Annex 4.12

Final report of the training programme – Ethiopia

Strengthening National Water Monitoring Capacities with Emphasis On Agricultural Water Management (GCP/GLO/207/ITA) Ministry of Water Resources

Evaluation of the Training Programme

By Dr. Girma Gebre Medhin

Abstract

The report provides a summary of the training activities by the project in Ethiopia:

1. Training in preparation for conducting the baseline survey (1 day course, total of 18 participants in two regions),
2. Training in water resources modeling (10 day course, 19 participants, 10 from the regions, others from national and sub-national authorities,)
3. Training in irrigation management, performance assessment and agricultural water management database system (12 day course, 18 participants from national and sub-national authorities.)

The training contributed to increasing capacities at national and regional levels with regard to data collection, data interpretation, modeling, GIS, and data dissemination in the field of water resources and their use in agriculture, as well as increasing knowledge of laws, institutions and policy options in agricultural water management.

I. Introduction and Background

One among the five anticipated outputs of the project was increasing capacities at national and regional levels with regard to data collection, data interpretation, modelling, GIS, and data dissemination in the field of water resources and their use in agriculture, as well as increasing knowledge of laws, institutions and policy options in agricultural water management. Initiating and conducting trainings based on identified gaps to people who will be involved in the generation as well as utilization of data and information has been among the actions determined during the launching of the project in December, 2008.

In line with the project objective and determined action plan, the following three major training interventions were implemented:

1. Training in preparation for conducting the baseline survey
2. Training in water resources modelling
3. Training in irrigation management, performance assessment and agricultural water management data base system

II. Summary of Training Interventions

2.1 Training in preparation to conduct baseline survey

The training was aimed at providing the basic baseline survey methodologies and use of tools such as the GPS. A total of 15 woreda staff drawn from the different woredas of the North Shewa zone in Amhara Region and three senior experts from Oromia region have participated in the trainings which were conducted separately. Training providers were the FAO water use survey consultant and the head of irrigation process of the Amhara water bureau. This one-day training to each of the regions provided the trainees with the necessary basic skills of conducting survey in agricultural water use and also use of basic survey instruments and tools. Participants of the training expressed satisfaction in the training and said, 'they will be of considerable assistance to the survey exercise in directly participating and sharing their gained skills to their peers".

2.2 Training in Water Resources Modelling

This training on was give to selected experts who have met the set criteria for participation. Most participants were experts with advanced level of education who have earned their first or second degrees in water related disciplines. Participants were drawn from the Ministry of Water Resources (MoWR), the Ministry of Agriculture and Rural Development (MoARD), Regional water Bureaus and the Awash Basin Authority. A total of 18 participants, 10 from the region, 5 from the MoWR, 1 from the MoARD and 2 from the Basin Authority took part in the training.

The 10-day training was composed of 4 training topics which were delivered through a combination of theoretical lectures and practical sessions. The training culminated with a 1-day field practice.

Topics covered by the training were:

- theoretical basis of water resources planning and modelling principles (1day)
- HEC_GeoHMS- Watershed delineation and derivation of watershed attributes (1day)
- HEC-HMS Model- Hydrological Modelling system (1.5 day)
- HEC-ResSim Model – Water Resources Planning and operation Model (4.5days)
- Field practice

Different soft wares and training aids were used to facilitate the training.

According to the training evaluation carried out at the completion of the training program, content and delivery of the program as well as the training materials used including the soft wares were rated highest with 94 percent and above percentage rating of efficiency scores. Overall training efficiency was 83 percent. Participants acknowledged the importance of the training and made recommendations for its scaling up.

2.3 Training in irrigation management, performance assessment and agricultural water management data base system

This training was aimed at enhancing the capacities of experts and professionals in irrigation water management. It was a 12 days training workshop in which experts drawn from the MoARD, MoWR, regional water bureaus, Basin Authorities have participated. The training was conducted in a fully participatory manner in which participants gained additional knowledge by at the same time sharing theirs through guided discussions. Participants were Irrigation engineers, Water resources engineers, Soil scientists and Irrigation agronomists, with extensive working experiences and high-level training.

The FAO water use survey consultant provided the training supported by senior experts of the MoWR. The training was carried out with the help of pre-prepared training modules which included the following:

- Crop and irrigation water requirement
- Irrigation scheduling
- surface irrigation systems
- Operation and maintenance of irrigation schemes
- Irrigation performance assessment
- guidelines for AWM

The overall satisfaction in the training of the participants was very high. All appreciated very much the contents of the training, the preparations made towards it and the mode of delivery which they said was very much practise oriented. All of them made strong recommendations that such trainings be continued at larger scale.

III. Training completion reports

Report on Training in Water Resources Modelling

3. 1. Introduction

As per the ToR (Annex A) and contract entered into with FAO to deliver training in water resources and hydrological modelling, the training was successfully delivered from 17th August to 26th August, 2009 in the venue provided by the Ministry of Water Resources. Due to the advanced nature of the course a criterion was set, in consultation with the national coordinator, for selecting appropriate participants. The majority of the participants were either senior B.Sc or M.Sc degree holders in one of water related subjects. In terms of administrative coverage, they were drawn from the Regional State water Bureaus and the Federal MoWR, MoARD and Awash Basin Authority. The total number of participants attended the courses were 18 of which 10 were from Regional States and 5 from MoWR, 1 from MoARD and 2 Awash Basin Authority (Annex B).
The training was organized into theoretical component, model demonstration component and the practical exercise component. Belebela and Wedecha reservoir systems and the associated irrigation abstractions located around Debre Zeit were considered for the exercise session.
The subsequent section provides the training session and the participants' evaluation.

3. 2. The Training Modules and Materials

The training session covered four components and a field trip at the end of the course. It was organized to cover fully the watershed delineation, the water yield /hydrology and water resources modelling component. Each training succession was accompanied with practical exercises and evaluation of the exercise. The key modules include:

- The theoretical basis of water resources planning and modelling principles (1 day)
- HEC-GeoHMS Model – Watershed delineation and derivation of watershed attributes (1 day)
- HEC-HMS Model – Hydrological Modelling System (1.5 day)
- HEC-ResSim Model – Water Resources Planning and Operation Model (4.5 days)
- Field Practice (1 day)

The schedule of training is attached as Annex C
The following materials and software were provided to the trainees for their reference and future use on DVD.

- Global Mapper and EthioDEM (Ethiopian DEM)
- ArcView 3.1 and associated documents
- HEC-GeoHMS and associated manuals and user guides
- HEC-HMS and associated technical and user manual
- HEC-ResSim and Associated user guides, Quick start manuals
- Power point presentation
- The complete data set for Belbela-Wedecha reservoir system to be used for the exercise.

Two reservoirs with on treatment plant were visits some 30 km north of Addis Ababa. The reservoirs are for Addis Ababa water supply. The trainees were able to appreciate the different components in the planning and operation of reservoirs based on the observation and explanation by the operation staff.

3.3. Course Evaluation

The training was evaluated by the participants of the workshop. The questionnaire was designed to reflect i) the theoretical and modeling capacity of the trainers' ii) the importance of the training for personal, institutional and national benefit, iii) achievement and future use of the model, iv) the training duration v) teaching materials in v) the training material/software, vi) organization and logistics service by the organizers (See, evaluation form in Annex B). The overall training as well as the logistics service was generally rated by the trainers as outstanding with performance rating of very good and above (83%) indicating the high degree of satisfaction of the participants in the training. As shown in the table below, the participants concern was more on the limited duration of the training than other items. The participants indicate the training was highly significant (92%) and they intend to use in their future carrier (84%).

No.	Summarized Evaluation Items	E (%)	VG (%)	G (%)	P (%)	(E+VG) (%)
i	The content and delivery of the raining	66	32	2	0	98
ii	Significance of the training	71	21	6	2	92
iii	Achievement and future use of the model	20	64	11	4	84
iv	Adequacy of the duration of the training	13	46	35	7	59
v	The training materials/software	47	47	4	2	94
vi	Organization and logistics service by the Organizers (FAO, MoWR)	28	44	19	9	72
Overall training efficiency		**42**	**41**	**13**	**4**	**83**

4. Recommendation for Future Capacity Building

On the basis of the participants' response indicated from Q9 to Q11 (Annex D), the key recommendations for future capacity building are given as follows:

- Participants strongly recommended similar trainings are very essential for planning and management of the water resources of the country and shall be provided continuously

- Duration was not adequate for the training and requires additional time to grasp the concept and the operations of the model fully.

Continuing from the participants suggestions, the trainer recommends the following points for capacity building in water resources management in future

- The water yield component (the hydrological component) can be delivered as one independent module. Including the theoretical concepts and the demo and the exercises, the whole exercise may take about 7 days

- The Water Resources component – this can further be viewed into as the planning and the operation component. The planning component includes the watershed delineation, the input preparation, incorporation of the development potentials and storage facilities (if any) and may take about 12-13 days distributed into 7 days for planning and the balance for operation component.

- Both hydrologic and water resources modeling including water yield estimation (inflow estimation) and the water resources planning will take about 20 days. This can be set as a continuous training organized twice a year or once a year depending on the availability of the budget.

IV. Training in Irrigation Water Management

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

2-4 November, 2009

Adama

4.1 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

4.2 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.

4.4 Training Evaluation

4.4.1 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 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.

4.4.2 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.

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

Item No.	Evaluation items by category	Evaluation Scale				
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

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.

Annex A: List of Trainees

Participants in Training on Water Resources Modelling
August 17- 26, 2009

No	Name of Participant	Region/Federal
1	Walea Witika	Afar
2	Metkel Equbay	Tigray
3	Fthawi Embaye	Tigray
4	Zelealem Fisseha	Tigray
5	Sewnet Eshetu	Amhara
6	Melese Sintayehu	Amhara
7	Awelu Ali	SNNPR
8	Menu Abas	SNNPR
9	Assefa Herpa	Awash Basin Authority
10	Muluken Wondie	Awash Basin Authority
11	Denbelash Mulun	Oromia
12	Samuel Hussen	Oromia
13	Yalew Belete	MoARD
14	Adissu Shimekaw	MoWR
15	Tesfaye Abebe	MoWR
16	Yohannes Degu	MoWR
17	Mohammed Hassen	MoWR
18	Solomon Cherie	MoWR
19	Tesfaye Abebe	MoWR

NB: 2 were invited from Tigray but 3 turned up

Annex B: Evaluation Form: Water Resources Planning Model

No.		Evaluation Grade				
1.		**Excellent = 5**	**V. Good =4**	**Good = 3**	**Poor =2**	**Total**
	The Training Course					
1	The contents of the course	41	20	1		
1.1	The theoretical/Scientific contents	//////////////	//			16
1.2	The Conceptual framework of modelling	///////////	/////			15
1.3	The contents of the exercises	////////////	////			15
1.4	Facilitation Skills of the trainers/interaction	/////	/////////	/		15
2	Significance of the training	34	10	3	1	48
2.1	To your institutions water management operation	///////////	///	/	/	16
2.2	To your Immediate work/project	////////	//////	//		16
2.3	Importance of the course to the country	///////////////	/			16
3.	Expected Achievements	9	29	4	2	
3.1	How much have you gained from the training?	///	////////////			16
3.2	Do you think you can improve the water management issues in your region using the model?	///	//////////	/		14
3.3	What is the level of acceptance of model usage in your office/region?	///	//////	////	//	15
4	Duration of the training (if adequate = 5, if not totally inadequate= 2 or other intermediate grades)	6	21	16	3	
4.1	Adequacy of duration of each training module	///	/////	//////	//	16
4.2	Adequacy of duration for the exercises	/	//////	//////		15
4.3	Overall duration for the training	//	/////////	///	/	15
5	Teaching Materials/Logistics provided to you	25	31	5	3	
5.1	Power point materials	////////	//////		/	16
5.2	The software materials	/////////	//////			16
5.3	Teaching aids/manuals	/////	////////	//		15
5.4	Training Hall and facilities	///	////////	///	//	16
6	Other Logistic Services	19	26	12	5	
6.1	Tea break/Lunch/related services	//////	//////	///		15
6.2	Convenience of the training venue	/////	/////	////	//	16
7	The facilitation provided by FAO	/////	//////	///	//	16
8	Facilitation provided by MoWR	///	/////////	//	/	15
	Future Training					
9	Which part of the training component shall be improved?					
10	How should you think the training should be delivered in the future?					
11	Overall recommendation on future training requirement (similar or different)					

Annex C: Participants

Irrigation Management and Performance Assessment and Agricultural Management Database System

November 2- 14 / 2009, Adama

No	Name	Region	Organization	Location	Telephone No.		E-mail address
					Mobile	Office	
1	Yemane Sahlu	Addis Ababa	AA Urban Agriculture	Addis Ababa		0115 594937	
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4	Lakachew Emiru	Amhara	BoARD	BahrDar	0918 705138	0582 201508	lakemi2006@yahoo.com
5	Daniel Belaineh	Amhara	BoWRD	BahrDar	0911 064727	0582 220622	danybelay@yahoo.com
6	Tesfaye Kebede	DireDawa	BoWMines & Energy	DireDawa	0915 731939	0251 110965	tesdire@yahoo.com
7	Frew Abebe	Federal	Awash Basin Authority	Worer	0913 007240	0221 140086	frew_is@yahoo.com
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11	Engidasew Zerihun	Federal	MoWR	Addis Ababa	0911 612438	0116 611111	engida61@gmail.com
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15	Abate Mengesha	Oromiya	BoOARD	Addis Ababa	0911 865835		
16	Lemma Adane	Oromiya	BoOWR	Addis Ababa	0912 180473		lemmadane@yahoo.com
17	Getahun Reta	SNNPR	WRDB	Hawassa	0913 385390	0462 210025	getahunreta@yahoo.com
18	Habtu Mekonnen	Tigray	BoARD	Mekelle	0914 750809	0344 410840	