cap project, there are various problems that occurred at the sites due to low quality of pump, which are made in the private sector. Quality assurance system must be established in the Ministry of Water Resources (MoWR). The EWTEC could be a core technical center of the rope pump standardization.

The Ethiopian side mentioned that the spare parts of the hand pump like Afridev should be made locally. The Japanese side mentioned that an operational test of Afridev pump utilizing local made spare parts was conducted in phase 2 of the EWTEC project. The results of the test should be re-evaluated.

(4) Hydrogeological map of Butajira-Ziway Area

During phase 2 of the EWTEC project, a hydrogeological study was conducted in Butajira –Ziway area. At the draft final report time, a seminar was held at Addis Ababa in order to have findings in common by inviting researchers and consultants from universities and private consulting companies in addition to the government officials in the respective regions. The results of the study were arranged for textbooks

in the EWTEC. JICA is currently conducting a groundwater development study, which covers entire Rift Valley Lakes Basin. The hydrogeological map of Butajira-Ziway area will be incorporated into this development study.

2. Problem that EWTWC is currently facing

The Japanese side mentioned several problems that the EWTEC is currently facing according to the expert's observations. The problems are budget constraint, provision of spare parts for drilling equipment, shortage of staff, salary scale etc, although some few supports are given from the Japanese side.

The Ethiopian side mentioned that they are continuously making efforts to put problems in perspective in association with the Business Process Reengineering (BPR) of the MoWR.

3. Future Plan of EWTEC

The Ethiopian side explained future expansion of the EWTEC facilities by using recently designed drawings and tables. The design will be completed soon taking some modification into account. Since the MoWR approved this expansion plan, construction work will start soon after budget approval. The new facilities are expected to start in Ethiopian year-2004 (September 2010).

The Ethiopian side requested JICA to support provision of internal facilities such as computers, desks and chairs etc. The JCC attendee agreed that the expansion program should be explained in the DAG water meeting in order to seek other financial resources and obtain supports from other donor countries etc.

4. Activities of Phase 3

The Japanese side explained activities in the second year of the project. In addition, third year training course schedule was also presented. The comments from the attendees were as follows.

1) Introduction of management system for EWTEC training

The EWTEC's ranking system and new certificate will be introduced on a trial basis at the basic courses starting from the end of April 2010 as well as new reporting system and new course modules. It will be officially introduced from new fiscal year of Ethiopia.

2) Criteria for Trainee Selection

New criteria for selection of trainee must be established considering trainees selection procedure, tuition for the trainee from the private sectors and NGOs etc.

3) TVETC course

Electric-Mechanical Technology (EMT) course will be held in August 2010 inviting teachers to the EWTEC from TVETC in the regions. The course grade of the EWTEC is practically oriented and the target trainees have some experiences in their business

field. On the contrary, the TVETC gives the basic technical training for the students. That is a different point of the grade of the courses comparing with the EWTEC and the TVETC.

4) Website and Annual Report

The Japanese side is currently managing the EWTEC website. It will be handed over to the Ethiopian side in the near future. The attendees of the JCC recommended the website should be linked to the MoWR website.

Annual report of the EWTEC will be published according to the Ethiopian calendar year; therefore, first annual report will be published in September-October 2010.

Annex 1: List of Participants

The MoWR side	
Dr. Marcos Wijore:	Director, Water Sector Support and Capacity Building Directorate
Mr. Getu Zegeye	Economic Advisor to the Minister
Mr. Tesfaye Taddese	Director, Groundwater Management Directorate
Mr. Eyasu Gebru	Director, Human Resource Directorate
Mr. Yohanes G/Medhin	Director, Water Supply and Sanitation Directorate
Mr. Endris Mohammed	Head, EWTEC
The Japanese side	
Dr. Akira Kamata	Chief advisor/ Organizational Operation
Mr. Akira Matsumoto	Assessment of Training Program/Organizational Management
The JICA Ethiopia Office	
Mr. Shinichiro Futami	Senior representative, JICA Ethiopia Office

Annex 2: Agenda

JOINT COORDINATING COMMITTEE (JCC)
AGENDA
On
Ethiopian Water Technology Center Project (EWTEC) -Phase 3-

Chairperson: Dr. Markos Wijore, Director, Water Sector Support and Capacity Building Directorate (WSSCBD), MoWR
Date: April 13, 2010 (Tuesday)
Time: 10:00-12:15 a.m.
Venue: Conference Room, Ministry of Water Resources

1. Opening remark	Dr. Markos Wijore, Director WSSCBD, MoWR
2. Brief explanation for EWTEC activities	Mr. Endris Mohammed, Head, EWTEC
3. Problem that EWTEC is currently facing	Dr. Akira Kamata, Chief Advisor, JICA Expert
4. Future plan of EWTEC	Mr. Endris Mohammed, Head, EWTEC
5. Activities of phase 3	Dr. Akira Kamata, Chief Advisor, JICA Expert
6. Closing remark	Dr. Markos Wijore, Director WSSCBD, MoWR

Annex 3 Training Course Schedule in 3rd Year

Training course	Location	Duration (weeks)	No. of Trainee	Instructor	2010: 8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	2011: 1	2	3	4	5	6	Total	Target Groups
1. Basic Courses																													
1.1 GM (1)	AA	12-16	20	CP/LC						20						20						20						140	ZWRO, RWB
1.2 DT	AA	12-16	10-15	CP/LC						10						10						10						135	WWCE, WWDE, RWB
1.3 DMMT	AA	12-16	10-15	CP/LC						10						10						10						135	WWCE, WWDE, RWB
1.4 WSE (1)	AA	6-8	20	CP/LC		20												20										120	ZWRO, TWSS, RWB
1.5 EMMT (1)	AA	6-8	20	CP/LC		20												20										120	ZWRO, TWSS, RWB
1.6 GM (2)	AA	8	20	CP/LC												20												100	WWO
1.7 WSE (2)	AA	4	20	CP/LC								20											20					80	WWO
1.8 EMMT (2)	AA	4	20	CP/LC								20											20					80	WWO
2 Advanced Seminar																													
2.1 GWM	AA(int.)	3	27	JE			27											27										108	African, RWB
2.2 GIS	AA(int.)	3	27	JE								27																54	African, RWB
2.3 RS	AA(int.)	3	27	JE																			27					54	African, RWB
2.4 Geophysical survey	AA	5	20	JE/CP															10									40	RWB, ZWRO
2.5 Water chemistry	AA	3	20	JE/CP																								20	RWB, GSE, Univ.
2.6 DT (Deep well)	Region	6	10	JE/CP																					10			30	WWCE, WWDE, Private
2.7 DT (Well rehabil)	Region	4	10	JE/CP																							10	30	WWCE, WWDE, RWB
2.8 DT (Trouble shooting)	Region	3	10	JE/CP																10								20	WWCE, WWDE, RWB, Private, NGO
2.9 DMMT (THD rig etc)	AA	3	15	JE/CP																								10	WWCE, WWDE, RWB, Private, NGO
2.10 WSE (Leakage control)	AA	2	20	JE/CP																								20	TWSS, RWB
2.11 WSE (Water quality)	AA	3	20	JE/LC																								0	TWSS, RWB
3. Training for TVETC																													
3.1 EMMT	Region	2	20-30	CP												20											20	120	TVETC Students
3.2 EMT	AA	3	15	CP																								0	TVETC Teachers
3.3 RWSS	AA	3	15	CP																								30	TVETC Teachers
3.4 SSID	AA	3	15	CP																								0	TVETC Teachers
4. Supplemental On-Demand Courses																													
4.1 RP installation	Region	1	15	LC/CP									10										10					60	Local Artisan, Woreda, NGO
4.2 RP manufacturing	Region	5	15	LC/FC																								0	NGO, private, WWO
4.3 HP maintenance	Region	2	15	CP/LC																								30	NGO, WWO
4.4 LSD (tentative)	Region	3	15	JE/LC																								0	NGO, WWO
4.5 GIS (Inventry preparation)	Region	1	10	JE/LC																								10	NGO
				Event												▲BPR?						▲Equipment procurement							

**CP=Ethiopian Counterpart Personnel, JE=Japanese Expert, LC=Ethiopian Local Consultant, FC=Foreign Consultant

**Training Course Line:

(Red) = MoWR's full responsibility

(Blue)=JICA's assistance (Japanese Expert or local Consultant)

Year	2009	2010	2011	2012	2013	Total
Total	187	264	324	364	407	1,546

Proj. Year	1st	2nd	3rd	4th	5th	6th	Total
Total	120	184	304	334	404	200	1,546

Condition

1. Facility expansion is completed by December 2010
2. Enough staff to conduct training is assigned.
3. Budget for implementation of courses are secured.

MINUTES OF MEETINGS BETWEEN
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THE ETHIOPIAN WATER TECHOLOGY CENTRE PROJECT PHASE - III
IN THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA

(Joint Coordination Committee)

The Japanese experts (hereinafter referred to as "the JICA experts") for the Ethiopian Water Technology Center Project Phase-III (hereinafter referred to as "the Project") dispatched by the Japan International Cooperation Agency (JICA) to the Federal Democratic Republic of Ethiopia (hereinafter referred to as "Ethiopia") had discussion on the Interim Report and Mid-Term Review of the project as a Joint Coordination Committee (JCC) meeting.

As a result of discussion, both sides confirmed the matters refereed to in the document attached hereto.

Addis Ababa, January 27, 2011

Mr. Masahiko Ikemoto
For Chief Advisor
JICA Expert of EWTEC Project

Dr. Markos Wijore
Director of Regional Support Directorate
Ministry of Water and Energy
Federal Democratic Republic of Ethiopia

ATTACHED DOCUMENT

1. Interim Report Explanation

The contents of the interim report were explained by Japanese expert of EWTEC. The explanation included history of EWTEC, outline of the project and activities of the project phase 3 according to expected four outputs.

2. Joint Mid-Term Review

The Mid-Term review was conducted from January 10 to 27, 2011 by both JICA Mid-Term review and two Ethiopian staff from MoWE. The leader of Mid-Term review team explained the overview of the review including methodology, overall results and followed by detailed explanation of the review by a Japanese evaluation expert.

Ethiopian members of the Joint Mid-Term Review gave a presentation on their own view on EWTEC through the experience of mid-term review.

3. Modification of PDM

Revised PDM (PDM 2) was explained by the Japanese Mid-term review team member.

4. Discussions

- Ethiopian side requested JICA's assistant to prepare future EWTEC vision such as for institutionalization.
- The chief adviser of EWTEC mentioned that communication gap should be filled based on the recommendation of the Mid-Term Review results.
- Ethiopian side requested the possibility of changing the modality of Japanese assistance and reconsidering Japanese experts' full time involvement as before.
- Ethiopian side mentioned that currently the basic drilling course accepts participants who already have a certain level of knowledge but it is better that the drilling technology course should accept participants who are juniors and have little knowledge.
- Japanese side explained that basic courses have been already transferred to Ethiopian side during the phase 2. Japanese side is transferring the technical knowledge step by step. Now Japanese side considers transferring advanced courses to the Ethiopian side.
- Ethiopian side asked the possibility of additional input from Japanese side. The Japanese side answered if the Ethiopian side decided the direction of future EWTEC such as semi-autonomous entity, additional input for marketing and financing may be necessary. As for the material input, the present equipment such as geophysical equipment is sufficient except a 300m drilling machine which is under maintenance. JICA Ethiopia explained that Japanese side requires the commitment from the Ethiopian side about the future

EWTEC. If MoWE makes a political decision for EWTEC such as semi-autonomous, Japanese side considers further necessary inputs. Commitment of Ethiopian side means not only the decision but also actual personnel assignment including center head, marketing and finance.

- Ethiopian side explained that training abroad is required for the course coordinators and instructors to upgrade knowledge.
- Ethiopian side mentioned that the terms of reference for the Japanese consultant have to be shared.
- Japanese side explained that the problem came also from Ethiopian side, that is, there is no commitment about EWTEC position and lack of counterpart and so on.
- Ethiopian side mentioned that the technical transfer for advanced courses in addition to basic course is requested.
- Ethiopian side mentioned that Ethiopian side will try the best to assign skilled staff.

Annex 1: List of Participants

Ethiopian side

H.E.Kebede Gerba	State Minister, MoWE
Dr. Markos Wijore	Director of Sector (Regional) support Directorate, MoWE
Mr. Tesfaye Tadesse	Director, Groundwater Investigation and Development Directorate, MoWE
Ms. Lakech Haile	Director, Groundwater Investigation and Development Directorate, MoWE
Mr. Dawit Tafesse	Senior Environmental Engineer, Groundwater Investigation and Development Directorate, MoWE
Mr. Melaku Behailu	Electromechanical Engineer, Sector (Regional) Support Coordination Directorate, MoWE
Mr. Endris Mohammed	Center Head, EWTEC

JICA experts

Dr. Akira Kamata	Chief advisor/ Organizational Operation
Mr. Masahiko Ikemoto	Assessment Program 2/ Training Management

JICA Ethiopia Office and JICA Mid-term Review Team

Mr. Koji Ota	Chief representative, JICA Ethiopia Office
Mr. Makoto Shinkawa	Deputy representative, JICA Ethiopia Office
Dr. Yuji Maruo	Team Leader of JICA Mid-term review team, JICA
Mr. Hideki Watanabe	Representative, JICA Ethiopia
Ms. Tamahi Yamauchi	Evaluation Consultant, IC-Net Ltd
Mr. Epherem Fufa	In-house consultant of Water Sector, JICA Ethiopia

Annex 2: Agenda

3rd JOINT COORDINATION COMMITTEE (JCC)
AGENDA
On
Ethiopian Water Technology Center Project (EWTEC) -Phase 3-

Chairperson: Mr. Kebede Gerba, State Minister, MOWE
Date: January 27, 2011 (Thursday)
Time: 14:00 – 17:00
Venue: MOWE Conference Room

1. 14:00-14:10 Opening Remark	Mr.Kebede Gerba, State Minister, MoWE
2. 14:10-14:40 Interim Report Explanation	Mr. Masahiko Ikemoto, JICA Expert for EWTEC
3. 14:40-14:50 Overview of Joint Mid-Term Review:	Dr.Yuji Maruo, Mid-Term Review Team Leader, Expert, JICA
4. 14:50-15:30 Report of Joint Mid-Term Review Modification of PDM:	Ms. Tamahi Yamauchi, Mid-Term Review Team
Member, Consultant, IC-NET	
<Break 15:30- 15:45>	
5.15:45-16:00 Experience of Joint Mid-Term Review:	Mr. Dawit Tafesse, Mid-Term Review Team Member, Senior Environment Engineer, MoWE
6. 16:00-16:20 Discussion and Q&A:	Chaired by Dr. Markos Wijore, Director, Sector (Regional) Support Coordination Directorate, MoWE
<16:20- Signing: Minutes of Meeting>	
7. Remarks by JICA Ethiopia:	Mr.Koji OTA, Chief Representative, JICA Ethiopia
8. Conclusive Remark	Mr. Kebede Gerba, State Minister, MoWE

MINUTES OF MEETINGS BETWEEN
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(Joint Coordination Committee)

The Japanese experts (hereinafter referred to as "the JICA experts") for the Ethiopian Water Technology Center Project Phase-III (hereinafter referred to as "the Project") dispatched by the Japan International Cooperation Agency (JICA) to the Federal Democratic Republic of Ethiopia (hereinafter referred to as "Ethiopia") had discussion on activities in the fourth year of the project as a Joint Coordination Committee (JCC) meeting.

As a result of discussion, both sides confirmed the matters refereed to in the document attached hereto.

Addis Ababa, June 14, 2012

Mr. Akira Doi
Chief Advisor of EWTEC
JICA Expert

MARKOS WIJORE (Dr.)
Director, Water Sector Support and Capacity Building Directorate

Dr. Markos Wijore
Director, Sector Support Directorate
Ministry of Water and Energy

ATTACHED DOCUMENT

1. Recruitment of additional EWTEC staff
   - The repeated attempt by ministry to recruit and fill vacant postions of EWTEC has failed as no one showed interest to be hired with such low level of salary scale. The Ministry agreed to continue its attempt to recruit key staff in all possible ways. However, it is believed that this problem may get solution only with the realization of the transformation of EWTEC into an autonomous public institution.
   - The Ethiopian side promised to assign a purchaser who has adequate procurement knowledge as soon as possible.

2. Budget allocation for spare parts and consumables for drilling rigs
   - The Ethiopian side said there is a difficulty to get budget allocated from MoFED that could be adequate for complete overhaul of drilling rig. For such major maintenance requirement, particularly, if the rig is going to operation in regional water bureau, the ministry can only rely on regional government. To facilitate such arrangement, inspection shall be conducted before the rig is sent back to EWTEC. Moreover, agreements such as MoU has to be reached between the Ministry and regions stating that some maintenance cost has to be covered by region in case of breakdown of machinery while it is in operation in the region.
   - There is a big problem of procurement of spare parts for drilling rig in the ministry because the parts such as drilling bit are not available in the market. Further assessment on this issue is required.

3. Store management
   - Necessary tools and equipment are often unavailable because the store key is only with a storekeeper who is often absent. It is suggested that this problem shall be solved internally in EWTEC by arranging a separate mechanical store in which frequently required items will be stored.

4. Office equipment maintenance.
   - The cost for maintenance has to be requested in the annual budget line. Inviting service staff from the market is possible through collecting proforma and the Ethiopian side can cover the maintenance cost. However, due to the prolonged purchasing process, to get timely maintenance for these equipments may not be possible. Therefore, additional measures such as assigning of permanent staff for IT equipment maintenance.
   - Having internet environment may solve the problem through downloading and updating antivirus software.

5. Bureaucratic procedure for hiring guest lecturers

MARKOS WIJORE (Dr.)
Director, Water Sector Support and Capacity Building Directorate

- To make a long term contract with guest lecturers for one year or two years and ask them to provide lectures when required is possible on competitive basis. However, the following critical problems are currently prevailing in hiring guest lecturers in EWTEC:
  - Short listing is allowed only for special cases.
  - Availability of appropriate candidates is limited in the market.

  Japanese side strongly requested to start preparation for hiring necessary guest lecturers early enough to fulfill the government procedure.

6. Budget allocation for building construction
   - Ministry was not successful to acquire budget from MoFED due to budget constraint. However, with the realization of the transformation of EWTEC into an autonomous institution, there may be a chance for resubmission of budget request to MoFED.
   - In the mean time, the ministry will continue lobbying activity to get budget.
   - Ministry is committed to closely follow-up the status of the EWTEC transformation at PM office and accelerate the process.

7. International course management
   - Regarding the international course on isotope hydrology, JICA will negotiate with IAEA to allocate money in future not only for instructors but also implementation cost and allowance for trainees so that the international course can be continued after EWTEC is transformed. Ethiopian side agreed to assign staff who would involve in coordinating the international course along with the Japanese side.

MARKOS WIJORE (Dr.)
Director, Water Sector Support and
Capacity Building Directorate

Annex 1: List of Participants

Ethiopian side

H.E. Kebede Gerba	State Minister, Ministry of Water and Energy
Dr. Markos Wijore	Director, Sector Support Directorate
Mr. Tesfaye Tadesse	Director, Groundwater Investigation and Development Directorate, MoWE
Mr. Abebe Mekonnen	A/Head of EWTEC
Mr. Tamiru Fekadu	Course coordinator of Groundwater Investigation Course
Mr. Tsegaye Endale	Course coordinator of Electro-Mechanical Machinery Maintenance Course
Mr. Hilemichael Agdew	Course coordinator of Water Supply Engineering Course
Mr. Girma Flate	Administrator

Japanese experts

Mr. Akira Doi	Chief advisor
Mr. Masahiko Ikemoto	Assessment Program 2/ Training Management
Mr. Gebeyehu Berhane	National consultant

The JICA Ethiopia Office

Mr. Makoto Shinkawa	Deputy Head, JICA Ethiopia Office
Mr. Sumi Yukiyasu	Project formulation advisor, JICA Ethiopia Office

MARKOS WIJORE (Dr.)
Director, Water Sector Support and
Capacity Building Directorate

Annex 2: Agenda

4th JOINT COORDINATION COMMITTEE (JCC)
AGENDA
On
Ethiopian Water Technology Center Project (EWTEC) -Phase 3-

Data: June 14, 2012 (Thursday), 2:00 p.m. – 4:00 p.m.
Venue: MoWE Conference Room
Chair person: Dr. Markos Wijore

1) 2:00-2:05	Opening Remark:	H.E. Kebede Gerba, State Minister, MoWE
2) 2:10-2:30	Progress of this year:	Mr. Abebe Mekonnen, Head of EWTEC
3) 2:30-2:45	Process of EWTEC transformation:	Mr. Gebeyehu Berhane, National consultant
4) 2:45-3:00	Current problem:	Mr. Akira Doi, Mr. Masahiko Ikemoto, JICA Expert for EWTEC
5) 3:00-3:40	Discussion:	
6) 3:40-3:50	Plan for next year:	Mr. Abebe Mekonnen, Head of EWTEC
7) 3:50-3:55	Remarks by JICA Ethiopia:	Mr. Makoto Shinkawa, Deputy Representative, JICA Ethiopia
8. Conclusive Remark:		H.E. Kebede Gerba, State Minister, MoWE

MARKOS WIJORE (Dr.)
Director, Water Sector Support and Capacity Building Directorate

MINUTES OF MEETINGS BETWEEN
THE TEAM OF THE JICA EXPERTS
AND
THE AUTHORITIES CONCERNED OF THE GOVERNMNT OF THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA ON
THE ETHIOPIAN WATER TECHOLOGY CENTRE PROJECT PHASE - III
IN THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA

(Joint Coordination Committee)

The Japanese experts (hereinafter referred to as "the JICA experts") for the Ethiopian Water Technology Center Project Phase-III (hereinafter referred to as "the Project") dispatched by the Japan International Cooperation Agency (JICA) to the Federal Democratic Republic of Ethiopia (hereinafter referred to as "Ethiopia") had discussion on activities in the fifth year of the project as a Joint Coordination Committee (JCC) meeting.

As a result of discussion, both sides confirmed the matters refereed to in the document attached hereto.

Addis Ababa, May 27, 2013

MARKOS WIJORE (Dr.)
Director, Water Sector Support and
Capacity Building Directorate

Mr. Akira Doi
Chief Advisor of EWTEC
JICA Expert

Dr. Markos Wijore
Director, Sector Support Directorate
Ministry of Water and Energy

ATTACHED DOCUMENT

Progress report on accomplishment of planned activities of EWTEC was presented by Mr.Tamiru and Mr. Ikemoto and presentation on the overall progress of the organizational transformation process of EWTEC into an autonomous public institution was made by Mr.Gebeyehu. Following the presentations, discussions were made by participants and the presented progress reports are generally accepted with the following agreed points:

1. Advanced courses including the international course are not included in the activity schedule of the project remaining period; however, if Ethiopian side can secure the necessary budget and qualified expert/s during this period, it may conduct the program by itself.

2. Distribution of periodic newsletters of EWTEC is thus far limited to MoWE, UNICEF, and guests visiting EWTEC and this distribution has to expand its coverage to other key stakeholders of EWTEC.
3. The training for instructors of TVETC is included in the activity schedule of the project remaining period.

MARKOS WIJORE (Dr.)
Director, Water Sector Support and
Capacity Building Directorate

Annex 1: List of Participants

Ethiopian side

Dr. Markos Wijore	Director, Sector Support Directorate
Mr. Tamiru Fekadu	Course coordinator of Groundwater Investigation Course
Mr. Asamnew Gulula	Co-evaluator, Sector Support Directorate

Japanese side

Mr. Akira Doi	Chief advisor
Mr. Masahiko Ikemoto	Assessment Program 2/Training Management
Mr. Shingo Arai	Information management/Training Management2
Mr. Gebeyehu Berhane	National consultant

The JICA Ethiopia Office

Mr. Kimiaki Jin	Chief representative, JICA Ethiopia Office
Mr. Sumi Yukiyasu	Project formulation advisor, JICA Ethiopia Office
Ms. Chiaki Yamada	Evaluation analyst
Mr. Ephrem Fufa	Water sector project coordinator

MARKOS WIJORE (Dr.)
Director, Water Sector Support and
Capacity Building Directorate

Annex 2: Agenda

"Joint Coordination Committee (JCC) for the Explanation of the Progress Report and the Results of the Termination Evaluation of the Ethiopian Water Technology Center Project"

May 27, 2013, Conference Room on the ground floor of the MoWE

Time	Program	Presenters
09:30-10:00	Preparation of JCC	
10:00-10:10	Opening remarks	Mr. Kebede Gerba State Minister, MoWE Chaired by Dr. Markos
10:10-10:40	Presentation of the Progress Report by EWTEC	Mr. Tamiru Fekadu Course Coordinator(GWI), EWTEC
10:40-11:10	Results of the Termination Evaluation of EWTEC Phase 3	Mr. Yukiyasu Sumi JICA Ethiopia Ms. Chiaki Yamada Pegasus Engineering
11:10-11:30	Q&A session	Chaired by Dr. Markos
11:30-12:00	Wrap-up and Closing	Mr. Kimiaki Jin Chief Representative, JICA Ethiopia

MARKOS WIJORE (Dr.)
Director, Water Sector Support and
Capacity Building Directorate

MINUTES OF MEETING BETWEEN
THE TEAM OF THE JICA EXPERTS
AND
THE AUTHORITIES CONCERNED OF THE GOVERNMNT OF THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA ON
THE ETHIOPIAN WATER TECHOLOGY CENTRE PROJECT PHASE - III
IN THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA

(Joint Coordination Committee)

The Japanese experts (hereinafter referred to as "the JICA experts") for the Ethiopian Water Technology Center Project Phase-III (hereinafter referred to as "the Project") dispatched by the Japan International Cooperation Agency (JICA) to the Federal Democratic Republic of Ethiopia (hereinafter referred to as "Ethiopia") had discussion on activities in the sixth year of the project and the future plan of EWTI as a Joint Coordination Committee (JCC) meeting.

As a result of discussion, both sides confirmed the issues referred to in the document attached hereto.

Addis Ababa, November 27, 2013

Mr. Akira Doi
Chief Advisor of EWTEC
JICA Expert

Dr. Markos Wijore
Representative,
Ethiopian Water Technology Institute

ATTACHED DOCUMENT

Final report on accomplishment of EWTEC phase III project was presented including this year's activity and the transformation of EWTEC into EWTI as an autonomous public institution by the project members. Following the presentation, discussion and recommendations were made by participant and the presented project completion report was accepted. The agreed points on future technical assistance needs of EWTI are as follows:

1) Both MoWIE and EWTI's side explained that EWTI is now at a critical transition stage and it needs urgent intervention of external assistance especially in the development of curriculum and teaching materials; and the timely completion of the building construction and the laboratory set-up are vital and pre-requisite to start the long-term training and other services of EWTI by next fiscal year (July 2014);

2) It is also reached common understanding that EWTI needs to strengthen its procurement and human resource management practices which were not done in the former EWTEC;

3) JICA side explained that:

   a) The release of the fund for the building construction has been delayed due to unclear issues on accumulated fund under MoFED, and JICA Ethiopia Office will follow-up the issue as much as possible and the fund is expected to be released by March 2014;

   b) It is planned to dispatch one advisor to EWTI after April 2014 and the advisor will assist the management of EWTI and assess what kind of further technical assistance EWTI requires;

   c) JICA has intention to continue supporting the implementation of international training courses although the priority is not as high as the above mentioned issues;

   d) Other technical assistance needs have to be detailed by MoWIE/EWTI and presented with a time frame so that JICA Ethiopia Office will review the possibility; and project level assistance may only be possible after thorough assessment and getting approval from the head office;

   e) JICA Ethiopia Office as current co-chairs of Water Technical Working Group has the opportunity to share the importance of contributions by EWTI towards water sector and facilitate discussions on this regard with other development partners.

4) It is also agreed that the effort which has already been started to get assistance from UNICEF for development of curriculum and teaching materials has to be continued at the level of higher officials of MoWIE so as to secure the necessary fund for this particular task.

Annex 1: List of Participants

Ethiopian side

H.E. Ato Kebede Gerba	State Minister, Ministry of Water, Irrigation and Energy
Dr. Markos Wijore	Representative, Ethiopian Water Technology Institute (EWTI)
Ato. Yohannes G/Medhin	Director of Water Supply and Sanitation Directorate
Ato. Abebe Mekonnen	Course coordinator, EWTI

Japanese side

Mr. Akira Doi	Chief advisor
Mr. Toru Ishibashi	Organizational management
Mr. Tamotsu Ishii	Machinery/Electric machinery
Mr. Masahiko Ikemoto	Assessment Program 2/Training Management
Mr. Shingo Arai	Information management/Training Management2
Ato. Gebeyehu Berhane	National consultant

JICA Ethiopia Office

Mr. Kimiaki Jin	Chief representative, JICA Ethiopia Office
Mr. Itsuro Takahashi	Project formulation advisor, Water and Sanitation, JICA Ethiopia Office
Ato. Ephrem Fufa	Water sector project coordinator

EWTI
Ethiopian Water Technology Institute

P.O.Box 2767/1000, Addis Ababa, Ethiopia
Tel. (251)-114431125/26/27, Fax.114431128
Email: ewtec@ethionet.et

Annex 2: Agenda

6th JOINT COORDINATION COMMITTEE (JCC)
AGENDA
On
Ethiopian Water Technology Center Project (EWTEC) -Phase 3-

Data: November 27, 2013 (Wednesday), 10:00 a.m. – 11:30 a.m.

Venue: MoWIE Conference Room

Chairperson: Dr. Markos Wijore

Time	Program	Presenters
10:00-10:10	Opening remarks	Mr. Kebede Gerba State Minister, MoWIE
10:10-10:40	Presentation of the Project Completion Report by EWTEC	Japanese expert
10:40-11:20	Discussion on future of EWTI	Chaired by Dr. Markos
11:20-11:30	Wrap-up and Closing	Mr. Kimiaki Jin Chief Representative, JICA Ethiopia

Annex 2

Federal Negarit Gazette

(Council of Ministers Regulation to establish the Ethiopian Water Technology Institute)

የኢትዮጵያ ፌደራላዊ ዲሞክራሲያዊ ሪፐብሊክ

ፌደራል ነጋሪት ጋዜጣ

FEDERAL NEGARIT GAZETTE

OF THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA

አሥራ ዘጠነኛ ዓመት ቁጥር ፷፪
አዲስ አበባ ሐምሌ ፴ ቀን ፪ሺ፭ ዓ.ም.

በኢትዮጵያ ፌደራላዊ ዲሞክራሲያዊ ሪፐብሊክ
የሕዝብ ተወካዮች ምክር ቤት ጠባቂነት የወጣ

19th Year No. 62
ADDIS ABABA 6th August 2013

ማውጫ

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የሚኒስትሮች ምክር ቤት የኢትዮጵያ ፌደራላዊ ዲሞክራሲያዊ ሪፐብሊክ አስፈፃሚ አካላትን ስልጣንና ተግባር ለመወሰን በወጣው አዋጅ ቁጥር ፮፻፺፩/፪ሺ፫ (እንደተሻሻለ) አንቀጽ ፭ እና አንቀፅ ፴፭ መሠረት ይህን ደንብ አውጥቷል።

፩. አጭር ርዕስ

ይህ ደንብ "የኢትዮጵያ ውሃ ቴክኖሎጂ ኢንስቲትዩት ማቋቋሚያ የሚኒስትሮች ምክር ቤት ደንብ ቁጥር ፪፻፺፫/፪ሺ፭" ተብሎ ሊጠቀስ ይችላል።

፪. ትርጓሜ

በዚህ ደንብ ውስጥ የቃሉ አገባብ ሌላ ትርጉም የሚያሰጠው ካልሆነ በስተቀር፡-

፩/ "የውሃ ቴክኖሎጂ" ማለት ለተለያዩ አገልግሎቶች የሚውል ውሃ መገኛን ለመፈለግ፣ ለመገንባት፣ ለማምረት እና ለማሰራጨት እንዲሁም የመጠጥ ውሃና ፍሳሽ፣ የመስኖ አገልግሎትና የውሃ ኃይል ተቋማት አፕሬሽንና ጥገናን በሚገባ ለማስተዳደር በተግባር ላይ የሚውል ቴክኖሎጂ ነው፤

፪/ "የውሃ ልማት" ማለት የውሃ ቴክኖሎጂን በመጠቀም ለተለያዩ አገልግሎቶች የሚውል ውሃ የማልማት ሥራ ነው፤

ያንዱ ዋጋ
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COUNCIL OF MINISTERS REGULATION No.293/2013

COUNCIL OF MINISTERS REGULATION TO ESTABLISH THE ETHIOPIAN WATER TECHNOLOGY INSTITUTE

This Regulation is issued by the Council of Ministers pursuant to Article 5 and Article 35 of the Definitions of Powers and Duties of the Executive Organs of the Federal Democratic Republic of Ethiopia Proclamation No. 691/2010 (as amended).

1. Short Title

This Regulation may be cited as the "Ethiopian Water Technology Institute Establishment Council of Ministers Regulation No. 293/2013".

2. Definitions

In this Regulation, unless the context otherwise requires:

1/ "water technology" means technology applied for water source identification, development, production and distribution of water for various uses as well as technology applied to administer properly the operation and maintenance of water supply and sewerage, irrigation and hydropower schemes;

2/ "water development" means activity executed using water technology to develop water for different uses;

ነጋሪት ጋዜጣ ፖ.ሣ.ቁ ፹ሺ፩
Negarit Gazeta P.O.box 80,001

፫/ "የውሃና ተዛማጅ ሥራዎች" ማለት የውሃ ልማትና ከዚሁ ጋር ተያያዥነት ያላቸው እንደ ውሃ አቅርቦትና መስኖ ተቋማት ጥገና፣ የውሃ ጉድጓድ መቆፈሪያዎችና የኤሌክትሮ ሜካኒካል መሳሪያዎች ጥገና እና ሌሎች መሰል ተግባራት ናቸው፤

፬/ "ስልጠና" ማለት ከውሃ ልማት ጋር በተያያዘ በዘርፉ ለተሰማሩና ወደፊት ለሚሰማሩ ሰልጣኞች የሚሰጥ መደበኛና አጫጭር ተግባር ተኮር ስልጠና ነው፤

፭/ "ሚኒስቴር" ማለት የውሃ፣ መስኖና ኢነርጂ ሚኒስቴር ነው፤

፮/ ማንኛውም በወንድ ፆታ የተገለፀው የሴትንም ይጨምራል።

፫. <u>መቋቋም</u>

፩/ የኢትዮጵያ ውሃ ቴክኖሎጂ ኢንስቲትዩት (ከዚህ በኋላ "ኢንስቲትዩት" እየተባለ የሚጠራ) በሕግ የሰውነት መብት ያለው ራሱን የቻለ የፌደራል መንግሥት መስሪያ ቤት ሆኖ በዚህ ደንብ ተቋቁሟል።

፪/ ኢንስቲትዩቱ ተጠሪነቱ ለሚኒስቴሩ ይሆናል።

፬. <u>ዋና መሥሪያ ቤት</u>

የኢንስቲትዩቱ ዋና መሥሪያ ቤት በአዲስ አበባ ከተማ ሆኖ እንደ አስፈላጊነቱ በማናቸውም ስፍራ ቅርንጫፍ ሊኖረው ይችላል።

፭. <u>የኢንስቲትዩቱ ዓላማ</u>

ኢንስቲትዩቱ የሚከተሉት ዓላማዎች ይኖሩታል፡-

፩/ በውሃ ልማት እና ተያያዥነት ባላቸው ዘርፎች ለተሰማሩ ተቋማት የቴክኖሎጂ ሽግግርን ተደራሽ ማድረግ፤

፪/ በዘርፉ የተሰማራውንና የሚሰማራውን የሰው ሃይል ከሌሎች በዘርፉ ሙያ ከሚያሰለጥኑ የቴክኒክና ሙያ እና የከፍተኛ ትምህርት ተቋማት ጋር በጋራ በመስራት በተግባር ተኮር ስልጠና ማብቃት፤ እና

፫/ ለቴክኒክና ሙያ ትምህርትና ስልጠና ተቋማት የሚፈለጉ አሰልጣኞችን ማፍራትና አቅም መገንባት።

፮. <u>የኢንስቲትዩቱ ሥልጣንና ተግባር</u>

ኢንስቲትዩቱ የሚከተሉት ሥልጣንና ተግባራት ይኖሩታል፡-

፩/ ከዓለም አቀፍ አሰራር አንጻር የተለዩ የክህሎት ክፍተቶችን ለመሙላት በሥራ ላይ በተለያዩ ደረጃዎች ለተሰማሩ የውሃና ተዛማጅ ስራዎች ባለሙያዎች አጫጭር ተግባር ተኮር ስልጠና በመስጠት ማብቃት፤

3/ "water and related activities" means activities of water development and those related activities such as water supply and maintenance of irrigation schemes, maintenance of drilling machineries and electro-mechanical equipment and other related activities;

4/ "training" means a regular and short-term practical training provided to the existing and potentially joining manpower of the sector in relation to water development;

5/ "Ministry" means the Ministry of Water, Irrigation and Energy;

6/ any expression in the masculine gender includes the feminine.

3. **Establishment**

1/ The Ethiopian Water Technology Institute (hereinafter the "Institute") is hereby established as an autonomous federal government office having its own legal personality.

2/ The Institute shall be accountable to the Ministry.

4. **Head Office**

The Institute shall have its head office in Addis Ababa and may have branch offices elsewhere, as may be necessary.

5. **Objectives**

The Institute shall have the objectives to:

1/ facilitate the transfer of technology to those engaged in water development and related activities;

2/ provide practical trainings to capacitate the existing and potentially joining manpower of the sector in cooperation with other technical and vocational education and training institutions and higher education instutuion; and

3/ produce and build capacity of instructors required by technical and vocational education and training institutions.

6. **Powers and Duties of the Institute**

The Institute shall have the powers and duties to:

1/ prepare and conduct short-term practical trainings on courses designed as per international methods to fill identified skill gaps of manpower working at different levels in water development and related activities;

፪/ በዘርፉ በአገር ውስጥ ማማሟላት የማይቻለውን ክፍተት ለማሟላት የሚያስችል የቴክኖሎጂ ሽግግር ማምጣት፤

፫/ ከዘርፉ የሙያ ደረጃዎችና ከአዳዲስ ቴክኖሎጂዎች ጋር በተያያዘ የቴክኒክና ሙያ ትምህርትና ሥልጠና በሚሰጡ ተቋማት መምህራን ዘንድ ያሉ ክፍተቶችን ለመሙላት አጫጭር ተግባር ተኮር የአሰልጣኝ ስልጠናዎች መስጠት፤

፬/ በዘርፉ የትምህርትና ስልጠና ፍላጎት መሰረት በውሃና ተዛማጅ ስራዎች ላይ በሚሰሩ የቴክኒክና ሙያ ትምህርትና ስልጠና ተቋማት የሚፈለጉ መምህራንን ማፍራት፤

፭/ በዘርፉ የሰው ኃይል ፍላጎት መሠረት በሀገሪቱ የቴክኒክና ሙያ ትምህርትና ስልጠና የብቃት ማዕቀፍ ከፍተኛ ደረጃ ፕሮግራሞች ላይ የረጅም ጊዜ ስልጠና መስጠት፤

፮/ የውሃ ሀብት ልማትን ለማሳደግ የሚረዱ የጥናትና ምርምር ስራዎችን ማከናወን፤

፯/ በዘርፉ ተፈላጊ ባለሙያዎችን ለሚያፈሩ የትምህርትና የስልጠና ተቋማት የስልጠና ፕሮግራሞች ማደራጀትና አዳዲስ ቴክኖሎጂዎችን በማላመድ ረገድ የቴክኒክና የምክር ድጋፍ መስጠት እና የብቃት ምዘና ማዕከል አገልግሎት መስጠት፤

፰/ በሌሎች ተቋማት ያሉ ክፍተቶችን በመለየት የዘርፉን ስፔሻላይዝድ ላብራቶሪ በማደራጀት አገልግሎት መስጠት፤

፱/ በዘርፉ የሚፈለገውን የሰው ኃይል ልማት በተመለከተ ከከፍተኛ የትምህርት ተቋማት ጋር ተባብሮ መስራት፤ በጋራ ምርምሮችን በማካሄድ በዘርፉ የአገር ውስጥ የምርምር አቅም እና የቴክኖሎጂ ሽግግር እንዲጠናከር ማገዝ፤

፲/ ለሚሰጣቸው አገልግሎቶች በመንግስት በሚወሰን ተመን መሠረት የአገልግሎት ዋጋ ማስከፈል፤

፲፩/ የንብረት ባለቤት መሆን፣ ውል መዋዋል፣ በራሱ ስም መክሰስና መከሰስ፤

፲፪/ ዓላማውን ከግብ ለማድረስ የሚረዱ ሌሎች ተዛማጅ ተግባራትን ማከናወን፡፡

፯. <u>የኢንስቲትዩቱ አቋም</u>

ኢንስቲትዩቱ፡-

፩/ አማካሪ ምክር ቤት (ከዚህ በኋላ "ምክር ቤት" እየተባለ የሚጠራ)፤

፪/ በመንግሥት የሚሾም አንድ ዋና ዳይሬክተርና እንደአስፈላጊነቱ አንድ ምክትል ዋና ዳይሬክተር፤ እና

፫/ አስፈላጊው ሠራተኞች፤

ይኖሩታል፡፡

2/ facilitate the transfer of technology that enable to fill the local gaps in the sector's development;

3/ conduct short-term practical trainings of trainers on courses designed in line with the sector's qualification levels and new technologies to fill identified skill gaps of instructors working in technical and vocational education and training institutions;

4/ produce instructors required by the technical and vocational education and training institutions that train in water and water related professions based on the demand of the sector's education and training;

5/ conduct long-term training as per national technical and vocational education and training qualification framework on higher level programs in accordance with the manpower requirement of the sector;

6/ conduct studies and researches that facilitate the growth of water resource development;

7/ provide technical and consultation support to education and training institutions that produce graduates required by the sector in organizing training program and introduction to new technologies; and serve as center for professional competence evaluation;

8/ establish and provide specialized laboratory services by identifying the gaps of other institutions operating in the sector;

9/ cooperate with higher education institutions on human resource development in the sector; conduct joint research and assist in strengthening of local research and technology transfer capacity in the sector;

10/ charge fees for the services it renders in accordance with the rate approved by the government;

11/ own property, enter into contracts and sue and be sued in its own name;

12/ perform such other related activities as are conducive to the attainment of its objectives.

7. <u>**Organization of the Institute**</u>

The Institute shall have:

1/ an Advisory Council (hereinafter the "Council");

2/ a Director General and as may be necessary, a Deputy Director General, to be appointed by the government; and

3/ the necessary staff.

፰. የምክር ቤቱ አባላት

ምክር ቤቱ ሰብሳቢውን ጨምሮ በመንግሥት የሚሰየሙ አባላት ይኖሩታል። ቁጥራቸውም እንደአስፈላጊነቱ ይወሰናል።

፱. የምክር ቤቱ ተግባራት

ምክር ቤቱ የሚከተሉት ተግባራት ይኖሩታል፡-

፩/ ኢንስቲትዩቱ በሚያከናውናቸው ተግባራት ላይ ያማክራል፤

፪/ የውሃ ልማትን ለማፋጠን በኢንስቲትዩቱ የተዘጋጁ ስትራቴጂዎችን፣ እቅዶችን፣ ጥናቶችን እና ምርምሮችን ገምግሞ አስተያየት ይሰጣል፤

፫/ በኢንስቲትዩቱ የአቅም ግንባታ መርሃ ግብሮች ላይ አስተያየት ይሰጣል፤

፬/ የኢንስቲትዩቱን የአቅድ አፈፃፀም በየሦስት ወሩ በመገምገም አስተያየት ይሰጣል።

፲. የምክር ቤቱ ስብሰባዎች

፩/ ምክር ቤቱ በየሦስት ወሩ መደበኛ ስብሰባ ይኖረዋል፤ ሆኖም አስፈላጊ ሆኖ ሲገኝ በማንኛውም ጊዜ አስቸኳይ ስብሰባ ሊያደርግ ይችላል።

፪/ በምክር ቤቱ ስብሰባ ላይ ከግማሽ በላይ የሚሆኑ አባላት ከተገኙ ምልዓተ ጉባዔ ይሆናል።

፫/ የዚህ አንቀጽ ድንጋጌዎች እንደተጠበቁ ሆኖ ምክር ቤቱ የራሱን የስብሰባ ሥነ-ሥርዓት ደንብ ሊያወጣ ይችላል።

፲፩. የዋና ዳይሬክተሩ ሥልጣንና ተግባር

፩/ ዋና ዳይሬክተሩ የኢንስቲትዩቱ ዋና ሥራ አስፈፃሚ በመሆን ከሚኒስቴሩ በሚሰጠው አጠቃላይ መመሪያ መሰረት የኢንስቲትዩቱን ሥራዎች ይመራል፣ ያስተዳድራል።

፪/ በዚህ አንቀጽ ንዑስ አንቀጽ (፩) የተመለከተው አጠቃላይ አነጋገር እንደተጠበቀ ሆኖ ዋና ዳይሬክተሩ፡-

ሀ) በዚህ ደንብ አንቀጽ ፮ የተመለከቱትን የኢንስቲትዩቱን ሥልጣንና ተግባራት በሥራ ላይ ያውላል፤

ለ) የኢንስቲትዩቱን ድጋፍ ሰጪ ሠራተኞች በፌደራል ሲቪል ሰርቪስ ሕጎች መሠረት እንዲሁም የኢንስቲትዩቱን ዓላማ በማስፈጸም ሥራ ላይ የሚሠማሩ ባለሙያዎችን የፌደራል ሲቪል ሰርቪስ ሕጎችን መሠረታዊ መርሆዎች ተከትሎ በመንግሥት በሚጸድቅ መመሪያ መሠረት ይቀጥራል፤ ያስተዳድራል፤

8. Members of the Council

Members of the Council, including the Chairperson, shall be designated by the government; and their number shall be determined as may be necessary.

9. Duties of the Council

The Council shall have the duties to:

1/ advice the Institute on its activities;

2/ review and forward its recommendation on strategies, plans, studies and researches formulated by the Institute with the view to facilitate the water development;

3/ forward its opinion on capacity building programs of the Institute;

4/ evaluate the performance report of the Institute every three months and forward its opinion.

10. Meetings of the Council

1/ The Council shall meet every three months; provided, however, that it may hold extraordinary meetings at any time as may be necessary.

2/ There shall be quorum where more than half of the members of the Council are present at a meeting.

3/ Without prejudice to the provisions of this Article, the Council may adopt its own rules of procedure.

11. Power and Duties of the Director General

1/ The Director General shall be the chief executive officer of the Institute and shall, subject to the general direction of the Ministry, direct and administer the activities of the Institute.

2/ Without limiting the generality of sub-article (1) of this Article, the Director General shall:

a) exercise the powers and duties of the Institute specified under Article 6 of this Regulation;

b) employ and administer employees engaged in support services of the Institute in accordance with the federal civil service laws and, in the case of professionals engaged in the core functions of the Institute, in accordance with directive approved by the government following the basic principles of the federal civil service laws;

ሐ) የኢንስቲትዩትን ስትራቴጂክ ዕቅድ፣ ዓመታዊ ዕቅድ፣ የሥራ ፕሮግራምና በጀት አዘጋጅቶ ለሚኒስቴሩ ያቀርባል፣ ሲፈቀድም ተግባራዊ ያደርጋል፣

መ) ለኢንስቲትዩቱ በተፈቀደው በጀትና የሥራ ፕሮግራም መሠረት ገንዘብ ወጪ ያደርጋል፣

ሠ) ከሦስተኛ ወገኖች ጋር በሚደረጉ ግንኙነቶች ኢንስቲትዩቱን ይወክላል፣

ረ) የኢንስቲትዩቱን የሥራ አፈፃፀምና የሂሳብ ሪፖርት አዘጋጅቶ ለሚኒስቴሩ ያቀርባል።

፫/ ዋና ዳይሬክተሩ ለኢንስቲትዩቱ ሥራ ቅልጥፍና በሚያስፈልግ መጠን ሥልጣንና ተግባሩን በከፊል ለሌሎች የኢንስቲትዩቱ የሥራ ሃላፊዎችና ሠራተኞች በውክልና ሊሰጥ ይችላል።

፲፪. <u>በጀት</u>

የኢንስቲትዩቱ በጀት በመንግሥት ይመደባል።

፲፫. <u>የሂሣብ መዛግብት</u>

፩/ ኢንስቲትዩቱ የተሟሉና ትክክለኛ የሆኑ የሂሣብ መዛግብት ይይዛል።

፪/ የኢንስቲትዩቱ የሂሣብ መዛግብትና ገንዘብ ነክ ሰነዶች በዋናው ኦዲተር ወይም እርሱ በሚሰይመው ኦዲተር በየዓመቱ ይመረመራሉ።

፲፬. <u>ደንቡ የሚፀናበት ጊዜ</u>

ይህ ደንብ በፌደራል ነጋሪት ጋዜጣ ታትሞ ከወጣበት ቀን ጀምሮ የፀና ይሆናል።

አዲስ አበባ ሐምሌ ፴ ቀን ፪ሺ፭ ዓ.ም

ኃይለማርያም ደሳለኝ

የኢትዮጵያ ፌደራላዊ ዲሞክራሲያዊ
ሪፐብሊክ ጠቅላይ ሚኒስትር

c) prepare and submit to the Ministry the strategic plan, annual plan, work program and budget of the Institute and implement same up on approval;

d) effect payments in accordance with the approved budget and work program of the Institute;

e) represent the Institute in its dealings with third parties;

f) prepare and submit to the Ministry the performance and financial reports of the Institute.

3/ The Director General may delegate part of his powers and duties to other officers and employees of the Institute to the extent necessary for the effective performance of the activities of the Institute.

12. <u>Budget</u>

The Institute's budget shall be allocated by the government.

13. <u>Books of Accounts</u>

1/ The Institute shall keep complete and accurate books of accounts.

2/ The books of accounts and financial documents of the Institute shall be audited annually by the Auditor General or an auditor designated by him.

14. <u>Effective Date</u>

This Regulation shall come into force on the date of publication in the Federal Negarit Gazette.

Done at Addis Ababa this 6th day of August, 2013.

HAILEMARIAM DESSALEGN

PRIME MINISTER OF THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA

Annex 3

Mid-Term Strategic Plan of EWTI

Ethiopian Water Technology Institute (EWTI)

Mid-Term Strategic Plan

November 2013

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1. Introduction

1.1 Background

In order to improve the drinking water supply coverage and operational sustainability of the constructed water schemes in the country, the former Ministry of Water Resources with the assistance of Japan Government established the Ethiopian Water Technology Center /EWTEC/ as project in 1998 with the aim to build the capacity of the human resource working in regional water bureaus and public water works construction enterprises.

Accordingly, as per the agreement between JICA and Ethiopian government the project started conducting training in the field of groundwater development and water supply engineering in January 1998 and the 1st phase of the project agreement has been extended by two subsequent project agreements (2nd phase and 3rd phase) and the 3rd phase agreement will be phased out in November 2013.

Since its establishment in 1998 up to October 2012 the project center has contributed much in human resource capacity building of the sector by providing training in 16 different type of short-term water technology courses for a total of about 3292 water professionals recruited from local and African countries.

On the other hand, the training needs survey which was conducted in 2009 by JICA/EWTEC indicated that there is still a higher demand for short-term practical training in different water technology courses with a total of around 15,000 technical & professional staff in the water sector. In view of this high demand of training services and to deal with other organizational problems of the center, an organization study of the center with the initiation of the Ministry of Water & Energy and as per instruction given by the Prime Minister has been carried out by joint study committee comprising members from both the MoWIE and MoE.

The organization study report which has been prepared by the joint study committee has forwarded its recommendation to constitute the center as an autonomous public institute and this recommendation has been jointly endorsed by the two ministries and finally got approval by the Prime Minister Office with instruction given to MoWIE to proceed with the transformation process of the center as per the study recommendation. Accordingly, the MoWIE submitted a draft Regulation to Prime Minister's Office to establish the Ethiopian Water Technology Institute and consequently, the Institute is legally established as of August 06, 2013 by Council of Ministers' Regulation No 293/2013.

And this mid-term strategic plan is the revised version of the one prepared by the joint study committee in August 2012 and it covers the period of two consecutive Ethiopian fiscal years: 2006 to 2007 (2013/14 to 2014/15) with the aim to align with the ending period of the national GTP.

1.2 Objectives, Duties & Responsibilities of the Institute

1.2.1 Objectives

The Institute shall have the objectives to:

1/ facilitate the transfer of technology to those engaged in water development and related activities;
2/ provide practical trainings to capacitate the existing and potentially joining manpower of the sector in cooperation with other technical and vocational education and training institutions and higher education institutions; and
3/ produce and build capacity of instructors required by technical and vocational education and training institutions.

1.2.2 Power & Duties of the Institute

The institute shall have the following power and duties to:

1. Prepare and conduct short-term practical trainings on courses designed as per international methods to fill identified skill gaps of manpower working at different levels in water development and related activities;

2. Facilitate the transfer of technology that enable to fill the local gaps in the sector's development;

3. Conduct short-term practical trainings of trainers, on courses designed in line with the sector's qualification levels and new technologies to fill identified skill gaps of instructors working in technical and vocational education and training institutions;

4. Produce instructors required by the technical and vocational education and training institutions that train in water and water related professions based on the demand of education and training;

5. Conduct long-term training as per national technical and vocational education and training qualification framework on higher level programs in accordance with the manpower requirement of the sector;

6. Conduct studies and researches that facilitate the water resource development;

7. Provide technical and consultation support to education and training institutions that produce graduates required by the sector in organizing training program and introduction to new technologies; and serve as center for professional competence evaluation;

8. Establish and provide specialized laboratory services by identifying gaps of the other institutions operating in the sector;

9. Cooperate with higher education institutions on human resource development in the sector; conduct joint research and assist in strengthening of local research and technology transfer capacity in the sector;

10. Charge fees for the services it renders in accordance with the rate approved by the Government;

11. Own property, enter into contracts and sue and be sued in its own name;

12. Perform such other activities as are conducive to the attainment of its objectives.

1.3 The Strategic Role of the Institute

In order to achieve its establishment objectives as well as to facilitate and support the achievement of the strategic goals set for the sector, the institute is expected to carry out successfully the following three main functions:

- Build the sector's implementation capacity through human resource development,
- Perform water technology capacity accumulation and transfer tasks that can solve problems observed in the sector's development endeavors, and
- Assist water TVETs in building their capacity and provide different technical and advisory services to support the various organizations engaged with the sector development activities.

It should be noted that through successful execution of the above-listed major functions, the Institute is destined to play a key role as capacity building arm of the sector in general, and to support the implementation of one WASH national program with practical training provisions for WASH professionals in particular.

EWTI will also continue engaging in a broaden and strengthened manner in supporting the implementation of the national water resource management policy through continuation of its practical training on both basic and advanced groundwater investigation/management, modeling and other related courses as well as conducting research and dissemination of hydro geological data to different users engaged in water resource development activities.

2 Organizational Assessment

2.1 Mission, Vision & Values

Mission

The mission is to be the leading institute of human resource capacity development and technology transfer center in the fields of ground & surface water development and scheme management by providing updated practical training and technical & advisory services for public, private and non-governmental organizations already engaged or plan to involve in water related activities.

Vision

The vision is to be the "Center of Excellence" of water sector in Ethiopia.

The capacity development of engineers and technicians engaged in the water sector is one of the most important issues to improve drinking water supply coverage and ensure food security through expansion of irrigation development not only in Ethiopia but also in other African countries. The Ethiopian Water Technology Institute (EWTI) has a vision to be a successful model to solve this critical and challenging issue in Ethiopia as well as other African countries.

Values

- Strives for Excellence
- Learning, Coaching & Developing others
- Quality and Relevancy
- Creativity & Innovation
- Transparency & Accountability
- Sprits of Cooperativeness
- Participatory Approach

2.2 Situation Analysis

The SWOT (Strength, Weaknesses, Opportunities and Threats) analysis is carried out in three categories: Internal (strength & weakness), External (opportunities & threats) and the major Challenges and Enabling conditions as discussed in the tables below.

2.2.1 Strengths and Weaknesses (Internal) Analysis

Internal	
Strengths	**Weaknesses**
▪ Extensive experience and capacity built both at national and on continent level in providing practical trainings in the water technology sector ▪ Equipped itself from time to time with basic equipment and other logistics required for practical training ▪ The institute has also necessary machineries and equipments as well as trained and experienced man manpower that enables at least to start up the delivery of technical services (groundwater investigation, water well drilling works and maintenance of Regis and related equipments) ▪ Ongoing facility expansion works, availability of adequate land in the compound of the institute for future expansion ▪ Established strong relationship with development partners, especially with JICA, and acquired a wide experience in training service delivery both at national and continent level by providing short term trainings pertinent to the water sector ▪ Strong and ever improving work relationship with the stakeholders and customers ▪ The fact that the institute, with its former project set-up as practical skill training center, has developed a strong good will and recognition by customers through its long years of practical training service rendering in the sector	▪ Lack of long term strategic plan that indicate or guide the future direction of the organization/center ▪ Absence of adequate organization structure that facilitate and support its role in the development of the sector ▪ Shortage of qualified manpower to perform the future roles expected from the institute to support the sector development ▪ Inadequate training budget allocated by the government to the center, which resulted in dependence on foreign fund support for a long period of time ▪ The existing salary scale of the center is not attractive enough to retain existing manpower or attract new employees from the market ▪ The office buildings, the dormitories, the class rooms and the cafeterias were built as a temporary arrangement and at the moment, most of these facilities are not good enough to provide proper service and are not enough to accept adequate number of trainees ▪ The existing training program is not designed with long and short term training program to fulfill or to be more responsive with the sector needs; and it is not also in line with national educational and training system requirements. ▪ Due to absence of established modern information network system and internet service, it is not possible to use advanced technology to access new technologies, for information storage, and exchange. ▪ The existence of high leadership gap to execute effectively a wide-ranging

	capacity building and technical support service functions destined to be carried out in the future by the established institute.

2.2.2 Opportunities and Threats (External) Analysis

External	
Opportunities	**Threats**
▪ Existence of clearly stated national vision, policy and strategies; ▪ The special emphasis given by the government to the sector's development and its commitment to produce the required manpower ▪ The existence of a big human resource gap in the sector for the successful implementation of the national growth and development plan to achieve sector goals ▪ The training needs survey conducted in 2009 has confirmed the existence of significant demand for practical trainings within the sector ▪ The national training and education system provides provisions that enables EWTI to work in coordination with other water TVETs so as to train and produce the required manpower for the sector, ▪ Absence of educational institutions that can produce qualified instructors with practical skills required for the technical & vocational collages of the water sector ▪ Lack of organizations that provide adequate local maintenance service for drilling rigs and related heavy machineries deployed in the service of the sector ▪ Existence of considerable demand in the Regions, particularly in the regions that require special support, for ground water investigation and for drilling works and which cannot be fulfilled by the private sector alone ▪ Availability of development partners that are willing to support the efforts of the institute to carry out its mandates and responsibilities ▪ Existence of conducive environment to conduct research activities in partnership with	▪ Appropriate organizational structure and staffing plan of the institute may not be approved within the anticipated period, ▪ Delay in the approval of the salary scale and benefit packages that is designed to retain the existing and attract the required professionals from the market ▪ Approval of the capital budget required for the completion of the already started facilities expansion works may be delayed, ▪ Insufficient budget allocation by the government for training activities and for the various services of the institute ▪ The fact that the technical, financial and material supports expected from development partners may not be obtained in time and in sufficient amount and the complicated nature of donor's policies in their support provisions, ▪ Inadequate attention given by the MoWIE in organizing and strengthening the institute

other organizations of similar objectives	

2.2.3 Challenges and Enabling Environment

Challenges/key problems and enabling environment are identified through the of the institute's internal and external situations analysis:

Weakness + Threats = Challenges	Enabling Environment
▪ Delay in the timely completion of the much needed facilities and expansion works currently under construction ▪ While the cost of training programs has increased considerably the government budget allocation has shown no improvement as it is still calculated on the basis of old rates making future programs implementation more difficult;	▪ Due to government's special attention and high commitment to the sector's development, the center has been transformed and reorganized as an autonomous legal entity to enable effective execution of its roles; hence there is a very high likelihood of securing adequate funding for the completion of the facilities under construction and for other required facilities ▪ Though not sufficient enough to carry out the full anticipated operation of the institute, at the moment it has necessary skilled and experienced manpower and equipment required to conduct both the selected training programs and to start up some of the provision of technical services (groundwater investigation, water well drilling works and maintenance of drilling rigs and other related equipments) as these technical services will allow the institute to generate some income to relieve the budget burden of the government; and availability of favorable condition created for the institute to continually build its capacity and device income generating strategies;

2.3 Customers and/or Stakeholders Analysis

The identified customers and stakeholders and their corresponding interests are analyzed as shown in the two tables respectively below.

Customers' Interest Analysis Summary Table

Customers	Customers' Interests
Regional Water Offices	▪ Qualified and skilled manpower at all levels ▪ Technical support ▪ Technical & consultancy service ▪ Appraisal of implementation capacity ▪ Study results that are capable of resolving critical problems of the sector development ▪ Water technology information ▪ Transferred new water technologies ▪ Basic water resource and related data required for the development of the sector

Customers	Customers' Interests
Zone and Woreda Water Offices	▪ Qualified and skilled manpower at all levels ▪ Transferred new water technologies
Urban Water Supply and Sewerage Services	▪ Qualified and skilled manpower ▪ Technical support ▪ Technical & consultancy service ▪ Study results that are capable of resolving critical problems of the sector development ▪ Water technology information ▪ Transferred new water technologies ▪ Basic water resource and related data required for the development of the sector
Federal and Regional Water Works Construction Enterprises	▪ Qualified and skilled manpower at all levels ▪ Technical support ▪ Technical & consultancy service ▪ Study results that are capable of resolving critical problems of the sector development ▪ Water technology information ▪ Transferred new water technologies ▪ Basic water resource and related data required for the development of the sector
Federal and Regional Water Works Design and Supervision Enterprises	▪ Qualified and skilled manpower at all levels ▪ Technical support ▪ Technical & consultancy service ▪ Study results that are capable of resolving critical problems of the sector development ▪ Water technology information ▪ Transferred new water technologies ▪ Basic water resource and related data required for the development of the sector
NGOs engaged in the Sector	▪ Qualified and skilled manpower at all levels ▪ Technical support ▪ Technical & consultancy service ▪ Appraisal of implementation capacity ▪ Study results that are capable of resolving critical problems of the sector development ▪ Water technology information ▪ Transferred new water technologies ▪ Basic water resource and related data required for the development of the sector
Private sector drilling Enterprises	▪ Qualified and skilled manpower at all levels ▪ Technical support provision ▪ Technical & consultancy service ▪ Appraisal of implementation capacity ▪ Study results that are capable of resolving critical

Customers	Customers' Interests
	problems of the sector development ▪ Water technology information ▪ Transferred new water technologies ▪ Basic water resource and related data required for the development of the sector
Private Consultants Engaged in the Water Sector	▪ Qualified and skilled manpower at all levels ▪ Technical support provision ▪ Technical & consultancy service ▪ Appraisal of implementation capacity ▪ Study results that are capable of resolving critical problems of the sector development ▪ Water technology information ▪ Transferred new water technologies ▪ Basic water resource and related data required for the development of the sector
Water TVETs	▪ Qualified and skilled manpower at all levels ▪ Technical support ▪ Technical & consultancy service ▪ Study results that are capable of resolving critical problems of the sector development ▪ Water technology information ▪ Transferred new water technologies ▪ Basic data of the trained manpower demand in the sector
Higher Education Institutions (Universities) that produce graduates required in the Sector	▪ Cooperation in conducting special practical training and joint research program in fields related to water technology Technical support ▪ Technical & consultancy service ▪ Study results that are capable of resolving critical problems of the sector development ▪ Water technology information ▪ Transferred new water technologies ▪ Basic data of the trained manpower demand in the sector ▪ Basic water resource and related data required for the development of the sector
Research Institutions working in fields related to Water Sector	▪ Cooperation in conducting special practical training and joint research program in fields related to water technology ▪ Technical support ▪ Technical & consultancy service ▪ Study results that are capable of resolving critical problems of the sector development ▪ Water technology information ▪ Transferred new water technologies

Customers	Customers' Interests
	▪ Basic water resource and related data required for the development of the sector
Trainees	▪ Training program designed based on market demand ▪ Advisory service while on training ▪ Complete service for trainees ▪ Required services provision on cooperative trainings ▪ Job searching support for trainees ▪ Linking training with business development by organizing micro and small scale enterprises ▪ Post training performance monitoring & evaluation and feedback ▪ Technological information of the water sector ▪ Transferred new technologies
Federal Government, House of Representatives	▪ Well organized institution capable of executing its responsibilities ▪ Strategic and annual plan of the institute that comply with the national long and short term strategies ▪ Timely submission of performance reports ▪ Effective level of annual physical and financial performance ▪ Policy ideas initiated based on results of study and research to resolve problems of the sector ▪ Basic water related data and information depicting the development level of the sector
Professional Associations in the Sector	▪ Participatory approach in training program formulation and development ▪ Training support cooperation

Stakeholders' Interest Analysis Summary Table

Stakeholders	Stakeholders' Interests
Ministry of Water, Irrigation and Energy	▪ Delivery of adequate number of trained manpower required in the sector ▪ Technical support to build the capacities of the regions, particularly to those regions that require special assistance, as well as support given to NGOs and private enterprises engaged in the sector; ▪ Strategic and annual institutional plan that comply with the national long and short term sector strategies ▪ Efficiency and effectiveness in its annual physical and financial performance ▪ Policy initiatives capable of resolving problems of the sector ▪ Basic water related data and information depicting the development level of the sector

Stakeholders	Stakeholders' Interests
Ministry of Education	▪ Producing qualified instructors with long-term training for water Technical and Vocational Education & Training (TVET) institutions ▪ Conducting long-term training, in accordance with the manpower requirement of the sector, on higher level water TVET programs as per the national TVET qualification framework Information regarding the trained manpower needs of the sector ▪ Transferred new technologies ▪ Special practical training support for instructors of water TVETs ▪ Information on sector problems and results of associated studies ▪ Basic data and information regarding the sector development
Ministry of Finance and Economic Development	▪ Timely submission of annual budget request ▪ Annual budget utilization reports ▪ Allocated resource utilization for planned tasks ▪ Institution's procurement and property administration is in comply with the national regulations ▪ Strategic and annual institutional plan that comply with the national long and short term strategies ▪ Effective annual physical and financial performance
Anti Corruption Commission	▪ Civic education ▪ Institutional system that is free from corruption ▪ Study and investigation (on suspected cases of corruption) ▪ Timely and accurate information delivery
General Auditor	▪ Proper accounting system established and implemented ▪ Proper maintenance of accounts' documents ▪ Proper resource utilization
Development Partners	▪ Participative approach ▪ Well developed implementation capacity ▪ Plan /program developed through the involvement and participation of concerned partners ▪ Effective resource utilization ▪ Good governance and conducive working environment ▪ Monitoring and evaluation

3. Strategic Themes, Results/Expected Outcomes & Strategic Goals

3.1 Strategic Themes & Results/Expected Outcomes

Strategic Theme I (T1) : Adequate and quality training provisions in selected water technology courses

Outcome: Adequately trained man power in sufficient number for the sector

Strategic Theme II (T2): Providing adequate and quality technical, professional advisory, and information services

Outcome: Solved problems as a result of the efficient and effective technical, professional advisory and information services delivery

Strategic Theme III (T3): Appropriate and affordable technology selection through study and research

Outcome: Solved problems with transferred technologies

Strategic Theme IV (T4): High participations of development partners and stakeholders

Outcome: Improved training program and resource acquisition

Perspectives: The four original perspectives stated in works of BSC scholars – Customers, Finance, Internal Business Process and Learning & Growth- are maintained in this strategic plan as performance measurement perspectives.

3.2 Strategic Goals/Objectives

The strategic goals are set based on the expected results stated under each strategic theme. In setting the strategic goals of the institute, the study team has carried out a thorough discussions regarding to what have to be accomplished in order to achieve the expected results in view of the customer demand and the identified list of challenges and enabling conditions.

Accordingly, after identifying and combining of similar or very related goals, the strategic themes' strategic goals are defined and set under the four perspectives as outlined below:

Under Customer Perspective:

- Increase customer satisfaction (T1 to T4)
- Increase supply of qualified manpower required in the sector (T1)
- Increase supply of required information (T2)
- Increase provision of specialized laboratory and other technical and professional advisory services (T2)
- Increase the supply/transfer of selected technology (T3)
- Increase participation of development partners and stakeholders (T4)

Under Financial Perspective

- Increase source of resources (T1 to T4)
- Improve resource utilization effectiveness (T1 to T3)

Under Internal Business Process Perspective

- Establish result-based training program delivery system (T1)
- Establish quality assurance system (T1)
- Establish specialized laboratory & other technical and professional advisory services provision system (T2)
- Establish information management and delivery system (T2)
- Establish technology accumulation & transfer system (T3)
- Establish system that promotes high participation of development partners and stakeholders (T4)
- Establish customer relations/communications system (T4)

Under Learning and Development Perspective:

- Enhance competency of the management and other staff /knowledge, skill and attitude (T1 to T4)
- Enhance technological capacity of the institute (T1 to T4)
- Enhance supply of manpower for the institute (T1 to T4)

Summary of Strategic Themes, Outcomes and Goals

Themes and Expected Outcomes		Strategic Theme I	Strategic Theme II	Strategic Theme III	Strategic Theme IV
		Theme: Adequate and quality training provisions in selected water technology courses **Outcome:** Adequately trained man power in sufficient number for the sector	**Theme:** Providing adequate and quality technical, professional advisory, and information services **Outcome:** Solved problems as a result of the efficient and effective technical, professional advisory and information services delivery	**Theme:** Appropriate and affordable technology selection through study and research **Outcome:** Solved problems with transferred technologies	**Theme:** High participations of development partners and stakeholders **Outcome:** Improved training program and resource acquisition
		Strategic Goals	**Strategic Goals**	**Strategic Goals**	**Strategic Goals**
Perspectives	Customer/ Citizen	▪ Increased supply of qualified manpower ▪ Increased customer satisfaction	▪ Increased customer satisfaction ▪ Improved supply of information ▪ Improved provision of specialized laboratory & other technical and professional advisory services	▪ Increased customer satisfaction ▪ Increased supply/transfer of technology	▪ Enhanced participation of partners and stakeholders ▪ Increased customer satisfaction
	Finance	▪ Increased source of resources ▪ Improved resource utilization effectiveness	▪ Increased source of resources ▪ Improved resource utilization effectiveness	▪ Increased source of resources ▪ Improved resource utilization effectiveness	▪ Increased source of resources
	Internal Working System	▪ Establish result based training delivery system ▪ Establish quality assurance system	▪ Establish specialized laboratory & other technical and professional advisory services provision system ▪ Establish information management & delivery system	▪ Establish technology accumulation & transfer system	▪ Establish system that promotes high participation of development partners and stakeholders ▪ Establish customer relations/ communication system
	Learning & Development	▪ Enhance competency of the management and other staff /knowledge, skill and attitude/ ▪ Enhance technological capacity of the institute ▪ Enhance supply of manpower for the institute	▪ Enhance competency of the management and other staff /knowledge, skill and attitude/ ▪ Enhance technological capacity of the institute ▪ Enhance supply of manpower for the institute	▪ Enhance competency of the management and other staff /knowledge, skill and attitude/ ▪ Enhance technological capacity of the institute ▪ Enhance supply of manpower for the institute	▪ Enhance competency of the management and other staff /knowledge, skill and attitude/ ▪ Enhance technological capacity of the institute ▪ Enhance supply of manpower for the institute

4. Description of Content, Scope & Weight of Perspective and Strategic Goals of the Institute

Perspective	Weight of Perspective	Strategic Goals	Weight of Goals (%)	Content and Scope of Goals	Expected Outcome
Customer/Citizen	40	Increased customer satisfaction	10	To accelerate sector development by achieving increased customer satisfaction in such a way that by identifying, analyzing short and long term training, technical & consultancy service needs of the government, the community and collaborators, the trainees and instructors, etc. and by designing and implementing customer-focused service delivery approach in the overall service provision system of the institute; and supporting this effort by intensive communication work	▪ Satisfaction of Customers on services provided by the institute ▪ Confidence created by customers on the institute due to improvement in performance achieved by trainees ▪ Decrease in customer complaints regarding the service provision
		Increased supply of qualified manpower	8	In collaboration with other water TVETs, produce and supply adequate number of qualified manpower through long and short term practical training programs for governmental and non-governmental as well as private organizations engaged in water related operations so as to support the rapid sector development in the country	▪ Adequate and competent manpower for effective contribution to sector development
		Improved supply of information	5	Establish integrated information management system and provide efficient information service to all users engaged in the sector on the following major areas: hydro geological, trained human resource requirement, and technology supply	▪ Resolved problems in the sector due to effective information supply ▪ Growth in information coverage

Perspective	Weight of Perspective	Strategic Goals	Weight of Goals (%)	Content and Scope of Goals	Expected Outcome
		Improved provision of specialized laboratory and other technical and professional advisory services	8	▪ Providing specialized sector's laboratory services for various service users engaged in water development related activities as well as research works ▪ Provide technical support for governmental and private sector enterprises, particularly for regions that require especial support, in the technical areas of groundwater study (including modeling & design), water well drilling works, installation and maintenance of electromechanical equipments so as to fill the existing major maintenance service gap in repairing of rigs and related drilling equipments; ▪ Perform the preparation of specification, selection and inspection activities for procurement of imported drilling rigs and related electromechanical equipments ▪ Support water TVETs by providing organizational strengthening and advisory service, orientation with new technology and provisions of competency evaluation service	▪ Resolved problems in the sector due to provision of technical and professional advisory service
		Increased supply of technology	5	▪ Collect and compile national and international good practices (including appropriate technology) and conduct study on selected technologies ▪ Promote and transfer study results and good practices to potential users	▪ Appropriate and affordable technology transferred with adequate number and put in operation with the user community

Perspective	Weight of Perspective	Strategic Goals	Weight of Goals (%)	Content and Scope of Goals	Expected Outcome
		Enhanced participation of partners and stakeholders	4	The goal includes the task of increasing the participation role of partners and stakeholders during the preparation of the institute's training plans, technical service provisions, consultancy services and other studies; and in carrying out joint monitoring and evaluation of planned activities so as to ensure and secure the continuation of the partners' material, financial and technical support provisions for the institute	▪ Growth in participation of partners on training program ▪ Growth in partners participation for the development of the implementation capability of the institute so that the institute would be effective in its technical and consultancy service provisions as well as in its research activities ▪ Staff of the institute acquired training opportunity due to partners' cooperation ▪ Micro and small scale enterprises engaged in technology transfer
Finance	20	Expanded source of resources	12	The goal includes developing mechanisms that will enable to generate human/expertise, material and financial resources from partners, government and internal revenue sources; familiarizing the system with concerned stakeholders and encouraging their participation; providing the service expected of the sector and creating conducive environment	▪ Organized information about sources of resources ▪ Growth in partners participation ▪ Increase in amount of resources
		Improved effectiveness of resource utilization	8	The goal includes developing effective and efficient system of utilizing resources obtained from government, partners and internal sources, as well as controlling and ensuring of proper utilization of resources as per the approved plan	▪ Enhanced development partnership ▪ Strategies developed to facilitate effective and efficient utilization of resources in the sector
Internal Working System	20	Improvement in effectiveness of service provision system	6	The goal includes developing and implementing efficient system for training, technical & consultancy services as well as for technology transfer and information dissemination service provided by the institute; carrying out follow up activities to ensure effectiveness of the installed system; continuously improving the system based on feedbacks from beneficiaries and stakeholders	▪ Satisfaction created with customers and stakeholders as a result of established working systems

Perspective	Weight of Perspective	Strategic Goals	Weight of Goals (%)	Content and Scope of Goals	Expected Outcome
		Develop &establish the institute's service provision working systems	5	The goal incorporates installing of efficient service provision system for training, specialized laboratory and other technical & professional advisory services as well as for technology transfer reflecting the interest of beneficiaries and stakeholders; develop and implement the programs; carrying out follow up activities to ensure effectiveness of the installed programs; continuously improving the programs based on feedbacks from beneficiaries and stakeholders	▪ Satisfaction created by customers and stakeholders ▪ Established working systems to implement training, specialized laboratory and other technical & professional advisory services as well as research & technology transfer activities ▪ Effectiveness of the training, specialized laboratory and other technical & professional advisory services as well as research & technology transfer activities due to the implementation of developed working systems
		Develop & establish quality assurance system	3	The goal comprises developing and implementing of efficient quality assurance system for training, technical & consultancy services provided by the institute; carrying out follow up activities to ensure effectiveness of the installed system; continuously improving the system based on feedbacks from beneficiaries and stakeholders	▪ Established system to assure quality ▪ Quality services provided using the implemented the system ▪ Satisfaction created to customers and stakeholders
		Build information service delivery and communication system	3	The goal covers developing and implementing of effective information service delivery system to collect, organize and analyze data, as well as establishment of efficient customer/users relationship/communication method; carrying out follow up activities to ensure effectiveness of the installed system; continuously improving the system based on feedbacks from customers and stakeholders	▪ Satisfaction created at customers and stakeholders ▪ Established information supply and customer relation/communication system ▪ Improved information supply due to implementation of the system ▪ Strengthened customer relationship due to implementation of the system

Perspective	Weight of Perspective	Strategic Goals	Weight of Goals (%)	Content and Scope of Goals	Expected Outcome
		Develop & Establish participatory system for partners and stakeholders	3	The goal incorporates developing and implementing of effective participatory system for partners and stakeholders; carrying out follow up activities to ensure effectiveness of the installed system; continuously improving the system based on feedbacks from partners and stakeholders	▪ Established system to facilitate higher participation of partners and stakeholders ▪ Strengthened participation due to implementation of the system ▪ Satisfaction created at customers and stakeholders
Learning & Development	20	Enhance institutional implementation capacity	10	The goal includes preparing of legal frameworks, institutional arrangements (organizational structure & staffing plan), installing appropriate salary scale, and creating conducive atmosphere for implementation so that the institute will be capable enough to perform its training, technical and consultancy service as well as research activities; continuously improving the system based on implementation feedbacks	▪ Prepared legal frameworks/documents ▪ Implemented organization arrangement ▪ Implemented salary scale
		Enhance competency of the management and other staff /knowledge, skill and perspective/	5	The goal comprises identifying and fulfilling the competency gap and shortage of manpower as per the staffing plan of the institute; capacitate through provision of trainings to fill the gap and conduct continuous monitoring and evolution activities	▪ Fulfilled manpower ▪ Identified competence gap ▪ Training provided as per the gap ▪ Improvement in performance result of the management and non-management staff ▪ Staff satisfaction ▪ Users/customers satisfaction
		Enhance technological capacity of the institute	5	The goal includes identifying and fulfilling of the technological gap of the institute for effective rendering its services to users and stakeholders; devise and implement short and long term strategies to fill the gap; and conduct sustained monitoring and evolution activities for continuous improvement of the system	▪ Service provision supported by modern technology ▪ Enhanced technological capacity ▪ Developed plan to fulfill the technology gap ▪ Improvement carried out as a result of evaluation on technology utilization

5. Strategic Goals, Measurement & Targets

Perspective	Strategic Goals	Measures	Base Year 2005 E.C.	Targets			
				2006 E.C.	2007 E.C.	2008 E.C.	Summary /3Yrs
Customer/Citizen	Increased customer satisfaction	Growth in percentage of coverage by the given training courses thus far	23	1	5	14	43
		Growth in percentage of coverage by the provided technical and consultancy service thus far	25	25	25	25	100
		Growth in percentage of satisfied customers by the transferred technology thus far	0	0	0	25	25
		Growth in percentage of satisfied customers by information supplied thus far	0	0	15	25	40
		Growth in percentage of satisfied partners and stakeholders by participation held thus far	10	40	20	10	80
	Increased supply of qualified manpower in adequate number	Number of sector professionals participated in short term training	251	52	305	610	967
		Number of water TVET trainees participated in short term trainings (at regional TVETs)	129	120	200	320	640
		Number of water TVET instructors participated in short term training courses	18	18	54	108	180
		Number of trainees participated in long term trainings (WWDC, EMMM, WWSCM, CM)	0	0	100	125	225
		Number of Level-B trainers participated in long term trainings (WWCSM)	0	0	27	54	81
		Number of persons took competency assessment exam in the institute	0	0	0	100	100
	Improved supply of information	Established database	0	0	1	0	1
		Number of topics included in the established data base (manpower, hydrology, hydrogeology and technology)	0	0	0	4	4
		Water well inventory geographic area coverage in percent	0	0	0	20	20
		Data collection, compilation and analysis accomplishment by number of regions (including 2 town administrations)	0	0	0	4	4
	Establishment of specialized laboratory and provision of other technical and professional advisory services	Gap analysis study of existing laboratory service provisions in the sector (no of studies)	0	1	0	0	1
		Specification development and procurement of laboratory equipment (by percent)	0	0	50	50	100
		Groundwater investigation studies by number of sites	8	10	12	16	38
		Capacity gap assessment of water TVETs by number of studies	0	1	0	0	1
	Increased supply of technology (technology refers here to water service equipments)	Types of technologies adopted or developed through study & research (in number)	0	0	1	1	2
		Types of technologies transferred to users (in number)	0	0	0	1	1

Perspective	Strategic Goals	Measures	Base Year 2005 E.C.	Targets			
				2006 E.C.	2007 E.C.	2008 E.C.	Summary /3Yrs
		Number of job opportunities created for citizens involving in the production &/or distribution process of the transferred technologies	0	0	0	200	200
		Number of beneficiaries of the transferred technology	0	0	0	40000	40000
	Enhanced participation of partners and stakeholders	Development partners working in cooperation with the institute (in number)	3	3	4	4	4
		Growth of stakeholders' participation in %	0	0	20	30	50
		Number of training needs assessment (TNA) study reports jointly finalized with stakeholders (symposiums organized to review TNA report, occupational standard review, etc)	0	0	1	0	1
Finance	Expanded source of resources	Number of project proposals prepared to mobilize fund from development partners	3	3	6	6	15
		Amount of fund secured from prepared project proposals, in million birr	40	84	60	60	204
		Amount of resource obtained from internal income generating activities (registration fees, laboratory service, drilling works, hydro geological studies, etc) in million birr	0	0	1.0	5.0	6.0
		Budget allocated from government, in million birr	2.5	2.4	25	80.00	107.4
	Improved effectiveness of resource utilization	The amount of money expended from budget allocated by government to realize the output attained as per the plan, in %	67	100	100	100	100
Internal Working System	Establishment of need based training provision system (both for short & long term)	Developed curriculum, instructional materials and other working manuals, in number (long-term 14 + short-term 6)	0	15	5	0	20
	Establishment of quality assurance system	Developed and implemented service delivery quality assurance system/ document, in number	0	0	1	0	1
	Establishment of specialized laboratory and other technical and professional advisory services delivery system	Developed and implemented specialized laboratory and other technical and professional advisory service provision system/ document, in number	0	0	2	0	2
	Establishment of information system	Developed and implemented information system/ document, in number	0	0	1	0	1
	Establishment of technology accumulation capacity and transfer system	Prepared and implemented technology accumulation capacity and transfer system / document, in number	0	0	1	0	1
	Establishment of system that promotes/facilitates participation of development partners and stakeholders	Prepared and implemented partners and stakeholders participation system / document, in number	0	0	1	0	1
		Number of consultative forums held with stakeholders	0	1	1	1	3

Perspective	Strategic Goals	Measures	Base Year 2005 E.C.	Targets			
				2006 E.C.	2007 E.C.	2008 E.C.	Summary /3Yrs
		Number of signed Memorandum of Understanding documents with stakeholders	0	2	3	3	8
	Build customer relations/ communication system	Media promotion, distributed promotion papers or brochures to customers, partners and stakeholders, by type	0	1	1	1	1
		Prepared semi-annual and annual bulletins of the institute, by type	0	1	2	2	2
	Establishment of plan and performance reporting system	Medium and short term plans/programs of the institute prepared and timely submitted to all concerned bodies, by type	0	1	1	1	1
		Performance reports of the institute prepared and submitted to all concerned parties, by type	0	4	4	4	4
Learning & Institutional Development	Enhance competency (knowledge, skills and attitudes) of the management and non-management staff	Management members trained to enhance their managerial competency, in percent	0	25	50	25	100
		Number of management members /leaders attained high performance result, in percent	90	90	100	100	100
		Number of non-managerial technical staff trained to enhance their competency, in percent	100	0	25	50	75
		Number of non-managerial staff attained high performance result, in percent	96	97	98	100	100
	Enhance technological capacity of the institute	IT coverage for those staff in need of the technology to perform their assigned duties, in percent	71	85	95	100	100
		Established information network, in number	0	0	1	0	1
	Enhance supply of manpower	Percentage of filled/occupied support staff positions as per approved manpower plan of the institute	-	35	75	100	100
		Percentage of filled or occupied positions of trainers/technologists as per approved manpower plan of the institute	-	50	75	100	100

Assumptions in Preparing the Target Plan for Long-Term Trainings:

In view of the long experience which the institute as "center" has experienced in providing the short-term practical trainings and in consideration of the facilities level both the existing and those planned to be fulfilled in the period up to end of 2007 Ethiopian fiscal year, out of the 16 (sixteen) water sector occupational standards that are approved and registered by Ministry of Education, the study committee has selected the following 4 (four):

- Water Well Drilling & Construction (starting from Level I to Level III)
- Electro Mechanical Equipment & Machinery Maintenance (starting from Level I to Level IV)
- Waterworks Site Construction Management (Level IV)
- Construction Management (Level V)

Occupational standards which are planned that the institute has to start providing as TVET program starting from the beginning of 2007 E.C. It is also assumed that by gradual fulfilling of the necessary facilities and man power, the institute is going to build its capacity to the level where it becomes capable to provide long-term training in all of the 16 occupational standards on Level IV & Level V.

Assumptions in Preparing the Target Plan for Short-Term Trainings:

Starting from the coming fiscal year of 2007 E.C., all the short-term trainings with the exception of the groundwater investigation which have been thus far given as regular or basic courses will only continue to be given after curriculum revision is done in line with the unit of competences categorized under the above-mentioned four selected long-term courses. It is also assumed that the average duration of all the short-term courses with the exception of the groundwater investigation and development course in the Institute will not exceed one month.

6. Strategic Initiatives

Projects Planned for Implementation in 2006 Ethiopian Fiscal Year

Since the year 2006 E.C. is assumed as transitional and preparation period of the institute so as to fulfill some basic facilities and recruit necessary manpower, in this budge year some key tasks/projects are planned to be accomplished in order to achieve targets set for the next 2 years (2007 and 2008 E.C) as outlined in the strategic plan of the institute.

The list of projects planned to be implemented are as follows:

- Completion and approval of organization structure, staffing plan and salary scale
- Recruitment of management staff and senior experts as per approved man power plan of the institute
- Development of curriculum and learning resource for the four selected long term TVET program of the institute
- Development of curriculum and learning resource for the short-term training courses in line with the unit of competences of the four selected long term TVET program of the institute as well as the revising of those Groundwater Development Study & Management short-term courses thus far given by the center
- Completion of the building construction
- Preparation of urgently needed technical, academic and administrative manuals of the institute
- Conduct study for establishment of the specialized laboratory service of the institute
- Conduct study for establishment of data base management system of the institute
- Procurement of vehicles, workshop and laboratory equipments

Annex 4

Organizational Structure and Staffing Plan of

EWTI

Ethiopian Water Technology Institute

Organizational Structure & Staffing Plan

A Joint Study Committee Report

by

Ministry of Water & Energy

and

Ministry of Education

August 2013

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1. Objectives of the Institute

The Institute shall have the objectives to:

1. facilitate the transfer of technology to those engaged in water development and related activities;
2. provide practical trainings to capacitate the existing and potentially joining manpower of the sector in cooperation with other technical and vocational education and training institutions; and
3. produce and build capacity of instructors required by technical and vocational education and training institutions.

2. Key Activities Analysis & Departmentalization

2.1 Guiding Principles for Internal Structuring

The internal structuring of the institution is based on the following guiding principles:

- Provision of efficient and customer centered services
- Balanced span of control
- Integration of work flow process
- Maintaining effective interrelationship and interdependency among business/work processes
- Economical
- Efficient decision making and coordination of tasks
- Institutional stability and flexibility

2.2 Main Duties and Responsibilities of the Institute

As per the draft establishment regulation of the institute, the main duties and responsibilities of the institute which are directly related to its objectives implementation are listed below:

- Conducting short-term practical trainings on courses designed as per international methods to fill identified skill gaps of manpower working at different levels in water development and related activities;

- Facilitating the transfer of technology that enable to fill the local gaps in the sector's development;

- Conducting short-term practical trainings of trainers, on courses designed in line with the sector's qualification levels and new technologies to fill identified skill gaps of instructors working in technical and vocational education and training institutions;

- Producing instructors required by the technical and vocational education and training institutions that train in water and water related professions based on the demand of education and training;

- Conducting long-term training as per national technical and vocational education and training qualification framework on higher level programs in accordance with the manpower requirement of the sector;

- Conducting studies and researches that facilitate the water resource development;

- Providing technical and consultation support to education and training institutions that produce graduates required by the sector in organizing training program and introduction to new technologies; and serve as center for professional competence evaluation;

- Providing specialized laboratory services by identifying gaps of the other institutions operating in the sector;

- Cooperating with higher education institutions on human resource development in the sector; conduct joint research and assist in strengthening of local research and technology transfer capacity in the sector;

2.3 Key Tasks Analysis Summary Sheet

No.	Description of Key Tasks	Task Content	Required Key Implementing Professionals	Identified Responsible Organizational Unit
1	Provide short term practical trainings for professionals engaged in the sector and	Short term practical trainings on water well drilling technology, water supply and sanitation , irrigation & drainage engineering technology, as well as on drilling equipments and electromechanical maintenance technology for government and non-government institution experts,	Hydro geologist, Geophysicist, Mechanical, Electrical, Water S&S and Irrigation Engineers, Drilling Engineer/Technologist	▪ Groundwater development study and management technology, ▪ Drilling technology, ▪ Water supply and sanitation engineering technology, ▪ Irrigation & drainage engineering technology, ▪ Electro mechanical equipment & machinery maintenance technology,
	In cooperation with international development partners, provide international short term practical trainings on sector related topics on continent level	Groundwater modeling, remote sensing, GIS, isotope hydrology, advanced hydraulics system maintenance, and computerized maintenance management system are some of the international level courses	Hydro geologist, GIS and Remote Sensing Expert, Hydro-chemist	▪ Groundwater development study and management technology,
2	Undertake study and research works to identify and fill the local gaps through transfer of cost-effective technology which are critical for rapid development of the sector; compile, organize and disseminate good international and national experiences	Generate project study proposals to conduct research on technologies (such as Hand pump, Rope pump, Fluoride treatment and mini water drilling machines, etc) that are deemed to support the sector development; carry out study and researches; compile good practices, and undertake technology transfer activities	Mechanical Engineer, Electrical Engineer, Hydro-Chemist, Economist	▪ Research and technology transfer
3	Conducting short-term practical trainings of trainers to fill identified skill gaps of instructors working	Short term practical trainings on groundwater technology, drilling technology, water supply and sanitation , irrigation & drainage	Hydro geologist, Geophysicist, Mechanical, Electrical, Water S&S and Irrigation Engineers,	▪ Groundwater development study and management technology, ▪ Drilling technology,

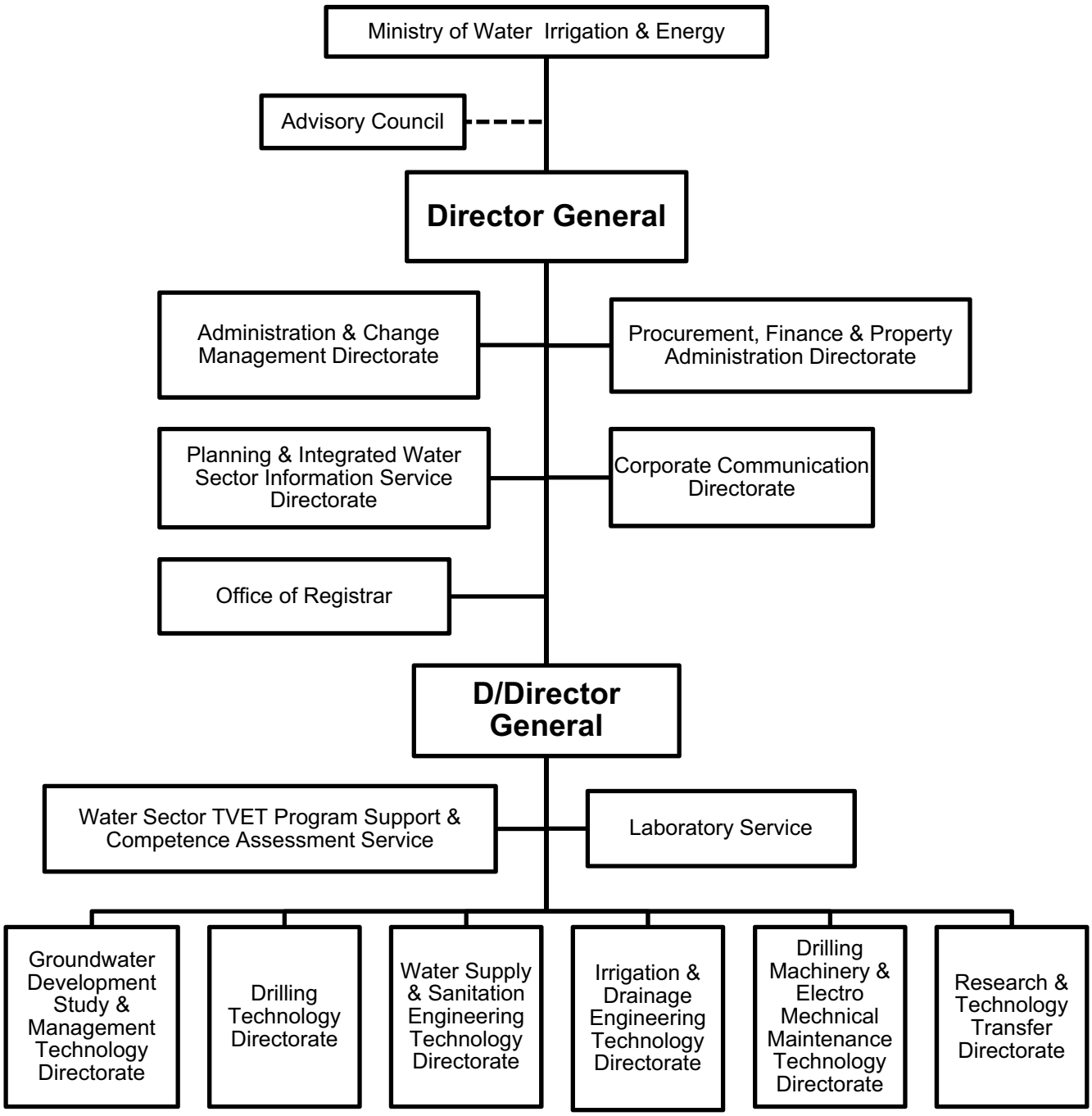
No.	Description of Key Tasks	Task Content	Required Key Implementing Professionals	Identified Responsible Organizational Unit
	in TVET institutions	engineering technology, as well as on drilling equipments and electromechanical maintenance technology for instructors working in water TVETs	Drilling Engineer/Technologist	▪ Water supply and sanitation engineering technology, ▪ Irrigation & drainage engineering technology, ▪ Electro mechanical equipment & machinery maintenance technology
4	Conduct long-term training to produce instructors required by TVETS that train in water and water related professions	In accordance with the national education and training system, provide long-term training ,mainly in level 4 & 5, to produce instructors on the following water technology fields: Water well drilling technology, water supply & sanitation and irrigation & drainage engineering technology, as well as on drilling equipments and electromechanical maintenance technology	Hydro geologist, Mechanical Engineer, Electrical Engineer, Water S & S Engineer, Irrigation Engineer, and Drilling Engineer/ Technologist,	▪ Drilling technology, ▪ Water supply and sanitation engineering technology, ▪ Irrigation & drainage engineering technology, ▪ Electro mechanical equipment & machinery maintenance technology
5	In accordance with the manpower needs of the sector, provide long term trainings on technical and vocational education and training higher programs for newly recruited students;	In accordance with the national education and training system, provide long term trainings, mainly in level 4 & 5, for students on the following water technology courses: Water well drilling technology, water supply & sanitation and irrigation & drainage engineering technology, as well as on drilling equipments and electromechanical maintenance technology	Hydro geologist, Mechanical Engineer, Electrical Engineer, Water S & S Engineer, Irrigation Engineer, and Drilling Engineer/ Technologist,	▪ Drilling technology, ▪ Water supply and sanitation engineering technology, ▪ Irrigation & drainage engineering technology, ▪ Electro mechanical equipment & machinery maintenance technology,
6	Organize training and provide advice to the educational and training institutions who	For the education and training institutions; ▪ Organize training and provide	Hydro geologist,	▪ Water Sector TVETs Support

No.	Description of Key Tasks	Task Content	Required Key Implementing Professionals	Identified Responsible Organizational Unit
	produce required professionals for the sector; Provide support in introducing/orienting with new technologies and give competence evaluation service;	advise (which includes on internal organization, preparation of curriculum, training facilities and materials, as well as preparation of human resource requirement plan, etc) ▪ Assist in introducing new technologies, ▪ Provide competence evaluation service,	Mechanical, Electrical, Water and Irrigation Engineer, Drilling Engineer/ Technologist,	and Competence Assessment Service
7	Providing specialized laboratory services in the sector;	Organize sector's specialized water and soil laboratories at national level, and provide services for government, non-government institutions and other service users	Chemist, Biologist, Soil Science Expert, and Geo-technical Expert	▪ Laboratory Service

3. Organization Structure of the Ethiopian Water Technology Institute

3.1 Organizational Structure

Based on the assessment and analysis of key tasks, the overall organizational structure of the Institute is as presented in the chart below.



3.2 Description of Major Duties of Organizational Units

Administration & Change Management Directorate

- Study and prepare medium and long term human resource requirement plan based on the work plan of the Institute,
- Study and prepare employee performance evaluation criteria or standards; monitor & follow-up and evaluate the implementation as per set standards,
- Based on appropriate plan, ensure the timely provision of the required and qualified manpower for organizational units by recruitment and /or promotion,
- Maintain the overall personnel records of the institute for efficient utilization with the support of modern technology,
- Ensure the provision of employee benefits and equitable services,
- Ensure the fulfillment of adequate general services and office facilities of the institute (telephone, internet, fax, electricity, water etc),
- Safeguard the working compound and properties of the institute, maintain the cleanness of work places and the compound,
- Carry out repair and maintenance of the buildings and office equipments & facilities,
- Provide transportation and insurance services,
- Implement and follow up result oriented performance evaluation system, assist working units of the organization as to the proper execution of the system,
- Study improved working systems, procedures and implement upon approval; provide follow-up and professional support, when other working units carry out the implementation.

Procurement, Finance & Property Administration Directorate

- Carry out financial administration of budget allocated by the government, self generated income, as well as finance obtained in the form of loan and donation; utilize the available fund in accordance with the financial procedures and regulations of the government; ensure timely collection of the institute's incomes from different services rendered,

- Perform procurement of goods and services in accordance with the government procurement procedures and regulations,
- Make sure that properties purchased by the institute and materials acquired from donors are properly checked against appropriate documents, handed over to the warehouse by receiving voucher, issue is made for authorized users by using store issue voucher, keep and maintain stock items as per the appropriate materials handling system, as well as perform property disposal activities for unserviceable or disposable items.

Planning & Integrated Water Sector Information Service Directorate

- Prepare medium and long term strategic plan of the Institute, consolidate the annual physical & financial plan and implementation schedules prepared by different working units; carry out monitoring, evaluation and feedback activities,
- Coordinate preparation of fund searching project proposals for the institute by different working units, organize the proposals in the formats suitable for development partners, disseminate to potential supporters and follow up accordingly,
- With the help of modern information management system, collect and organizes data about hydrogeology of the country, human resources requirement and technology thus far used in the sector,
- Provide information service for stakeholders engaged in study & research development of the sector as well as for other users, and
- Prepare monthly, quarterly and annual work plan performance reports of the institute and presents to the institute's top management

Corporate Communication Directorate

- Gathers information on the activities of the institute, give press releases to the media, promote the activities of the institute,
- Prepares and distribute broacher and periodic bulletin, carries out audio visual recordings and documentaries that will demonstrate the institute's performances,
- Establish, update and manage the website of the institute to provide up to date information to users.

Office of the Registrar

- Handle and maintain the academic relationship between the institute and students, respond academic inquiries of students' from the time of their registration up to the completion of the their training and education program, and these includes: announcement for registration of students, carry out academic registration, decide on education schedule in consultation with concerned directorates and notify the same to the students, and update or correct this schedule from time to time as required; prepare academic result grading procedure manual, and notify the same to the students; record and properly maintain the academic results of students; verify and issue education certificates up on request of students or education institutes or organizations.

Water Sector TVETs Program Support and Competence Assessment Service

- Provide support for preparation of curriculum, detailed specification of training materials and facilities, in introducing new technologies and in fund searching from development partners;,
- Provide competence assessment service in high level water sector technical & vocational education and training programs (Level 4 & 5); in addition, provide competence assessment service for low level and medium level (Level 1 up to 3) graduates, where water technical & vocational education and training or appraisal service is not available.,

Laboratory Service

- Provide water laboratory services including sample collection, analysis, data management, result reporting, and consultations that sustain regulatory compliance to international and national water quality standards; and
- Provide soil testing laboratory services including sample collection and analysis, reporting the chemical and physical information of the soil which can be used to optimize plant growth or assist in solving soil-related problems; and also performs quality and strength analysis on collected or received samples of soil, rock, sand, gravel, etc, mainly for the purpose of dam, irrigation canal and water supply & sewerage system structures constructions.

Groundwater Development Study & Management Technology Directorate

- Prepare short-term training programs on groundwater technology based on the occupational standards developed as per national technical and vocational training strategies, and in accordance with the strategic plan of the institute; develop curriculum, prepare required training materials/ equipments and conduct training programs,
- Provide technical consultancy services for regions, particularly regions that require special assistance on groundwater investigation studies, modeling, and other related studies.

Drilling Technology Directorate

- Prepare short-term and long term training programs on drilling technology based on occupational standards developed as per the national technical and vocational training strategies, and in accordance with the strategic plan of the institute; develop curriculum, prepare required training materials/ equipments and conduct training programs,
- Perform water well drilling and rehabilitation works and provides consultancy services for regions, particularly for those regions that require special assistance.

Water Supply and Sanitation Engineering Technology Directorate

- Prepare short-term and long term training programs on water supply and sanitation technology based on the occupational standards developed as per the national technical and vocational training strategies, and in accordance with the strategic plan of the institute; develop curriculum, prepare required training inputs and arrange training programs,
- Provide technical consultancy services on water supply and sanitation study and design and related study activities for regions, particularly for those regions that require special assistance

Irrigation & Drainage Engineering Technology Directorate

- Prepare short-term and long term training programs on irrigation and drainage engineering technology based on the occupational standards developed as per the national technical and vocational training strategies, and in accordance with the

strategic plan of the institute; develop curriculum, prepare required training inputs and arrange training programs,

Drilling Machinery & Electro Mechanical Maintenance Technology Directorate

- Prepare short and long term training programs on maintenance of electromechanical equipments based on occupational standards developed as per the national technical and vocational training strategies, and in accordance with the strategic plan of the institute; develop curriculum, prepare required training materials/equipments and conduct training programs,
- Perform major maintenance activities on drilling rigs and related water service equipments, preparation of technical specifications, evaluation and selection, commissioning and installation as well as technical consultancy services for governmental, non-governmental and private organizations engaged in the water sector.

Research and Technology Transfer Directorate

- Explore, identify, compile and transfer appropriate technologies that will help to resolve the major operational problems and constraints in the water resources development sector of the country; as well as perform from time to time improvement based on performance of the transferred technologies; ensure the existence of demand for selected technologies through creation of market linkage for those enterprises and factories that will be engaged in producing the technologies and thereby create the capacity to supply quality water technology products with affordable prices; in this process, the directorate will provide all rounded support to fill identified gaps.

4. Analysis of Manpower Requirement

4.1 General Considerations and Assumptions

- Analyzing the manpower requirement for the achievement of the goals set in the BSC strategic plan of the institute,
- The preparation of the curriculum for long-term training program and curriculum revision for short-term training will be completed in 2005 E.C. (2012/2013) and will be updated every year.

4.2 Assumptions for Short-term Trainings

4.2.1 Drilling Technology

- Admitting 45 persons at a time in 3 classrooms,
- Duration of training will be 3 weeks (14 days/ 10 working days in class room and 7 field days),
- Conduct 4 round training programs per year,
- Total number of trainees = 4x45 = 180.

4.2.2 Groundwater Development Study & Management Technology

Groundwater Investigation and Development

- Admitting 40 persons at a time in 2 classrooms,
- Duration of training will be 61 days (49 days/ 36 working days in class room and 12 consecutive field days),
- Conduct 2 round training programs per year,
- Total number of trainees = 2x40 = 80.

  Mostly, to be covered by in-house capacity)

GIS and Remote Sensing (for Groundwater Investigation and Management)

- Admitting 40 persons at a time in 2 classrooms,
- Duration of training will be 28 days (25 days/ 20 working days in class room and 3 field days),
- Conduct 2 round training programs per year,

- Total number of trainees = 2x40 = 80.

Groundwater Modeling

- Admitting 20 persons in 1 classroom,
- Duration of training will be 21 days (14 working days in class room and 1 field day)
- Conduct 1 round training program per year,
- Total number of trainees = 1x20 = 20.

4.2.3 Drilling Machinery & Electro Mechanical Maintenance Technology

- Admitting 60 persons at a time in 3 classrooms,
- Duration of training will be 3 weeks,
- Conduct 4 round training programs per year,
- Total number of trainees = 4x60 = 240.

4.2.4 Water Supply and Sanitation Engineering Technology

- Admitting of 60 persons at a time in 3 classrooms,
- Duration of training will be 3 weeks,
- Conduct 4 round training programs per year,
- Total number of trainees = 4x60 = 240.

4.2.5 Irrigation & Drainage Engineering Technology

- Admitting of 60 persons at a time in 3 classrooms,
- Duration of training will be 3 weeks,
- Conduct 4 round training programs per year,
- Total number of trainees = 4x60 = 240.

4.3 Assumptions for Long-term Trainings

For water sector TVET program, the ministry of education, as part of its development of the Ethiopian Occupational Standards, has approved and notified the national occupational standards for about 16 specific occupations in the field of water sector professions in 2010. However, in consideration of the present transformational state of the institute and the time

that would require to fulfill the various facility requirements as well as in consideration of the experience gained which are only in the very limited number of fields/occupations during the past practical training provision (as training center), it is assumed that in the next 3 to 5 years the institute will engage in long-term training provision in the following four occupations /which are part of the 16 registered occupational standards/:

1. Water Well Drilling & Construction (starting from Level I to Level III)
2. Electro Mechanical Equipment & Machinery Maintenance (starting from Level I to Level IV)
3. Waterworks Site Construction Management (Level IV)
4. Construction Management (Level V)

It is also assumed that the institute may make adjustment on the above list based on result of current demand assessment survey and its level of achievement in fulfilling the facility requirements.

Taking the aforementioned general assumptions in to consideration, the detailed manpower requirement analysis report (of the objective implementing work units) is annexed.

4.4 Proposed Staffing Plan of the Institute

Ethiopian Water Technology Institute Manpower Requirement Summary Table

No.	Organizational Unit /Job Title	Required Number of Job Position
1	**Office of the Director General**	
	Director General	1
	Legal Advisor	1
	Discipline Officer	1
	Internal Auditor	1
	Women's Affairs Expert	1
	Executive Secretary II	1
	Secretary II	1
	Total	**7**
2	**Office of Deputy Director General**	
	Deputy Director General	1
	Executive Secretary I	1
	Total	**2**
3	**Administration & Change Management Directorate**	
	Director	1
	Secretary II	1
	Secretary I	1
	Human Resource Management Team	
	Team Coordinator	1
	Senior Human Resource Management Expert	1
	Human Resource Management Expert	1
	Junior Human Resource Management Expert	1
	General Service Team	
	Team Coordinator	1
	Student Service Officer	1
	Transport Service Officer	1
	Liaison Officer	1
	Chief Librarian	1
	Librarian	1
	Assistant Librarian	1
	General Maintenance Officer	2
	Telephone Operator	2
	Records & Archive Officer	1
	Senior Staff Nurse	1
	Health Assistant	1
	Post Person	1
	Janitor	4
	Photo Copier	2

No.	Organizational Unit /Job Title	Required Number of Job Position
	Gardener	4
	Security Guard	15
	Office Assistant/ Messenger	12
	Truck Driver	10
	Light Vehicle Driver	18
	System Improvement Team	
	Team Coordinator	1
	Senior System Improvement Expert	1
	System Improvement Expert	1
	Total	**90**
4	**Procurement, Finance & Property Administration Directorate**	
	Director	1
	Secretary II	1
	Financial Management Team	
	Team Coordinator	1
	Senior Financial Mgt Expert	2
	Financial Mgt Officer	1
	Junior Fin Mgt Officer	1
	Cashier	1
	Revenue Collector	1
	Procurement & Property Administration Team	
	Team Coordinator	1
	Senior Procurement Expert	1
	Purchaser	1
	Senior Property Admin Expert	1
	Property Admin Officer	2
	Stock Control Officer	2
	Total	**17**
5	**Planning & Integrated Water Sector Information Service Directorate**	
	Director	1
	Secretary II	1
	Planning , Monitoring & Evaluation Team	
	Team Coordinator	1
	Senior Planning , Monitoring & Evaluation Expert	1
	Planning , Monitoring & Evaluation Expert	1
	Senior Project Preparation & External Relation Expert	1
	Senior Market Research Expert	1
	Integrated Water Sector Information Service Team	
	Team Coordinator	1
	Senior Network Infrastructure & Database Administrator	1
	Network Infrastructure & Database Administrator	1

No.	Organizational Unit /Job Title	Required Number of Job Position
	Data Encoder	2
	Senior GIS Expert	1
	Computer Hardware Expert	1
	Total	**14**
6	**Corporate Communication Directorate**	
	Director	1
	Secretary II	1
	Senior Corporate Communication Expert	1
	Corporate Communication Expert	1
	Audiovisual Technician	1
	Total	**5**
7	**Office Of the Registrar**	
	Director	1
	Secretary II	1
	Records Officer	1
	Records Clerk	2
	Total	**5**
8	**Water Sector TVET Support & Competence Assessment Service**	
	Head, Service	1
	Secretary II	1
	Water Sector TVET Program Support Officer	1
	Competence Assessment Service Coordination Officer	1
	Total	**4**
9	**Laboratory Service Directorate**	
	Director	1
	Secretary II	1
	Water Laboratory Team	
	Team Coordinator	1
	Senior Chemist	1
	Senior Biologist	1
	Lab Technician	1
	Soil Laboratory Team	
	Team Coordinator	1
	Senior Soil Science Expert	2
	Geo Technical Expert	1
	Lab Technician	1
	Total	**11**
10	**Groundwater Development Study & Management Technology Directorate**	
	Director	1

No.	Organizational Unit /Job Title	Required Number of Job Position
	Secretary II	1
	Lead Hydro geologist	1
	Senior Hydro geologist	1
	Hydro geologist	1
	Senior Geophysicist	1
	Geophysicist	1
	Total	**7**
11	**Drilling Technology Directorate**	
	Director	1
	Secretary II	1
	Lead Drilling Technologist	1
	Senior Drilling Technologist	2
	Drilling Technologist	1
	Drilling Superintendent	1
	Chief Driller	2
	Driller	2
	Assistant Driller	2
	Electrician	1
	Total	**14**
12	**Water Supply & Sanitation Engineering Technology Directorate**	
	Director	1
	Secretary II	1
	Lead Water Supply Engineer	1
	Senior Water Supply Engineer	1
	Water Supply Engineer	1
	Senior Surveyor	1
	Total	**6**
13	**Irrigation & Drainage Engineering Technology Directorate**	
	Director	1
	Secretary II	1
	Lead Irrigation Engineer	1
	Senior Irrigation Engineer	1
	Irrigation Engineer	1
	Senior Surveyor	1
	Total	**6**
14	**Drilling Machinery & Electro Mechanical Maintenance Technology Directorate**	
	Director	1
	Secretary II	1
	Drilling Machinery Maintenance Technology Team	
	Lead Mechanical Engineer	1
	Senior Mechanical Engineer	2

No.	Organizational Unit /Job Title	Required Number of Job Position
	Mechanical Engineer	1
	Electro Mechanical Maintenance Technology Team	
	Lead Electrical Engineer	1
	Senior Electrical Engineer	1
	Electrical Engineer	1
	Drilling Machineries & Electro Mechanical Equipment Maintenance Workshop	
	Shop Superintendent	1
	Senior Technician/Mechanic	2
	Senior Technician/Electrician	2
	Technician/Mechanic	2
	Technician/Electrician	1
	Electromechanical Store Person	1
	Total	**18**
15	**Research & Technology Transfer Directorate**	
	Director	1
	Secretary II	1
	Senior Chemical Engineer /Water Treatment Technology/	1
	Hand Pump Technology Capacity Accumulation & Transfer Team	
	Lead Mechanical Engineer	1
	Senior Mechanical Engineer	1
	Welder	1
	Machinist	1
	Solar & Wind Powered Water Technology Capacity Accumulation & Transfer Team	
	Lead Electro Mechanical Engineer	1
	Senior Mechanical Engineer	1
	Senior Electrical Engineer	1
	Electrician	1
	Welder	1
	Total	**12**
	Grand Total	**218**