Annex 4.10

Report on the training on database management, GIS application and performance assessment

Federal Democratic Republic of Ethiopia

Ministry of Water Resources

Food and Agricultural Organization of the United Nations

Project: Strengthening national water monitoring capacities, with emphasis on agricultural water management (GCP/GLO/207/ITA)

Training workshop on irrigation management, Performance Assessment and Agricultural Water Management database system

2-4 November, 2009

Adama Ras Hotel, Adama

By Dr. Girma Gebre Medhin, Facilitator

1. Introduction

The training is a capacity development intervention in irrigation water management implemented jointly by the Ministry of Water Resources and the FAO. Key experts and professionals selected as participants of the training workshop were drawn from the Ministry of Water Resources (MoWR), the Ministry of Agriculture and Rural Development (MoARD) Regional Bureaus of Agriculture and Rural Development (BoARDs), Basin Authorities----- Irrigation engineers, Water resources engineers, soil scientists, Agronomists, irrigation Agronomists with diverse experiences in irrigation and irrigation water management have participated in the training

2. Training Methodology

The training was prepared to be conducted in a participatory manner in which lectures were combined with brain-storming and discussion of issues and subjects. Pre-prepared training modules with brief theoretical notes, illustrations and Schemas were used in the training allowing participants to determine the intensity of discussions and mutual learning on specific areas they attach particular importance to. The Modules prepared and used for the training were the following:

1. Crop and irrigation water requirement
2. Irrigation scheduling
3. surface irrigation systems
4. Operation and maintenance of irrigation schemes
5. Irrigation performance assessment
6. guidelines for AWM

Much effort was made during the training to relate discussions to practical experiences, challenges and constraints related to lack of know-how and skill in the different areas of irrigation water management. A field visit organized to the Wonji-Showa large-scale irrigation scheme (Sugar estate) has provided the opportunity for participants to relate their discussions and deliberations to reality on the ground.

3 Training Evaluation

3.1 Training Impact

Trainees were made to respond to carefully selected questions related to major training topics and issues before the commencement of the training as a means of gauging knowledge and skill levels of participants. This same list of questions was again given at the completion of the training program to participants for their responses. The proportion of the trainees who responded correctly to any of the questions varied from a minimum of 12.5% to 68.8% before the training and 37.5% to 100% after the training. On average, the correct answers to the questions changed from abut 31% to about 71% (Table 2) below) This indicates that the training has considerably contributed to the enhancement of knowledge, skill and information levels of participants, as could be evidenced by the considerably higher scores attained by the participants after completing the training.

Table 2: Assessment of the Knowledge gained by the participants before and after training

Questions	Before Training	After Training	% of

	Correct	%	Correct	%	Baseline
1. What factors influence irrigation water requirement?	11	68.8	16	100.0	45
2. What methods do you use for estimating crop water requirement?					
3. Do you use CROPWAT? If yes, any observation on using it					
4. What factors determine size of irrigable area?	6	37.5	14	87.5	133
5. What is irrigation duty?	5	31.3	12	75.0	140
6. List types of irrigation efficiencies	4	25.0	12	75.0	200
7. What does irrigation scheduling mean?	3	18.8	13	81.3	333
8. What are the common approaches for irrigation scheduling	7	43.8	14	87.5	100
9. What determine irrigation scheduling?	5	31.3	13	81.3	160
10. If 24-hr irrigation is reduced to 16-hr irrigation, the corresponding change in irrigation duty is will be __	4	25.0	7	43.8	75
11. Water saving can only be possible during peak water requirement: Yes □ No □	8	50.0	16	100.0	100
12. What do you know about soil water holding capacity, field capacity and permanent wilting point	8	50.0	14	87.5	75
a) Soil water holding capacity:					
b) Field capacity:					
c) Permanent wilting point:					
13. Where do you place seeds in furrows in the following conditions	7	43.8	14	87.5	100
a) Saline					
b) Waterlogging					
c) Water shortage					
14. What is irrigation performance?	4	25.0	14	87.5	250
15. Please list some irrigation performance measures	2	12.5	12	75.0	500
Total/average	**74**	**30.8**	**171**	**71.3**	**131**

3.2 Evaluation of content and delivery of the training

A pre-prepared training evaluation questionnaire was also completed by the trainees to evaluate the different aspects of the training. As could be seen from the summarized evaluation of the training, the training has been perceived as a success by participants.

Summary of Evaluation Results of the Training

A 1- 5 scale for evaluating the different aspects of the training including preparatory work, delivery and outcomes. Score 1 represents strong disagreement with the statement while 5 represent complete concurrence to the statement.

The content, preparation, and delivery the training facilities and venue as well as the overall satisfaction were given high scores. The training techniques as well as mastery of the profession of the trainer obtained special recognition and appreciation by training participants

Many have recommended the training to be scaled up and recognized the contribution of such training towards the improvement of irrigation water management in the country. Training participants have discussed and deliberated on issues of special importance during and after the conclusion of the training and summarized their findings and recommendations including way-forward suggestions.

Table 3: Summary of Evaluation Results of the Training

Item No.	Evaluation items by category	Evaluation			Scale	
		1	**2**	**3**	**4**	**5**
I	***Contents of the Training***					
1.1	The training has relevance to my work and responsibility			1	4	14
1.2	Items included in the training are properly selected			1	5	14
1.3	The training addresses well identified knowledge and skill gaps				3	16
1.4	The Training will considerably help me to better perform my current duties				6	13
1.5	The training will for sure help me in the assignments and responsibilities I am going to assume			1	9	10
1.6	The training was less technical and complicated to understand and grasp	16	1		2	
II.	**Preparation**					
2.1	Objectives to be attained through the training are clearly elaborated				8	11
2.2	The materials are pitched at the right level				6	13
2.3	The contents of the training sessions are well structured and sequenced				7	12
2.4	Contents of the training are prepared in understandable and simple manner to participants				4	14
2.5	Modules and training aids were well prepared				4	15
2.6	The background material was relevant, well prepared and helpful				2	17
2.7	The training is prepared to fill existing crucial knowledge and skill gaps				5	13
2.8	Training needs of target groups are well considered				8	11
2.9	Challenges and constraints in anticipated new tasks are well considered			1	7	11
III.	**Delivery**					
3.1	The training was well balanced in terms of lecturing and encouraging participation by trainees			1	3	16
3.2	Prepared modules training aids (including visualization techniques) and live examples were used effectively		1		5	13
3.3	Effort has been made to use practical examples			1	3	14
IV.	**The trainer**					
4.1	The trainer is knowledgeable about the training items				1	17
4.2	The trainer is knowledgeable in training delivery techniques and methods				1	17
4.3	The trainer is well prepared for the sessions				2	16
4.4	The trainer to views and opinions of training participants				1	17
4.5	The trainer managed well within the time allocated				2	16
V.	**Training facility**					
5.1	The training venue is conducive to the training.		1	2	4	12
5.2	The training is conducted in a convenient location			3	4	13
5.3	Tools and equipments worked well during the sessions				6	11
VI	**Level of satisfaction**					
6.1	The training has achieve the intended targets				4	13
6.2	I am satisfied with the additional knowledge I gained from the training				2	16
6.3	I will apply the knowledge I gained and share it with my work colleagues				6	12
6.4	I am confident that the training has prepared me well to assume upcoming work/management responsibilities				4	14
6.5	I recommend the training to be given to a wider target group.				2	16

TIME TABLE FOR TRAINING

1. Irrigation water management 2. Irrigation performance assessment
3. Use of Web-based AWM Database

2-14 November 2009, Adama Ras Hotel, Nazareth

Time: Morning 8:30 am-12: 30 pm Coffee/tea breaks at 10:30 am and 3:15 pm for 20 minutes
Afternoon 2:00-5:00 pm
Lunch break at 12:30 -2:00 pm Facilitator: Girma G/Medhin (Dr.)

Date	Time	Subjects Topics Major Contents	Trainer
Nov 2	Before noon	**Introduction** • Welcome speech • Briefing on training objectives • Self-introduction (experience and expectation of the training) • Modality of the training and setting rules • What GCP/GLO/207/ITA is providing	Dr. Grima G/Medhin Yibeltal Tiruneh
	Afternoon	Irrigation water management practices in Ethiopia	Yibeltal Tiruneh/ participatory discussion
Nov 3		**Module 1: Crop and irrigation water requirements** • Climatic factors • Cropping pattern • Computation method • Examples and exercises	Yibeltal Tiruneh
Nov 4		**Module 2: Irrigation Scheduling** • Soil and water relationship • Determining irrigation schedules • Examples	Yibeltal Tiruneh
Nov 5		• Exercise • CROPWAT/ETo Calculator	Yibeltal
Nov 6		**Module 3: Surface irrigation systems** • Phases of surface irrigation (hydraulics of surface irrigation) • Surface irrigation methods	Yibeltal Tiruneh
Nov 7		**Field visit**	Oromia water bureau
Nov		**Sunday break**	
Nov 9		**Module 3: Surface irrigation systems** • Field practices (depends on availability of instruments)	Yibeltal Tiruneh
Nov 10		**Module 4: Operation and maintenance of irrigation schemes** • Organizational aspect of O & M • Operation- Water distribution • Maintenance	Yibeltal/Yalew Belete (MoARD)
Nov 11		**Module 5**: **Irrigation performance assessment (cont'd)** • Objective • Framework of performance assessment • Performance measures and methodology	Yibeltal Tiruneh
Nov 12		• **Module 5: Continued** • Performance indicators and their computation • Methodology of performance assessment (RAP)	Yibeltal Tiruneh/Yaew Belete
Nov 13		**Module 6: Guidelines for AWM Database** Questionnaire • Monitoring and Evaluation • Guidelines for survey and basin profile preparation • Cropping pattern database • Cropping pattern for Awash Basin • Methodology for estimating indicators	Yibeltal Tiruneh
Nov 14	Half day	• Web-based AWM data base system • Application of GIS • Evaluation of training, certification and closing	Belay Seyoum Facilitator

Recommendations by the participants to the institutions they represent

We, the participants of the training have as senior experts in the sub sector have discussed during the course of the training on major issues that need to be considered at local as well as national levels. We have also agreed to bring these issues to the attention of the respective institutions we are represented from.

Short report on the training for senior experts jointly carried out by the MoWR and the FAO

1. Content of the training

The training main topics were:

- Irrigation water management
- Operation and maintenance
- Performance assessment
- Drainage and Salinity
- Monitoring and Evaluation of water management

2. Composition of the training participants

Agronomists, soil scientists, agricultural and water resources engineers drawn from the Ministry of Water Resources, the Ministry of Agriculture and Rural Development Bureaus of Agriculture and Rural Development, the Awash basin Authority Addis Ababa and DireDawa Administrations have participated in the training

3. Training Methodology

- The training has combined theoretical practical experiences and was particularly focused on challenges and problems in irrigation water use
- Pre-prepared training manuals, computer programs, case studies and field visits were used in facilitating the training
- With particular emphasis to soil and plant interactions, crop water requirement calculations, planning of irrigation development, the training has created better understanding in that it has shown all of these should be undertaken in a participatory manner.

4. Results of the training

- Has enabled trainees to better identify problems and challenges in irrigation water use
- Has created understanding on socio-economic factors not well considered before
- Has shown that operation and maintenance need to be highly focused on
- Has shown that irrigation water use need to be carried out in an integrated manner
- Has revealed the relationship between water productivity and growth in yield and production

5. Gaps identified based on knowledge and understanding gained through the training

5.1 irrigation water management

- Lack of awareness at the different levels on productive irrigation water use
- Shortage of gauging instruments and facilities to support irrigation water use
- Focus of irrigation design only on water supply
- Neglect of drainage aspects in irrigation
- Lack of participation by beneficiaries in irrigation studies
- Lack of effective irrigation between irrigation and watershed management
- Poor fallow-up and control on salinity
- Less focus on pressurized irrigation

5.2 Operation and maintenance

- Lack of timely maintenance and up-keep of irrigation structures
- Lack of strong water users' associations
- Low ownership feelings and dependency
- Destruction of irrigation structures by free-grazing cattle.
- Poor handing over of small-scale irrigation schemes
- Lack of operation and maintenance supported by regular budget allocation
- Lack of harmonized operation and maintenance manual.

5.3 Institution

- Lack of stream-lining and coordinated action of stakeholders
- Frequent change in government structure related to irrigation

5.4 Extension

- Lack of irrigation extension
- Shortage of trained manpower at the different levels
- Lack of irrigation related research outputs
- Lack of consistent timely supply of inputs in the required quality and quantity
- Lack of post-harvest technologies
- Lack of lining irrigation based production to markets

5.6 Performance Assessment

- Lack of proper monitoring and evaluation of the statuses of irrigation schemes
- Lack of information on irrigation schemes
- Performance studies not conducted with the participation of all relevant experts

5.7 Policy related issues

- Lack of legal framework for the establishment of Water User Associations (WUA)
- Lack of focus on the implementation of policies relevant to irrigation

6. Issues that require increased attention

6.1 Related to water use

- Trainings and skill up grading based on improved irrigation water use at the different levels
- Supplying and installing gauging instruments for irrigation schemes
- Seeking participation of beneficiaries and pertinent professionals during the design and study phases
- Focusing on information handling and management
- Provision of legal framework and supporting the organization of WUAs
- Follow-up on the implementation of national policies relevant to irrigation and endeavoring to close existing gaps
- Supporting the scaling-up of efficient irrigation technologies
- Undertaking watershed management activities prior to the implementation irrigation infrastructure development
- Strengthening the popularization of efficient technologies taking in to account the likely future shortage of water due to the impact of climate change

6.2 Developing a self-standing institutional arrangement and structure for irrigation development

6.3 Regulation of all irrigation development activities by government and none government actors

6.4 Performance Assessment

- Conducting national level study involving all professionals
- Establishing stakeholders' forum following the study

6.5 Guiding all those participating in irrigation development to act in a coordinated manner

6.6 Provision of regular training tailored to solving problems at operation levels to all involved in operation of irrigation schemes