

**PUBLIC WATER CORPORATION (PWC)
MINISTRY OF IRRIGATION AND WATER RESOURCES (MIWR)**

**PROJECT FOR HUMAN RESOURCES
DEVELOPMENT FOR WATER SUPPLY
IN
THE REPUBLIC OF SUDAN**

**MANAGEMENT MANUAL
OF THE TRAINING COURSE**

March 2011

JAPAN INTERNATIONAL COOPERATION AGENCY

**EARTH SYSTEM SCIENCE CO., LTD.
JAPAN TECHNO CO., LTD**

Table of Contents

Chapter I Management Manual of the Training Course	1-1
1-1. Purpose.....	1-1
1-2. Management System of Training Course.....	1-1
1-3. General Procedure of the Training.....	1-1
1-4. Work Items	1-2
1-4-1. Before Training Stage.....	1-2
1-4-2 Training Stage	1-5
1-4-3 After Training Stage.....	1-8
1-5. Training Report.....	1-9
Chapter II Evaluation Manual	2-1
2-1. Introduction.....	2-1
2-2. Evaluation of the Training Courses	2-1
2-2-1. Purpose	2-1
2-2-2. Evaluation Process	2-1
2-2-3. Evaluation Method	2-1
2-2-4. Feedback.....	2-1
2-2-5. Sample Sheet	2-2
2-2-6. Feedback and Analysis	2-2
2-3. Lecturer Evaluation.....	2-2
2-3-1. Purpose	2-2
2-3-2. Evaluation Process	2-2
2-3-3. Evaluation Method	2-2
2-3-4. Evaluation Sheet.....	2-3
2-3-5. Analysis	2-3
2-3-6. Utilization of Evaluation and Feedback	2-3
2-4. Lodge Evaluation.....	2-3
2-4-1. Purpose	2-3
2-4-2. Evaluation Process	2-3
2-4-3. Evaluation Method	2-3
2-4-4. Evaluation Sheet.....	2-4

2-4-5. Analysis	2-4
2-4-6. Evaluation Utilization and Feedback.....	2-4
2-5. Final Examination and Its Evaluation.....	2-4
2-5-1. Purpose	2-4
2-5-2. Examination Process	2-4
2-5-3. Implementation.....	2-5
2-5-4. Rating and Modeled Answer Explanation.....	2-5
2-5-5. Analysis	2-5
2-5-6. Examination Result Analysis and Feedback	2-5

[Annexes]

- ANNEX-1. Training Procedure and Check list
- ANNEX-2. Sample of the Training Report
- ANNEX-3. Training Evaluation Sheet
- ANNEX-4. Lecturer Evaluation Sheet
- ANNEX-5. Lodge Evaluation Sheet
- ANNEX-6. Final Examination and Modeled Answer

CHAPTER I

MANAGEMENT MANUAL OF THE TRAINING COURSE

1-1. PURPOSE

This management manual is aimed at efficient implementation of each training course. The training course coordinators and their assistant staff will be expected to utilize this manual. This manual was developed based on the training implementation (November 2009 - February 2011). The manual must be revised based upon the development of the training implementation system.

1-2. MANAGEMENT SYSTEM OF TRAINING COURSE

The training implementation system has been improved since February 2009. Figure 1-1 shows the current system as of March 2011. However, the system still depends on JICA support. The PWCT must establish a system which does not rely on JICA support in the future.

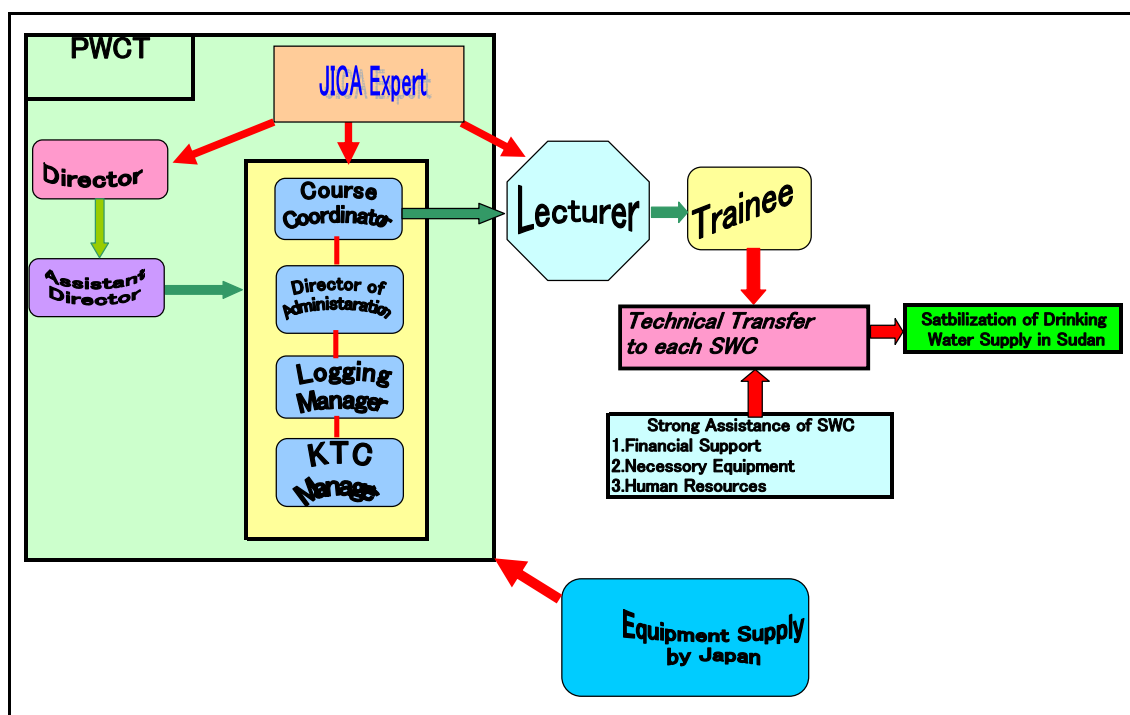


Figure 1-1. Management System of the Training Course

1-3. GENERAL PROCEDURE OF THE TRAINING

The necessary procedure to implement training programs has been shared among the PWCT staff. 34 tasks are now listed to carry out the training course as shown in Annex-1. Those

34 tasks are sorted by the periods of "Before", "during" and "after" the training courses.

1-4. WORK ITEMS

This chapter explains the major tasks in which the training coordinators must be involved according to a timeline basis (before-during-after a training course).

1-4-1. Pre-Training Stage

15 tasks are listed to prepare for the training course. Those works should start two weeks before training starts.

(1) Security of the Generator

Electricity had not been stable until April 2009 when the Maroe Dam started to provide electricity in Sudan. That decreases the chances of a power down. However, power downs during meetings and training have still occurred in 2011. Although the PWCT has generators for an emergency, management systems such as Daily maintenance, fuel recharge, and quick response are not adequate. The PWCT must cope with those problems so as not to prevent training activities.

(2) Arrangement of the Residence

Most trainees will stay in the lodge of PWCT except the trainees from Khartoum city. Trainees will arrive at the lodge on Saturday since every training course starts from Sunday. The Lodge Management Manual should be utilized.

(3) Preparation for Orientation

It is important for trainees to take an orientation program before every training course starts. The orientation explains the overview of the PWCT, training purpose, and regulations, evaluations and examinations. After the orientation, participants will take a memorial photograph together.

(4) Preparation of the Trainee Data

The PWCT should keep trainees' data beforehand and preserve it in a designated format. Information about training experience in other countries or domestic should be included in the CV and resumes. This information must be referred to when planning human resource development.

(5) Preparation of Lecturer Data

The PWCT should strive to find qualified lecturer resources. The PWCT must keep lecturer

data and share it with SWCs. Lower evaluated lecturers (D, E rank) must be screened and reconsidered for utilization.

(6) Discussion and Coordination with the Lecturers

The PWCT should discuss schedules, objectives, materials, and examinations with lecturers. Examination and materials in particular should be carefully designed. At least two weeks will be required for the preparation stage.

(7) Training Schedule

An outline schedule and a detailed one should be prepared. The Outline should be sent to SWCs two weeks before the start. The detailed one will be distributed to the trainees during the orientation of the training course.

(8) Training Place

The PWCT has two training places, the PWC building and the Kilo Ten Training Center (KTC). Recently, the PWCT planned to construct a new training facility next to the KTC building. It is expected to be completed by the end of 2011. If the PWCT utilizes other organizations for the training, it should ask for their use in advance.

(9) Textbook Preparation

The PWCT has developed textbooks for seven training courses. This policy has not been changed. The responsible staff should prepare textbooks for training courses as well. Lecturers should draft textbooks, however, the PWCT should abide by copyright law. Format of the textbooks should be standardized. A soft copy should be preserved for future training courses.

(10) Printing Work of the Textbook

The printing work must be completed at least two days before the training starts. This means the weekend before the course starts. Both side printing and mono tone should be done. The course coordinators should inform the format to the lecturer who will prepare the textbooks so as not to use color charts or figures.

(11) Preparation for Examination Paper and Model Answers

The PWCT has implemented the examinations except for the organizational management course. This examination aims at checking trainees' understanding. The training course coordinators should discuss the contents of the examination.

The question and answer sheets should be prepared before training starts.

(12) Confirmation of Equipment for Training

The PWCT has equipment for Electricity, the Machine, the Wells, The Water Analysis and Computer training.

That equipment should be properly maintained. The training course coordinators should discuss which equipment should be used for the course.

(13) Preparation of Questionnaire for Trainees

There are 15 States in northern Sudan. However, it is difficult to research the situation of every State. Again, the PWCT is not always able to go on a survey trip. Under these circumstances, the PWCT has prepared questionnaires for the trainees. The questionnaires are effective tools to assess the training needs in the SWCs. The training course coordinators should prepare them depending on the course.

(14) Preparation of Evaluation Sheet

Evaluations for training courses, lecturers and a lodge must be carried out in the PWCT. The evaluation format has been prepared (as shown in the Chapter II Evaluation Manual). However, the question sheet item for the training course evaluation should be prepared depending on the training course.

(15) Preparation Meeting Before Training start

The PWCT has managed the chief course coordinator system since 2009. The chief coordinator is responsible for all training procedures with other staff support. This system encourages staff to acquire experience on other training courses and enhance the capacity to implement the training courses. The role of each staff should be specified beforehand.

Table 1-1. Task List Before Starting Training Program

No.	Management item	Person in Charge		Execution Stage			Date and Check	
		Main	Assistant	Before	Training	After	Date	Check
1	Security of the generator			●				
2	Arrangement of the residence			●				
3	Preparation for orientation			●				
4	Preparation of trainee data			●				
5	Preparation of lecturer data			●				
6	Discussion and coordination with the lecturer			●				
7	Training schedule			●				
8	Training place			●				
9	Textbook making			●				
10	Printing work of the textbook			●				
11	Preparation for examination paper and model answer			●				
12	Confirmation of equipment for training			●				
13	Preparation of questionnaire for trainee			●				
14	Preparation of evaluation sheet			●				
15	Preparation of meeting before training			●				

1-4-2. Training Stage**(1) Orientation**

The PWCT has implemented the orientation program on the first day. It is important for the trainees who would join the training course for the first time. Therefore, the clear instruction should be made.

Table 1-2. Orientation Program

No.	Item	Time Schedule	Minute	Responsible Person
1	Greeting of the Director General of PWC	9:00-9:05	5	Mr. Mohamed H.M. Ammar
2	Greeting of the Director of PWCT	9:05-9:10	5	Mm. Eatidal Elrayah Malik
3	Greeting of the Representative of JICA office	9:10-9:15	5	Mr. Kenichi Shishido
4	Self Introduction of trainees and PWCT Staff	9:15-9:25	10	Mr. Egbal
5	Explanation of JICA Project and Training Center	9:25-9:45	20	Mr. Mitsuro Uemura
6	Entering Rule of Lodgings	9:45-9:55	10	Mr. Hashim Abdelahim
7	Explanation of Training Course	9:55-10:10	15	Mr. Egbal and Mr. Saito
8	Question and Answer	10:10-10:30	20	Mr. Hashim and Mr. Egbal
9	Photography of Trainees	10:30-11:00	20	Mr. Muzamil
10	Breakfast	11:00-11:30	30	Mr. Egbal
11	Water Policy in Sudan	11:30-12:00	30	Mr. Hilal
12	Water Condition in Sudan	12:00-12:30	30	to be confirmed
13	Brief Explanation of the Training Course (Introduction to "Well Management" Course)	12:30-13:30	60	Mr. Egbal

(2) Photograph of the Training Course

The photograph taken during the training course must be utilized to prepare the training reports. The PWCT staff should try to take as clear shots as possible. In case that photo is taken inside the building, it tends to be darker due to the lack of light. That photo sometimes should be retouched.

A portrait photograph of each trainee must be taken for CV data.

(3) Food Services

Food services should be provided from one day before the course starts until the final day. So far, the food services are outsourced since there is not enough space for cooking in the PWCT. However, the food services system has been always lowly evaluated by the trainees. Although once the new training center opens, the style of food providing should be better, the PWCT staff have no other choice but to outsource the food services for the moment. The responsible staff should take care of trainees' satisfaction, quality and time.

(4) Examination

Examinations, which aim at checking trainees' understanding, are held one day before the final day.

The time depends on the training courses, although normally two hours are allocated for the examination. Punctuality should be kept. The environment of the examination such as seats for trainees should be checked in advance. The PWCT staff should supervise the trainees during the examinations.

(5) Evaluation of the Lecturer

The training course coordinators should distribute evaluation sheets for every trainee. The evaluation for the lecturers should be carried out immediately after training program completion because the more time passes, the more the impression recedes.

(6) Evaluation of the Training Course

The evaluation for the training course should be implemented one day before the final day. The sheets should be analyzed after the training course.

(7) Evaluation of the Residence

The evaluation for the lodge should be implemented on the final day.

The trainee from Khartoum State, who did not stay in the lodge, does not have to fill out the sheet. The sheets should be analyzed after the training course.

(8) Examination Paper check

The training course coordinators must check the results and prepare a data list. Regarding the rating, careful cross checking is required to avoid mistakes.

(9) Analysis of the Examination

A list of Examination results should be prepared, in which the top scorer, lowest and average should be calculated. Excellence awards should be issued at the closing ceremony on the final day.

(10) Training Certificate Making

The PWCT has given certificates to every trainee who has completed the whole program. The certificates describe the course title, contents, name, affiliation, duration and signature of the director of the PWCT. The subject of the training course should be mentioned although it has not mentioned the subject of the course so far.

(11) Award of Excellence

The PWCT awarded the excellent trainees who achieved the top three scores in every training course. The certificates have been signed by the JICA expert so far. After project phase 1, the director or the course coordinator should sign the certificates.

(13) Closing Ceremony

A closing Ceremony is held on the final day. The certification for every trainee and award of excellence will come after the speech by the PWCT director. Comments by the JICA Experts or discussion among the trainees is occasionally made.

(14) Payment of Allowance of the Trainee

25 SDG per day will be paid for each trainee as daily allowance in which transportation cost is included. The payment is done on the final day along with issuing the receipt. The accountant in the administrative department is responsible for payment.

(15) Payment of the Lecturers

100 SDG per hour will be paid as a fee for each lecturer. 50 SDG is paid in case of an assistant. The payment has been paid when all the training program has finished so far, although payment should be done immediately after one lecture has been completed. It is found that the PWCT staff occasionally visits to pay the fee to the lecturer's organizations. As this is not efficient, payment should be done immediately after the class in the PWCT.

Table 1-3. Task list during the training course

No.	Management item	Person in Charge		Execution Stage			Date and Check	
		Main	Assistant	Before	Training	After	Date	Check
16	Orientation				●			
17	Photography of the training				●			
18	Food providing service				●			
19	Enforcement of the examination				●			
20	Enforcement of evaluation of the lecturer				●			
21	Enforcement of evaluation of the training course				●			
22	Enforcement of evaluation of the residence				●			
23	Enforcement of examination paper inspection				●			
24	Analysis of the examination				●			
25	Training certificate making				●			
26	Award of excellence making				●			
27	Trainee interview				●			
28	Closing ceremony				●			
29	Payment of allowance of trainee				●			
30	Payment of lecturer				●			

1-4-3. Post Training Stage

There are four tasks that should be done after the training courses. The PWCT staff previously did not work well on those tasks and relied upon the JICA Experts' efforts. This is the major bottle neck for the PWCT staff to implement the whole procedure by themselves.

(1) Analysis of the Questionnaire

Questionnaires must be analyzed immediately after the training courses. The data is used for needs assessment for future training course planning. The current problems in the SWCs are reviewed and needs for training should be assessed.

(2) Analysis of the Evaluation Sheet

The analysis method of the questionnaires is shown in the Evaluation Manual. The training coordinators should analyze and keep the data. Tendencies and changes in evaluation result for one year should be analyzed.

(3) After Training Meeting and Evaluation

The training Review Meeting comes after the analysis of the questionnaires. This meeting leads to improve training quality. The issues that have been pointed out by trainees will be swiftly fed back to the coming training course implementation.

(4) Training Report

There are few countries that has established the evaluation system which includes feedback, that is, submission of the training report to each SWC or any other organization. In Sudan, the PWCT established the system to send the feedback report to the participating organizations. This system made the PWCT highly appreciated. The PWCT should keep utilizing this system.

Table 1-4. Task List of Post Training Course

No.	Management item	Person in Charge		Execution Stage			Date and Check	
		Main	Assistant	Before	Training	After	Date	Check
31	Analysis of questionnaire					●		
32	Analysis of the evaluation sheet					●		
33	After training meeting and evaluation					●		
34	Training report making					●		

1-5. TRAINING REPORT

A sample report is shown in Annex-2. The training coordinators should submit the training report to the SWCs within one week after the training courses.

CHAPTER II

EVALUATION MANUAL

2-1. INTRODUCTION

This chapter will explain the evaluation system in the PWCT. There are three evaluation areas in the training course implementation, that is, the training course, lecturers and lodge facilities. Furthermore, a trainee understanding check is carried out.

2-2. EVALUATION OF THE TRAINING COURSES

2-2-1. Purpose

Questionnaires for training course satisfaction are prepared for participating trainees during the program. This is aimed at quantifying the satisfaction of each training program, and contributes to further improvement of the training courses. Every trainee should give the PWCT feedback sheets.

2-2-2. Evaluation Process

- (1) The PWCT explains how to fill in the feed-back sheets
- (2) Sheet distribution
- (3) Filling in the sheets on the final day of each training course
- (4) Sheet collection
- (5) Analysis
- (6) Feedback

2-2-3. Evaluation Method

Five-grade evaluation is applied.

A: Excellent

B: Good

C: Fair

D: Poor

E: Very poor

Trainees are able to fill their comments at the bottom of the sheet. The comments will be studied by the PWCT.

2-2-4. Feedback

The returned sheets are swiftly analyzed. The responsible person should tackle the

complaints that were mentioned in the feedback sheet to improve training courses.

2-2-5. Sample Sheet

The sample sheet is shown in Annex-3. The question list depends on the training courses.

2-2-6. Feedback and Analysis

It is generally found that there is close relevancy between training course quality and trainees' satisfaction with lecturers. To utilize qualified lecturers seems to be the main factor to enhance the improvement of the training courses. Therefore, it is important to prepare evaluation lists to analyze the quality of lecturers. The results should be fed back to the State Water Corporations that sent the trainees.

2-3. LECTURER EVALUATION

2-3-1. Purpose

The lecturer evaluation is aimed at quantifying the trainees' satisfaction to keep the quality of lectures so as to motivate trainees and improve the training courses. Every trainee must respond to the feedback sheets.

2-3-2. Evaluation Process

- 1) The PWCT explains how to fill in the feedback sheets
- 2) Sheet distribution
- 3) Filling in the sheets on the final day of each training course
- 4) Sheet collection
- 5) Analysis
- 6) Feedback

2-3-3. Evaluation Method

Five-grade evaluation is applied.

- A: Excellent
- B: Good
- C: Fairly
- D: Poor
- E: Very poor

Trainees are able to fill in their comments at the bottom of the sheets. The comments will be analyzed.

2-3-4. Evaluation Sheet

An evaluation sheet sample is shown in Annex-4. The sheet format is standardized regardless of the training course type.

2-3-5. Analysis

The lecture evaluation is composed of four items, that is, basic skill, presentation, time allocation and material utilization. The collected response sheet needs prompt analysis. A-E numbers are sorted. The proportion of A is used as a comparison indicator.

2-3-6. Utilization of Evaluation and Feedback

A working group is set up to analyze the results. The PWCT should keep utilizing qualified lecturers. The PWCT should consider changing lecturers if a lower evaluation is found. The report should be fed back to the trainees and each SWC.

2-4. LODGE EVALUATION

2-4-1. Purpose

The evaluation of the residence in the PWCT aims at improvement of the accommodation environment. Every trainee should fill in the sheet. The PWCT is now planning to construct another training facility at the Kilo Ten area, with international standards. The PWCT will prepare new sheets for the facility in the future.

2-4-2. Evaluation Process

- (1) The PWCT explain how to fill in the feedback sheets
- (2) Sheet distribution
- (3) Filling in the sheets on the final day of each training course
- (4) Sheet collection
- (5) Analysis
- (6) Feedback

2-4-3. Evaluation Method

Five-grade evaluation is applied.

- A: Excellent
- B: Good
- C: Fair
- D: Poor
- E: Very poor

Trainees may fill in their comments at the bottom of the sheets. The comments will be analyzed.

Food services evaluation is included in the sheet. However it must be analyzed separately, apart from the lodge evaluation.

2-4-4. Evaluation Sheet

The sheet for the lodge evaluation is shown in the Annex-5. The sheet format is standardized regardless the course difference.

2-4-5. Analysis

The responsible staff should analyze the feedback sheets which were answered by trainees. There are six questions about reception, room condition, restaurant, food services, toilet and showers and recreation room satisfaction. Complaint about lodge and food must be checked.

2-4-6. Evaluation Utilization and Feedback

The PWCT should improve the management system of the lodge and food services to provide trainees a more comfortable environment. The report should be fed back to the trainees and each SWC.

2-5. FINAL EXAMINATION AND ITS EVALUATION

2-5-1. Purpose

There are two types of training programs, one in which trainee's understanding level can be checked by examinations and the other in which that level is unable to be checked by a paper test. Most programs have an examination, however, only the Organizational Management course does not have an examination system. The objective of the examination is to check the understanding of trainees and to use the data for future training courses. The PWCT occasionally implements initial examination to check competency as well as the final test.

2-5-2. Examination Process

- (1) The explanation of the examination method
- (2) Pre-discussion on the examination
- (3) Preparation of the questions and modeled answers
- (4) Printing the necessary copies one day before the examination
- (5) Paper distribution
- (6) Answer sheet collection and rating
- (7) The results should be summarized and the highest and lowest scores should be

identified

- (8) Modeled answers explanation
- (9) Feedback

2-5-3. Implementation

The PWCT prepares question sheets and modeled answer sheets, and the course coordinators rate each examination sheet. The question sheets should be prepared by the preceding day of the final day and necessary copies should be printed. Two hours are allocated for an examination. However it can be changed. The contents should not be too much so as to be able to answer them within the designated time. A practical exercise could be combined. The venue is normally at the Assembly hall in the PWCT to provide sufficient space.

2-5-4. Rating and Modeled Answer Explanation

The training coordinators must carefully check the sheets filled in by the trainees. Cross checking should be done by a sub chief coordinator.

The lecturer who prepared the examination sheet should explain the objective and best answers and instruct the trainees. The sheet must be returned to the trainees.

2-5-5. Analysis

The training course coordinators should analyze the results in detail. Academic background, majors, states, examination areas of trainees must be referred to.

2-5-6. Examination Result Analysis and Feedback

The training reports must summarize the final results and update trainees' profiles. That information could be basic data for planning capacity development.

[ANNEXES]

- ANNEX-1. Training Procedure and Check list
- ANNEX-2. Sample of the Training Report
- ANNEX-3. Training Evaluation Sheet
- ANNEX-4. Lecturer Evaluation Sheet
- ANNEX-5. Lodge Evaluation Sheet
- ANNEX-6. Final Examination and Modeled Answer

ANNEX-1. Training Procedure and Check List

No.	Management item	Person in Charge		Execution Stage			Date and Check	
		Main	Assistant	Before	Training	After	Date	Check
1	Security of the generator			●				
2	Arrangement of the residence			●				
3	Preparation for orientation			●				
4	Preparation of trainee data			●				
5	Preparation of lecturer data			●				
6	Discussion and coordination with the lecturer			●				
7	Training schedule			●				
8	Training place			●				
9	Textbook making			●				
10	Printing work of the textbook			●				
11	Preparation for examination paper and model answer			●				
12	Confirmation of equipment for training			●				
13	Preparation of questionnaire for trainee			●				
14	Preparation of evaluation sheet			●				
15	Preparation of meeting before training			●				
16	Orientation				●			
17	Photography of the training				●			
18	Food providing service				●			
19	Enforcement of the examination				●			
20	Enforcement of evaluation of the lecturer				●			
21	Enforcement of evaluation of the training course				●			
22	Enforcement of evaluation of the residence				●			
23	Enforcement of examination paper inspection				●			
24	Analysis of the examination				●			
25	Training certificate making				●			
26	Award of excellence making				●			
27	Trainee interview				●			
28	Closing ceremony				●			
29	Payment of allowance of trainee				●			
30	Payment of lecturer				●			
31	Analysis of questionnaire					●		
32	Analysis of the evaluation sheet					●		
33	After training meeting and evaluation					●		
34	Training report making					●		

ANNEX-2. Sample of the Training Report

**Project for
Human Resources Development
for Water Supply
(HRDPW)**

**Well Management Course
(1st Course)**

Training Report



July, 2009

**Earth System Science
Japan Techno**

Table of Contents

1. Introduction	1
2. Preparation.....	4
2-1. Various Seminars	5
2-2. Accommodation Facilities	5
3. Implementation of the Training Course.....	6
3-1. Orientation	6
3-2. Lecturers	7
3-3. Trainees.....	7
3-4 Training Program	8
3-5. Attendance	9
3-6. Evaluation of The Training Course.....	10
3-6-1. Lecturers	10
3-6-2. Training Course	11
3-6-3. Accommodation.....	12
3-6-4. Final Examination.....	13
3-7. Interview of Trainees	14
3-8. Closing Ceremony and Award of Excellence.....	14
3-9. Course Evaluation Meeting.....	15
4. Issues for the Coming Course.....	17
4-1. About Course Management	17
4-1-1. Training Equipment	17
4-1-2. Management of the Accommodation	17
4-2. About Training Course.....	17
4-2-1. Preparation.....	17
4-2-2. Preparation of Textbook and Question of Examination.....	17

« Appendices »

- Appendix-1 Curriculum Vitae of Lecturers
- Appendix-2 List of Photograph of Trainees
- Appendix-3 Training Program
- Appendix-4 Attendance Sheet of Trainees
- Appendix-5 Evaluation Sheet and Analysis Results for Lecturers
- Appendix-6 Evaluation Sheet and Analysis Results for Training Course
- Appendix-7 Evaluation Sheet and Analysis Results for Accommodation
- Appendix-8 Questionnaire for Trainees
- Appendix-9 Analysis Results of the Questionnaire for Trainees

1. INTRODUCTION

The 1st training course of “Well Management” was carried out from 12th July to 23rd July, 2009. The summary of the training course is shown in *Table-1* and the summary of the course schedule is shown in *Table-2*. A total 19 trainees, one (1) of them feminine trainees, participated in the training course.

Table-1 Summary of the Training Course and Results

Course	Well Management		
Period	12 th July to 23 rd July, 2009 (11 days)		
JICA Expert	Mr.Masakazu Saito		
Course Coordinator	Mr. Egbal Bakheit Alamir (Chief coordinator)		
Lecturer	Water Supply Facility Design	Mr. Gamal Alamin Yousif Hamad	Design Manager, PWC
	Introduction to Well Drilling	Mr. Abdalla Mohammed Daffalla	Private Consultant
	Well Design	Mr. Abdel Razig Mukhtar Mohammed	Private Consultant
	Submersible Pump	Mr. Abdul Majid Wais	Grundfos GZA-South Africa (Pump Manufacturer) Country Manager
	Diesel Engine	Mr. Mohammed Ahmed Abdel Bagi Siraj	Associated Professor, University of Khartoum – Faculty of Engineering
	Well Problem	Mr. Mohamed Elhassan Ibrahim Abu Kuker	Consultant, PWC
	Water Quality	Ms. Nadia Babiker Ibrahim Shakak	Head of hydro chemical laboratory section, GWR & Directorate, Min. of Irrigation & Water Ressources
Contents of the Course	Design of Small-Scale Water Supply System, Well Drilling Method, Precautions about Well Design (Well Diameter, Casing, Gravel etc.), Theory and Structure of Submersible Pump and Motor, Causes of Well Problem (Well Structure, Bio-Effects, Corrosion, Deterioration of Aquifer etc.), Groundwater Quality (Water Quality Items, Standard, Effects on Human Health, Analysis Methods etc.)		
Number of Trainees	19 trainees (1 woman)		
Number of Lodgers	19 trainees (a woman)		

Evaluation	Lecturer	Training Course	Accommodation	Final Examination
A (%)	54.7	51.4	54.2	10.5
B (%)	37.1	38.9	28.8	68.4
C (%)	7.5	8.2	11.1	21.1
D (%)	0.6	1.6	3.4	0.0
E (%)	0.2	0.0	2.5	0.0
Overall Evaluation	C	C	C	D
Remarks	1) Breakfast (11:00) and lunch (16:00) were provided to trainees and lecturers, daily 2) The training course was carried out in both English and Arabic 3) Examination was carried out to understand the intelligibility of trainees 4) Award the certificate to all trainees 5) Award of top performer trainee with the award of excellence 6) PWCT staff were banned to act as a lecturer			

Table-2 Summarized Schedule of the Training Course

No.	Date	(1) 9:00 - 11:00	(2) 11:30-13:30	(3) 14:00 - 16:00	Lecturer
1	12 Jul (Sun)	Orientation(1)	Orientation(2)	Interview (1)	
2	13 Jul (Mon)	Water Supply Facility Design (C)	Water Supply Facility Design (C)	Water Supply Facility Design (C)	(1),(2),(3): Mr. Gamal
3	14 Jul (Tue)	Introduction to Well Drilling (C)	Well Design (C)	Well Design (C)	(1): Mr. Daffalla (2),(3): Mr. Mukhtar
4	15 Jul (Wed)	Submersible Pump (C)	Submersible Pump (C)	Submersible Pump (C)	(1),(2),(3): Mr. Wais
5	16 Jul (Thu)	Diesel Engine (C)	Submersible Pump (P)		(1): Dr. Siraj (2),(3): Mr. Wais Assis. Lecturer: Mr. Gabush
6	18 Jul (Sat)	Diesel Engine (C)	Diesel Engine (P)		(1),(2),(3): Dr. Siraj Assis. Lecturer: Mr. Seif
7	19 Jul (Sun)	Submersible Pump (P)			(1),(2),(3): Mr. Wais Assis. Lecturer: Mr. Gabush
8	20 Jul (Mon)	Water Supply Facility Design (P)		Water Supply Facility Design (C)	(1),(2),(3): Mr. Gamal
9	21 Jul (Tue)	Well Problem (C)	Well Problem (C)	Well Problem (C)	(1),(2), (3) Mr. Eldulri
10	22 Jul (Wed)	Water Quality (C)	Review (Self-Study)	Examination	(1):Ms. Nadia
11	23 Jul (Thu)	Interview (2)	Explanation of Examination	Certification	

(C): Theoretical Training
(P): Practical Training

2. PREPARATION

The JICA Expert arrived in Sudan on 30th May, 2009. From the following day on 31st May, 2009, the collaborative work for the training preparation with the JICA Expert and the PWCT staff members, headed by Mr. Egbal, Chief Course Coordinator was commenced. The contents of the training preparation was such as confirmation of participation of trainees and contact with lecturers and so on, as shown in *Table-3*.

As it was the 1st training course of Well Management, a series of discussion concerning the training contents was held between the JICA Expert and the PWCT. As the result, a course outline was established for the purpose to formulate the common understanding between the concerned parties.

In the orientation of the training course, an explanation of the training course was made to the trainees by Mr. Egbal, Chief Course Coordinator, based on the above course outline.

Table-3 List of Preparatory Work Items

No	Management Item	Person in Charge	Remarks
1	Security of the generator	Eatidal	
2	Arrangement of the residence	Hashim	
3	Preparation for the Orientation	Egbal, Hashim	
4	Preparation of trainee's data	Egbal, Hannan, Ala	
5	Preparation of lecturer's data	Egbal, Hanan, Ala	
6	Discussion and coordination with the lecturers	Egbal	
7	Training schedule	Egbal	
8	Training place	Egbal	
9	Textbook making	Egbal	
10	Printing work of the textbook	Osama, Muzamil	
11	Preparation for examination paper and model answer	Lecturers, Egbal	
12	Confirmation of equipment for training	Egbal	
13	Preparation of questionnaire for trainees	Egbal	
14	Preparation of evaluation sheet	Egbal	
15	Before training meeting	Egbal	

2-1. VARIOUS SEMINARS

Preparatory seminars for the training course were carried out after the inbound of JICA Experts, as listed in *Table-4*.

Table-4 Preparatory Seminars for the Training Course

Seminars	Objective Person	Initiative
Basic policy for the 1 st training course	PWCT staff	Mr.Saito (JICA Expert) Course coordinator (PWCT)
Confirmation of the schedule and contents of the course	Lecturer PWCT staff	Mr.Saito (JICA Expert) Course coordinator (PWCT)
Confirmation of the works regarding the course	PWCT staff JICA Experts	Chief course coordinator (PWCT)

Through the above seminars, training contents and execution methodologies of Well Management training course was discussed. At the same time, the policy of preparation work for the 2nd and 3rd training course was discussed, too.

2-2. ACCOMMODATION FACILITIES

The administrative manager and the staff responsible for the accommodation inspected the accommodation facilities, following the “Check list for the Accommodation” prepared by the JICA Expert prior to the arrival of trainees.

The quality of the accommodation facilities was made by the trainees was inquired to the trainees.

An improvement of the toilet and the shower shall be done, as some trainees claimed of their quality.

In addition, the improvement of the accommodation facilities in the respect of the comfortability for the woman is also necessary, as this course has a female trainee

3. IMPLEMENTATION OF THE TRAINING COURSE

3-1. ORIENTATION

The orientation was held on 12th July, 2009, according to the schedule shown in *Table-5*.

As this is the 1st training course of Well Management, the explanation of “Water Policy of Sudan” and “Present Water Supply Condition of Sudan” were included in the Orientation.

Table-5 Orientation Program

No.	Item	Time Schedule	Minutes	Responsible Person
1	Greeting of the Director of PWCT	9:00-9:05	5	Mm. Eatidal Elrayah Malik
2	Greeting of the Representative of JICA office	9:05-9:10	5	Mr. Kenichi Shishido
3	Explanation of JICA Project and Training Center	9:10-9:30	20	Mr. Mitsuro Uemura
4	Self Introduction of trainees and PWCT Staff	9:30-9:40	10	Mr. Egbal
5	Memorial Phtography	9:40-9:50	10	Mr. Egbal
6	Entering Rule of Lodgings	9:50-10:00	10	Mr. Hashim Abdelahim
7	Question and Answer	10:00-10:20	20	Mr. Hashim and Mr. Egbal
8	Photography of Trainees	10:20-11:00	40	Mr. Muzamil
9	Breakfast	11:00-11:30	30	Mr. Egbal
10	Water Policy in Sudan	11:30-12:00	30	Mr. Hilal
11	Present Water Condition in Sudan	12:00-12:30	30	Mr. Ibrahim Alzain
12	Brief Explanation of the Training Course (Introduction to “Well Management” Course)	12:30-13:30	60	Mr. Egbal, Mr. Saito



Photo-1 Orientation



Photo-2 Group photograph

3-2. LECTURERS

Seven (7) lecturers were selected to carry out the training course.

The list of lecturers is shown in *Table-6* and the curriculum of the lecturers is attached in *Appendix-1*.

Table-6 List of Lecturers

Name	Affiliation	Subject in Charge
Mr. Gamal Alamin Yousif Hamad	Design Manager, PWC	Water Supply Facility Design
Mr. Abdalla Mohammed Daffalla	Private Consultant	Introduction to Well Drilling
Mr. Abdel Razig Mukhtar Mohammed	Private Consultant	Well Design
Mr. Abdul Majid Wais	Grundfos GZA-South Africa (Pump Manufacturer) Country Manager	Submersible Pump
Mr. Mohammed Ahmed Abdel Bagi Siraj	Associated Professor, University of Khartoum - Faculty of Engineering	Diesel Engine
Mr. Mohamed Elhassan Ibrahim Abu Kuker	Consultant, PWC	Well Problem
Ms. Nadia Babiker Ibrahim Shakak	Head of hydro chemical laboratory section, GWR & Directorate, Min. of Irrigation & Water Ressources	Water Quality

3-3. TRAINEES

19 trainees, including one (1) female trainee, participated in this training course.

Six (6) trainees from Darfur three States (two (2) trainees from each State) of 19 trainees participated in this training course, in the course of the “Human Resources Development Project in Darfur” by JICA.

Remaining 13 trainees were selected as the result of the discussion between PWCT and each SWC, in the course of the present project. In the initial plan, 15 trainees (1 trainee from 15 States) was expected. However, South Darfur State could not arrange the cost of the training fee and the Sennar State could not select the suitable trainee. Therefore, 13 trainees were finally decided.

Table-7 shows the list of trainees and the photography of trainees is shown in *Appendix-2*.

Table-7 List of Trainees' Information

No	Name	Gender	Age	Qualification	Subject	State	Job Position	Remarks
1	Ibrahim Jozouly Ibrahim	m	27	Diploma	Ground Water Techn.	Northern	Hydrogeologist	PWCT trainee
2	Adil Khadir Ahmed	m	34	BSc	Geology	River Nile	Hydrogeologist	PWCT trainee
3	Ali Omer Mahmoud	m	41	BSc	Geology	Red Sea	Research & Planning	PWCT trainee
4	Hashim Mohamed Abd Allateef	m	49	Diploma	Drilling	Kassala	Project Manager	PWCT trainee
5	Hatim Musa Mahmoud	m	30	MSc.	Hydrogeologist	Gedaref	Hydrogeologist	PWCT trainee
6	Hoyam Omer Elsony	f	29	BSc.	Hydrogeologist	Khartoum	Geologist	PWCT trainee
7	Omer Awad El Geed El Hadi	m	32	BSc.	Geophysics	El Gezira	Geophysics Engineer	PWCT trainee
8	El Sadig Ishag Ali	m	42	BSc.	Ground Water Techn.	White Nile	Water Resources Eng	PWCT trainee
9	Hassan Adam Khleel	m	31	BSc.	Geology	Blue Nile	Geologist	PWCT trainee
10	Mohamed Saeed Nasiredin	m	40	Diploma	Mechanical Engineer	North Kordofan	Mechanical Engineer	PWCT trainee
11	Izz El Dien El Nur Ahmed Gily	m	47	BSc.	Geology	South Kordofan	Geologist	PWCT trainee
12	Abdoalshafee Abdallah Adam	m	30	BSc.	Geophysics	North Darfur	Operation & Maintenance	Darfur Project
13	Mohammed Yagoub Mohammed Abaker	m	36	Diploma	Ground Water	North Darfur	Operation & Maintenance	Darfur Project
14	Ibrahim Adam Ahmed Kharallah	m	40	Diploma	Ground Water	North Darfur	Operation & Maintenance	PWCT trainee
15	Mobarek Yousif Ishag	m	26	BSc.	Geology	West Darfur	Geologist	PWCT trainee
16	Abdalsamed Abdalla Hussein	m	30	BSc.	Geology	West Darfur	Geologist	Darfur Project
17	Mohamed Hassan Mohamed	m	31	BSc.	Geology	West Darfur	Geologist	Darfur Project
18	Fath Elrehman Mustafa Ali	m	29	BSc.	Geology	South Darfur	Geologist	Darfur Project
19	Hassan Adam Mohammed	m	34	Diploma	Water Supply	South Darfur	Water Supply Eng.	Darfur Project

3-4 TRAINING PROGRAM

The training course aims at developing the capacity of the management of the transmission facility, generally called "Water Yard" in Sudan, which includes well, submersible pump, generator etc.

Recently, the trend of the selection of the well pump is transferring from the type of diesel motorized reciprocating pump to the type of electrical submersible pump. Therefore, the importance of the management of the conditions and the capacity of the well became more significant.

Each trainee is the technical staff who are related to the well management activities in each SWC and they have the different technical background such as geology, mechanical, water supply etc. The training contents were formulated so that the engineers of the different technical background can learn various subjects, as the well manager is needed to have the knowledge of the various technical fields such as mechanics, electricity, well design, water supply facility design, water quality, well drilling etc.

The equipment for the well investigation such as air-lifting, pumping test and well camera is now being procured in the course of the present project. The practical training for such well investigation works is planned to be included in the coming 2nd and 3rd training course.

3-5. ATTENDANCE

The trainee No.9 (Blue Nile State) was absent from the lectures on 12th July, 2009. And the trainee No.4 (Kassala State) was absent from 1st and 2nd lectures on 22nd July, 2009.

It was confirmed between the JICA Expert and PWCT that the attendance management shall be executed using the absence pre-information format, which shall be submitted from the trainee to the chief course coordinator, in case a trainee need to be absent from lectures.

Table-8 shows the attendance record together with the 1st course situation, and the attendance sheet is attached in *Appendix-4*.

Table-8 Record of Tardiness and Absence of the Trainees

unit: hour

No.	Name	Absence	Remarks
1	Ibrahim Jozouly Ibrahim		
2	Adil Khadir Ahmed		
3	Ali Omer Mahmoud		
4	Hashim Mohamed Abd Allateef	4	Absence of 1st and 2nd lectures of 10th day
5	Hatim Musa Mahmoud		
6	Hoyam Omer Elsony		
7	Omer Awad El Geed El Hadi		
8	El Sadig Ishag Ali		
9	Hassan Adam Khleel	6	Absence of 1st day
10	Mohamed Saeed Nasiredin		
11	Izz El Dien El Nur Ahmed		
12	Abdoalshafee Abdallah Adam		
13	Mohammed Yagoub Mohammed		
14	Ibrahim Adam Ahmed Kheiralah		
15	Mobaerk Yousif Ishag		
16	Abdalsamed Abdalla Hussein		
17	Mohamed Hassan Mohamed		
18	Fath Elrahaman Mustafa Ali		
19	Hassan Adam Mohammed		
Total		10	

3-6. EVALUATION OF THE TRAINING COURSE

3-6-1. Lecturers

Seven (7) lecturers were participated in this training course.

The trainees evaluated each lecturer after the end of the respective course, following the “Lecturer Evaluation Sheet”. The result of the evaluation of lecturers is shown in *Table-9* and detailed evaluation results are attached in *Appendix-5*.

Dr. Siraj had a higher evaluation, receiving 89% for evaluation “A” and Mr. Wais had a lower evaluation, receiving 39.8% for evaluation “A”. However, the overall evaluation of Mr. Wais was “C”. The overall evaluation of the lecturers for this training course was evaluated as “C”, receiving 51.4% of “A” evaluation and 38.9% of “B” evaluation from the trainees.

Table-9 Evaluation Ratio of Lecturers

unit: %

Evaluation	Mr.Gamal	Mr.Daffalla	Mr.Mukhtar	Mr.Wais	Dr.Siraj	Mr.Mohamed Elhassan	Ms.Nadia	Average
A	43.9	54.8	63.4	39.8	83.7	56.9	40.2	54.7
B	41.8	40.4	31.1	50.1	15.3	38.0	42.6	37.1
C	12.9	4.5	5.5	10.1	0.2	3.6	15.6	7.5
D	1.4	0.2	0.0	0.0	0.0	1.2	1.2	0.6
E	0.0	0.0	0.0	0.0	0.7	0.2	0.5	0.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Overall Evaluation	C	C	B	D	A	C	C	C
Evaluation Criteria	A	Evaluation A \geq 80%						
	B	60% < Evaluation A \leq 80%						
	C	40% < Evaluation A \leq 60%						
	D	20% < Evaluation A \leq 40%						
	E	Evaluation A \leq 20%						

3-6-2. Training Course

Seven (7) lecturers were in charge of each subject in this training course. And the trainees evaluated the training course by the same method used to evaluate the lectures, filling up the “Training Course Evaluation Sheet”. The Training Course Evaluation Sheet and detailed evaluation analysis is attached in *Appendix-6*.

According to analysis of the training course evaluation, shown in *Figure-1*, evaluation “A” indicated 51.4% and evaluation “B” indicated 38.9%. The overall evaluation of the training course by trainees was evaluation “C”.

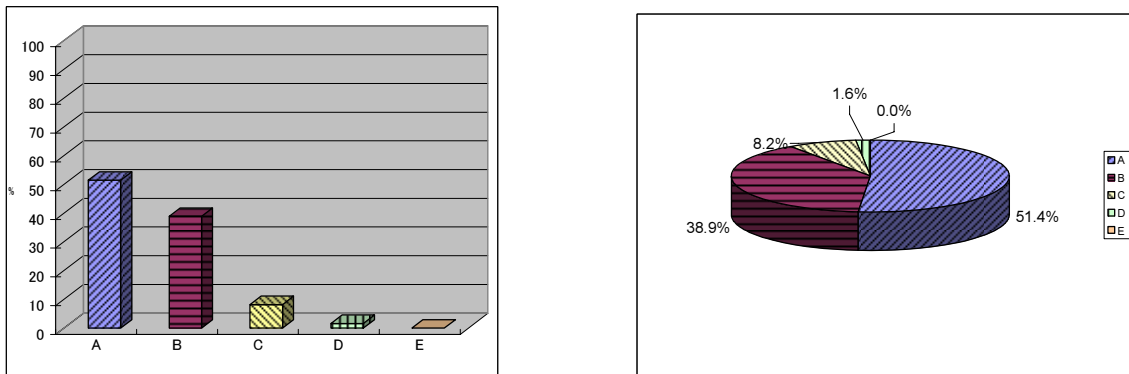


Figure-1 Overall Evaluation of Training Course



Photo-3 Scene of the course: Introduction to Well Drilling



Photo-4 Scene of the course: Practical training of diesel engine

3-6-3. Accommodation

19 trainees, one (1) who was woman, made use of the accommodations. Trainees evaluated the accommodation filling up the “Accommodation Evaluation Sheet”. The Accommodation Evaluation Sheet and detailed evaluation result are attached in *Appendix-7*.

As for the accommodations, evaluation “A” indicated 54.2%, as shown in *Figure-2*, and the overall evaluation for the accommodations was “C”.

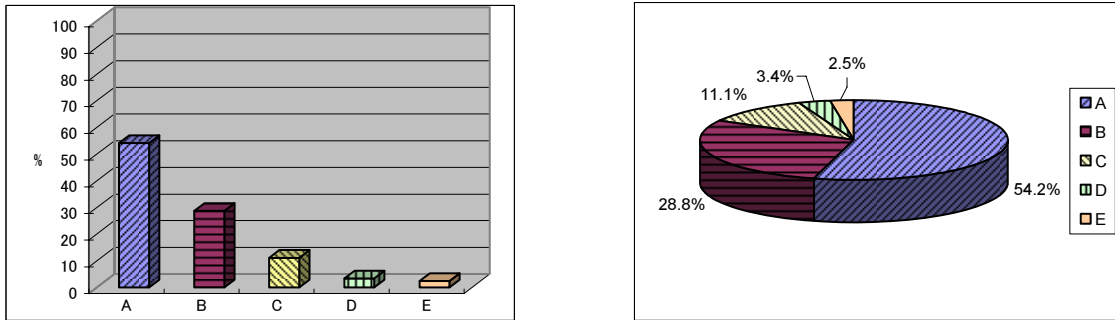


Figure-2 Overall Evaluation of the Accommodation

The evaluation for the facilities was “C” “due to a low evaluation given to the toilet and shower by 41.7% of trainees. 15.0% of trainees evaluated hygiene aspects as “C” to “E”.

The food provided to trainees was evaluated as “D”. 26.3% of trainees evaluated as “C” to “E” for the food quantity. The further improvement of both facilities and food shall be achieved.

3-6-4. Final Examination

The final examination was held on 22nd July, from 14:00 to 16:00 and the exam was composed of 35 selectable questions (100 points).

As shown in *Table-10*, the highest score was 87 points (Gedaref SWC) and the lowest score was 45 points (El Gezira SWC).

Table-10 Results of the Examination

No.	Name	Age	Subject	Qualification	Job Position	State	Final Results							Total	
							1. Water Supply Facility Design	2. Introduction to Well Drilling	3. Well Design	4. Submersible Pump	5. Diesel Engine	6. Well Problem	7. Water Quality		
1	Ibrahim Jozouly Ibrahim	27	Ground Water Techn.	Diploma	Hydrogeologist	Northern	6	9	14	9	11	14	11	74	
2	Adil Khadir Ahmed	34	Geology	BSc	Hydrogeologist	River Nile	14	9	9	6	11	14	14	77	
3	Ali Omer Mahmoud	41	Geology	BSc	Research & Planning	Red Sea	11	6	11	9	9	14	14	74	
4	Hashim Mohamed Abd Allateef	49	Drilling	Diploma	Project Manager	Kassala	11	11	3	11	9	9	11	65	
5	Hatim Musa Mahmoud	30	Hydrogeologist	MSc.	Hydrogeologist	Gedaref	14	14	11	11	14	9	14	87	
6	Hoyam Omer Elsony	29	Hydrogeologist	BSc.	Geologist	Khartoum	11	9	3	9	6	0	11	49	
7	Omer Awad El Geed El Hadi	32	Geophysics	BSc.	Geophysics Engineer	El Gezira	9	9	6	3	3	6	9	45	
8	El Sadig Ishag Ali	42	Ground Water Techn.	BSc.	Water Resources Eng.	White Nile	11	11	9	11	14	14	11	81	
9	Hassan Adam Khleel	31	Geology	BSc.	Geologist	Blue Nile	11	6	11	6	9	14	14	71	
10	Mohamed Saeed Nasiredin	40	Mechanical Engineer	Diploma	Mechanical Engineer	North Kordofan	11	9	11	9	14	9	14	77	
11	Izz El Dien El Nur Ahmed Gily	47	Geology	BSc.	Geologist	South Kordofan	9	6	9	11	14	14	14	77	
12	Abdoalshafee Abdallah Adam	30	Geophysics	BSc.	Operation & Maintenance	North Darfur	11	11	6	9	9	14	14	74	
13	Mohammed Yagoub Mohammed Abaker	36	Ground Water	Diploma	Operation & Maintenance	North Darfur	11	6	11	6	9	11	9	63	
14	Ibrahim Adam Ahmed Kharallah	40	Ground Water	Diploma	Operation & Maintenance	North Darfur	6	9	6	6	9	9	11	56	
15	Mobarek Yousif Ishag	26	Geology	BSc.	Geologist	West Darfur	9	9	9	9	9	9	11	65	
16	Abdalsamed Abdalla Hussein	30	Geology	BSc.	Geologist	West Darfur	14	9	11	11	9	9	11	74	
17	Mohamed Hassan Mohamed	31	Geology	BSc.	Geologist	West Darfur	14	9	9	11	6	6	11	66	
18	Fath Elrehman Mustafa Ali	29	Geology	BSc.	Geologist	South Darfur	11	6	0	6	11	9	11	54	
19	Hassan Adam Mohammed	34	Water Supply	Diploma	Water Supply Eng.	South Darfur	11	11	9	9	6	9	14	69	
							Maximum	14	14	14	11	14	14	14	87
							Average	10.8	8.9	8.3	8.5	9.6	10.2	12.1	68
							Minimum	6	6	0	3	3	0	9	45

3-7. INTERVIEW OF TRAINEES

The 1st Interview was held on 12th July. The objective of the 1st Interview was to confirm the present job, the experience of well management and the request for the training contents of the trainees.

The inquiries for the Final Interview was collected on 22nd July and the Final Interview was held on 23rd July to confirm the contents of the inquiries paper. The objective of the Final Interview was to inquire about the training system.

The results of the above interviews will be made use for the formulation of the 2nd and 3rd training contentes.

The questionnaire for 1st and Final Interviews are attached in *Appendix-8* and the results in *Appendix-9*.



Photo-5 Scene of the 1st Interview



Photo-6 Scene of the Final Interview

3-8. CLOSING CEREMONY AND AWARD OF EXCELLENCE

The closing ceremony of the training course was held on 23rd July, where only PWCT related persons and trainees partiipated in the ceremony.

The certificates were given by the Director of PWCT and for the top 5 performers shown in *Table-111*; three awards of excellence were given by the JICA Expert.

Table-111 List of the Top Performers

Trainee No.	Name	State	Score	Rabk
5	Hatim Musa Mahmoud	Gedaref	87	1
8	El Sadig Ishag Ali	White Nile	81	2
2	Abi Khadir Ahmed	River Nile	77	3
10	Mohamed Saeed Nasiredin	North Kordofan	77	3
11	Izz El Dien El Nur Ahmed Gilly	South Kordofan	77	3



Photo-7 Certificate Awarding



Photo-8 Group Photo of the Closing Ceremony

3-9. COURSE EVALUATION MEETING

The course evaluation meeting was held on 24th July. Concerning each preparation categories of training preparation, training execution and after training works, the work sharing ratio between the JICA Expert and PWCT staff was evaluated, the points to be improvement for each operation items were discussed. The policy of preparation work for the coming 2nd training course was discussed, too.

Table-122 shows the ratio of training course implementation works sharing of the 1st training course in addition to the target of the year 2009.

Though this is the 1st training course, the course coordinators have the experience of the execution of the other training courses. Then they could independently complete the relatively simple operations. However, concerning the operations which require the detailed contents inspections for each training items, the delay of the work by PWCT staff was observed and then the assistance of the JICA Expert was necessary.

PWCT is expected to make the further efforts to achieve the target value of the work sharing ratio of the year 2009.

Table-12 Training Course Implementation Work Sharing Ratio

No.	Management item	Person in charge	Execution Period			July 09 (1st)		Target 2009 (%)	
			Before	Training	After	JICA	PWCT	JICA	PWCT
1	Security of the generator	Eatidal	●			0	100	0	100
2	Arrangement of the residence	Hashim	●			0	100	0	100
3	Preparation for the orientation	Egbal, Hashim	●			40	60	20	80
4	Preparation of trainee data	Egbal, Hannan, Ala	●			20	80	10	90
5	Preparation of lecturer data	Egbal, Hannan, Ala	●			20	80	0	100
6	Discussion and coordination with the lecturer	Egbal	●			30	70	10	90
7	Training schedule	Egbal	●			50	50	20	80
8	Training place	Egbal	●			50	50	40	60
9	Textbook making	Egbal	●			50	50	20	80
10	Printing work of the textbook	Osama, Muzamil	●			50	50	0	100
11	Preparation for examination paper and model answer	Lecturers, Egbal	●			60	40	40	60
12	Confirmation of equipment for training	Egbal	●			30	70	40	60
13	Preparation of questionnaire for trainee	Egbal	●			60	40	50	50
14	Preparation of evaluation sheet	Egbal	●			60	40	50	50
15	General meeting	Egbal	●			60	40	50	50
16	Orientation	Hashim, Egbal		●		20	80	20	80
17	Photography of the training	Muzamil, Alaa		●		20	80	40	60
18	Food providing service	Hashim, Zeinab		●		0	100	0	100
19	Enforcement of the examination	Egbal		●		40	60	0	100
20	Enforcement of evaluation of the lecturer	Osama, Alaa		●		0	100	0	100
21	Enforcement of evaluation of the training course	Osama, Alaa		●		0	100	0	100
22	Enforcement of evaluation of the residence	Osama, Alaa		●		0	100	0	100
23	Enforcement of examination paper inspection	Egbal		●		50	50	20	80
24	Analysis of the examination	Egbal		●		50	50	30	70
25	Training certificate making	Egbal, Hannan		●		30	70	20	80
26	Award of excellence making	Egbal, Hannan		●		30	70	20	80
27	Trainee interview	All staffs		●		50	50	50	50
28	Closing ceremony	Hashim		●		20	80	20	80
29	Payment of allowance of trainee	Hashim			●	0	100	0	100
30	Payment of lecturer	Hashim			●	0	100	0	100
31	Analysis of questionnaire	Egbal			●	50	50	50	50
32	Analysis of the evaluation sheet	Egbal			●	50	50	50	50
33	After training meeting and evaluation	Egbal, (Saito)			●	60	40	60	40
34	Training report making	Egbal			●	50	50	60	40

4. ISSUES FOR THE COMING COURSE

4-1. ABOUT COURSE MANAGEMENT

4-1-1. Training Equipment

The training equipment for the practical training of the submersible pump, the control panel, the generator, the air-lifting, the pumping test and the borehole camera etc. is being procured.

PWCT and the workshop manager of PWCT shall carry out the proper management of the above equipment, as the equipment shall be kept in the PWC workshop after the procurement.

4-1-2. Management of the Accommodation

The inspection and the maintenance of the toilet and the shower of the accommodation is necessary, as some trainees pointed out the problem of their quality. The quality and the quantity of the food shall also be reconsidered, as their problem was pointed out by some trainees.

4-2. ABOUT TRAINING COURSE

4-2-1. Preparation

The course coordinators shall independently execute the training preparation, in order to achieve the work sharing ratio target of the year 2009.

4-2-2. Preparation of Textbook and Question of Examination

In general aspects, delays were observed in various operations for the preparation of the textbooks and questions of examination.

The course coordinators shall acquire the ability to make the schedule chart in order to have a common understanding with the concerned parties. And the ability to check the delay of the operation, using such schedule chart is also shall be acquired by they course coordinators.

The processes of the selection of the trainees and lecturers, the preparation of the textbooks of the questions of the examination and the printing and the binding of the textbooks, shall be completed in as less days as possible comparing to the initial schedule.


Appendices

Appendix-1	Curriculum Vitae of Lecturers	1
Appendix-2	List of Photograph of Trainees.....	8
Appendix-3	Training Program	9
Appendix-4	Attendance Sheet of Trainees	12
Appendix-5	Evaluation Sheet and Analysis Results for Lecturers	13
Appendix-6	Evaluation Sheet and Analysis Results for Training Course	22
Appendix-7	Evaluation Sheet and Analysis Results for Accomodation	24
Appendix-8a	Questionnaire for Trainees (1 st Interview)	26
Appendix-8a	Questionnaire for Trainees (Final Interview).....	29
Appendix-9a	Results of the Questionnaire (1 st Interview).....	31
Appendix-9b	Results of the Questionnaire (Final Interview).....	35

APPENDIX-1 CURRICULUM VITAE OF LECTURERS


CV

No: (1)

		<u>Well Management Training Course 1st</u>	
		12 -23.July,2009	
1	Personal Data Full Name Date Of Birth Age Address For Correspondence E-mail Nationality Religion	GAMAL ALAMIN YOUSIF HAMAD 1960/10/20 48 0912925435 gamyous@hotmail.com Sudanese Muslim	
2	Education Record Institution City/Country Years attended Qualification Subject	University of Khartoum Khartoum /Sudan 1980-1985 BSc.Honour Civil Engineer	
3	Training or Study in Foreign Countreis Institution City/Country Period Certificate/Degree awarded Field of Study	International Water Academy Oslo/ Norway Dec.2001to March 2003 Followed Training Program International Water Resources Management& Conflict Resolution	
4	Employment Record 1) Present place of Employment Name Address Telephone or Fax Title of present job Date of Taking Up Post Type of Organization 2) Previous Job Name and address of Organization Previous Title/Post and Dates(from/to) Description of your previous job	Public Water Corporation Khartoum/Sudan P.O.Box 381 0183 417699 - Fax:0183 416799 Design Manager March,2008 Govenmental/public Public Water Corporation Construction Manager 2003-2008 Supervising Water projects in country	
5	Language Proficiency 1) Engilsh Speaking Listening Writing/Reading 2) Mother Toungue 3) Other Launguage	Good Good Good Arabic	


CV

No: (2)

		Well Management Training Course 1st	
		12 -23.July,2009	
1	Personal Data Full Name Date Of Birth Age Address For Correspondence E-mail Nationality Religion	Abdalla Mohammed Daffalla 1947 62 0122884669 daffallaabdalla@yahoo.com Sudanese Muslim	
2	Education Record Institution City/Country Years attended Qualification Subject	Germany Celle/Germany 1976-1979 Msc. Drilling Engineer	
3	Training or Study in Foreign Countreis Institution City/Country Period Certificate/Degree awarded Field of Study	Vermeer Company Switzerland 2003 Directional Drilling Course	
4	Employment Record 1) Present place of Employment Name Address Telephone or Fax Title of present job Date of Taking Up Post Type of Organization 2) Previous Job Name and address of Organization Previous Title/Post and Dates(from/to) Description of your previous job	consultant Private Algadier Ground Water Resources 2005-2007 Manager - Drilling Administration	
5	Language Proficiency 1) Engilsh Speaking Listening Writing/Reading 2) Mother Toungue 3) Other Launguage	Excellent Excellent Excellent Arabic German	


CV

No: (3)

		<u>Well Management Training Course 1st</u>	
		12 -23.July,2009	
1	Personal Data Full Name Date Of Birth Age Address For Correspondence E-mail Nationality Religion	Abdel Razig Mukhtar Mohammed 1945 64 P.O.B 10408 khartoum -Shark Hotel Gamhoriya Avenue abdelrazg249@yahoo.com Sudanese Muslim	
2	Education Record Institution City/Country Years attended Qualification Subject	University of Zagreb Zagreb - Croatia Ph.D Geology (Hydrogeology)	
3	Training or Study in Foreign Countreis Institution City/Country Period Certificate/Degree awarded Field of Study		
4	Employment Record 1) Present place of Employment Name Address Telephone or Fax Title of present job Date of Taking Up Post Type of Organization 2) Previous Job Name and address of Organization Previous Title/Post and Dates(from/to) Description of your previous job	Environment and Development Services(EDS) Khartoum -Sudan Tel: 770447- 790096 Director General Private Consultancy Firm Salsabeil Groundwater Development Company Team Leader / 2007	
5	Language Proficiency 1) Engilsh Speaking Listening Writing/Reading 2) Mother Toungue 3) Other Laanguage	Excellent Excellent Excellent Arabic	


CV

No: (4)

		<u>Well Management Training Course 1st</u>				
		12 -23 .July,2009				
1	Personal Data Full Name Date Of Birth Age Address For Correspondence Email Nationality Religion	Abdul Majid Wais 1956 52 0249922122700 amajid@grundfos.com Sudanese Muslim				
2	Education Record Institution City/Country Years attended Qualification Subject	University of Khartoum Khartoum- Sudan 76-81 Bsc honour Mechanical Engineer				
3	Training or Study in Foreign Countreis Institution City/Country Period Certificate/Degree awarded Field of Study	PDJ Academy -DK 2000 Communication Module-1				
4	Employment Record 1) Present place of Employment Name Address Telephone or Fax Title of present job Date of Taking Up Post Type of Organization 2) Previous Job Name and address of Organization Previous Title/Post and Dates(from/to) Description of your previous job	GRUNGFOS GZA-South Africa Sudan 0249922122700 Country Manager July , 2006 Govenmental/public GRUNDFOS Gulf Distription Senior Sales Eng.				
5	Language Proficiency 1) Engilsh Speaking Listening Writing/Reading 2) Mother Toungue 3) Other Launguage	Excellent Excellent Excellent Arabic				
6	Training Examination Record					
		1st	2nd	3rd	4th	5th
	Date					
	Score					
	Evaluation					


CV

No: (5)

		<u>Well Management Training Course 1st</u>	
		12 -23.July,2009	
1	Personal Data Full Name Date Of Birth Age Address For Correspondence Email Nationality Religion	Mohammed Ahmed Abdel Bagi Siraj 31/12/1952 52 0122192132 maasirraj@yahoo.com Sudanese Muslim	
2	Education Record Institution City/Country Years attended Qualification Subject	University of Birmingham Birmingham/ England 1983-1988 PhD Mechanical Engineer	
3	Training or Study in Foreign Countreis Institution City/Country Period Certificate/Degree awarded Field of Study		
4	Employment Record 1) Present place of Employment Name Address Telephone or Fax Title of present job Date of Taking Up Post Type of Organization 2) Previous Job Name and address of Organization Previous Title/Post and Dates(from/to) Description of your previous job	University of Khartoum -Faculty of Engineering Sudan / Khartoum 0122192132 Associated Professor 2006 Govenmental/public Mechanical Engineer Department Head	
5	Language Proficiency 1) Engilsh Speaking Listening Writing/Reading 2) Mother Toungue 3) Other Launguage	Excellent Excellent Excellent Arabic	

CV

No: (6)

		<u>Well Management Training Course 1st</u>	
		12 -23.July,2009	
1	Personal Data Full Name Date Of Birth Age Address For Correspondence E-mail Nationality Religion	Mohamed Elhassan Ibrahim Abu Kuker 1/1/1949 50 0912206919 Sudanese Muslim	
2	Education Record Institution City/Country Years attended Qualification Subject	Management for Development Foundation(MDF), Ede Netherlands 1991 Diploma	
3	Training or Study in Foreign Countreis Institution City/Country Period Certificate/Degree awarded Field of Study	Cairo- Egypt One week Multilayer Ground water Modeling using AQUA3D& GIS, CEDARE,	
4	Employment Record 1) Present place of Employment Name Address Telephone or Fax Title of present job Date of Taking Up Post Type of Organization 2) Previous Job Name and address of Organization Previous Title/Post and Dates(from/to) Description of your previous job	PWC Consultant Govenmental/public Groundwater& Wadis Directorate,Ministry of Irrigation Director / 2002 to 2008	
5	Language Proficiency 1) Engilsh Speaking Listening Writing/Reading 2) Mother Toungue 3) Other Launguage	Excellent Excellent Excellent Arabic German	




















CV

No: (7)

		<u>Well Management Training Course 1st</u>	
		12 -23.July,2009	
1	Personal Data Full Name Date Of Birth Age Address For Correspondence E-mail Nationality Religion	Nadia Babiker Ibrahim Shakak Ministry of Irrigation & Water Resources, shakak@alumni.itc.nl Sudanese Muslim	
2	Education Record Institution City/Country Years attended Qualification Subject	Netherland/ Austria 2004 MSc Geo-informatics Science & Earth Observation, Specialisation,	
3	Training or Study in Foreign Countreis Institution City/Country Period Certificate/Degree awarded Field of Study	Vienna 1999 Course Application of isotopes techniques in water resources	
4	Employment Record 1) Present place of Employment Name Address Telephone or Fax Title of present job Date of Taking Up Post Type of Organization 2) Previous Job Name and address of Organization Previous Title/Post and Dates(from/to) Description of your previous job	Ministry of Irrigation & Water Resources GWR& Directorate P.O.Box, 15006 0918046925 Hydro chemist/ Head hydro chemical Laboratory Section 1989 Govenmental/public NRWC hydro - chemist in water research center 1981-1989 Supervise the work and the lab. Staff.	
5	Language Proficiency 1) Engilsh Speaking Listening Writing/Reading 2) Mother Toungue 3) Other Launguage	Excellent Excellent Excellent Arabic	

APPENDIX-2 LIST OF PHOTOGRAPH OF TRAINEES

List of Trainees of Well Management Course 1st (12 - 23.Jul. 2009)

			
1.Ibrahim Jozouly Ibrahim Northern	2.Adil Khadir Ahmed River Nile	3.Ali Omer Mahmoud Red Sea	4.Hashim Mohamed Abd Allateef Kassala
			
5.Hatim Musa Mahmoud Gedaref	6.Hoyam Omer Elsony Khartoum	7.Omer Awad El Geed El Hadi El Gezira	8.El Sadig Ishag Ali White Nile
			
9.Hassan Adam Khleel Blue Nile	10.Mohamed Saeed Nasiredin Northern Kordofan	11.Izz El Dien El Nur Ahmed Southern Kordofan	12.Abdoalshafee Abdallah Adam Northern Darfur
			
13.Mohammed Yagoub Mohammed Northern Darfur	14.Ibrahim Adam Ahmed Kharallah Northern Darfur	15.Mobarek Yousif Ishag Western Darfur	16.Abdalsamed Abdalla Hussein Western Darfur
			
17.Mohamed Hassan Mohamed Western Darfur	18.Fath Elrahaman Mustafa Ali Southern Darfur	19.Hassan Adam Mohammed Southern Darfur	

APPENDIX-3 TRAINING PROGRAM

Detailed time schedule for the 1st Training Course
(Well Management)

12/Jul to 23/Jul, 2009

Date	Start	End	Subject	Content	Place	Lecturer
12	9:00	11:00	Orientation (1)		PWCT 1F Hall	
Sun	11:00	11:30	Breakfast		PWCT 1F Hall	
	11:30	13:30	Orientation (2)		PWCT 1F Hall	
	13:30	14:00	Pray			
	14:00	16:00	Interview (1)		PWCT 1F Hall	
13	9:00	11:00	Water Supply System Design (C)	General & Design Consideration	PWCT 1F Hall	Mr. Gamal Alamin Yousif Hamad
Mon	11:00	11:30	Breakfast		PWCT 1F Hall	
	12:00	14:30	Water Supply System Design (C)	Design of Low Capacity Water Yard	PWCT 1F Hall	Mr. Gamal Alamin Yousif Hamad
	15:00	15:30	Pray			
	15:30	17:30	Water Supply System Design (C)	Construction of Low Capacity Water Yard	PWCT 1F Hall	Mr. Gamal Alamin Yousif Hamad
14	9:00	11:00	Introduction to Well Drilling (C)	Drilling Method, Material, Drilling Problem	PWCT 1F Hall	Mr. Abdalla Mohammed Daffalla
Tue	11:00	11:30	Breakfast		PWCT 1F Hall	
	11:30	13:30	Well Design (C)	Elements of Well Design	PWCT 1F Hall	Mr. Abdel Razig Mukhtar Mohammed
	13:30	14:00	Pray			
	14:00	16:00	Well Design (C)	Well Testing & Exercise	PWCT 1F Hall	Mr. Abdel Razig Mukhtar Mohammed
15	9:00	11:00	Submersible Pump (C)	Theory of Submersible Pump	PWCT 1F Hall	Mr. Abdul Majid Wais
Wed	11:00	11:30	Breakfast		PWCT 1F Hall	
	11:30	13:30	Submersible Pump (C)	Pump Control System	PWCT 1F Hall	Mr. Abdul Majid Wais
	13:30	14:00	Pray			
	14:00	16:00	Submersible Pump (C)	Field Problem of Submersible Pump	PWCT 1F Hall	Mr. Abdul Majid Wais
16	9:00	11:00	Diesel Engine (C)	Fundamental of Diesel Engine	PWCT 1F Hall	Dr. Mohammed Ahmed Bagi Siraj
Thr	11:00	11:30	Breakfast		PWCT 1F Hall	
	11:30	12:00	Moving to Masheesh		Bus	
	12:00	13:30	Submersible Pump (P)	Disassemble/Assemble, Performance Test, Control System	Masheesh	Mr. Abdul Majid Wais
	13:30	14:00	Pray		Masheesh	
	14:00	16:00	Submersible Pump (P)	Disassemble/Assemble, Performance Test, Control System	Masheesh	Mr. Abdul Majid Wais
	16:00	16:30	Moving to PWCT		Bus	
18	9:00	11:00	Diesel Engine (C)	Operation of Diesel Engine	PWCT 1F Hall	Dr. Mohammed Ahmed Bagi Siraj
Sat	11:00	11:30	Breakfast		PWCT 1F Hall	
	11:30	12:00	Moving to N.Co.M.W.E		Bus	
	12:00	13:30	Diesel Engine (P)	Part of Engine and Function	N.Co.M.W.E	Mr. Abdul Majid Wais
	13:30	14:00	Pray		N.Co.M.W.E	
	14:00	16:00	Diesel Engine (P)	Part of Engine and Function	N.Co.M.W.E	Mr. Abdul Majid Wais
	16:00	16:30	Moving to PWCT			
19	8:30	9:00	Moving to Masheesh			
Sun	9:00	11:00	Submersible Pump (P)	Disassemble/Assemble, Performance Test, Control System	Masheesh	Mr. Abdul Majid Wais
	11:00	11:30	Breakfast		Masheesh	
	11:30	13:30	Submersible Pump (P)	Disassemble/Assemble, Performance Test, Control System	Masheesh	Mr. Abdul Majid Wais
	13:30	14:00	Pray		Masheesh	
	14:00	16:00	Submersible Pump (P)	Disassemble/Assemble, Performance Test, Control System	Masheesh	Mr. Abdul Majid Wais
	16:00	16:30	Moving to PWCT		Bus	
20	8:30	9:00	Moving to Omdorman		Bus	
Mon	9:30	10:30	Water Supply System Design (P)	Visitation of Small-Scale Water Supply Facilities	Water Yard at Omdorman	Mr. Gamal Alamin Yousif Hamad
	10:30	11:30	Moving to kilo 10		Bus	
	11:30	12:00	Breakfast			
	12:00	13:30	Water Supply System Design (P)	Visitation of Small-Scale Water Supply Facilities	Water Yards around kilo 10	Mr. Gamal Alamin Yousif Hamad
	13:30	14:00	Moving to PWCT		Bus	
	14:00	14:30	Pray			
	14:30	16:00	Water Supply System (C)	Report of Visitation of Small-Scale Water Supply Facilities	PWCT 1F Hall	Mr. Gamal Alamin Yousif Hamad

Detailed time schedule for the 1st Training Course
 (Well Management)

12/Jul to 23/Jul, 2009

Date	Start	End	Subject	Content	Place	Lecturer
21 Tue	9:00	11:00	Well Problem (C)	Design and Construction	PWCT 1F Hall	Mr. Mohamed Elhassan
	11:00	11:30	Breakfast		PWCT 1F Hall	
	11:30	13:30	Well Problem (C)	Microbial Effects	PWCT 1F Hall	Mr. Mohamed Elhassan
	13:30	14:00	Pray			
22 Wed	14:00	16:00	Well Problem (C)	Corrosion, Aquifer Problems	PWCT 1F Hall	Mr. Mohamed Elhassan
	9:00	11:00	Water Quality (C)	Groundwater Quality, Assessment and Management	PWCT 1F Hall	Ms. Nadia Babiker Ibrahim Shakak
	11:00	11:30	Breakfast		PWCT 1F Hall	
	11:30	14:00	Review (Self-Study)		PWCT 1F Hall	(Mr. Egbal)
	14:00	14:30	Pray			
23 Thu	14:30	16:00	Examination		PWCT 1F Hall	(Mr. Egbal)
	9:00	11:00	Interview (2)	Interview with 3 group, Analysis of examination	PWCT Conference Room	(JICA Experts, Course Coordinators)
	11:00	11:30	Breakfast		PWCT 1F Hall	
	11:30	13:30	Explanation of Examination	Explanation of answers and result of examination	PWCT 1F Hall	(Mr. Egbal)
	13:30	14:00	Pray			
	14:00	16:00	Certification	Certificate and payment	PWCT 1F Hall	(Mr. Egbal)

APPENDIX-4 ATTENDANCE SHEET OF TRAINEES

Well Management First Training Course 12, July to 23, July 2009
 Attendance Sheet

Name	12		13		14		15		16		18		19		20		21		22		23				
	9:00-11:00	11:30-13:30	14:00-16:00	9:00-11:00	11:30-13:30	14:00-16:00	9:00-11:00	11:30-13:30	14:00-16:00	9:00-11:00	11:00-16:00	8:30-14:00	8:30-13:30	14:00-16:00	9:00-11:00	11:30-13:30	14:00-16:00	9:00-11:00	11:30-13:30	14:00-16:00	9:00-11:00	11:30-13:30	14:00-16:00		
1 Mr. Gamel																									
2 Mr. Daffalla																									
3 Mr. Mukhtar																									
4 Mr. Wais																									
5 Dr. Siraj																									
6 Mr. Mohammed Elhassan																									
7 Ms. Nadia																									
1 Ibrahim Jozouly Ibrahim	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2 Adil Khadir Ahmed	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3 Ali Omer Mahmoud	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4 Hashim Mohamed Abd Allateef	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
5 Hatim Musa Mahmoud	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
6 Hoyam Omer Eisoney	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
7 Omer Awad El Geed El Hadi	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
8 El Sadig Ishag Ali	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
9 Hassan Adam Kheel	X	X	X																						
10 Mohamed Saeed Nasiredin	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
11 Izz El Dien El Nur Ahmed	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
12 Abdoalshafee Abdallah Adam	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
13 Mohammed Yagoub Mohammed	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
14 Ibrahim Adam Ahmed Kheirallah	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
15 Mobaerk Youisif Ishag	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
16 Abdalshame Abdalla Hussein	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
17 Mohamed Hassan Mohamed	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
18 Fath Elrahman Mustafa Ali	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19 Hassan Adam Mohammed	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

✓ : trainee Attend the Lucrue X : trainee didn't Attend the Lucrue 15 : minutes of delay

APPENDIX-5 EVALUATION SHEET AND ANALYSIS RESULTS FOR LECTURERS

The evaluation sheet of the lecturer at training

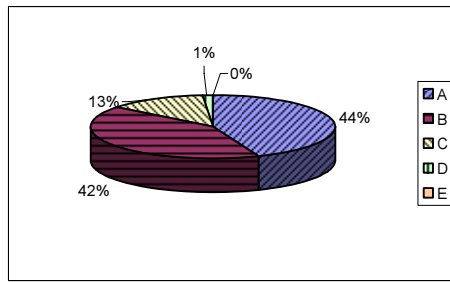
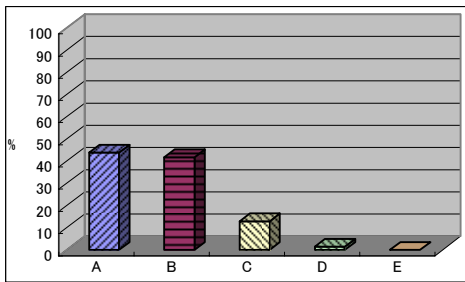
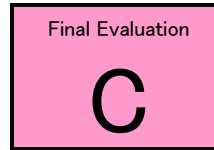
Course Name		Well Management (1st)	Training Date			Time				
Lecturer Name			Trainee Name			Trainee No.				
Training Place			Subject Name			Evaluation				
No.	Item	Questionnaire Contents				A	B	C	D	E
1	Basic behavior	Did the lecturer hold a lecture calmly?								
2		Did the lecturer do a well-controlled lecture?								
3		Did the lecturer show a good feeling and sympathy for a trainee?								
4		Did the lecturer at training do eye contact?								
5	Speech	Were the size and the tempo of the voice of the lecturer at training appropriate?								
6		Did the lecturer emphasize the important matter?								
7		Did the Lecturer confirm your understanding on most important matter repeatedly?								
8		Did the lecturer do plain expression?								
9		Did the lecturer at training push forward a lecture while confirming the understanding of the trainee?								
10	Development	Did the lecture at training go along smoothly?								
11		Did the lecturer inform you about the final goal and objective of the lecture?								
12		Did the contents of the lecture have consistency?								
13		Did the lecturer give direction to trainees of the right pages which were talked in the lecture?								
14		As for the lecture of the lecturer, was the focal point summed up?								
15		Did the lecturer answer for question and doubt from trainees precisely?								
16	Time	Was the lecturer conscious of time during a lecture?								
17		Was not there a problem for distribution at the time of the lecturer at training?								
18		Did the lecturer at training start a lecture on time?								
19		When time was short, did the lecturer at training adjust it appropriately?								
20	Training tools	Did the lecturer at training utilize PowerPoint and a slide effectively?								
21		Was it easy to understand the text which a lecturer at training distributed?								
22		Was the utilization of the document which the lecturer distributed appropriate?								
23	Comment									
	* A	Excellent								
	B	Good								
	C	Fair								
	D	Poor								
	E	Very poor								

Mr.Gamal Evaluation Results (12 - 23,July 2009)

Trainee No	Basic Behavior					Speech					Development					Time					T.Tools				
	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E
1	1	2	1			1	4				1	4	1			3	1				2	1			
2	1	3					5				2	4				2	1	1			2	1			
3	1		2	1		1	2	2			2	4				1	3				2	1			
4	4					5					6					4					3				
5	2	2				4	1				5	1				2	2				3				
6	4					1	4				6					3	1				2	1			
7	2	2					4		1		2	4				1	3				2	1			
8		4					5				3	3					4					3			
9	1	3				2	2	1			3	3				4					2	1			
10	1	3				3	2				5	1				2	2				2	1			
11		1	3			1	1	3			1		5			1		1	2		1	1	1		
12	2	2				2	3					4	2			3	1				3				
13	1	3	1			2	2	1			3	3				1	2	1				2	1		
14	4					4	1				6					4					3				
15	1	3				3	1	1			1	4	1			4					3				
16	2	2					3	2			2	3	1				1	2	1		3				
17		1	3			1	3	1			3	3						3	1		2	1			
18	2	2				1	2	2				4	2			1	2	1			1	2			
19		4				1	3	1			1	4	1								1	2			
Total	29	37	10	1	0	32	48	14	1	0	46	49	19	0	0	40	23	9	4	0	37	18	2	0	0

No.6: Absence

Rank	Point	(%)
A	184	43.9
B	175	41.8
C	54	12.9
D	6	1.4
E	0	0.0
Total	419	100.0



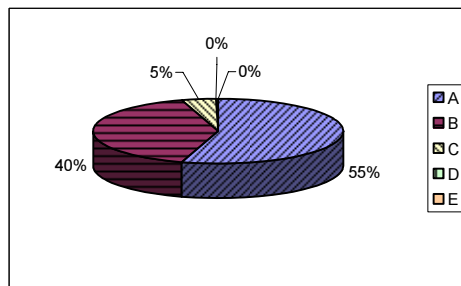
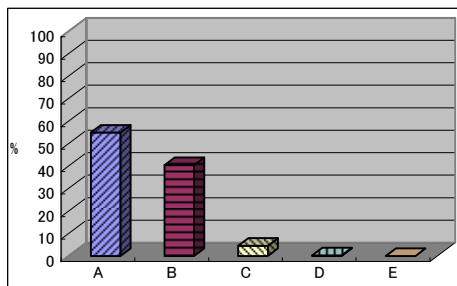
Trainee No.	Comment
1	no comment
2	no comment
3	no comment
4	The lecturer carried the lecture as excelent - as posible
5	no comment
6	no comment
7	Ithink I'm became best lectuer by lecture gradwaly by making refreshing information . Go a head
8	no comment
9	no comment
10	no comment
11	Most time the lecturer read from the text , all time he is sitting . He gave us high lights on many things like well c , pumps , ingines water Quality etc.
12	no comment
13	no comment
14	no comment
15	no comment
16	no comment.
17	no comment
18	no comment
19	no comment

Mr.Daffalla Evaluation Results (12 – 23,July 2009)

Trainee No	Basic Behavior					Speech					Development					Time					T.Tools				
	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E
1	4					5					6					4					3				
2	4					1	4				3	3				4						3			
3	2	2				4	1				2	4				3	1				2	1			
4	4					5					6					4					3				
5	1	3				3	2				3	3				3	1				1	2			
6	4						5					6				4					2	1			
7	4					4	1				4	2			2	1	1				2	1			
8	3	1					4	1			3	3			2	2					1	2			
9	2	2				3	2				4	2			2	2					1	2			
10	3	1				3	2				3	3			3	1					2	1			
11		4				1	4				3	3			4						1	2			
12	1	3				1	3	1			1	5			4						1	2			
13	3	1				3	2				5	1			2	2					3				
14	2	2				1	3	1			2	2	2				3	1				2	1		
15	2	2				2	3				4	2			4						2	1			
16	3	1				1	2	2			2	4			2	2					3				
17	1	3				2	3					3	3		2	2					2	1			
18	2	2				3	1	1			1	4	1		4							2	1		
19		4				1	4				2	4			4						3				
Total	45	31	0	0	0	43	46	6	0	0	54	54	6	0	0	57	14	4	1	0	30	24	3	0	0

Rank	Point	(%)
A	229	54.8
B	169	40.4
C	19	4.5
D	1	0.2
E	0	0.0
Total	418	100.0

Final Evaluation
C



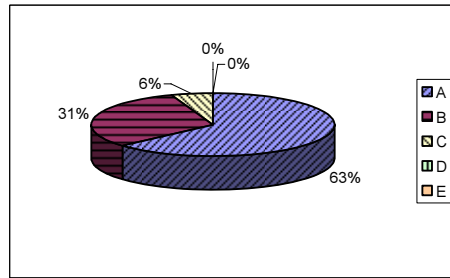
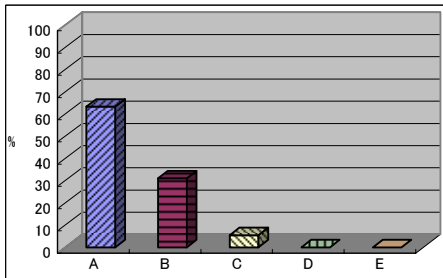
Trainee No.	Comment
1	no comment
2	no comment
3	no comment
4	no comment
5	no comment
6	no comment
7	I think the lecturer is the bast but we need a lot of time with him (one lecture not enough)
8	no comment
9	no comment
10	no comment
11	no comment
12	no comment
13	no comment
14	no comment
15	no comment
16	no comment
17	no comment.
18	no comment
19	no comment

Mr.Mukhtar Evaluation Results (12 – 23,July 2009)

Trainee No	Basic Behavior					Speech					Development					Time					T.Tools				
	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E
1	4					5					6					4					3				
2	4						5				6					4					2	1			
3	4					4	1				6					4					3				
4	4					5					6					4					3				
5	4					5					6					4					3				
6	4					1	4				6					4					3				
7	4					3	2				2	3	1			3	1					3			
8	4					3	2				6					4						3			
9	4					3	2				5	1				4						3			
10	3	1				3	2				3	3				1	3				1	2			
11	2	2				2	2	1			5	1				3	1				1	1	1		
12		4				2	2	1				3	3			1	2	1				3			
13		2	2			1	2	2				5	1			3	1				1	1	1		
14	3	1				2	2	1			1	4	1			3	1				1	2			
15	2	2				4	1				3	3				3	1					3			
16	3	1				3	2				4	2				2	2					3			
17	4					4	1				5	1				3	1				1	2			
18	3	1				1	3	1				4	2			1	2	1			1	1	1		
19	1	3				5					4	1	1			1	3					3			
Total	57	17	2	0	0	56	33	6	0	0	68	37	9	0	0	49	24	3	0	0	35	19	3	0	0

Rank	Point	(%)
A	265	63.4
B	130	31.1
C	23	5.5
D	0	0.0
E	0	0.0
Total	418	100.0

Final Evaluation
B



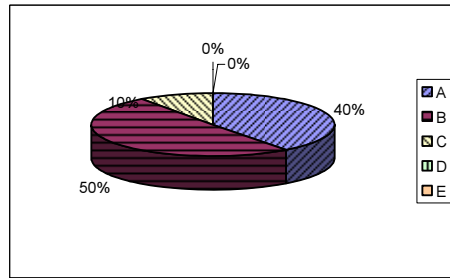
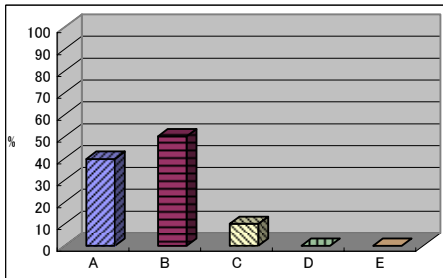
Trainee No.	Comment
1	no comment
2	no comment
3	no comment
4	no comment
5	no comment
6	no comment
7	We need to study about wire line logging more and we must use chart to show the curve and discuss it and how to mak intrbretation
8	no comment
9	no comment
10	no comment
11	no comment
12	the lecturer is qualified , but the lesson is full of equations and many parameter to be understood during 2 hours which is difficult
13	no comment
14	no comment
15	no comment
16	no comment
17	no comment
18	no comment.
19	no comment

Mr.Wais Evaluation Results (12 – 23,July 2009)

Trainee No	Basic Behavior					Speech					Development					Time					T.Tools				
	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E
1	4					5					3	3				4					3				
2	1	3					4					3	3			4						3			
3	4					2	3				6					1		3			1	2			
4	4					5					6					4					3				
5		1	3				4	1				2	4			4						3			
6	4					1	4				1	5			3	1					3				
7	1	2	1			1	3	1				5	1			3	1				2	1			
8		4					5					6				4					3				
9	4					2	3				5	1			2	2					3				
10	4					3	2				3	3			2	2					2	1			
11		2	2				3	2				5	1		1	3					1	2			
12	1	3				1	4				1	3	2		1	3					3				
13	1	3				3	2				6				4						1	2			
14	1	2	1			1	3	1			3	2	1		2	2					1	2			
15		3	1			2	3					5	1		4						2	1			
16	1	3				1	4				1	4	1		1	2	1				3				
17	1	2	1			2	3				3	3			3	1					1	2			
18		3	1			1	3	1				3	3		2	2					1	1	1		
19	4					1	4					6				4					3				
Total	35	31	10	0	0	31	57	6	0	0	38	59	17	0	0	38	33	5	0	0	24	29	4	0	0

Rank	Point	(%)
A	166	39.8
B	209	50.1
C	42	10.1
D	0	0.0
E	0	0.0
Total	417	100.0

Final Evaluation
D

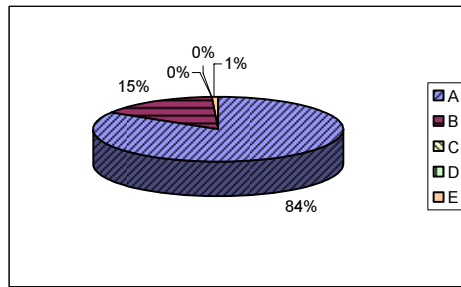
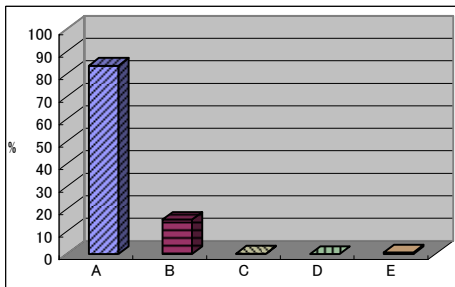
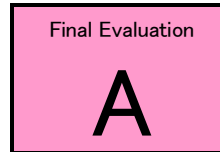


Trainee No.	Comment
1	we need more practical , for this subject
2	the dose of this lucture is so hard to understand by only (6 h) , so I think you have to give this lesson more and ti lecture on . So as to take highly understanding in this part of course
3	no comment
4	no comment
5	no comment
6	no comment
7	no comment
8	no comment
9	no comment
10	no comment
11	no comment
12	no comment
13	no comment
14	we need more lecturer because other state needed pump well with submerseble pump
15	no comment
16	no comment
17	no comment
18	no comment.
19	no comment
20	no comment

Dr.Siraj Evaluation Results (12 – 23,July 2009)

Trainee No	Basic Behavior					Speech					Development					Time					T.Tools				
	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E
1	4					5					6					4					3				
2	4					5					5	1				4					2	1			
3	4					5					6					2	2				2	1			
4	4					5					6					4					3				
5	4					5					6					4					3				
6	4					5					5			1	3				1	2				1	
7	4					5					6					4					3				
8	4					1	4				6					2	2				2	1			
9	4					5					6					4					3				
10	4					3	2				4	2				3	1				3				
11	4					5					6					4					2	1			
12	4					5					6					4					3				
13	4					5					6					4					3				
14	2	2				2	2	1			3	3				3	1					3			
15	4					5					6					4					3				
16	4					5					6					4					3				
17	3	1				2	3				4	2				3	1				1	2			
18		4					5				6					4					3				
19	4					1	4				6					4					3				
Total	69	7	0	0	0	74	20	1	0	0	99	14	0	0	1	64	11	0	0	1	44	12	0	0	1

Rank	Point	(%)
A	350	83.7
B	64	15.3
C	1	0.2
D	0	0.0
E	3	0.7
Total	418	100.0

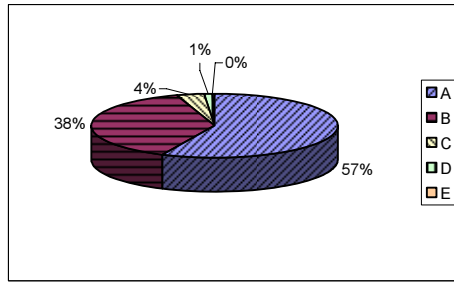
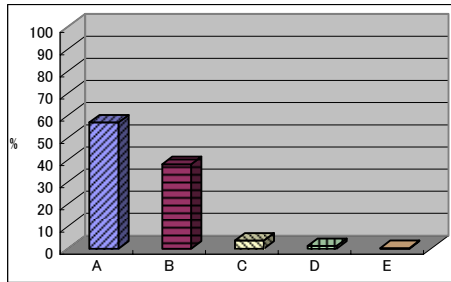
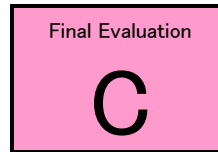


Trainee No.	Comment
1	no comment
2	I think this part of course need more time to be absoral
3	no comment
4	no comment
5	no comment
6	no comment
7	We must increase time of the subject
8	no comment
9	no comment
10	no comment
11	no comment
12	no comment
13	no comment
14	no comment
15	no comment
16	no comment
17	no comment
18	no comment.
19	no comment

Mr. Mohamed Elhassan Evaluation Results (12 – 23,July 2009)

Trainee No	Basic Behavior					Speech					Development					Time					T.Tools				
	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E
1	4					5					6					4					3				
2		4				5						4	2			2	2					3			
3			2	2		2	3				5	1				1	3					3			
4	4					5					6					4						3			
5	3	1				5					2	3		1		4						2		1	
6	4					5					6					4						2			1
7	2	2				1	4				1	5				2	1	1				2		1	
8	4						5					6					4					3			
9	2	2				4	1				6					4						3			
10	4					3	2				2	4				3	1					1	2		
11	3	1				3	2				3	3				1	2	1				3			
12	1	3				2	3				2	4				4						3			
13	1	3				3	2				3	3				4						2	1		
14	1	3					4	1			1	5				3	1					3			
15	2	2					5				1	5				4						2		1	
16	4					5					6					4						2			1
17	3	1				2	3				6					1	3					1	1		1
18		4					3	2			1	5				3	1					1	2		
19	4					5						6					4						3		
Total	46	28	2	0	0	55	37	3	0	0	57	54	2	1	0	52	22	2	0	0	28	18	6	4	1

Rank	Point	(%)
A	238	56.9
B	159	38.0
C	15	3.6
D	5	1.2
E	1	0.2
Total	418	100.0



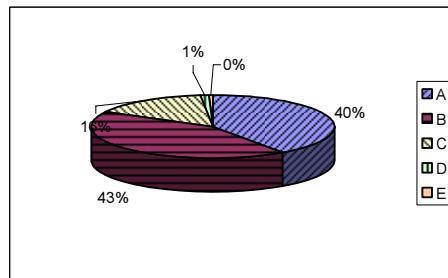
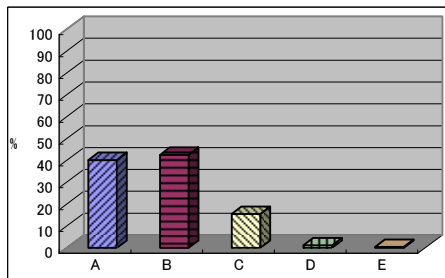
Trainee No.	Comment
1	no comment
2	the lecturer some time go fastly , so I think the are many points been dismiss, general I think the lesson is quite g
3	no comment
4	no comment
5	the Manual sheet should be well prepared and driected with lecturer presentation to conserve the trainee time and for mximum anderstanding
6	no comment
7	no comment
8	no comment
9	no comment
10	no comment
11	no comment
12	no comment
13	no comment
14	no comment
15	no comment
16	no comment
17	no comment
18	no comment.
19	no comment

Ms.Nadia Evaluation Results (12 – 23,July 2009)

Trainee No	Basic Behavior					Speech					Development					Time					T.Tools				
	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E
1	4					4	1				6					4					3				
2		1	3				2	3				1	5			1	2	1			1	2			
3	1	2	1			2	3				4	2				2	2				1	2			
4	4					5					6					4					3				
5		1	3			1	2	1	1			1	4	1		1	3				1	1		1	
6	4						4	1				5		1		3			1		2			1	
7		3	1				4	1				3	3			4					1	2			
8		4				5					6					4					3				
9	4					5					6					4					3				
10	4					2	3				4	2				2	2				1	2			
11		1	3			1	1	2	1			3	3			2	2				2	1			
12		3	1				5				2	3	1			1	3				3				
13	2	2				5					6					4					2	1			
14	1	3				1	4				2	4				2	2				1	2			
15	2	2					5					6				4					3				
16		4					5					4	2			1	2	1			3				
17		2	2				3	2			3	3				2	2				2	1			
18		1	3				4	1			1	3	2			1	3				2	1			
19		4					5					1	5			4					1	1	1		
Total	26	33	17	0	0	31	51	11	2	0	46	41	25	1	1	40	29	6	0	1	25	24	6	2	0

Rank	Point	(%)
A	168	40.2
B	178	42.6
C	65	15.6
D	5	1.2
E	2	0.5
Total	418	100.0

Final Evaluation
C



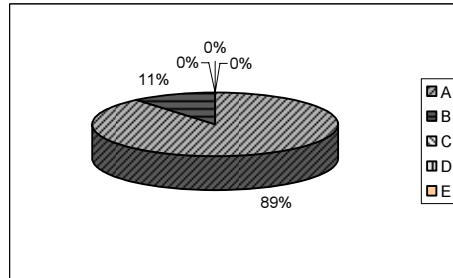
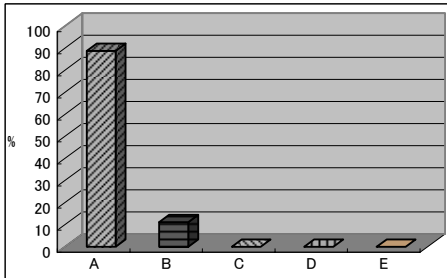
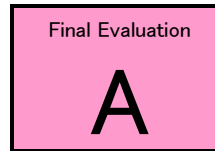
Trainee No.	Comment
1	no comment
2	the lectural go faslty during the lesson so forme, I think there are many miss under stand point in the lesson.
3	the time of this tobic is not enough , because it is very important tobic, so we hope to be carfully about the tobiocs
4	no comment
5	the power point slides does not match the hand power point sheet
6	no comment
7	I think it's better if we do practical chemical analysis and how we use indicator
8	no comment
9	no comment
10	no comment
11	she just dectate the passage from the text
12	no comment
13	no comment
14	no comment
15	no comment
16	no comment
17	no comment
18	no comment.
19	no comment.
20	no comment
21	no comment

Dr.Sami Evaluation Results (24, June to 7,July 2009)

Trainee No	Basic Behavior					Speech					Development					Time					T.Tools				
	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E
1	4					5					6					4					3				
2		4					5					6				4					3				
3	4					5					6				4					3					
4	4					5					6				4					3					
5	4					5					5				4					3					
6																									
7	4					5					6				4					3					
8	4					5					6				4					3					
9	4					2	3				1	5			3	1				3					
10	4					5					6				4					3					
11	3	1				3	2				6				4					3					
12	4					5					5	1			4					3					
13	4					4	1				5	1			4					3					
14	2	2				5					2	4			4					3					
15	4					5					6				3	1				3					
16	4					5					6				4					3					
Total	53	7	0	0	0	64	11	0	0	0	72	17	0	0	0	58	2	0	0	0	45	0	0	0	0

No.6: Absence

Rank	Point	(%)
A	292	88.8
B	37	11.2
C	0	0.0
D	0	0.0
E	0	0.0
Total	329	100.0



Trainee No.	Comment
1	no comment
2	no comment
3	no comment
4	no comment
5	very good teacher and explain all information
6	
7	no comment
8	no comment
9	no comment
10	no comment
11	no comment
12	no comment
13	no comment
14	no comment.
15	no comment
16	no comment

No.6: Absence

APPENDIX-6 EVALUATION SHEET AND ANALYSIS RESULTS FOR TRAINING COURSE

The evaluation sheet of the training course

Course Name		Well Management (1st)	Evaluation Date			Evaluation *				
Trainee Name			Trainee Number							
Position / State										
No.	Item	Questionnaire Contents				A	B	C	D	E
1	Design of Water Supply System by Mr. Gamal	Was the lecture plain?								
2		Were the teaching materials plain?								
3		Was the text book good?								
4		Was the explanation of the lecturer good?								
5		Did this lecture help you?								
6	Introduction to Well Drilling by Mr. Daffalla	Was the lecture plain?								
7		Were the teaching materials plain?								
8		Was the text book good?								
9		Was the explanation of the lecturer good?								
10	Did this lecture help you?									
11	Well Design by Mr. Mukhtar	Was the lecture plain?								
12		Were the teaching materials plain?								
13		Was the text book good?								
14		Was the explanation of the lecturer good?								
15	Did the lecture help you?									
16	Submersible Pump and Control System by Mr. Wais	Was the lecture plain?								
17		Were the teaching materials plain?								
18		Was the text book good?								
19		Was the explanation of the lecturer good?								
20	Did the lecture help you?									
21	Diesel Engine by Dr. Siraj	Was the lecture plain?								
22		Were the teaching materials plain?								
23		Was the text book good?								
24		Was the explanation of the lecturer good?								
25	Did the lecture help you?									
26	Causes of Well Problem by Mr. Elduri	Was the lecture plain?								
27		Were the teaching materials plain?								
28		Was the text book good?								
29		Was the explanation of the lecturer good?								
30	Did the lecture help you?									
31	Water Quality by Ms. Nadia	Was the lecture plain?								
32		Were the teaching materials plain?								
33		Was the text book good?								
34		Was the explanation of the lecturer good?								
35	Did the lecture help you?									
36	Practical Training at Masheesh (Submersible Pump and Control System)	Was the training place appropriate for you?								
37		Was the training equipment satisfactory for you?								
38		Was the grouping size for practical training appropriate for you?								
39		Were you able to really touch and operate in training?								
40		Did the lecturer and the assistant support you?								
41	Did this practical training help you?									
42	Practical Training at N.Co.M.W.E (Diesel Engine)	Was the training place appropriate for you?								
43		Was the training equipment satisfactory for you?								
44		Was the groping size for practical training appropriate for you?								
45		Were you able to really touch and operate in training?								
46		Did the lecturer and the assistant support you?								
47	Did this practical training help you?									
	Comment									

* A: Excellent, B: Good, C: Fair, D: Poor, E: Very Poor

APPENDIX-7 EVALUATION SHEET AND ANALYSIS RESULTS FOR ACCOMMODATION

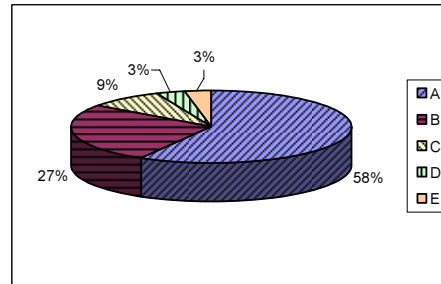
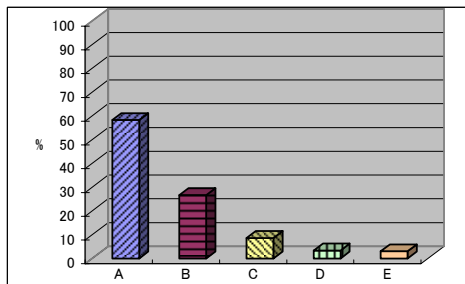
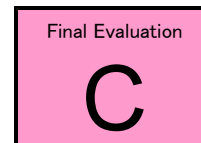
The evaluation sheet of the accommodations

Course Name	Well Management	Evaluation Date	Evaluation *				
Room No.		Trainee name					
Lodging Period		Trainee No					
No.	Item	Questionnaire Contents	A	B	C	D	E
1	Reception	Was the reception smooth?					
2		Was the correspondence of the receptionist good?					
3	Bed Room	How was the environment of the room?					
4		How was the equipment of the room?					
5		Was size of the room enough?					
6	Dining Room (Restaurant)	How was the environment of the dining room?					
7		Was the dining room hygienic?					
8		Was the kitchen hygienic?					
9		Was equipment of a dining room and the kitchen enough?					
10	Food Service	Was quantity of the meal enough?					
11		How about the quality of the meal?					
12		Was the food service any delay?					
13	Toilet Shower	Were the toilet and the shower hygienic?					
14		Was number of toilet and showers enough?					
15	Recreation Room	How was the environment of the recreation room?					
16		Were you satisfied with television and a magazine?					
17		Was the recreation room hygienic?					
18	Comment						
	* A	Excellent					
	B	Good					
	C	Fair					
	D	Poor					
	E	Very poor					

Evaluation Results of the Accommodation (12 July to 23 July 2009)

No	Reception					Bed Room					Dining Room					Food Service					Toilet and Shower					Recreation Room				
	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E
1		2				3					4					2	1				1	1				3				
2	2					2	1				4					1	2					1	1				3			
3	2					3					4					1	2							2	2	1				
4	2					3					3	1				2	1				1			1	2	1				
5	2					2	1				4					1	2						2	2	1					
6	2					3					4					2	1				2			2					1	
7	1	1				3						2	2				3						2			3				
8		2				2	1				4					2	1				1	1			2	1				
9	2					3					2	2				1	2				1	1		2		1				
10	1	1				2	1				2	2				2	1				1	1		2	1					
11	2					3					3	1				1	2				1	1		2					1	
12	1	1				2	1				4					2	1				1	1		1					2	
13	1	1				3					4					3					1	1		1	2					
14	2					3					2	2				2	1					1	1		3					
15	2					3					4					2	1				2			2	1					
16	2					2	1				4					2	1				1	1		2	1					
17	2					2	1				1	3				2		1				1	1		2	1				
18	2					3					1	2	1			3					1	1		1	2					
19		2					3						3	1			1	2				2			1	1			1	
Total	28	10	0	0	0	47	10	0	0	0	48	19	8	1	0	20	22	13	2	0	6	12	10	7	3	26	20	5	1	5

Rank	Facilities			Food			Overall	
	Point	(%)	Evaluation	Point	(%)	Evaluation	Point	(%)
A	155	58.3	C	20	35.1	D	175	54.2
B	71	26.7		22	38.6		93	28.8
C	23	8.6		13	22.8		36	11.1
D	9	3.4		2	3.5		11	3.4
E	8	3.0		0	0.0		8	2.5
Total	266	100.0		57	100.0		323	100.0



Trainee	Comment
1	No Comment
2	about the toilet no and stem , food services quality must be selected according to common in family.
3	No Comment
4	for the dining room , the water cooler needs repair - many days the quality of the meal is nit good - for the toilet and the shower tunctioning property - it needs sepair , no magazine & news paper
5	Liberary suported with internet net work is essentially needed
6	No Comment
7	a lot of time no watter, also no cooler for drinking water, no any activity time just (T.V)
8	More importance must be done to dark points
9	No Comment
10	No Comment
11	No Comment
12	No Comment
13	I advice that the tolite must be reepaired
14	No Comment
15	No Comment
16	No Comment
17	No Comment
18	No Comment
19	No Comment

APPENDIX-8A QUESTIONNAIRE FOR TRAINEES (1ST INTERVIEW)

First Interview Paper – “Well Management” (1st)

Date:
 Name of trainee:
 State:
 Present Position:
 Detail of Work:
 Name of Interviewer:

Example for filling-up this interview form	
What type of pump for water supply is generally used in your state?	<input checked="" type="checkbox"/> Handpump <input type="checkbox"/> Diesel Pump <input type="checkbox"/> Centrifugal Pump <input checked="" type="checkbox"/> Submersible Pump

No.	Question	Answer
Present Position and Job		
1	What is the major work of your department in the respect of water supply? Please check the items in the right.	<input type="checkbox"/> Planning <input type="checkbox"/> Investigation <input type="checkbox"/> Design <input type="checkbox"/> Construction Work (<input type="checkbox"/> Practical <input type="checkbox"/> Supervising) <input type="checkbox"/> Maintenance <input type="checkbox"/> Rehabilitation <input type="checkbox"/> Periodical Check of Water Supply System <input type="checkbox"/> Other (Please specify: _____)
2	What is your own work? Please check the items in the right.	<input type="checkbox"/> Planning <input type="checkbox"/> Investigation <input type="checkbox"/> Design <input type="checkbox"/> Construction Work (<input type="checkbox"/> Practical <input type="checkbox"/> Supervising) <input type="checkbox"/> Maintenance <input type="checkbox"/> Rehabilitation <input type="checkbox"/> Periodical Check of Water Supply System <input type="checkbox"/> Other (Please specify: _____)
3	Are you Chief of your department and/or chief?	<input type="checkbox"/> yes <input type="checkbox"/> no If yes, How many members in your team? _____ persons.
4	How many water yards with the well and motorized pump in your State?	_____ water yards
5	What is the percentage of the water yards not working?	_____ %

No.	Question	Answer
2. Experience		
6	If you have the experiences of the construction of water supply facility, Please check the items in the right.	<input type="checkbox"/> well siting and geophysical survey <input type="checkbox"/> well drilling <input type="checkbox"/> Air-Lifting <input type="checkbox"/> Pumping Test <input type="checkbox"/> Water Quality Analysis <input type="checkbox"/> Generator Installation <input type="checkbox"/> Pump Installation <input type="checkbox"/> Pipeline construction <input type="checkbox"/> Water Tank Construction <input type="checkbox"/> Public Tap Construction
7	If you check the above, what is the type of your work. Please check the items in the right.	<input type="checkbox"/> Planning <input type="checkbox"/> Investigation <input type="checkbox"/> Design <input type="checkbox"/> Supervising <input type="checkbox"/> Practical Work
8	If you have the experiences of the well monitoring, what was the item of the monitoring? Please check the items in the right.	<input type="checkbox"/> Static Water Level <input type="checkbox"/> Dynamic Water Level <input type="checkbox"/> Discharge Rate of Pump <input type="checkbox"/> Discharge Pressure of Pump <input type="checkbox"/> Specific Capacity of Well <input type="checkbox"/> Turbidity of Well Water <input type="checkbox"/> Sand Contents of Well Water <input type="checkbox"/> Sand Sedimentation in Well Bottom <input type="checkbox"/> Pumping Test <input type="checkbox"/> Borehole Camera <input type="checkbox"/> Pump Operation
9	Do you have the experience of repair work of the water yard? If so, please check the items in the right.	<input type="checkbox"/> Repair or Replace of Submersible Pump <input type="checkbox"/> Repair or Replace of Diesel Pump <input type="checkbox"/> Repair or Replace of Control Panel and control cable <input type="checkbox"/> Repair or Replace of Control Piping and valves <input type="checkbox"/> Repair or Replace of Generator and Power Cable <input type="checkbox"/> Repair of Well (Rehabilitation)
10	If you have the experience of the well rehabilitation, what was the item of the well rehabilitation? Please check the items in the right.	<input type="checkbox"/> Cleaning by Air-Lifting <input type="checkbox"/> Cleaning by submersible pump <input type="checkbox"/> Bailing or Swabbing <input type="checkbox"/> Brushing <input type="checkbox"/> High Pressure Fracturing by mud-pump <input type="checkbox"/> Chemical Treatment (acid etc.) <input type="checkbox"/> Casing Repair (double casing etc.)

No.	Question	Answer
Well Management		
11	What do you think the most important subject for the rehabilitation of water yard? Please check the items in the right.	<input type="checkbox"/> Repair of submersible pump <input type="checkbox"/> Repair of diesel pump <input type="checkbox"/> Repair of Generator <input type="checkbox"/> Well Cleaning by air-lifting or submersible pump <input type="checkbox"/> Well Cleaning by bailing, swabbing, brushing <input type="checkbox"/> Well Cleaning by high pressure fracturing <input type="checkbox"/> Well Cleaning by acid treatment <input type="checkbox"/> Others (Pl)
12	What do you want to learn for the well management? Please check the items in the right.	<input type="checkbox"/> Repair of submersible pump <input type="checkbox"/> Repair of diesel pump <input type="checkbox"/> Repair of Generator <input type="checkbox"/> Record Keeping of Drilling Work <input type="checkbox"/> Record Keeping of Pumping Test Work <input type="checkbox"/> Record Keeping of Pump Installation <input type="checkbox"/> Planning of Well Investigation <input type="checkbox"/> Planning of Well Maintenance & Rehabilitati
13	Is there well monitoring activities in your state? If it is not sufficiently carried out, please specify the reason.	<input type="checkbox"/> Yes, Sufficiently <input type="checkbox"/> Yes, but not sufficiently <input type="checkbox"/> No activities Reason: ()
14	Is there well rehabilitation activities in your state? If it is not sufficiently carried out, please specify the reason.	<input type="checkbox"/> Yes, Sufficiently <input type="checkbox"/> Yes, but not sufficiently <input type="checkbox"/> No activities Reason: ()

APPENDIX-8B QUESTIONNAIRE FOR TRAINEES (FINAL INTERVIEW)

The Final Interview Paper for Trainees – “Well Management”

Date:

Name of trainee:

State:

Present Position:

Detail of Work:

Name of interviewer:

1 . The training

- (1) Please tell us your opinion about this training.

- (2) Please tell us the points to be improved in the future training.

- (3) Was 2-week training enough for you?

- (4) Do you want to participate in the next PWCT training?

- (5) What kind of training do you expect in future?

- (6) How and when will you report to your boss or director the contents and results of this training?

- (7) How and when will you review this training contents?

Thank you very much for your cooperation.

Results of 1st Interview – Well Management (1st)

Present Position and Job	Trainees No.																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1 Major Work of your Department	Selection																		
	Planning		x	x	x	x	x	x	x	x	x	x							
	Investigation																		
	Design	x																	
	Construction Work (Practical)																		
	Construction Work (Supervising)	x																	
2 Your Own Work	Maintenance																		
	Rehabilitation																		
	Periodical Check of WSS	x																	
	Others																		
	Monitoring & Data Interpretation																		
	Management of well																		
3 Are you Chief of your department and/or chief?	Planning			x	x	x													
	Investigation																		
	Design	x	x																
	Construction Work (Practical)																		
	Construction Work (Supervising)	x																	
	Maintenance																		
4 How many water yards with the well and motorized pump in your water yard's not working?	Rehabilitation																		
	Periodical Check of WSS																		
	Others																		
	yes (how many members?)	6			45														
	no	450	600	0	180	500													
	%	30%	15%		15%	50%	20%	40%											
5 What is the percentage of the water yard's not working?	Management of well																		
	Monitoring & Data Interpretation																		
	Management of labours																		
	Others																		
	yes (how many members?)																		
	no	15	25	25	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
%	40%	0%	30%	25%	30%	40%	35%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%	

Results of 1st Interview – Well Management (1st)

Question	Trainee No.																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
11 Your idea of the most important subject for the rehabilitation of water yard																			
Selection																			
Repair of submersible pump																			
Repair of diesel pump																			
Repair of Generator																			
Well Cleaning by air-lifting or submersible pump																			
Well Cleaning by bailing, swabbing, brushing																			
Well Cleaning by high pressure fracturing																			
Well Cleaning by acid treatment																			
Others																			
12 What do you want to learn for the well management?																			
Repair of submersible pump																			
Repair of diesel pump																			
Repair of Generator																			
Record Keeping of Drilling Work																			
Record Keeping of Pumping Test Work																			
Record Keeping of Pump Installation																			
Planning of Well Investigation																			
Planning of Well Maintenance & Rehabilitation																			
Well Cleaning by air-lifting or submersible pump																			
Well Cleaning by bailing, swabbing, brushing																			
Well Cleaning by high pressure fracturing																			
Well Cleaning by acid treatment																			
Others																			
13 Well monitoring activities in your state																			
Yes, Sufficiently																			
Yes, but not sufficiently																			
No activities (reason)																			

Results of 1st Interview – Well Management (1st)

Question	Trainee No.																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
14 Well rehabilitation activities in your state	x								x	x		x	x		x				
Selection Yes, Sufficiently		x																	
Yes, but not sufficiently No activities (reason)		x	only certain locations	lack of materials	lack of equipment	x	x	x			x (no machine)			x (lack of materials)			x	x	x
Well Management																			

APPENDIX-9B RESULTS OF THE QUESTIONNAIRE (FINAL INTERVIEW)

Results of Questionnaire concerning Training System

No.	1. Opinion about the Training	2. Points to be improved	3. Were two weeks for the training was enough?	4. Intention to attend the next training	5. Requests	6. Report to your superiors	7. Review of the contents of the training
1	Very good	1) duration was short 2) practical training of air-lifting and rehabilitation are needed	more than 3 weeks	yes	Borehole logging, pumping test analysis	reporting	during work and in a spare time
2	It improved my ability in the various fields (hydrogeology, drilling, design, well test, ...)	The training of geophysical survey, borehole logging, water quality analysis is needed.	more than 3 weeks	yes	Applied geology	reporting	in a spare time
3	The idea of the training was good, but the explanation way of some lecturers had problems.	The contents of more applications and trouble shooting are needed.	more than 3 weeks	yes	More detailed contents, analysis using computer	reporting	in a spare time
4	I think that this training is very important for all the engineers relating to the well.	None.	two weeks were enough	yes	Well development, well camera, well design	after 1 week	after 2 weeks
5	The idea of the training course is excellent and useful, but the concrete contents and the lecturer's experiences shall be reconsidered.	1) Library and internet in the accommodation 2) improvement of food 3) improvement of training contents and lecturers 4) Improvement of toilet and shower	two weeks were enough	yes	Groundwater modeling (including evaluation, monitoring, operation & maintenance)	after 1 week	in the office and during the field work
6	More practical training is needed.	Pre-information of detailed training contents	more than 3 weeks			Report to my boss and discuss	
7	It was a good occasion to improve the skills of myself and all the field engineers.	Training of geological survey, fishing, management using computer is needed.	two times per year of two weeks training	yes	Same contents, but more practical training (well camera, borehole logging)	reporting	7:00 to 10: in the night and 7:00 to 8:30 in the morning
8	I could obtain the knowledge concerning the well and water yard.	The training of the monitoring the water yard is needed.	two weeks were enough	yes	Same contents, but more advanced training	reporting by field work and pictures as soon as possible	use training documents as a reference
9	More detailed information concerning the well and the water yard is needed.	More detailed contents are needed.	not enough	yes	More practical training	explanation using the textbook	use training documents as a reference
10	It was good training course to become a better manager.	1) More than 3 weeks of duration is needed. 2) More practical training at the workshop.	not enough	yes	Operation & Maintenance (submersible pump, control panel, diesel engine)	reporting	in a spare time

Results of Questionnaire concerning Training System

No.	1. Opinion about the Training	2. Points to be improved	3. Were two weeks for the training was enough?	4. Intention to attend the next training	5. Requests	6. Report to your superiors	7. Review of the contents of the training
11	Very good. I think I can transfer the knowledge of the pump and the diesel engine to my colleagues and labours.	more training period and practical training	more than 3 weeks	yes	training of well management and monitoring	reporting and explanation	in a spare time, reviewing carefully all the contents
12	The contents was appropriate to me and I enjoyed them. They were useful for the water yard management and the database making.	more practical training	not enough	yes	practical training of geophysical survey and advance training of tools and materials	reporting and explanation	in a spare time
13	I could increase the knowledge which was not my speciality. It was useful.	1) more advanced contents and practical training 2) the lecturers shall be qualified and well experienced	two weeks were enough	yes	practical training using the equipment of well development and pumping test	reporting with training documents	every day in a spare time, and each time necessary, reviewing the training documents
14	I could improve my ability through the training.	more practical training	not enough	yes	training of well management equipment (rehabilitation, pump, geophysical survey, computer, well camera, well design etc.)	reporting	in a spare time
15	I could increase the knowledge concerning the well management.	more training period and practical training	two weeks were enough	yes	practical training of well camera, geophysical survey, well rehabilitation and well design	reporting	after going back
16	It was very good.	more training period and more global practical training	not enough	yes	practical training of geophysical survey, well design and well camera	after go back to the state	from now, by the next training
17	Good.	more global practical training, more practical training of diesel engine, well drilling, shieve analysis	two weeks were enough	yes	training of geophysical survey, well logging, well camera	reporting	from now, by the next training
18	It was good experience to become a well manager.	more practical training	more than 3 weeks	yes	training of water distribution and rain water harvesting	reporting	in a spare time
19	I could increase the knowledge concerning well management.	qualified lecturers, more practical training	two weeks were enough	yes	water distribution network and purification	reporting after going back	after going back

ANNEX-3. Training Evaluation Sheet

The evaluation sheet of the training course

Course Name		Well Management	Training Date		Time				
Trainee Name			Trainee Name		Trainee No.				
Organization Name			Position		Evaluation				
No.	Item	Questionnaire Contents			A	B	C	D	E
1	Introduction to a PC	Was the lecture plain?							
2		Were the teaching materials plain?							
3		Was the explanation of the lecturer good?							
4		Did this lecture help you?							
5	Data Management	Was the lecture plain?							
6		Were the teaching materials plain?							
7		Was the explanation of the lecturer good?							
8		Did this lecture help you?							
10	Fundamental of Database	Was the lecture plain?							
11		Were the teaching materials plain?							
12		Was the explanation of the lecturer good?							
13		Did the lecture help you?							
14	Application of Database	Was the lecture plain?							
15		Were the teaching materials plain?							
16		Was the explanation of the lecturer good?							
17		Did the lecture help you?							
18	GIS	Was the lecture plain?							
19		Were the teaching materials plain?							
20		Was the explanation of the lecturer good?							
21		Did this lecture help you?							
22	Geoprocessing	Was the training place appropriate for you?							
23		Was the training equipment satisfactory for you?							
24		Was the grouping size for practical training appropriate for you?							
25		Were you able to really touch and operate in training?							
26		Did the lecturer and the assistant support you?							
27		Did this practical training help you?							
28	Practical Training at N.Co.M.W.E	Was the training place appropriate for you?							
29		Was the training equipment satisfactory for you?							
30		Was the grouping size for practical training appropriate for you?							
31		Were you able to really touch and operate in training?							
32		Did the lecturer and the assistant support you?							
33		Did this practical training help you?							
34	Comment								
	* A	Excellent							
	B	Good							
	C	Fair							
	D	Poor							
	E	Very poor							

ANNEX-4. Lecturer Evaluation Sheet

The evaluation sheet of the lecturer at training

Course Name	Well Management (1st)	Training Date		Time			
Lecturer Name		Trainee Name		Trainee No.			
Training Place		Subject Name		Evaluation			
No.	Item	Questionnaire Contents	A	B	C	D	E
1	Basic behavior	Did the lecturer hold a lecture calmly?					
2		Did the lecturer do a well-controlled lecture?					
3		Did the lecturer show a good feeling and sympathy for a trainee?					
4		Did the lecturer at training do eye contact?					
5	Speech	Were the size and the tempo of the voice of the lecturer at training appropriate?					
6		Did the lecturer emphasize the important matter?					
7		Did the Lecturer confirm your understanding on most important matter repeatedly?					
8		Did the lecturer do plain expression?					
9		Did the lecturer at training push forward a lecture while confirming the understanding of the trainee?					
10	Development	Did the lecture at training go along smoothly?					
11		Did the lecturer inform you about the final goal and objective of the lecture?					
12		Did the contents of the lecture have consistency?					
13		Did the lecturer give direction to trainees of the right pages which were talked in the lecture?					
14		As for the lecture of the lecturer, was the focal point summed up?					
15		Did the lecturer answer for question and doubt from trainees precisely?					
16	Time	Was the lecturer conscious of time during a lecture?					
17		Was not there a problem for distribution at the time of the lecturer at training?					
18		Did the lecturer at training start a lecture on time?					
19		When time was short, did the lecturer at training adjust it appropriately?					
20	Training tools	Did the lecturer at training utilize PowerPoint and a slide effectively?					
21		Was it easy to understand the text which a lecturer at training distributed?					
22		Was the utilization of the document which the lecturer distributed appropriate?					
23	Comment						
	* A	Excellent					
	B	Good					
	C	Fair					
	D	Poor					
	E	Very poor					

ANNEX-5. Lodge Evaluation Sheet

The evaluation sheet of the accommodations

Course Name		Well Management	Evaluation Date	Evaluation *							
Room No.		Trainee name									
Lodging Period		Trainee No									
No.	Item	Questionnaire Contents					A	B	C	D	E
1	Reception	Was the reception smooth?									
2		Was the correspondence of the receptionist good?									
3	Bed Room	How was the environment of the room?									
4		How was the equipment of the room?									
5		Was size of the room enough?									
6	Dining Room (Restaurant)	How was the environment of the dining room?									
7		Was the dining room hygienic?									
8		Was the kitchen hygienic?									
9		Was equipment of a dining room and the kitchen enough?									
10	Food Service	Was quantity of the meal enough?									
11		How about the quality of the meal?									
12		Was the food service any delay?									
13	Toilet Shower	Were the toilet and the shower hygienic?									
14		Was number of toilet and showers enough?									
15	Recreation Room	How was the environment of the recreation room?									
16		Were you satisfied with television and a magazine?									
17		Was the recreation room hygienic?									
18	Comment										
* A		Excellent									
B		Good									
C		Fair									
D		Poor									
E		Very poor									

ANNEX-6. Final Examination and Modeled Answer

Final Examination of O & M of Water Treatment Plant

Q-1 What is function of thermal relay in the control panel?

- A. To detect over current and shut off the circuit**
- B. To detect phase failure and warning
- C. Same function of switch
- D. To detect high atmospherically temperature and shut off the circuit

Q-2 Why are there use star-delta or auto transformer start at pump starting?

- A. When pump is stating, high voltage occurs
- B. When pump is stating, high current occurs**
- C. When pump is stating, earthling occurs
- D. When pump is stating, power factor is very low

Q-3 Sometimes direct start method also is using. What case are they using?

- A. Big capacity of pump
- B. Medium capacity of pump
- C. Small capacity of pump**
- D. Only compressor starting

Q-4 Indication of ampere meter is very high compare to usual time, what is happen?

- A. Bigger load is coming**
- B. Smaller load is coming
- C. High voltage is coming
- D. Main breaker is problem

Q-5 What is function of main breaker?

- A. To detect high current and shut off the circuit
- B. To switch off the circuit manually.
- C. Both A and B**
- D. To switch on and off the motor directly

Q-6 Which is error about characteristic of water ?

- A. Water is small compressible, but usually hydraulic calculation is neglect
- B. Water density is 1 kg/m³** (1000kg/m³)
- C. Actual water has viscosity
- D. Temperature of max water density is 4 C

Q-7 Which is error about pressure?

A. Pressure is proportionally increased water depth

B. Pressure at same point depends on the direction

C. If density is changed, pressure is also changed

D. Pressure of 1m water depth is about 9.81 KPa $p=\rho gh=1000 \times 9.81 \times 1=9810\text{Pa}$

Q-8 Canal width is 2m, water depth is 1m and average velocity is 2m/s. How much water is flowing ?

A. 120 m³/min

B. 240m³/min

$A=2 \times 1=2\text{m}^2$, $v=2 \times 60=120\text{m}/\text{min}$, $Q=A \times v=2 \times 120=240\text{m}^3/\text{min}$

C. 480m³/min

D. 600m³/min

Q-9 Diameter of pipe is changed double bigger, how much velocity is changed?

A. Increase double

B. Increase 4 times

C. Same as before

D. Decrease double

E. Decrease 4 times

$A_1 \times v_1 = A_2 \times v_2$, $v_2 = (A_1/A_2) \times v_1$

$(A_1/A_2) = (\pi/4)D_1^2 / (\pi/4)D_2^2 = D^2 / (2D)^2 = 1/4$

Q-10 What is purpose of orifice uses?

A. To measure pressure

B. To measure density of water

C. To measure water weight

D. To measure flow rate

Q-11 What is error about Bernoulli's theorem and head loss

A. Potential head + Pressure head + velocity head = constant at ideal fluid

B. Head loss is proportioned pressure (velocity squared)

C. If two point of pipe is same elevation, potential head is also same

D. Head loss is no consideration in ideal fluid

Q-12 What does correct rectangle weir?

A. Flow rate is proportioned height squared

B. Flow rate is proportioned height power 1.5 (power^{3/2})

C. Flow rate is proportioned height power 2.5

D. Flow rate is proportioned height cubed

Q-13 Pipe diameter is 1000mm, velocity is 2m/s and there is 90 degree elbow. How much is the force at the elbow?

$$F = \rho \cdot Q \cdot v = 1000 \times (\pi/4) \times 1^2 \times 2 \times 2 = 3140\text{N}$$

Q-14 Installing smaller diameter pipe in pumping system results in reduction in

- A. Static head
- B. Frictional head
- C. Flow rate**
- D. Velocity

Q-15 Which is pump installation mistake ?

A. Installation of pump is above 10m from suction water level

- B. Pressure gages are installed suction and delivery pipe
- C. Water meter is installed delivery pipe
- D. Installation of pump is below 100m from elevated tank

Q-16 If flow rate is increased in centrifugal pump by valve operation,

- A. Pump head is fluctuated
- B. Pump head is no change
- C. Pump head is decreased**
- D. Pump head also is increased

Q-17 Why we should calculate NPSH ?

- A. There is limitation of flow rate principally
- B. There is limitation of delivery head principally
- C. There is limitation of velocity principally
- D. There is limitation of suction head principally**

Q-18 Why they use parallel pump operation at intake ?

- A. Adjustment of pressure
- B. Adjustment of suction head
- C. Variation of river water level
- D. Adjustment of flow rate**

Q-19 Why slow sand filter is difficult to operate in Sudan ?

- A. High pH
- B. High artificially polluted water
- C. High turbidity**
- D. High operation cost

Q-20 Purpose of Jar-test is

- A. To find optimum chlorine dosage rate
- B. To find optimum filter operation
- C. To find optimum coagulant dosage rate**
- D. To find optimum pump operation

Q-21 Generally which parameter is ignored to measure in Sudan

- A. pH
- B. Residual chlorine
- C. Radio active**
- D. Turbidity

Q-22 What does correct about Nile river ?

- A. Resource of White Nile is from Ethiopia (Lake Victoria)
- B. Resource of Blue Nile is from Lake Victoria (Ethiopia)
- C. July and August is high turbidity**
- D. Down stream of Nile river is Japan (Egypt)

Q-23 What is main purpose of pre-chlorination ?

- A. pH adjustment
- B. To keep residual chlorine
- C. Facilitation of coagulation
- D. To prevent occurrence of algae**

Q-24 Flow rate is 500m³/h, two filter 5m x 10m each. How much is filtration velocity?

- A. 100m/day
- B. 120m/day** $F_v = Q/A = 500 \times 24 / (5 \times 10 \times 2)$
- C. 150m/day
- D. 200m/day

Q-25 Flow rate is 1000m³/h Clarifier inner diameter is 8m outer is 24m How much is surface loading? (The unit is mm/min)

41.5mm/min

Q-26 Flow rate is 1000m³/h Chlorine gas (100% concentration gas) dosage is 0.02kg/min. How much is Chlorine dosage rate? (The unit is mg/litter)

1.2mg/litter

Q-27 Flow rate is 500m³/h PAC (25% concentration liquid) dosage is 250ml/min. How much is PAC dosage rate? (The unit is mg/litter)

7.5mg/litter

Q-28 What is different from treatment method at Soba and Kh north plant ?

- A. There is using Alum at Soba
- B. There is liquid chlorination at Soba
- C. There is using multi layer filter at Soba

D. There is pre-sedimentation basin at Soba

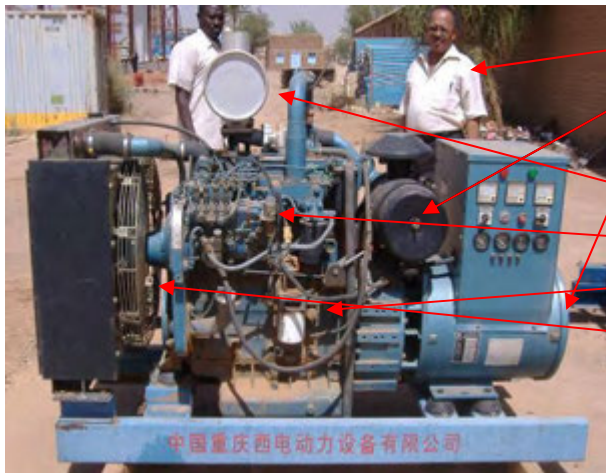
Q-29 Coagulation process is

- A. Only rapid mixing
- B. Only slow mixing

C. First rapid mixing, second slow mixing

- D. First slow mixing, second rapid mixing

Q-30 This is picture of generator, select parts of name and the function



	Name	Function
A	(5)	(2)
B	(2)	(3)
C	(3)	(1)
D	(7)	(4)
E	(4)	(5)
F	(6)	(6)
G	(1)	(7)

Name of generator

- 1. Radiator, 2. Air filter, 3. Alternator, 4.Engine, 5. Lecturer, 6. Oil filter,
- 7. Exhaust manifold and Silencer

Their function

- 1. To generate electricity, 2. To teach generator, 3. To clean suction air,
- 4. To increase power and reduce sound, 5. To prime, 6. To clean oil, 7. To cool engine