VI.3 Proceedings of Follow up Training (November 2009)

MINISTRY OF AGRICULTURE AND COOPERATIVES
THE REPUBLIC OF ZAMBIA

THE STUDY ON THE CAPACITY BUILDING AND DEVELOPMENT FOR SMALLHOLDER IRRIGATION SCHEME IN NORTHERN AND LUAPULA PROVINCES IN THE REPUBLIC OF ZAMBIA

PROCEEDINGS OF FOLLOW UP TRAINING

NOVEMBER 2009

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
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CHAPTER 1 RATIONALE AND TRAINING OBJECTIVES

Upon completion of the kick-off training workshop on temporary diversion weir smallholder irrigation held from 16 to 18 April 2009, the pilot project, as part of the captioned study, is being carried out by the participants of the said training workshop as well as their fellows in the prioritized eight districts in Northern and Luapula Provinces.

For the successful implementation of the pilot project, there is a due need to review and share experiences that the BEOs/CEOs and TSB officers gained on the field so that dissemination mechanism of smallholder irrigation development can be further improved. The lessons learned during the pilot project in this phase-1 study (FY2009) shall also be reflected to the implementation plan of the phase-2 study (FY2010). In this regard, a follow up workshop was held from November 4 to 5, 2009 at Kasama Farm Institutes.

The follow up workshop was an opportunity for the participants to present what they have achieved in smallholder irrigation development since the kick-off training and to prove their commitment as frontline agriculture extensionist. The main objectives of the follow-up workshop are as follows:

1. To share the progress and achievement of the pilot project in each District,
2. To identify issues/problems and those causes/effective countermeasures related to promotion of the smallholder irrigation development,
3. To gain and internalize collective lessons to further disseminate smallholder irrigation development, and
4. To know the effect of compost manure and also the method of how to make a quick making compost, Bokashi.

CHAPTER 2 TRAINING PROGRAMME AND THE PARTICIPANTS

2.1 Training Programme

The workshop was a net two-day live-in and out-activities at Kasama Farm Institute. Methodologies employed were participatory assessment of their achievement, peer-to-peer learning through interactive presentation and discussion, brainstorming, and lecture-interactive discussion as well as practice on quick making compost, so-called Bokashi, etc.

Following are the original programme and due to unforeseeable situation some modifications to the original programme were made. There was fuel shortage almost the whole Country at that time, such that Luapula group failed to start off Mansa town as planned, and thereby could not attend the Day 1 activities. They arrived at Kasama Farm Institute on the evening of Day-1 (they were supposed to arrive one day before the Day-1). Therefore, the programme was changed by undertaking Module-4 ‘A Quick Making Compost: Bokashi’ after the lunch of Day 1. Thereafter, Module 3 and Module 4, the most important parts of this workshop, followed.

Day 1 (November 4, Wednesday):

Module 1 – Program Orientation

- Registration and Pre-WS Questionnaire
- Opening, Self-Introduction, and Overview of the WS
- Contribution from the JICA Team
- Surfacing of the Participants’ Expectation

Module 2 – Output Presentation of Smallholder Irrigation Development

- Output Preparation by District (Form 1&2, & on Billboard)

Lunch Break
Output Presentation by District

Module 3 – Lessons Sharing among Participants

Problems arisen & Actions taken (Form 3, group preparation)
Proud Achievements and Events (Form 4, group preparation)

DAY 2(November 5, Thursday):

Module 3 – Lessons Sharing among Participants (Con'd)

Recapitulation (2 from the participants)
Problems arisen and Actions taken (workshop discussion)
Proud Achievements and Events (workshop discussion)
Lunch Break

Module 4 – Quick Making Compost: Bokashi

Bokashi Compost (Lecture)
Bokashi Compost (Practice)

Module 5 – Training Evaluation

Workshop Evaluation
Closing

2.2 Training Participants

This follow up workshop invited the officers who had participated in the kick-off training, together with some new comers. They are; replacements to those who had participated in the kick off training due to staff movement, fellow CEOs who have been actively participating in the smallholder irrigation development, and TSB officers at Districts which will additionally be included in the next year's pilot projects. Additional Districts are; Nakonde, Isoka in Northern Province and Nchelenge and Milenge in Luapula Province. Following table shows the summary of participants (for detail, see Attachment 2):

Table 2.2.1 Summary of the Participants for the Follow Up Workshop

Particulars	Participants	Remarks
Northern Province		
Mbala District	7 (4M, 3F)	
Mpika District	4 (3M, 1F)	
Mungwi District	5 (2M, 3F)	
Kasama District	2 (1M, 1F)	
Mporokoso District	4 (2M, 2F)	
Luwingu District	6 (6M, 0F)	
Nakonde District	1 (1M, 0F)	
Isoka District	1 (1M, 0F)	30
Luapula Province		
Kawambwa District	5 (4M, 1F)	
Mansa District	4 (3M, 1F)	
Nchelenge District	1 (1M, 0F)	TSB
Milenge District	1 (1M, 0F)	TSB
Mwanse District	1 (1M, 0F)	
Samfya District	1 (1M, 0F)	13
Northern Province	5 (4M, 1F)	Overall Management (cum trainer)
Luapula Province	1 (1M, 0F)	
Total	49 (37M, 14F)	Excluding JICA Members
Back support: JICA Study Team	3 (3M, 0F)	

Source: JICA Study Team.

2.3 Pre-training Questionnaire Result

At the beginning of the training, a questionnaire was distributed to all the trainees so as to study their expectations to the training, experiences during the activities of smallholder dissemination and the view to improve farmers' livelihood, etc. This section of the proceeding describes the results of the questionnaire.

2.3.1 Participants' Service in Government

Figure 2.3.1 shows years engaged in the government service for the participants. The mode falls in the category of 1-5 years, and then followed by a group of 16-20 years in the government service. This shows about half of the participants fall in the newly recruited groups like within 5 years. The average year in the government service is 10.3 years.

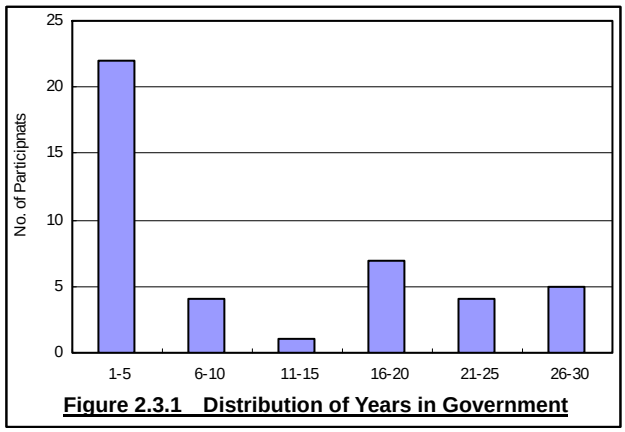


Figure 2.3.1 Distribution of Years in Government

2.3.2 Expectation from the Training

The questionnaire asked the participants what they expect from the follow up training by listing the most 2 expectations. As this was a follow up training, many participants expected 'sharing successes and challenged of the colleagues (13 votes)' as the top expectation. Table 2.3.1 summarizes the expectations which have acquired more than one vote. Followed the 'sharing successes and challenged of the colleagues' were 'plan way forward for next season (9 vote)', 'learn more progress with other District (7 votes)', 'evaluation of seasonal activities that occurred in phase 1 (6 votes)', 'gain more knowledge in smallholder irrigation development (4 votes)' and so on so forth.

Of them, 'plan ways forward for next season' was not the topic, which is undertaken in this follow up training though it acquired 2nd top expectation as 9 votes. This was explained to the participants during the surfacing session of the expectation. Logistic issues were also mentioned as 'improve logistical support (fuel and allowances), 3 votes', and 'get allowances at the end of the workshop (2 votes)'. As summary, all the expectation but 2, namely 'plan way forward for next season' and 'logistical support' were not to be undertake as the training was of follow up.

Table 2.3.1 Expectations to the Training listed by Participants

No.	Expectations	Vote
1	Sharing successes and challenges (from the colleagues)	13
2	Plan way forward for next season	9
3	Learn more progress with other Districts	7
4	Evaluation of seasonal activities that occurred in phase 1	6
5	Gain more knowledge in smallholder Irrigation Development	4
6	Improve logistical support (fuel and allowances)	3
7	Be fully knowledgeable in the implementation on the Smallholder Irrigation.	3
8	Know exactly if at all irrigation schemes will be funded	2
9	Get allowances at the end of the workshop	2
10	Know how to make Bokashi practically	2
11	Learn how the programme is going to be effective	2

Source: JICA Study Team, Pre-training questionnaire survey, administered on November 4, 2009

2.3.3 Felt-Needs in Assistance from the Government

Participants were asked in the questionnaire by 'What assistance they needed from the Government in implementing the smallholder irrigation? List two assistances'. Following table summarizes the needs with which they think they can better extend smallholder irrigation schemes. 'Transport e.g.

motorbike' was the top-need by far among others. It obtained as many as 35 replies, followed by 'allowance (17 replies)', 'improvement in fuel (8 replies)', 'working equipment (6 replies)', 'logistics support (5 replies)' which is relevant to the 1st and 2nd needs, and 'funding of smallholder irrigation schemes (4 replies), etc.

Since a BEO or CEO operates in a wide area, say about 22km x 22km square as average in the 2 Provinces, it may be natural that they listed 'transport (e.g. motorbike)' as the top-need. Allowance, they think, would work as very good incentive according to interviews to some of the participants. The amount is now ZMK 50,000 as lunch allowance, and it seems it is working as incentive rather than substitute of lunch they are to miss out during their field operation.

Table 2.3.2 Participants' Needs in Assistance from the Government

No.	What assistance do you need from the Government in implementing the smallholder irrigation? List two assistances	Reply
1	Transport (e.g. motorbike)	35
2	Allowances	17
3	Improvement in fuel	8
4	Working equipments e.g. protective clothing, cement	6
5	Logistics support	5
6	Funding of smallholder irrigation schemes	4
7	Training	3
8	Plan for the year 2010	3
9	Considering irrigation crops under FSP as they do to rain fed maize	2
10	Holding Workshop at least each quarter	1

Source: JICA Study Team, Pre-training questionnaire survey, administered on November 4, 2009

2.3.4 Problems and Efforts to Solve during the Smallholder Dissemination

The pre-training gave the participants a question of 'On your experiences as a CEO/BEO/TSB staff: Please describe the problem (s) you have faced or are facing in implementing smallholder irrigation this season'. Foremost problem was 'transport' listed by 22 participants as in the following table. This is very much relevant with the above-mentioned felt-needs in assistance from the government. The 2nd problem was 'lack of financial assistance (11 replies)' as is also pertinent to the above-mentioned 'allowance'. The 3rd problem was 'inadequate logistics (9 replies)', which is in fact a way-around of statement of the top 2 problems.

'Low turn up by farmers' was a problem listed as 4th problem (5 replies). During dry season, farmers are usually engaged in repair of houses, establishment of village infrastructure such as community school, village road, village gathering place (a relatively big round thatched house), etc. These activities sometimes collided with smallholder irrigation development, it was learnt from the participants.

Some of the participants had a problem in 'organizing farmers who had hopes of being paid after work done and inputs', as listed by 3 replies. Some programme has provided minimum wage level of payment to participant farmers and also, upon completion of work, gave out input e.g. improved seeds with fertilizer. Some farmers have experienced with these arrangements, so by nature they expected same arrangement in this smallholder irrigation development.

Table 2.3.3 Participants' Experiences on Problems

No.	On your experiences as a CEO/BEO/TSB staff: Please describe the problem (s) you have faced or are facing in implementing smallholder irrigation this season.	Reply
1	Transportation has been a problem for moving to the project site, hence monitoring is limited	22
2	Lack of financial assistance	11
3	Inadequate logistics e.g. fuel, late distribution of fuel, servicing of motor bikes	9

4	Low turn up by farmers	5
5	Working long hours without meal allowances	3
6	Seepage on the weir	3
7	Organizing farmers who had hopes of being paid after work done and inputs	3
8	Identification of site to do new development was difficult, most of them had old furrows	2
9	Women participation was poor and communication was poor	2
10	No protective attire	2
11	CEOs no implementing programs in good time	1
12	Farmers wanted to go straight in constructing permanent weir instead of temporal	1

Source: JICA Study Team, Pre-training questionnaire survey, administered on November 4, 2009

In conjunction with the problems above, the participants were also asked by 'what kind of efforts they have exercised to solve the problems'. To cope with transport problem, most of them borrowed bicycle and in cases hired it (16 replies). There were participants who sourced out of their pocket to supplement fuel (8 replies). There were 2 participants who prepared packed lunch to cope with long-hour field work forcing them to miss out lunch. This is an encouraging attitude, learnt by other participants.

On difficulty of dealing with farmers, they emphasized that the work is for community, involved local authority such as chiefs, asked assistance from District TSB officers, invited farmers to see the fellow farmers' activities, etc.

Table 2.3.4 Participants' Efforts to Solve the Problems Above

No.	Please describe what kind of efforts you have done to solve the problems (S) above	Reply
1	Use of borrowed and hired bicycle	16
2	Using personal resources to buy fuel	8
3	Organize meetings with farmers	6
4	Encourage them that it is their community we are developing	6
5	Servicing of the motorbikes	4
6	Putting sand bags which was provided by farmers and JICA and using clay soil	2
7	Involvement of Chiefs and TSB staffs	2
8	I go with packed lunch	2
9	Construction of temporal weirs	2
10	Demonstrating to the farmers how effective the technology is	2
11	Encouraging women to participant	1
12	Inviting far away farmers to see how others are implementing the program	1
13	I have provided the slashes to enable the community improve some weirs	1
14	Facilitated to farmers to buy their own inputs and trained them how to make manure	1
15	Moved through the whole stretch of stream to locate the appropriate diversion structure	1
16	Coordination of the relevant authority to work together	1
17	Wearing canvas as protective clothing	1

Source: JICA Study Team, Pre-training questionnaire survey, administered on November 4, 2009

2.3.5 Best Experiences in Implementing Smallholder Irrigation Development

They have faced many problems on the course of promoting smallholder irrigation schemes as stated above, but on the other hand they have had proud achievements, impressive event, best experiences, etc. through working together with the farmers, by overcoming their difficulties, by achieving the targets set in their action plans, etc. Following table summarizes the best experiences.

Twelve participants took as the best experiences 'seeing the farmers having been able to construct temporal weirs with locally available materials'. Farmers are their clients, so that the farmers' achievement as was planed and also by overcoming difficulties gave the extension officers a happiest moment. Second best experience is also quite in line with the first one, that is 'seeing farmers who welcomed the project and eager to work no matter how difficult the task was and seeing them plant crops in their schemes'.

What came at 3rd position is 'Furrow pegging and thereafter digging of the canal'. As the pilot project introduced a simple way of aligning canal that is "progressive line leveling with sprit line level", even CEOs/BEOs and farmer themselves could align canal. Using spirit line level enabled them to carry on the canal aligning without waiting for dumpy level, a sophisticated survey equipment.

As stated by 4 participants, there was 'high demand for smallholder irrigation even from some communities who do not have perennial streams. This demand from such communities endorses high opportunity in extending the smallholder irrigation development.

Table 2.3.5 Participants' Best Experiences in Implementing Smallholder Irrigation Development

No.	Please describe the best experience you have had on the course of implementing smallholder irrigation in this season	Reply
1	Farmers have been able to construct temporal weirs with locally sourced materials successfully.	12
2	Farmers welcoming the project and eager to work no matter how difficult the task is and seeing them plant crops in their schemes	8
3	Furrow pegging and thereafter digging of the canals	6
4	High demand for smallholder irrigation even from some communities who do not have perennial streams	4
5	Now an expert in selecting potential sites for smallholder irrigation	4
6	When I constructed the trigonal weir and other temporary weirs for the first time on my own	4
7	Coordination between TSB and extension staff, chiefs and farmers	3
8	Discovering of a water source and taping water to the canal	2
9	Farmers have developed interest on implementing smallholder irrigation	2
10	On scheme in Mufili Camp, a group was stopped by one farmer who has a water furrow down. He complained of receiving little water but I explained to and convinced him	1
11	Mungwi river water bridge and its success was my best experience	1

Source: JICA Study Team, Pre-training questionnaire survey, administered on November 4, 2009

2.3.6 Experiences on Compost Manure

Taking advantage of the training which invited as many as 49 participants, a compost manure was lectured and also practiced. Since irrigation results in 2 times cultivation of same land per annum in most cases, soil fertility would be exploited quite rapidly unless it has to be well taken care of. Therefore, quick making compost, called *Bokashi*, was undertaken as one of the training modules. In this regard, the pre-training questionnaire asked the participants about their knowledge and experiences on compost.

Table 2.3.6 summarizes the replies, from which we can see;

- ✓ What they know most is 'pit compost', followed by 'Bokashi'. In fact, Bokashi was preliminary introduced by JICA study team during the kick-off training held in April 2009, and demonstrated in 2 sites of 2009 dry season. Those who replied 'I know and demonstrated Bokashi' are therefore all associated with the activity by JICA study team.

- ✓ Heap compost is popular to some extent in Zambia as known by 6 participants and demonstrated by 6 participants. Heap compost here is very simple one whereby 1) all the materials are piled up with watering, 2) 2 weeks after the preparation; it is once turned up with watering, and then 3) left over for about 3 months for decomposition. The heap is not covered by mud or plastic sheet, thereby allowing nitrogen to evaporate in air (if it is covered by mud, it is called *Chimato* compost which can retain nitrogen in the decomposed material).

- ✓ All the participants knew the role of compost manure as replied to the question of 'In what way do you think compost manure works?' Primary role is to improve physical soil texture as replied by 29 participants. In addition, 23 participants replied 'fertilization of the soil' as one of roles,

which is also quite correct. However, the effect of fertilization may not be as expected if it is prepared in conventional heap compost. This is because most of the nitrogen could easily be evaporated without any covering of the heap.

✓ Difficulties they faced in disseminating compost manure are 'materials for Bokashi (9 replies)', followed by 'farmer prefers chemical fertilizer than compost (7 replies)', 'laborious work and the long time to be decomposed (5 replies)', etc. It may be automatic that the farmers prefer chemical fertilizer because as far as effectiveness is concerned, conventional compost manures cannot compete with chemical fertilizer. However, since compost improves soil texture, chemical fertilizer can be better retained in such improved soil. This context, if given to farmers, may contribute to promoting compost.

Table 2.3.6 Participants' Knowledge and Experiences on Compost

No.	Which compost manure type do you know?	Reply
1	Pit compost	40
2	Bokashi Compost	12
3	Heap compost	6
4	Chinese compost	3
5	None	-
No.	**Which compost manure type have you ever demonstrated?**	**Reply**
1	Pit compost	30
2	Heap compost	6
3	Bokashi Compost	4
4	None	8
No.	**In what way do you think compost manure works?**	**Reply**
1	Improves the soil structure, texture and water retention	29
2	Fertilization of the soil (hence reducing input costs to the small scale farmers)	23
3	Provides nutrients to the crops	10
4	Reduces acidity to the soil	2
5	It increases production	1
No.	**What are the difficulties you have faced in disseminating compost manure?**	**Reply**
1	Farmers can not afford to buy *Bokashi* manure requirements, e.g. rice, molasses not available in the locality	9
2	Farmers prefer chemical fertilizer than compost	7
3	Too laborious to make and takes long time to decompose	5
4	None	4
5	Lack of animal manure to most farmers	3
6	Farmer believe that compost manure is not as effective as organic manure	2
7	Lack of proper ratios for applying and material used when making compost	2
8	Lack of agricultural lime	1
9	Not yet started	1
10	Need some training	1
11	Farmers complain that we need a heavy dosage if you have to increase area and it losses viability quickly	1
12	Lack of reading materials	1

Source: JICA Study Team, Pre-training questionnaire survey, administered on November 4, 2009

2.3.7 Projects to Improve Livelihood of the People

Last question asked the participants activities/projects which can contribute the most to improving people's livelihood. Answers were 'irrigation system (16 replies)', 'livestock (13 replies)', 'permanent weir and canal lining (11 replies)', (crop/vegetable production (6 replies)', 'training (6 replies)' among others.

Table 2.3.7 Project/ Development Activities to Improve the People's Livelihood

No.	What activities /projects do you think are needed to improve the livelihood of the smallholder, list two:	Replies
1	Irrigation system	16

2	Livestock rearing e.g. fish farming, goats rearing	13
3	Farmers need permanent weirs/canal lining	11
4	Crop/vegetable production	6
5	Training (not specified)	6
6	Sensitize farmers on the importance of using compost manure	4
7	Ready market	4
8	Study tours to other successful places in the provinces/districts	3
9	Provision of soft loans for the inputs for irrigation	3
10	Soil conservation methods	2
11	Land management	1
12	Nutrition	1
13	Home basic management	1
14	Farming	1
15	Encourage farmers to have savings groups in order to have access to soft loans	1

Source: JICA Study Team, Pre-training questionnaire survey, administered on November 4, 2009

CHAPTER 3 ACHIEVEMENTS IN 2009 DRY SEASON

Numerical targets were set during the kick-off workshop, held in April 2009 corresponding to the onset of 2009 dry season. The targets were set at; TOT (training of trainers; training from participated BEO/CEO to the fellow BEOs/CEOs who were not in the kick-off training), sites to be improved, and sites to be newly developed. Sites to be improved and newly developed included not only the target number of sites, but also expected canal length, expected area to be irrigated, expected farmers to be organized. However those except for the target number of the sites are reference only. Following sessions present the achievements in comparison with the targets:

3.1 Achievement on TOT

Table 4.1.1 summarizes the achievement on TOT in comparison with the target. It shows the targets in upper rows and the actual achievement in the lower rows such as how many times of TOTs they have carried out and how many fellow CEOs have been trained.

Table 3.1.1 Planned TOT and Actually Implemented TOT by District

District	Mbala	Mpika	Mungwi	Kasama	Mporokoso	Luwingu	Kawambwa	Mansa	Total/Ave.
Target									
Times	3	6	4	2	2	3	2	4	26
Participants	15	26	5	6	3	6	5	12	78
Participants/TOT	5	4	1	3	2	2	3	3	3
Achievement									
Times	10	6	6	2	3	3	0	15	45
Trained BEOs/CEOs	13	10	36	2	25	7	0	36	129
BEOs/CEOs/TOT	1.3	1.7	6.0	1.0	8.3	2.3	−	2.4	3

Source: JICA Study Team, from the Kick-off Training on April 16 – 18, and Follow up Training on Nov. 4 & 5, 2009.

In total, 45 TOTs were carried out as compared to 26 planned. It was to train a total of 78 fellow BEOs and CEOs while the actually trained reached 129 personnel. Most of the districts carried out TOT as planned or rather exceeded their targets except for Kawambwa District. The District has not carried out any TOT. In Kawambwa district, the participated TSB officer in the kick-off training was transferred soon after he went back to his station, and handing over of the programme to the successor was not properly done.

Looking into the trained BEOs/CEOs per TOT, it ranges from only one personnel to as many as 8 personnel. In fact, there is a difficulty of inviting many fellow BEOs/CEOs to a TOT. BEOs/CEOs are supposed to attend every quarterly meeting at District level. If the quarterly meeting were to be held as supposed to be, a TOT to which all the BEOs/CEOs can attend could have been arranged. However,

faced with financial difficulties, this sort of plenary meeting at district is not carried out regularly but only once a year where all the BEOs/CEOs together with district staff are to review the year's activities and plan for the next year.

Therefore except for some TOTs carried out at Mungwi and Mporokoso Districts, most of the TOTs mentioned above were carried out at site inviting neighbor CEOs only. Mungwi and Mporokoso Districts took an advantage of a quarterly meeting which was held by chance. Otherwise, trained BEOs/CEOs invited fellow CEOs who are in most cases their neighbors during the construction of weir, pegging of canal, digging of canal, etc.

3.2 Achievement on Improved Sites

There are already existing smallholder irrigation schemes established by farmers. Most of the facilities do not, however, have diversion structure, and simply withdraw stream water to their canal by gravity. Therefore, amount of water withdrawn to the canal can hardly meet crop requirement especially during late irrigation season when water level in the stream gets lower. Taking this situation into account, smallholder irrigation development in 2009 dry season undertook improvement of these existing temporary irrigation schemes as one of the major activities. Table 3.2.1 summarizes the achievement for improved sites in comparison with the targets, from which following are found:

- ✓ A total of 100 existing sites have been improved in 2009 dry season, against the target of 137 sites. This shows achievement ratio of 73%. By district, Kasama has done nothing in improvement, while Mbala District has improved as many as 22 sites, followed by Mansa (19 sites), Luwingu (17 sites), Mporokoso (16), so on so forth.

- ✓ In terms of farmers concerned, there are total 4,060 members, composed of 2,553 male members and 1,507 female members, benefited from the improvement. They are mostly original members. A typical site has 41 memberships (26 male members and 15 female members) as average. On the other hand, average number of land owners per site is only 5, which means one out of about 8 members has the land ownership. Those members share the land by mutual agreement whereby payment to the owners is seldom applied.

- ✓ Original canal length in total was 194 km summated for the 100 sites, under which a total area of 149 ha had been irrigated before the improvement. The improvement altogether has done an additional canal digging of 27 km. With the canal additionally dug, a total of 177 ha have been newly opened. However, not all of the 177 ha was irrigated and planted in this season. Some areas were found it was too late to plant crop whereby those areas were left unplanted in this 2009 dry season. Out of the 177 ha newly opened, area actually irrigated and planted was 98 ha in total. Thus the average irrigated/planted area newly added in this 2009 dry season arrives at 0.98 ha per site. Summing up the original irrigated area of 149ha, the improved sites altogether irrigate 247 ha, giving an average irrigated area of 2.47ha per site. If all the opened area, 177ha, is to be irrigated next year, there could be a total of 326ha in total for the 100 sites.

- ✓ As per irrigated are per beneficiary, original average area was 0.0366 ha (0.15 lima). The improvement opened an area of 0.0477 ha (0.19 lima) per beneficiary, out of which 0.0242 ha (0.097 lime) was actually irrigated and planted per beneficiary. Now a typical beneficiary enjoys irrigated agriculture at a land of 0.0608 ha (0.24 lima). If all the opened area is to be irrigated in, e.g., next year, he/she can do the irrigated agriculture at 0.08 ha (0.32 lime).

3.3 Achievement on New Development Sites

Table 3.3.1 summarizes the achievement on new development sites in comparison with the target (for the target, only site number is compared). The target in terms of site was 115 while BEOs/CEOs with

District TSBs altogether developed as many as 94 sites in the 2009 dry season. Mbala District has developed as many as 25 sites, followed by Mansa District (22 sites), Mpika District (12 sites), Kawambwa District (10 sites), Luwingu District (9 sites), and so on so forth. Following are the findings:

- ✓ Ninety four (94) sites newly developed consist of 82% of the target of 115 sites. Though it had not reached the target, it can be still said that all the concerned officers had worked very well given just 3-day kick-off training plus fuel. Out of the 94 newly developed site, those which had started irrigation/planting in this 2009 dry season were 63 sites while the rest, 31 sites, have not yet started irrigation and they are still engaged in canal digging, canal extension, land opening, land demarcation, etc. The 31 sites are expected to start irrigated agriculture in the following 2010 dry season.
- ✓ Under the development of 94 new sites, concerned officers altogether have organized as many as 3,112 farmers (2,095 male members and 1,023 female members). Out of whom, in this 2009 dry season, 1,674 farmers have been benefited by irrigated agriculture, composed of 1,081 male beneficiaries and 599 female beneficiaries. A typical new site is established with 33 farmers, 22 male and 11 female members, as the average membership for all the 94 sites. As for landowners, there are 536 owners in total for the 94 sites, arriving at an average of 6 landowners per site.
- ✓ Canal excavated in this 2009 dry season reached a total stretch of 71km. A typical site is therefore given an average length of 0.75km. The area opened has arrived at 104 ha in total, and the average area opened per site is estimated at 1.1 ha. This means that an average area of 0.0333 ha (0.133 lima) was opened per beneficiary farmer. Now all the opened areas have not been put under irrigation in this dry season, but the areas can be referred to as the expected ones to be irrigated next year.
- ✓ Out of the 104 ha newly opened, area actually irrigated and planted in this 2009 dry season remained 52ha. It means about half of the opened area could start irrigated agriculture this year, while it was too late for the other half area to plant crops this season. This half of the area is to start irrigated agriculture next year. Average irrigated area per site arrives at 0.55 ha (2.2 lima) when divided by all the 94 sites and 0.82 ha (3.28 lima) when divided by those sites which actually started irrigation this year, 63 sites. As per irrigated area per farmer beneficiary, it is 0.017 ha (0.07 lima) and 0.031 ha (0.12 lime) respectively.
- ✓ Since most of the sites are still progressing construction and therefore have not fully been developed, the participants were asked the plan for the next 2010 dry season. Their plan is; 1) an additional canal length of 154 km is to be excavated, 2) with canal, an additional area of 207 ha is to be irrigated, and 3) thereby a total of 259ha is to be put under irrigation by the 94 sites altogether. It means that a typical site will have an average irrigated area of 2.76 ha, providing 0.083 ha ((0.33 lima) of irrigated land per beneficiary.

Table3.2.1 Summary of Improvement for Existing Sites in 2009 Dry Season

District	Target	Achieved	Nr. of member farmers			Nr. of Land Owners	Original		Additional with Improvement			Original + Newly Irrigated, ha	Original + Opened, ha	Command Area, ha	Nr. of Fish Pond
	No. of Sites	No. of Sites	Total	Male	Female		Original C. Length, km	Originally Irrigated Area, ha	Canal Length newly dug, km	Opened Area in 2009, ha	Area newly irrigated in 2009, ha				
Mbala	39	22	555	362	196	123	56.60	42.75	3.70	33.50	18.50	61.25	76.25	91.14	NA
Average			25	16	9	6	2.57	1.94	0.17	1.52	0.84	2.78	3.47	4.14	NA
Mpika	25	7	217	152	62	78	22.50	14.75	3.50	23.53	22.40	37.15	38.28	65.50	NA
Average			31	22	9	11	3.21	2.11	0.50	3.36	3.20	5.31	5.47	9.36	NA
Mungwi	27	5	182	120	62	0	15.30	0.00	1.05	17.50	8.00	8.00	17.50	27.50	8
Average			36	24	12	0	3.06	0.00	0.21	3.50	1.60	1.60	3.50	5.50	2
Kasama	10	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
Mporokoso	13	16	1,347	786	561	93	22.95	31.05	0.50	28.55	2.00	33.05	59.60	75.20	25
Average			84	49	35	6	1.43	1.94	0.03	1.78	0.13	2.07	3.73	4.70	2
Luwingu	8	17	1,138	745	393	47	45.65	11.50	2.26	22.25	6.00	17.50	33.75	168.00	13
Average			67	44	23	3	2.69	0.68	0.13	1.31	0.35	1.03	1.99	9.88	1
Kawambwa	11	14	359	219	140	84	14.85	13.38	1.97	7.60	3.27	16.65	20.96	48.00	80
Average			26	16	10	6	1.06	0.96	0.14	0.54	0.23	1.19	1.50	3.43	6
Mansa	4	19	262	169	93	40	16.00	35.35	13.70	44.00	38.00	73.35	79.35	164.25	NA
Average			14	9	5	2	0.84	1.86	0.72	2.32	2.00	3.86	4.18	8.64	NA
Grand Total	**137**	**100**	4,060	2,553	1,507	465	193.85	**148.78**	26.68	176.92	**98.17**	**246.95**	**325.70**	639.59	126
Average			41	26	15	5	1.9385	**1.4878**	0.2668	1.7692	**0.9817**	**2.4695**	**3.2570**	6.3959	2.42
Per Member							0.0477	**0.0366**	0.0066	0.0436	**0.0242**	**0.0608**	**0.0802**	0.1575	0.06

Table3.3.1 Summary of New Development in 2009 Dry Season

District	Target	Achieved	Nr. of member farmers			Nr. of Land Owners	Done in 2009 Dry Season			Plan for Next 2010 Dry Season			Command Area, ha	Nr. of Fish Pond
	No. of Sites	No. of Sites	Total	Male	Female		Canal Length dug in 2009, km	Opened Area in 2009, ha	Irrigated Area in 2009, ha	Canal Length to be dug, km	Additional Area to be irrigated, ha	Area to be irrigated, ha		
Mbala	36	25	903	654	249	323	13.30	14.30	5.80	29.10	21.75	27.55	17.06	NA
Average			36	26	10	13	0.53	0.57	0.23	1.16	0.87	1.10	0.68	NA
Mpika	10	12	355	234	121	16	19.81	8.15	6.65	15.30	33.13	39.78	59.86	12
Average			30	20	10	1	1.65	0.68	0.55	1.28	2.76	3.31	4.99	1
Mungwi	6	6	265	142	123	0	9.12	11.30	1.30	7.50	16.75	18.05	16.75	2
Average			44	24	21	0	1.52	1.88	0.22	1.25	2.79	3.01	2.79	0
Kasama	7	5	220	159	61	28	2.90	0.63	0.38	13.30	8.25	8.63	65.00	0
Average			44	32	12	6	0.58	0.13	0.08	2.66	1.65	1.73	13.00	0
Mporokoso	8	5	228	126	102	14	1.60	14.15	1.25	8.20	13.90	15.15	15.50	2
Average			46	25	20	3	0.32	2.83	0.25	1.64	2.78	3.03	3.10	0
Luwingu	6	9	447	327	120	25	3.55	5.00	0.50	63.55	65.00	65.50	80.00	4
Average			50	36	13	3	0.39	0.56	0.06	7.06	7.22	7.28	8.89	0
Kawambwa	12	10	225	155	70	61	3.01	8.71	4.71	2.91	6.45	11.16	29.00	0
Average			23	16	7	6	0.30	0.87	0.47	0.29	0.65	1.12	2.90	0
Mansa	30	22	469	298	177	69	17.56	41.50	31.25	14.35	42.25	73.50	105.50	NA
Average			21	14	8	3	0.80	1.89	1.42	0.65	1.92	3.34	4.80	NA
Grand Total	**115**	**94**	3,112	2,095	1,023	536	70.84	**103.74**	**51.84**	154.21	207.48	**259.32**	388.67	20
Average			33	22	11	6	0.7536	**1.1036**	**0.5515**	1.6405	2.2072	**2.7587**	4.1347	0.43
Per Member							0.0228	**0.0333**	**0.0167**	0.0496	0.0667	**0.0833**	0.1249	0.01
		31	not irrigated yet at all in 2009 dry season out of the total 94 sites											
		63	acutually irrigated in 2009 dry season out of the total 94 sites						**0.8229**					
Members irrigated			1,674	1,081	599	332			**0.0310**					

3.4 Difficulty in Developing Area

Table 3.4.1 compares targets set during the kick-off training and actual achievements by item, not only number of sites improved/developed but also others such as number of farmers, canal length to be dug, area to be improved/developed, etc. Of course, those targets other than number of sites were just based on assumptions or based on their past experiences, but it may imply that what the extension officers can plan is very much relevant to their site situation or not and if not so what areas have to be put right. The table indicates:

- ✓ In terms of improvement, there is not much difference between what they had targeted and what they have actually achieved except for 'area'. They targeted a total of 507 ha to be irrigated with improvement, including the original area. They have opened an additional area, with which a total area of 326 ha became either under irrigation or ready for irrigation. Out of the 326 ha, area actuary irrigated was 247 ha as against the target of 507ha. We may say the extension officers tend to overestimate 'area' to be opened/irrigated.

- ✓ As for new development, there is a big difference between the targeted area and achieved area. They targeted they were to irrigated 368 ha while actually opened area was 104 ha (28%). Out of the opened area, actually irrigated area was only 52 ha, equivalent to only 14 % of what was targeted. Accordingly, big gap tool place in terms of irrigated area per site. They targeted they were to irrigated an average area of 3.2 ha per site while the actual irrigated area per site was 0.55 ha only. Canal excavation was also overestimated; a total of 71 km was dug against targeted 228 km. Therefore, they obviously overestimated area and also canal length manageable in a season. The targets of the area and canal length are still within achievable ranges according to existing examples, but not set as the targets in just one season.

Table 3.4.1 Comparison between Targets and Achievements

Particulars	Improvement		%	New Development		%
	Target	Achievement		Target	Achievement	
No. of sites	137	100	73	115	94	82
No. of farmers	3,069	4,060	132	2,708	3,112	115
No. of farmers per site	22	41	186	24	33	138
Area, ha	507	326*	64	368	104*	**28**
		247**	49		52**	**14**
Area per site, ha	3.7	3.3*	89	3.2	1.1*	**34**
		2.5**	68		0.55**	**17**
Canal length, km	280	221	79	228	71	31
C. length per site, km	2.0	2.2	110	2.0	0.75	38

Note: * means area opened and ** denotes area irrigated/planted in 2009 dry season.
Source: JICA Study Team, follow up training held on November 4&5, 2009

3.5 Difficulties facing the BEOs/CEOs

Participants were divided into groups by district, and asked to report, as district, what problems/issues they have faced during the extension of smallholder irrigation development, causes of the problems, measures taken, lessons, etc. Table 3.5.1 summaries the problems by category; and major ones are as follows:

- ✓ 'Logistics' issues were by far the commonest problem, which are lock of motorbike, shortage of fuel, lack of spare parts, no protective cloths, and these have resulted in de-motivating some BEOs/CEOs as 'staff motivation' was stated following the logistics problem. These issues were reported also in relation to monitoring and follow-up.

- ✓ With respect to farmers, there was an expectation for handout. They expected, for example,

chemical fertilizer and seeds upon completion of the construction work. This expectation made CEOs' work difficult to move ahead.

- ✓ Land issue was reported by 3 districts as; 1) a landowner did not allowed canal passing through his land, 2) some farmers felt fear of land being given to other farmers, 3) a landowner demanded payment to let the canal passing through, etc.
- ✓ There were 2 districts they have faced difficulty during canal construction. One site exposed rock to on its course of canal, and in the other site farmers altered the alignment towards higher side, trying to get the water to nearby his house, but resulted in vain.

Table 3.5.1 Difficulties BEOs/CEOs have Faced during Dissemination

Problems/ Issues	No.	Remarks
Logistics	15	Lack of motorbike, fuel shortage, no protective cloth, etc.
Staff motivation	5	No allowance, No remuneration
Farmers	5	Not motivated, expect free hand-outs, etc.
Land issue	3	Do not allow canal passing,
Canal construction	2	Rock on the rote of canal, slow work pace
Monitoring & follow-up	1	Due to lack of mobility
Between sites	1	Upper site came up, hence downstream site lost water.
Communication b/t farmers & CEOs	1	No means of communication
Not enough production	1	

Source: JICA Study Team, follow up training held on November 4&5, 2009

3.6 Proud Achievement

Participants reported as district their proud achievements, the reason, and ways of disseminating such achievement to other fellow extension officers. Table 3.6.1 summarizes the achievements, and typical ones among others are:

Four (4) districts reported, as their proud achievement, 1) irrigation started and increased area under irrigation, 2) construction or accomplishment of the temporary weirs, 3) targets were met or even exceeded, and 4) farmers becoming better in their participation, responses, etc. Exposure visit and exchange visit together with some training can be a good way of extending these achievement to fellows, it is learnt.

Mpika District has already started facilitation of acquisition of Water Rights and registration of groups by the Registrar of Societies. One group had its file opened for Water Rights at Water Board under the Ministry of Energy and Water Development. Mpika District is taking care of the irrigation groups, which has to be followed by other district TSBs as well.

Table 3.6.1 Proud Achievement by District

Proud Achievement	No.	How it can be extended
Irrigation started, Increased area under irrigation	4	Encourage colleagues to set up demos. Exchange visits
Construction of Temporary weirs	4	Expose them to the site. Training of fellow CEOs (TOTs), Exchange visits
Targets achieved or exceeded	4	During monthly meetings and field visits conduct TOTs. By inviting them for training at a constructed site
Farmers improved their participation, response, etc. Farmers able to organize the up fronts in construction.	4	To hold sensitization meetings in the camps and blocks Through COBSI Weekly Bulletins and site field days
Trained all district staff	1	Through exposure visits to sites
Furrow able to cross a stream	1	Exposure visits
Started facilitation of acquisition of Water Rights and registration of groups. One group had its file opened.	1	Through trainings
Good relationship b/t CEOs & TSBs	1	Conducting TOTs

Trained 5 schemes in *Bokashi* Compost making	1	Exposure visits
No land disputes amongst the farmers	1	To provide training in *Bokashi* making
Crop diversification	1	Field trips, reports/meeting and field days
Food security	1	

Source: JICA Study Team, follow up training held on November 4&5, 2009

CHAPTER 4 ACHIEVEMENT OF THE TRAINING OBJECTIVES AND THEIR SATISFACTION

4.1 Achievement of Training Objectives

Objectives are by the end of the training the participants are able to:

1. To share the progress and achievement of the pilot project in each district,
2. To identify issues/problems and those causes/effective countermeasures related to promotion of the smallholder irrigation development,
3. To gain and internalize collective lessons to further disseminate smallholder irrigation development, and
4. To know the effect of compost manure and also the method of how to make a quick making compost, Bokashi.

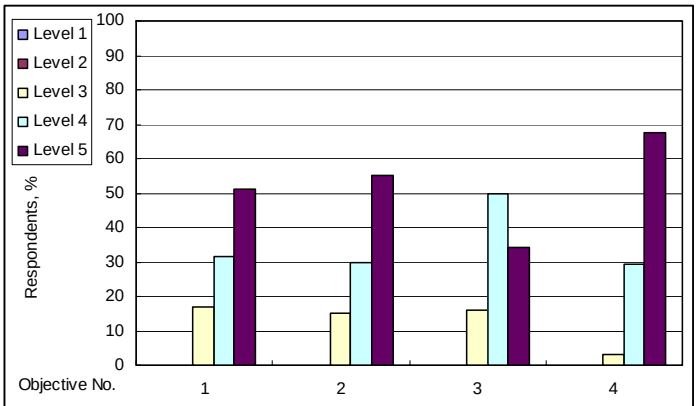


Figure 4.1.1 Achievement in a Level of 1-5 by Objectives

At the end of the training course, the participants were asked how much they have achieved the objectives of the training in a range of 1 to 5; level-1 is the least achieved while level-5 is the most achieved. There was no participant who gave either level-1 or level-2 achievement. More than 80% of the participants replied that they have achieved the training objectives by a level of either 4 or 5. In fact, more than 50 % of the participants replied they have achieved the Objective-1 and Objective-2 at the level-5, and nearly about 70% of them did so for the Objective-5. In Objective-4, 'To gain and internalize collective lessons to further disseminate smallholder irrigation development', those who replied level-4 achievement was more than that of level-5. Some participants said the training was a bit short in terms of discussion time, which may have resulted in the achievement.

4.2 Participants' Satisfaction by Session

At the end of each session, the participants were asked of what extend he/she was satisfied: level 1 is the least satisfied while level 5 is the most satisfied. Table 4.2.1 shows the sessions undertaken during the net 2-day training, and Figure 4.2.1 summarizes the level of satisfaction of the participants. The highest satisfaction can be seen in such sessions as '1.1 Programme Orientation', '1.2 Contribution from JICA Study Team', '1.5 Problems arisen and Actions taken (group preparation) and 2.1 those presentation', and '2.3 Practice on Bokashi compost'.

Two sessions marked relatively lower satisfaction, which are '1.4 Output preparation & presentation by district', and '2.2 Lecture on Bokashi compost'.

Why '1.4 Output preparation & presentation by district' marked relatively lower satisfaction may have come from the difference between

Table 4.2.1 Sessions Undertaken by Training

Session	
1.1	Program orientation
1.2	Contribution from JICA Study Team
1.3	Surfacing of the Participants' Expectation
1.4	Output Preparation & Presentation by District
1.5	Problems arisen and Actions taken (Group Preparation)
2.1	Problems arisen and Actions taken (WS discussion)
2.2	Bokashi Compost (lecture)
2.3	Bokashi Compost (Practice)
2.4	Training Evaluation

what had been reported by some of the districts as midterm achievements before the training and what was finally reported during the training. A typical example was Kasama District. Kasama TSB had once reported that they improved 6 existing sites and newly developed 10 sites as at mid September. However, their real achievements by the time of the training were 0 site in terms of improvement and 5 sites in new development. According to them, they had reported projected sites that they were to improve or develop by the time of the follow up training. This kind of reporting was seen in some other districts as well. To clarify between what they had reported before and what they reported during training took quite long time which was in fact a kind of wasting of time for others. This situation may have resulted in the relatively lower satisfaction.

Bokashi compost requires many materials than conventional composts, and the process of making is also a bit complicated including regular turning up. In addition, lecture on aerobic and anaerobic bacteria may have been not so familiar to most of the participants. Therefore, satisfaction marked on the session may have been lower than the others.

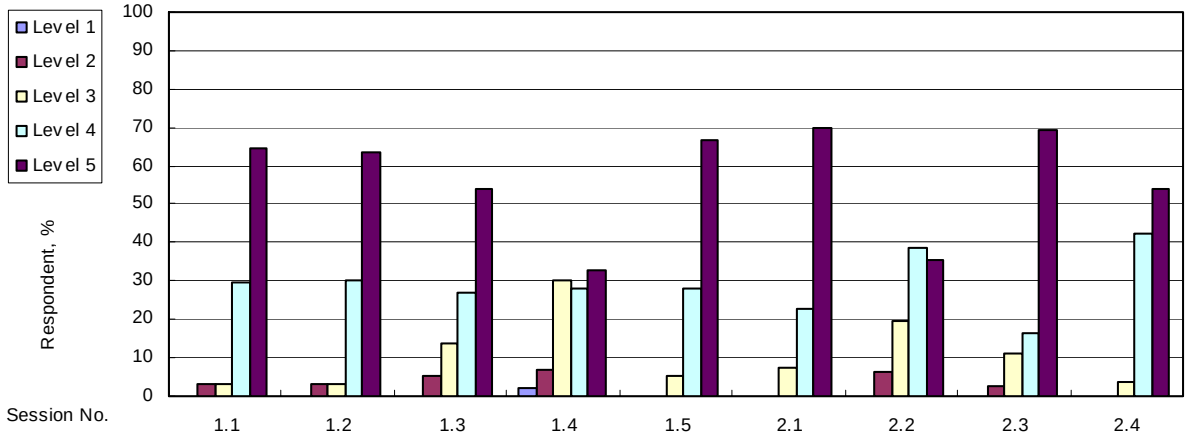


Figure 4.2.1 Participant Satisfaction in a level of 1-5 by Session

4.3 Participants' Satisfaction by as a Whole, Logistics, Theory, Practice, and Own Participation

In addition to asking the participants of their satisfaction by session, satisfaction by as a whole, logistics, theory, practice and own participation were also asked in a level of 1-5. Figure 4.3.1 shows the satisfactions for the participants by those issues.

Issue which marked highest level-5 satisfaction was 'practice' and then followed by 'own participation'. More than 50% participants gave level-5 satisfaction to the 'practice' and close to 50% participants in the 'own participation'. Such issues as 'as a whole' and 'theory (on Bokashi compost)' also marked high level of satisfactions as the summated percentage of level-4 and level-5 satisfactions can arrive at close 90%. As per 'logistics', however there were participants who gave satisfaction level-2 and even level-1, both of which together account for almost a quarter (10 out of 43 valid replies).

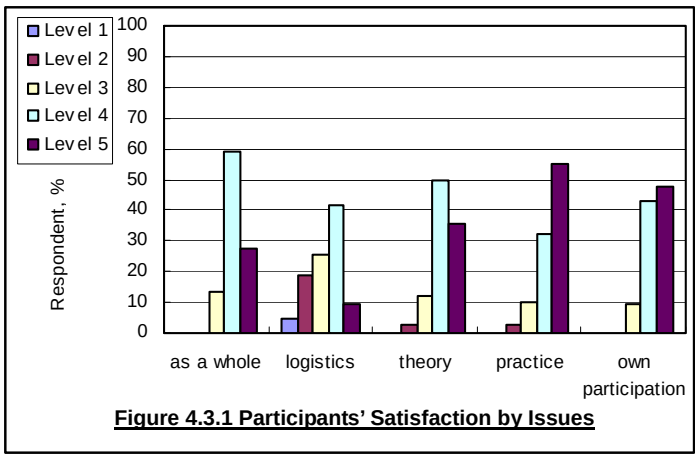


Figure 4.3.1 Participants' Satisfaction by Issues

They felt some difficulties in lodging where they accommodated in Kasama Farm Institute. The institute is located in the suburb of Kasama town, causing a little difficulty of commuting from town without pre-arranged transportation. Also, some of the difficulties are associated with either bedding and/or water problem, casing trouble on them. There are 8 participants who requested to improve water supply. This situation led the participants to mark such lower satisfaction.

4.4 Participants' Comments to Improve

In addition to rating the satisfaction above, the participants were asked to make comments to improve if any with respect to: 1) as a whole, 2) logistics, 3) theory, 4) practice, 5) own participation, and 6) how to best improve the training course in future. Following are the excerpt of the comments and probable measures to take for future trainings:

- ✓ Three participants raised that the duration should be longer than the net-2 days in order to undertake all the topics including interactive discussions thoroughly. Similar comment was given by 10 participants, saying 'time was too short'.
- ✓ Fourteen (14) participants suggested that the venue be changed to Luapula. In fact, as aforementioned, participants from Luapula arrived in late afternoon of Day-1, missing almost all the session of that day. It was due to nation-wide fuel shortage. Faced with this problem and also taking into account the long distance between Mansa, the capital of Luapula Province, and Kasama, those who came from Luapula Province recommended the change of the venue to Luapula.
- ✓ Leaning materials were also requested to improve the training. The materials requested are such as pen, notebook, and box files. Box files in fact facilitates good keeping of record and materials provided, e.g. handouts. Therefore provided that there is enough budget, it should be considered.
- ✓ Allowance issue was also raised; e.g. to raise the amount to the government recommended level, give some down payment upon the arrival of the participants, etc.

ATTACHMENT 1-1 ORIGINAL SCHEDULE OF ACTIVITIES

DATE / TIME	ACTIVITIES	RESPONSIBLE
Day 0 (Tue): Gathering to the training center (Kasama Agriculture Institute)		
Day 1 (Wed): Officer of the Day; Mr. K. Simukoko/ Mr. F. Mporokoso		
Module 1 – Program Orientation		
7:30-8:30	Registration, and Pre-WS Questionnaire	Ms. Christine
8:30-9:30	Opening, Self Introduction, and Overview of the WS	Mr. Zulu
9:30-10:30	Contribution from the JICA Team	Mr. Hashiguchi
10:30-10:45	Tea Break	
10:45-11:00	Surfacing of the Participants' Expectation	Mr. Simukoko
Module 2 – Output Presentation of Smallholder Irrigation Development		
11:00-12:00	Output Preparation by District (Form 1&2, & on Billboard)	Mr. Simukoko
12:00-13:00	Lunch Break	Ms. Christine
13:00-15:00	Output Presentation by District	Mr. Simukoko
15:00-15:15	Tea Break	
Module 3 – Lessons Sharing among Participants		
15:15-16:15	Problems arisen & Actions taken (Form 3, group preparation)	Mr. Kabwe
16:15-17:00	Proud Achievements and Events (Form 4, group preparation)	Mr. Kabwe
DAY 2(Thu): Officer of the Day; Mr. F. Mporokoso/ Mr. Simukoko		
Module 3 – Lessons Sharing among Participants (Con'd)		
8:00-8:30	Recapitulation (2 from the participants)	
8:30-12:00	Problems arisen and Actions taken (workshop discussion)	Mr. Kabwe/ Simukoko
8:30-12:00	Proud Achievements and Events (workshop discussion)	Mr. Kabwe/ Simukoko
12:00-13:00	Lunch Break	
Module 4 – A Quick Making Compost: Bokashi		
13:00-14:00	Bokashi Compost (lecture)	Ms. Bulaya
14:00-16:30	Bokashi Compost (Practice)	Ms. Bulaya
Module 5 – Training Evaluation		
16:30-16:45	Workshop Evaluation	Mr. Simukoko
16:45-17:00	Closing	Mr. Kabwe
DAY 3(Fri): Home Sweet Home		

ATTACHMENT 1-2 MODIFIED SCHEDULE OF ACTIVITIES

DATE / TIME	ACTIVITIES	RESPONSIBLE
Day 0 (Tue): Gathering to the training center (Kasama Agriculture Institute)		
Day 1 (Wed): Officer of the Day; Mr. K. Simukoko/ Mr. F. Mporokoso		
Module 1 – Program Orientation		
7:30-8:30	Registration, and Pre-WS Questionnaire	Ms. Christine
8:30-9:30	Opening, Self Introduction, and Overview of the WS	Mr. Zulu
9:30-10:30	Contribution from the JICA Team	Mr. Hashiguchi
10:30-10:45	Tea Break	
10:45-11:00	Surfacing of the Participants' Expectation	Mr. Simukoko
Module 4 – A Quick Making Compost: Bokashi		
11:00-13:00	Bokashi Compost (lecture)	Ms. Bulaya
13:00-14:00	Lunch Break	Ms. Christine
14:00-16:30	Bokashi Compost (Practice)	Ms. Bulaya
Module 2 – Output Presentation of Smallholder Irrigation Development		
16:30-18:00	Output Preparation by District (Form 1&2, & on Billboard)	Mr. Simukoko
DAY 2(Thu): Officer of the Day; Mr. F. Mporokoso/ Mr. Simukoko		
Module 2 – Output Presentation of Smallholder Irrigation Development		
8:00-9:00	Output Preparation by District (Form 1&2, & on Billboard)	Mr. Simukoko
9:00-12:00	Output Presentation by District	Mr. Simukoko
12:00-13:00	Lunch Break	Ms. Christine
Module 3 – Lessons Sharing among Participants		
13:00-14:30	Problems arisen & Actions taken (Form 3, group preparation)	Mr. Kabwe
13:00-14:30	Proud Achievements and Events (Form 4, group preparation)	Mr. Kabwe
14:30-16:00	Problems arisen and Actions taken (workshop discussion)	Mr. Kabwe/ Simukoko
14:30-16:00	Proud Achievements and Events (workshop discussion)	Mr. Kabwe/ Simukoko
Module 5 – Training Evaluation		
16:00-16:45	Workshop Evaluation	Mr. Simukoko
16:45-17:00	Closing	Mr. Kabwe
DAY 3(Fri): Home Sweet Home		

ATTACHMENT 2 PARTICIPANT LIST, Venue: Kasama Farm Institute Date: April 16 – 18, 2009

No.	Name	Title	Station (Office)	Camp	Remarks
1	**Kenneth Zulu**	**Provincial Irrigation Eng.**	**Northern**	-	Mr.
2	**Simukoko Kelvin Mbokosi**	**Senior Technical Officer**	**Northern**	-	Mr.
3	**Annie Kalima Bulaya**	**Junior Technical Officer**	**Northern**	-	Mrs.
4	**Frank Mwansa Mporokoso**	**Campassman**	**Northern**	-	Mr.
5	**Innocent Mulauzi**	**Senior Land Hus.**	**Northern**		Mr.
6	Ackson Mbewe	Junior Technical Officer	Kasama	-	Mr.
7	Kasalina Sanama	Agricultural Assistant	Kasama	Chitambi	Ms.
8	Rodgers Phiri	Junior Technical Officer	Mungwi	-	Mr.
9	Simasiku Steven	Junior Technical Officer	Mungwi	-	Mr.
10	Josephine K. Mulenga	Agricultural Assistant	Mungwi	Ngulula	Ms
11	Carol Mwanza	Agricultural Assistant	Mungwi	Misamfu	Ms
12	Beauty Chisanga	Agricultural Assistant	Mungwi	Nseluka	Mrs.
13	Freddy Banda	Chief Technical Officer	Mbala	-	Mr.
14	Machua Kaira	Junior Technical Officer	Mbala	-	Mr.
15	Chansa Grace	Agricultural Assistant	Mbala	Lunzua	Mrs.
16	Kaonga Christopher	Agricultural Assistant	Mbala	Nondo	Mr.
17	Nicholas Kapaya	Agricultural Assistant	Mbala	Mambwe Mis.	Mr.
18	Mary Nambela Mwape	Agricultural Assistant	Mbala	Senga Hill	Mrs.
19	Musaba Eugenia Sikazwe	Agricultural Assistant	Mbala	Lucheche	Mrs.
20	Nakoze T. Chizyuka	Junior Technical officer	Mpika	-	Mr.
21	Fidelis Bwalya	Agricultural Assistant	Mpika	-	Mr.
22	Mercy B. Khwabe	Agricultural Assistant	Mpika	Chintu	Mrs.
23	Mulenga Francis	Agricultural Assistant	Mpika	Chilonga	Mr.
24	Fred Mukaiwa	Junior Technical Officer	Luwingu	-	Mr.
25	Bwalya Giles	Agricultural Assistant	Luwingu	Mufili	Mr.
26	Mark Kombe	Agricultural Assistant	Luwingu	Tungati	Mr.
27	Andrew Nyirenda	Agricultural Assistant	Luwingu	Shimumbi	Mr.
28	Kaumba Bertha	Agricultural Assistant	Luwingu	Mfungwe	Mr.
29	Chileshe Bwembya	Agricultural Assistant	Luwingu	Mapulanga	Mr.
30	Chomba Litepo	Junior Technical Officer	Mporokoso	-	Mr.
31	Mayenda Barbara	Agricultural Assistant	Mporokoso	Kapumo	Ms.
32	Catherine Mwempwa	Agricultural Assistant	Mporokoso	Chishamwamba	Ms.
33	Michelo N. Mweemba	Agricultural Assistant	Mporokoso	Kalabwe	Mr.
34	Kellies Sakajila	Junior Technical Officer	Nakonde		Mr.
35	Nelson Phiri	Junior Technical Officer	Isoka		Mr.
1	Alex Kabwe	**Provincial Irrigation Eng.**	**Luapula**	-	Mr.
2	Kelly Nkandu	Junior Technical Officer	Mansa	-	Mr.
3	Golden Mwaba	Agricultural Assistant	Mansa		Mr.
4	Melody Shakumbwa	Agricultural Assistant	Mansa	Kapyata	Ms.
5	Micheal Nondo	Agricultural Assistant	Mansa	Chifula	Mr.
6	Lovemore Mumba	Junior Technical Officer	Kawambwa	-	Mr.
7	Chiona Noah	Agricultural Assistant	Kawambwa		Mr.
8	Lisimba Elizabeth	Agricultural Assistant	Kawambwa	Shinonde	Ms.
9	Cryton Simbaya	Agricultural Assistant	Kawambwa		Mr.
10	Albert Kangwa	Agricultural Assistant	Kawambwa		Mr.
11	Dickens Chikwekwe	Junior Technical Officer	Mwense	-	Mr.
12	Able Sichamba	Junior Technical Officer	Milenge	-	Mr.
13	Siwale Brian	Junior Technical Officer	Nchelenge	-	Mr.
14	Lukonde Muimui	Technical Officer	Samfya	-	Mr.
1	K. Hashiguchi	JICA Study Team			Mr.
2	T. Ieizumi	Ditto			Mr.
3	H. Hiruta	Ditto			Mr.

ATTACHMENT 3 PARTICIPANT PRE-TRAINING QUESTIONNAIRE RESULT

NO.	EXPECTATIONS	VOTE
1	Sharing successes and challenges	13
2	Plan way forward for next season	9
3	Learn more progress with other Districts	7
4	Evaluation of seasonal activities that occurred in phase 1	6
5	Gain more knowledge in smallholder Irrigation Development	4
6	Improve logistical support (fuel and allowances)	3
7	Be fully knowledgeable in the implementation on the Smallholder Irrigation.	3
8	Know exactly if at all irrigation schemes will be funded	2
9	Get allowances at the end of the workshop	2
10	Know how to make Bokashi practically	2
11	Learn how the programme is going to be effective	2
12	Assess the impact of the Smallholder Irrigation Development	1
13	Be advised on how others worked with fellow CEOs	1
14	My camp be considered for upgrading	1
15	Exchange ideas	1
16	Improve on the double line weir construction	1
17	Provision of protective clothing	1
18	Know how much land irrigated in the just ended phase	1
19	Be awarded since I have beaten the target	1
20	To learn on my failures	1
21	To be equipped with skills on Chinese compost making practically	1
22	To be motivated financially and materially	1
23	Highlight and share constraints	1
24	To be provided with transport (motorbike)	1
25	Learn more on how to construct a permanent weir	1
26	Know more about weir construction programmes	1
27	Know if the weirs proposed have been funded	1
28	Transformation of challenges into workable solutions	1
29	More farmers accessing furrow water	1
30	Increased production under irrigation	1
32	That the pilot districts have implemented temporary diversion weir construction	1
33	That farmers have appreciated the concept	1
34	Presentation of reports on diversion weirs	1
35	Proposed irrigation schemes will be considered for funding.	1
NO.	**COMMENT**	**TOTAL**
1.0	**What assistance do you need from the Government in implementing the smallholder irrigation? List two assistances**	
1	Transport (e.g. motorbike)	35
2	Allowances	17
3	Improvement in fuel	8
4	Working equipments e.g. protective clothing, cement	6
5	Logistics support	5
6	Funding of smallholder irrigation schemes	4
7	Training	3
8	Plan for the year 2010	3
9	Considering irrigation crops under FSP as they do to rain fed maize	2
10	Holding Workshop at least each quarter	1
1.1	**On your experiences as a CEO/BEO/TSB staff: Please describe the problem (s) you have faced or are facing in implementing smallholder irrigation this season.**	
1	Transportation has been a problem for moving to the project site, hence monitoring is limited	22
2	Lack of financial assistance	11
3	Inadequate logistics e.g. fuel, late distribution of fuel, servicing of motor bikes	9
4	Low turn up by farmers	5
5	Working long hours without meal allowances	3
6	Seepage on the weir	3
7	Organizing farmers who had hopes of being paid after work done and inputs	3

8	Identification of site to do new development was difficult, most of them had old furrows	2
9	Women participation was poor and communication was poor	2
10	No protective attire	2
11	CEOs no implementing programs in good time	1
12	Farmers wanted to go straight in constructing permanent weir instead of temporal	1
1.2	**Please describe what kind of efforts you have done to solve the problems (S) above**	
1	Use of borrowed and hired bicycle	16
2	Using personal resources to buy fuel	8
3	Organize meetings with farmers	6
4	Encourage them that it is their community we are developing	6
5	Servicing of the motorbikes	4
6	Putting sand bags which was provided by farmers and JICA and using clay soil	2
7	Involvement of Chiefs and TSB staffs	2
8	I go with packed lunch	2
9	Construction of temporal weirs	2
10	Demonstrating to the farmers how effective the technology is	2
11	Encouraging women to participant	1
12	Inviting far away farmers to see how others are implementing the program	1
13	I have provided the slashes to enable the community improve some weirs	1
14	Facilitated to Farmers to buy their own inputs and trained them how to make manure	1
15	Moved through the whole stretch of stream to locate the appropriate diversion structure	1
16	Coordination of the relevant authority to work together	1
17	Wearing canvas as protective clothing	1
1.3	**Please describe the best experience you have had on the course of implementing smallholder irrigation in this season**	
1	Farmers have been able to construct temporal weirs with locally sourced materials successfully.	12
2	Farmers welcoming the project and eager to work no matter how involving the task is were and seeing them plant crops in their schemes	8
3	Furrow pegging and thereafter digging of the canals	6
4	High demand for smallholder irrigation even from some communities who do not have perennial streams	4
5	Now an expert in selecting potential sites for smallholder irrigation	4
6	When I constructed the trigonal weir and other temporary weirs for the first on my own	4
7	Coordination between TSB and extension staff, chiefs and farmers	3
8	Discovering of a water source and taping water to the canal	2
9	Farmers have developed interest on implementing smallholder irrigation	2
10	On scheme in Mufili Camp, a group was stopped by one farmer who has a water furrow down. He complained of receiving little water but I explained to and convinced him	1
11	Mungwi river water bridge and its success was my best experience	1
2.0	**On Agriculture: Which compost manure type do you know?**	
1	Pit compost	40
2	Bokashi Compost	12
3	Heap compost	6
4	Chinese compost	3
5	None	-
2.1	**Which compost manure type have you ever demonstrated**	
1	Pit compost	30
2	Heap compost	6
3	Bokashi Compost	4
4	None	8
2.2	**In what way do you think compost manure works?**	
1	Improves the soil structure, texture and water retention	29
2	Fertilization of the soil (hence reducing input costs to the small scale farmers)	23
3	Provides nutrients to the crops	10
4	Reduces acidity to the soil	2
5	It increases production	1
2.3	**What are the difficulties you have faced in disseminating compost manure?**	
1	Farmers cant not afford to buy Bokashi manure requirements, e.g. rice, molasses not available in the locality	9

2	Farmers prefer chemical fertilizer than compost	7
3	Too laborious to make and takes long time to decompose	5
4	None	4
5	Lack of animal manure to most farmers	3
6	Farmer believe that compost manure is not as effective as organic manure	2
7	Lack of proper ratios for applying and material used when making compost	2
8	Lack of agricultural lime	1
9	Not yet started	1
10	Need some training	1
11	Farmers complain that we need a heavy dosage if you have to increase area and it losses viability quickly	1
12	Lack of reading materials	1
3.0	**On Livelihood improvement for the smallholder farmers in your area: What activities /projects do you think are needed to improve the livelihood of the smallholder, list two**	
1	Irrigation system	16
2	Livestock rearing e.g. fish farming, goats rearing	13
3	Farmers need permanent weirs/canal lining	11
4	Crop/vegetable production	6
5	Training (not specified)	6
6	Sensitize farmers on the importance of using compost manure	4
7	Ready market	4
8	Study tours to other successful places in the provinces/districts	3
9	Provision of soft loans for the inputs for irrigation	3
10	Soil conservation methods	2
11	Land management	1
12	Nutrition	1
13	Home basic management	1
14	Farming	1
15	Encourage farmers to have savings groups in order to have access to soft loans	1

ATTACHMENT 4 COMMENTS ON EACH SESSION

Day-1	COMMENTS	Respondent
Session 1.1	**Program orientation**	
	Very good	5
	Excellent	2
	Well presented	2
	Came late	1
Session 1.2	**Contribution from JICA study team**	
	Good	5
	Excellent facilitation	4
	He was elaborate	1
	The comment was good but could not address the real problem to help project to success.	1
	The presentation was good though not much has been done on the weir construction.	1
Session 1.3	**Surfacing of the participants expectation**	
	Well done	2
	All expectation were presented	2
	Very good	2
	Fairly done	1
	Excellent	1
	Good presentation	1
	Some expectation not answered	1
Session 1.4	**Output preparation and presentation by district**	
	Good	4
	There has been inadequate information from the province to the districts	2
	Fair connections on the figures	2
	The output was well prepared and presented by projects	1
	Low performance by most districts	1
	The issues on transport & allowance came out but the TL emphasized on self reliance	1
Session 1.5	**Problem Arisen and Action taken**	
	Very good	3
	JICA Team highlighted the progress	1
	Excellent	1
	Well presented	1
	Fair	1
	Successfully conducted by staff	1
	Problems not tackled and fair of the projects to succeed due to inability of the implementation to achieve the targets as a result of logistical issue	1
Day 2		
Session 2.1	**Problem Arisen and Actions Taken**	
	Very good	4
	Successfully conducted and well presented	3
	Excellent	1
	Very interesting	1
Session 2.2	**Bokashi Compost (Lecture)**	
	Very Good	4
	Well presented by Mrs. Bulaya	3
	Not present (*these participates came late due to fuel shortage*).	3
	Very good	1
	Excellent	1
	Unable to read the flip charts presentation from the back of the class	1
	Need to prepare adequately	1
Session 2.3	**Bokashi Compost (Practice)**	
	Not present (*these participates came late due to fuel shortage*)	4
	Excellent	4
	Well understood	2
	Good presentation	2
	Need to prepare material adequately	1
	The practice has to be systematic in facilitation	1
Session 2.4	**Training Evaluation**	
	Very good and adequate training	2
	Very Good	2
	On issue on transport was not revealed	1
	Well done	1
	I have gained more knowledge and the training has been of great help	1

ATTACHMENT 5 ACHIEVEMENT ON IMPROVEMENT

Nr.	Site Name	Nr. of member farmers			Nr. of Land Owners	Weir Type	Original		Additional with Improvement		Original + Newly Irrigated, ha	Original + Opened, ha	Command Area, ha	Nr. of Fish Pond
		Total	Male	Female			Original C. Length, km	Area originally irrigated, ha	Canal Length newly dug, km	Opened Area in 2009, ha	Area newly irrigated in 2009, ha			
Kasama														
1		0	0	0	0		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
Total		0	0	0	0		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
Mbala														
1	Chin'gombe	30	15	15	1	2	2.50	0.00	0.00	0.25	0.25	0.25		
2	Chisinga	10	5	5	1	3	1.50	0.75	0.50	1.50	1.25	2.00	2.25	
3	Songolo	14	7	7	4	2	1.50	6.00	0.50	3.00	2.00	8.00	9.00	
4	Mukatula	15	14	1	7	2	5.00	3.50	0.20	1.50	0.50	4.00	5.00	
5	Katwezye	12	8	4	12	2	3.00	3.00	0.00	3.25	3.00	6.00	6.25	
6	Nakatali	26	3	23	2	2	3.00	1.00	0.00	0.75	0.50	1.50	1.75	
7	Mutasenka	15	10	5	3	2	3.00	2.50	0.50	3.50	3.00	5.50	6.00	
8	Kasapo	40	30	10	31	2	2.00	2.50	0.00	0.50	0.50	3.00	3.00	
9	Tvikatane	40	30	10	2	4	4.50	2.00	0.00	1.00	0.50	2.50	3.00	
10	Tvatvane	40	25	15	7	3	3.00	3.50	0.00	1.00	0.75	4.25	4.50	
11	Fikachilika	34	20	14	7	2	4.00	2.50	0.00	1.00	0.50	3.00	3.50	
12	Taikalika	28	18	9	7	2	3.50	2.50	0.50	1.25	0.50	3.00	3.75	
13	Samdulula	35	25	10	10	2	3.00	2.50	0.00	0.50	0.25	2.75	3.00	
14	Buyantanshi	30	25	5	8	2	3.00	2.50	0.00	0.75	0.50	3.00	3.25	
15	Township	15	9	6	2	2	2.00	0.75	0.00	1.75	1.50	2.25	2.50	
16	Musisha	12	7	5	3	2	1.50	0.50	0.00	1.50	1.00	1.50	2.00	
17	Nyambwe	25	15	10	6	4	2.00	1.50	0.00	0.50	0.00	1.50	2.00	
18	Chipundu	14	10	4	3	2	2.00	1.00	0.00	0.75	0.50	1.50	1.75	
19	Saise B	25	17	12	1	5	1.20	0.75	0.00	1.50	0.50	1.25	2.25	
20	Twazwane	15	9	6	1	2	1.80	1.50	0.50	3.00	0.50	2.00	4.50	
21	Saise	45	35	10	4	2	0.10	0.50	1.00	1.25	0.50	1.00	1.75	
22	Katito	35	25	10	1	2	3.50	1.50	0.00	3.50	0.00	1.50	5.00	
Total	22	555	362	196	123		56.60	42.75	3.70	33.50	18.50	61.25	76.25	91.14	NA
Average		25	16	9	6		2.57	1.94	0.17	1.52	0.84	2.78	3.47	4.14	NA
Mpika														
1	Ubulimi Tabupwa	54	45	9	4	3	3.50	1.25	0.00	8.20	7.70	8.95	9.45	10.50	
2	Natubalange	20	12	8	2	3	1.50	0.50	3.00	1.50	1.50	2.00	2.00	3.50	
3	Kabale Irrig. Scheme	31	17	11	1	4	5.00	1.50	0.00	3.00	3.00	4.50	4.50	7.50	
4	Katongo Kapala	50	37	13	50	4	3.50	3.00	0.00	3.50	3.50	6.50	6.50	7.00	
5	Minamba Irri Scheme	24	17	7	1	1	1.00	1.50	0.50	0.83	0.70	2.20	2.33	9.00	
6	Nkupisha	23	15	8	5	3	4.00	2.00	0.00	5.00	5.00	7.00	7.00	12.00	
7	Chailo Irrig. Scheme	15	9	6	15	3	4.00	5.00	0.00	1.50	1.00	6.00	6.50	16.00	
Total	7	217	152	62	78		22.50	14.75	3.50	23.53	22.40	37.15	38.28	65.50	NA
Average		31	22	9	11		3.21	2.11	0.50	3.36	3.20	5.31	5.47	9.36	NA
Mporokoso														
1	Katwayamba	977	555	422	0	3	2.00	12.00	0.00	10.00	0.00	12.00	22.00	20.00	4
2	Pilibukeni FG.	15	9	6	1	1	0.50	0.50	0.00	2.50	1.00	1.50	3.00	5.00	1
3	Kayokolo	20	8	12	1	2	1.50	1.00	0.50	0.50	0.00	1.00	1.50	5.00	1
4	Kampemba	15	10	5	0	2	0.30	1.00	0.00	0.75	0.00	1.00	1.75	5.00	3
5	Misumbi	35	15	20	20	2	3.00	1.00	0.00	1.00	0.00	1.00	2.00	4.00	2
6	Chelu	30	18	12	20	2	1.25	0.50	0.00	0.50	0.00	0.50	1.00	0.50	0
7	Chilala	50	20	30	41	2	2.00	1.00	0.00	3.00	1.00	2.00	4.00	5.00	6
8	Kafibe	21	16	5	1	1	1.60	2.00	0.00	0.30	0.00	2.00	2.30	1.20	0
9	Mulenga Malupenga	6	6	0	1	1	1.00	2.00	0.00	0.50	0.00	2.00	2.50	1.50	2
10	Malupenga	15	11	4	3	1	2.00	1.80	0.00	0.25	0.00	1.80	2.05	2.00	0
11	Kawikisha G. 1	40	29	11	0	2	1.50	0.50	0.00	1.50	0.00	0.50	2.00	2.00	0
12	Kawikisha G 2	10	8	2	1	2	0.80	1.25	0.00	1.25	0.00	1.25	2.50	3.00	3

Nr.	Site Name	Nr. of member farmers			Nr. of Land Owners	Weir Type	Original		Additional with Improvement			Original + Newly Irrigated, ha	Original + Opened, ha	Command Area, ha	Nr. of Fish Pond
		Total	Male	Female			Original C. Length, km	Area originally irrigated, ha	Canal Length newly dug, km	Opened Area in 2009, ha	Area newly irrigated in 2009, ha				
13	Mulenga	8	6	2	4	2	1.60	5.00	0.00	5.00	0.00	5.00	10.00	5.00	0
14	Sokoni FG.	35	30	5	0	2	1.50	0.25	0.00	0.25	0.00	0.25	0.50	5.00	3
15	Chongo Chinondo	50	30	20	0	2	2.00	1.00	0.00	0.25	0.00	1.00	1.25	1.00	0
16	Sokoni Men's Club	20	15	5	0	2	0.40	0.25	0.00	1.00	0.00	0.25	1.25	10.00	0
Total	**16**	**1,347**	**786**	**561**	**93**		**22.95**	**31.05**	**0.50**	**28.55**	**2.00**	**33.05**	**59.60**	**75.20**	**25**
Average		**84**	**49**	**35**	**6**		**1.43**	**1.94**	**0.03**	**1.78**	**0.13**	**2.07**	**3.73**	**4.70**	**1.56**
Mungwi															
1	Kalupa Wamilimo	53	28	25	0	2	0.80	0.00	1.00	4.00	2.00	2.00	4.00	2.50	8
2	Twikatane	50	35	15	0	2	2.00	0.00	0.00	4.50	4.50	4.50	4.50	5.00	0
3	Chiparnano	20	13	7	0	2	3.50	0.00	0.05	3.00	0.50	0.50	3.00	5.00	0
4	Buyantanshi	15	5	10	0	3	7.00	0.00	0.00	3.00	1.00	1.00	3.00	10.00	0
5	Twikatane Kabulyeni	44	39	5	0	2	2.00	0.00	0.00	3.00	0.00	0.00	3.00	5.00	0
Total	**5**	**182**	**120**	**62**	**0**		**15.30**	**0.00**	**1.05**	**17.50**	**8.00**	**8.00**	**17.50**	**27.50**	**8**
Average		**36**	**24**	**12**	**0**		**3.06**	**0.00**	**0.21**	**3.50**	**1.60**	**1.60**	**3.50**	**5.50**	**1.60**
Luwingu															
1	Chambata	60	52	8	1	1	0.20	0.00	0.00	0.25	0.25	0.25	0.25	5.00	0
2	Chishishi	63	48	15	1	1	0.30	0.50	1.50	2.00	1.50	2.00	2.50	15.00	0
3	Lima	75	68	7	12	1	0.40	0.00	0.00	0.25	0.25	0.25	0.25	12.00	4
4	Twalilileni	45	25	20	1	3	0.70	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0
5	Milandu	53	30	23	2	1	0.70	0.00	0.00	7.00	3.00	3.00	7.00	8.00	0
6	Ipandula	68	50	18	1	3	0.30	0.00	0.00	0.00	0.00	0.00	0.00	12.00	0
7	Katwesheko	35	20	15	3	0	0.10	0.00	0.20	0.00	0.00	0.00	0.00	8.00	0
8	Natumane Akapi	40	22	18	1	4	0.20	0.00	0.00	0.00	0.00	0.00	0.00	6.00	0
9	Muchishe	23	20	3	2	1	0.40	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0
10	Lunika	20	12	8	4	1	0.35	0.00	0.00	0.00	0.00	0.00	0.00	7.00	0
11	Bwafwano	63	33	30	3	0	1.50	1.00	0.05	0.50	0.00	1.00	1.50	12.00	0
12	Chinyanta	40	15	25	1	1	8.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0
13	Mapulanga	98	50	48	3	0	12.00	0.75	0.00	1.00	0.00	0.75	1.75	18.00	0
14	Kapisha	150	105	45	3	0	3.00	2.00	0.00	2.00	0.00	2.00	4.00	10.00	4
15	Chisosa Saili	150	90	60	6	0	12.00	4.00	0.50	5.00	1.00	5.00	9.00	8.00	0
16	Mufili/Chibwale	120	73	47	2	0	4.20	3.00	0.00	4.00	0.00	3.00	7.00	18.00	3
17	Makumba	35	32	3	1	0	1.30	0.25	0.00	0.25	0.00	0.25	0.50	4.00	2
Total	**17**	**1,138**	**745**	**393**	**47**		**45.65**	**11.50**	**2.26**	**22.25**	**6.00**	**17.50**	**33.75**	**168.00**	**13**
Average		**67**	**44**	**23**	**3**		**2.69**	**0.68**	**0.13**	**1.31**	**0.35**	**1.03**	**1.99**	**9.88**	**0.76**
Kawambwa															
1	Kabalenge 1	30	18	12	6	1	0.10	0.25	0.05	0.75	0.75	1.00	1.00		18
2	Kapweshi	12	8	4	2	2	3.00	0.75	0.10	0.25	0.25	1.00	1.00		6
3	Kabalenge 2	40	28	12	4	4	3.00	1.00	0.06	0.50	0.50	1.50	1.50		0
4	Lende Ngoma	50	29	21	5	2	1.50	0.75	0.75	0.25	0.25	1.00	1.00		0
5	Katulwende	4	3	1	4	4	0.71	2.00	0.01	0.25	0.25	2.25	2.25		7
6	Mipanga	10	4	6	10	5	1.50	0.50	0.00	0.00	0.00	0.50	0.50		0
7	Milindu	47	30	17	1	0	0.50	2.00	0.00	0.00	0.00	2.00	2.00		0
8	Senga	57	37	20	25	0	1.50	1.20	0.30	0.50	0.50	1.70	1.70		38
9	Chansamalamba	7	4	3	1	6	0.50	0.50	0.00	0.00	0.00	0.50	0.50		2
10	Kapama	25	7	18	3	1	0.34	0.20	0.30	0.40	0.40	0.60	0.60		0
11	Kamungu	13	9	4	5	2	0.45	0.50	0.05	0.10	0.10	0.60	0.60		4
12	Luena	22	17	5	14	2	1.30	2.80	0.32	0.20	0.20	3.00	3.00		3
13	Chibolya	7	5	2	1	2	0.30	0.75	0.00	0.00	0.00	0.75	0.75		0
14	Kamukeshi 1	35	20	15	3	0	0.15	0.18	0.03	0.07	0.07	0.25	0.25		2
Total	**14**	**359**	**219**	**140**	**84**		**14.85**	**13.38**	**1.97**	**7.60**	**3.27**	**16.65**	**20.98**	**48.00**	**80**
Average		**26**	**16**	**10**	**6**		**1.06**	**0.96**	**0.14**	**0.54**	**0.23**	**1.19**	**1.50**	**3.43**	**5.71**

Nr.	Site Name	Nr. of member farmers			Nr. of Land Owners	Weir Type	Original		Additional with Improvement			Original + Newly Irrigated, ha	Original + Opened, ha	Command Area, ha	Nr. of Fish Pond
		Total	Male	Female			Original C. Length, km	Area originally irrigated, ha	Canal Length newly dug, km	Opened Area in 2009, ha	Area newly irrigated in 2009, ha				
Mansa															
1	Mabondo	10	5	5	1	2	0.10	3.00	0.10	4.00	4.00	7.00	7.00	8.00	
2	Akasakalabwe	10	5	5	1	2	0.50	0.50	0.10	1.00	1.00	1.50	1.50	3.50	
3	Mwililwa	25	14	11	2	3	1.50	3.00	0.10	0.75	0.75	3.75	3.75	18.00	
4	Kapundu	30	18	12	1	3	0.30	2.00	0.30	3.00	3.00	5.00	5.00	7.00	
5	Mutima	15	10	5	1	3	0.50	3.00	0.10	2.00	2.00	5.00	5.00	11.00	
6	Chimbwi	11	7	4	1	3	0.40	0.75	0.10	1.00	1.00	1.75	1.75	4.75	
7	Lwamfumu	20	15	5	3	3	1.50	3.00	0.10	2.25	1.25	4.25	5.25	24.00	
8	Makanga	10	5	5	1	2	0.20	1.00	1.50	2.00	2.00	3.00	3.00	10.00	
9	Kanina	10	8	2	2	2	0.20	1.00	1.50	3.00	3.00	4.00	4.00	4.00	
10	Mwengele 1	8	5	3	2	2	1.50	2.00	1.50	2.00	2.00	4.00	4.00	7.00	
11	Mwengele 2	8	5	3	2	3	2.00	2.00	2.00	5.00	5.00	7.00	7.00	7.00	
12	Bumpeketa	12	8	4	2	2	1.00	2.00	0.20	2.00	1.00	3.00	4.00	12.00	
13	Chimfula	10	7	3	4	3	1.50	1.00	0.50	1.00	1.00	2.00	2.00	6.00	
14	Bunga	15	11	4	3	3	0.10	1.00	0.50	3.00	2.00	3.00	4.00	8.00	
15	Lupuma 1	12	8	4	2	3	0.40	0.10	1.00	8.00	5.00	5.10	8.10	5.00	
16	Likundushi	10	7	3	5	3	2.00	2.00	2.00	1.00	1.00	3.00	3.00	5.00	
17	Lupuma 2	12	8	4	2	3	0.20	2.00	0.10	1.00	1.00	3.00	3.00	5.00	
18	Tinta Ulukasu	19	12	7	2	3	2.00	5.00	1.00	1.00	1.00	6.00	6.00	17.00	
19	Chisesema	15	11	4	3	3	0.10	1.00	1.00	1.00	1.00	2.00	2.00	2.00	
Total	**19**	**262**	**169**	**93**	**40**		**16.00**	**35.35**	**13.70**	**44.00**	**38.00**	**73.35**	**79.35**	**164.25**	**NA**
Average		**14**	**9**	**5**	**2**		**0.84**	**1.86**	**0.72**	**2.32**	**2.00**	**3.86**	**4.18**	**8.64**	**NA**
Grand Total	**100**	**4,060**	**2,553**	**1,507**	**465**		**193.85**	**148.78**	**26.68**	**176.92**	**98.17**	**246.95**	**325.70**	**639.59**	**126**
Average		**41**	**26**	**15**	**5**		**1.94**	**1.49**	**0.27**	**1.77**	**0.98**	**2.47**	**3.26**	**6.40**	**2.42**
Per Member							**0.05**	**0.0366**	**0.01**	**0.04**	**0.0242**	**0.0608**	**0.0802**	**0.1575**	**0.06**

Weir Type: 0: Natural Diversion, 1:Inclined, 2:Single-Line, 3:Double-Line, 4:Trigonal, 5:Masonry

ATTACHMENT 6 ACHIEVEMENT ON NEW DEVELOPMENT

Nr.	Site Name	Nr. of member farmers			Nr. of Land Owners	Weir Type	Done in This 2009 Dry Season			Plan for Next 2010 Dry Season			Comeand Area, ha	Nr. of Fish Pond
		Total	Male	Female			Canal Length dig in 2009, km	Opened Area in 2009, ha	Irrigated Area in 2009, ha	Canal Length to be dug, km	Area to be irrigated, ha	Area to be irrigated, ha		
Kasama														
1	Mchwaki	54	54	0	9	3	1.70	0.13	0.00	2.00	2.50	2.50	20.00	0
2	Soni	6	5	1	6	0	0.00	0.00	0.00	1.00	0.75	0.75	0.00	0
3	Chipompo	90	54	36	6	5	0.30	0.00	0.00	7.70	2.00	2.00	20.00	0
4	Lunda	53	32	21	7	3	0.60	0.25	0.25	1.00	2.00	2.25	20.00	0
5	Kaungatoka	17	14	3	0	2	0.30	0.25	0.13	1.60	1.00	1.13	5.00	0
Total	5	220	159	61	28		2.90	0.63	0.38	13.30	8.25	8.63	65.00	0
Average		44	32	12	6		0.58	0.13	0.08	2.66	1.65	1.73	13.00	0
	Members irrigated	70	46	24	7									
Mbala														
1	Muzuma	30	19	11	1	2	0.50	0.00	0.00	1.00	0.50	0.50		
2	Kavala	40	20	20	2	3	0.20	0.50	0.25	2.00	0.50	0.75		
3	Kaele	20	10	10	2	2	0.30	0.55	0.30	1.00	1.50	1.80		
4	Mansimbwe	30	20	10	1	2	0.30	0.25	0.25	0.50	0.50	0.75		
5	Twikatane	24	23	1	2	4	0.10	0.25	0.00	0.50	0.50	0.50		
6	Mukana	38	30	8	17	2	0.50	0.50	0.25	1.50	0.50	0.75		
7	Kalaiya	34	34	0	17	2	0.10	0.25	0.00	1.00	1.00	1.00		
8	Chisheila	55	55	0	60	2	0.10	0.25	0.00	0.50	0.25	0.25		
9	Twatasiya	25	16	9	1	2	0.20	1.25	0.25	1.00	1.00	1.25		
10	Mukunda	10	8	2	10	4	0.20	0.00	0.00	1.00	0.25	0.25		
11	Mwenge	100	78	22	65	3	1.50	4.00	1.00	1.50	3.00	4.00		
12	Nachasuwa	100	47	53	22	3	0.80	0.75	0.50	0.50	0.25	0.75		
13	Twikatane	35	23	12	4	4	1.00	1.00	0.50	2.50	2.00	2.50		
14	Micheto	20	13	7	7	2	0.50	0.75	0.25	2.00	0.75	1.00		
15	Mpanganikula	39	30	9	10	2	1.00	0.75	0.25	1.00	0.50	0.75		
16	Bomba Ngolye	70	64	6	7	3	0.50	0.00	0.00	3.00	1.00	1.00		
17	Natweshe	50	40	10	8	2	0.30	0.00	0.00	2.00	0.75	0.75		
18	Chishawasha	20	15	5	2	2	0.10	0.25	0.00	0.50	0.25	0.25		
19	Samuel	15	15	0	2	4	0.20	0.25	0.25	2.00	0.50	0.75		
20	Tulemane	15	10	5	11	4	0.50	1.00	0.50	1.00	0.50	1.00		
21	Kapata	15	11	4	6	4	1.00	0.75	0.25	1.00	0.75	1.00		
22	Chitene	12	10	2	5	2	0.10	0.00	0.00	0.50	0.50	0.50		
23	Manyika	11	8	3	11	2	0.10	0.00	0.00	0.10	1.00	1.00		
24	Twikatane	70	40	30	20	5	3.00	0.50	0.50	0.00	2.00	2.50		
25	Tulemane	25	15	10	10	4	0.20	0.50	0.50	1.50	1.50	2.00		
Total	25	903	654	249	323		13.30	14.30	5.80	29.10	21.75	27.55	17.06	NA
Average		36	26	10	13		0.53	0.57	0.23	1.16	0.87	1.10	0.68	NA
	Members irrigated	459	298	161	178									
Mpika														
1	Yande Irrig. Scheme	40	21	19	1	3	1.50	1.00	0.25	1.00	2.25	2.50	3.00	0
2	Lubuto Irrig. Scheme	34	22	12	1	4	2.75	1.60	1.10	0.00	2.38	3.48	3.50	0
3	Kakubo Irrig. Scheme	15	7	8	1	3	2.50	0.75	0.75	0.00	2.50	3.25	3.25	0
4	Mollisova Irrig. Schem	32	19	13	1	4	1.50	2.50	2.50	2.00	1.50	4.00	3.00	0
5	Kampemba Irrig. Sch.	21	16	5	1	1	0.53	0.50	0.50	0.50	2.50	3.00	2.63	0
6	Ibenge Irrig. Scheme	20	14	6	3	3	0.50	1.00	0.75	0.00	3.00	3.75	1.25	0
7	Kakabolika Irrig. Sch.	15	10	5	1	4	0.20	0.30	0.30	1.50	2.00	2.30	0.40	0
8	Kamansimpundu I. S	20	13	7	2	1	0.15	0.05	0.05	1.80	3.00	3.05	0.45	0
9	Chibanga Twikatane	16	12	4	2	3	0.08	0.20	0.20	1.50	2.00	2.20	0.28	0
10	Mulamba Irrig. Sch.	54	40	14	0	3	4.00	0.00	0.00	1.50	5.00	5.00	12.00	0
11	Makaliki Irrig. Sch.	28	20	8	1	3	6.00	0.00	0.00	0.50	2.00	2.00	30.00	12
12	Chikwanda Irrig. Sch.	60	40	20	2	3	0.10	0.25	0.25	5.00	5.00	5.25	0.10	0
Total	12	355	234	121	16		19.81	8.15	6.65	15.30	33.13	39.78	58.86	12
Average		30	20	10	1		1.65	0.68	0.55	1.28	2.76	3.31	4.99	1

Nr.	Site Name	Nr. of member farmers			Nr. of Land Owners	Weir Type	Done in This 2009 Dry Season			Plan for Next 2010 Dry Season			Command Area, ha	Nr. of Fish Pond
		Total	Male	Female			Canal Length dug in 2009, km	Opened Area in 2009, ha	Irrigated Area in 2009, ha	Canal Length to be dug, km	Additional Area to be Irrigated, ha	Area to be Irrigated, ha		
	Members Irrigated	273	174	99	15									
Mporokoso														
1	Mwitaba	30	20	10	0	1	0.20	1.50	0.00	1.80	2.00	2.00	3.00	0
2	Mwange Wampandwe	15	9	6	1	1	0.60	1.00	0.50	0.50	1.00	1.50	1.60	2
3	Kabusha	148	72	76	11	2	0.30	6.00	0.00	2.70	6.00	6.00	6.00	0
4	Mulama	10	10	0	2	2	0.30	3.25	0.75	2.20	2.50	3.25	2.50	0
5	Malindimo	25	15	10	0	2	0.20	2.40	0.00	1.00	2.40	2.40	2.40	0
Total	5	228	126	102	14		1.60	14.15	1.25	8.20	13.90	15.15	15.50	2
Average		46	25	20	3		0.32	2.83	0.25	1.64	2.78	3.03	3.10	0
	Members Irrigated	25	19	6	3									
Mungwi														
1	Natubombeshe	25	17	8	0	2	1.80	1.75	0.25	0.50	1.50	1.75	1.50	2
2	Twafwano	35	20	15	0	1,2,4	0.60	0.00	0.00	0.00	0.75	0.75	0.75	0
3	Kalemba	80	35	45	0	3	0.02	0.00	0.00	4.00	4.00	4.00	1.50	0
4	Kalungu	30	20	10	0	2	2.80	5.30	0.80	0.50	4.50	5.30	7.00	0
5	Chikawama	70	35	35	0	1	2.40	2.25	0.25	2.00	4.00	4.25	3.50	0
6	Mungwi Bridge	25	15	10	0	5	1.50	2.00	0.00	0.50	2.00	2.00	2.50	0
Total	6	265	142	123	0		9.12	11.30	1.30	7.50	16.75	18.05	16.75	2
Average		44	24	21	0		1.52	1.88	0.22	1.25	2.79	3.01	2.79	0
	Members Irrigated	125	72	53	0									
Luwingu														
1	Chambata	80	52	8	1	1	0.20	0.00	0.00	4.00	4.00	4.00	5.00	0
2	Chishishi	53	48	15	1	1	0.30	1.00	0.50	3.50	14.00	14.50	15.00	0
3	Lim a	75	68	7	12	1	0.40	0.00	0.00	6.00	10.00	10.00	12.00	4
4	Twalilileni	45	25	20	1	3	0.70	0.00	0.00	15.00	8.00	8.00	10.00	0
5	Mitandu	53	30	23	2	1	0.70	4.00	0.00	2.70	7.00	7.00	8.00	0
6	Ipandula	68	50	18	1	3	0.30	0.00	0.00	5.30	10.00	10.00	12.00	0
7	Natumane Akapi	40	22	18	1	4	0.20	0.00	0.00	14.80	4.00	4.00	6.00	0
8	Muchishe	23	20	3	2	1	0.40	0.00	0.00	3.60	3.00	3.00	5.00	0
9	Lunika	20	12	8	4	1	0.35	0.00	0.00	8.65	5.00	5.00	7.00	0
Total	9	447	327	120	25		3.55	5.00	0.50	63.55	65.00	65.50	80.00	4
Average		50	36	13	3		0.39	0.56	0.06	7.06	7.22	7.28	8.89	0
	Members Irrigated	53	48	15	1									
Kawambwa														
1	Chifinsa 1	15	9	6	4	1	0.60	0.50	0.50	0.80	1.60	2.10		0
2	Chifinsa 2	12	10	2	7	2	0.04	0.06	0.06	0.78	3.00	3.06		0
3	Kelwe	78	51	27	35	5	1.30	1.10	1.10	0.20	0.50	1.60		0
4	Tumfwano	25	16	9	1	2	0.20	0.50	0.50	0.00	0.25	0.75		0
5	Kansombo	12	7	5	2	4	0.32	0.75	0.75	0.50	0.25	1.00		0
6	Kabalenge	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00		0
7	Chipepo	25	17	8	4	2	0.30	0.50	0.50	0.41	0.25	0.75		0
8	Kasanda	15	11	4	4	5	0.12	1.00	1.00	0.15	0.50	1.50		0
9	Natwange	8	5	3	2	5	0.13	0.30	0.30	0.07	0.10	0.40		0
10	Kapulo	35	29	6	2	2	0.00	0.00	0.00	0.00	0.00	0.00		0
Total	10	225	155	70	61		3.01	8.71	4.71	2.91	6.45	11.16	29.00	0
Average		23	16	7	6		0.30	0.87	0.47	0.29	0.65	1.12	2.90	0
	Members Irrigated	190	126	64	59									
Mansa														
1	Mushipashi	12	8	4	12	3	0.20	2.00	2.00	0.10	1.00	3.00	3.00	
2	Lwamfumu	45	30	15	2	2	3.00	3.00	3.00	0.50	1.00	4.00	13.00	
3	Chilila	15	9	6	3	3	0.20	0.75	0.75	0.50	2.00	2.75	1.50	
4	Sepe	10	8	2	4	3	1.00	1.00	1.00	0.10	0.50	1.50	1.50	
5	Mabondo ntoposhi	26	18	8	1	2	2.50	4.75	4.50	0.50	0.50	5.00	14.50	

Nr.	Site Name	Nr. of member farmers			Nr. of Land Owners	Weir Type	Done in This 2009 Dry Season			Plan for Next 2010 Dry Season			Command Area, ha	Nr. of Fish Pond
		Total	Male	Female			Canal Length dug in 2009, km	Opened Area in 2009, ha	Irrigated Area in 2009, ha	Canal Length to be dug, km	Additional Area to be Irrigated, ha	Area to be Irrigated, ha		
6	Kamabala	32	16	16	2	3	1.00	3.50	1.50	1.00	2.00	3.50	6.50	
7	Kapyata	10	7	3	2	2	0.50	1.00	1.00	0.50	1.00	2.00	2.00	
8	Fipangwa	30	18	12	4	2	0.20	0.25	0.25	1.00	2.00	2.25		
9	Kapundu	30	20	16	5	3	0.30	2.00	2.00	1.00	0.75	2.75	2.25	
10	Mwililwa Upper	20	12	8	1	3	0.30	3.00	1.00	0.50	4.00	5.00	8.00	
11	Mwengele	20	10	10	7	2	0.03	2.25	0.25	0.50	2.00	2.25	5.25	
12	Chalwe	18	10	8	5	3	0.40	2.75	0.75	1.00	3.00	3.75	6.75	
13	Mabondo/Chimfula	10	7	3	2	2	1.00	0.25	0.25	0.50	2.00	2.25		
14	Mapalo	10	8	2	2	3	0.20	1.00	1.00	0.80	5.00	6.00	6.00	
15	Mwililwa Lower	25	15	10	2	2	3.50	5.00	5.00	1.00	0.50	5.50	5.00	
16	Sweulu	30	23	7	1	3	0.40	2.00	2.00	1.00	7.00	9.00	9.00	
17	Machengela	16	9	7	5	2	0.10	0.25	0.25	0.10	0.50	0.75	10.25	
18	Mwombe	12	9	3	1	2	0.10	1.00	1.00	0.50	2.00	3.00	3.00	
19	Talwaka	48	30	18	2	3	0.40	2.00	1.00	1.00	2.00	3.00		
20	Twesheko	15	9	6	3	2	0.20	0.75	0.75	0.25	0.50	1.25		
21	Kabula	19	12	7	2	3	2.00	2.00	1.00	1.00	1.00	2.00	5.00	
22	Chimfula	16	10	6	1	3	0.03	1.00	1.00	1.00	2.00	3.00	3.00	
Total	**22**	**469**	**298**	**177**	**69**		**17.56**	**41.50**	**31.25**	**14.35**	**42.25**	**73.50**	**105.50**	**NA**
Average		**21**	**14**	**8**	**3**		**0.80**	**1.89**	**1.42**	**0.65**	**1.92**	**3.34**	**4.80**	**NA**
	Members irrigated	**469**	**298**	**177**	**69**									
Grand	**94**	**3,112**	**2,095**	**1,023**	**536**		**70.84**	**103.74**	**51.84**	**154.21**	**207.475**	**259.32**	**388.665**	**20**
Average		**33**	**22**	**11**	**6**		**0.75**	**1.10**	**0.55**	**1.64**	**2.21**	**2.76**	**4.13**	**0.43**
Per Member							**0.02**	**0.0333**	**0.0167**	**0.0496**	**0.0667**	**0.0833**	**0.1249**	**0.0129**
	31	**not irrigated yet at all in 2009 dry season out of the total 94 sites**												
	63	**acutually irrigated in 2009 dry season out of the total 95 sites**							**0.82**					
	Members irrigated	**1,674**	**1,081**	**599**	**332**				**0.0310**					

Weir Type: 0: Natural Diversion, 1:Inclined, 2:Single-Line, 3:Double-Line, 4:Trigonal, 5:Masonry

ATTACHMENT 7 PROBLEMS/ISSUES ARISEN AND COUNTERMEASURES

District	No.	Problems/Issues Arisen	Cause of the Problems	Countermeasures	Lessons	Countermeasures in the future, if not solved yet.
Kasama	1	Low adoption rate by farmers	Different Expectations	Intensified extension	Need for more extension services	
	2	Insufficient Logistics	Unknown		Low participation -limited area of operation	
	3	Land owners demanding a payment	Natural Terrain	Through intervention by chief	Need to involve local leaders in developmental projects	Appeal for logistical support from Authority
	4	Obstacles along Canal route		Made embankment using boulders	Need for initiative in problem solving	
Mungwi	1	Slow rate of work at Kalemba chiti site	Farmers involved in other community activities			
	2	Some farmers not willing to allow furrows to pass through their fields	Fear of land being give to other farmers			
	3	Farmers not following pegs along the furrow	Waiting to increase area for irrigation			
	4	Inadequate transport	Motor bikes break downs			
	5	Logistics – Allowances – Protective clothing	Unknown		Low morale	Request JICA to provide as well as Ministry of Agriculture
Mbala	1	No reliable transport No transport in some camps	-No spare parts, hence no repairs -No funding -Transport not provided	-We hire transport from local community -Farmers carry officers on bicycle and Donkey, ox-cart	Money meant for domestic use is diverted to government duties with fear of not achieving the target	Proper budgeting required as well as improving funding of the program
	2	Lack of motivation	-Lack of allowances -Inadequate fuel, inadequate funding -poor activity planning	-No control over the problem	Rendering sacrificial service	Inadequate funding required
	3	Lack of regular follow ups	Poor activity planning	Problem beyond our control	No proper data given out by fellow CEO	Increase fund and logistical support
Mpika	1	Farmers thought inputs will be provided	Used to been given handouts by other projects	By facilitation project objectives/programs	Farmers bought their own seed	
	2	Farmers refused to adopt project at one potential site because they thought project will take away fertile land	There were rumors that their land will be used for sugar cane growing by a private company	We facilitated project objectives program but could not listen so we walked away	Some are not willing to improve because of cultural implication	

District	No.	Problems/Issues Arisen	Cause of the Problems	Countermeasures	Lessons	Countermeasures in the future, if not solved yet.
	3	Lost one scheme because water has yet dried up at Itongo	A group of farmers also dug a furrow from the stream source, hence disturbing the water catchment	Nothing has been done because of nature		In the future we should educate farmers on having activities away from the stream sources and near/along stream beds
	4	No remuneration for the ever hard working officers implementing the project	JICA did not plan	Launched complaint to JICA and Province TSB office		JICA must provide allowances
	5	Motor bike breaking downs	No funding for repairs	Reported to JICA and Provincial office		JICA must plan and fund repairs
	6	Inadequate fuel allocation	Initial plan for fuel allocation not followed	Reported to JICA and provincial TSB office		Revote to what was planned by District initially
Luwingu	1	Lack or transport (motorbikes) for CEOs/BEOs. Inadequate fuel allocation	No supply from the Ministry of Agriculture and Cooperatives/JICA	Hiring bicycles from farmers, walking long distances to sites	It is no easy to carry out operations successfully without transportation.	Request the ministry/JICA to provide transport (motorbikes)
	2	No allowances for field operations	No funding by MACO/JICA	Meals and accommodation provided by farmers sometimes	Planned operation effected in terms of the time frame	MACO/JICA to provide funds
	3	Lack of protective clothing for field officers	No provision by MACO/JICA	Continues sensitization on irrigation farming	Sometimes sustain injuries	MACO/JICA to provide protective clothing
	4	Low participation by some farmers	Little knowledge on the importance of irrigation farming		There is need to conduct training in irrigation farming	MACO staff to continue training farmers in irrigation farming
Mporokoso	1	No transport (Motorbike)	Lack of motor bike	Borrowing from other departments	Poor performance	Provision of motorbikes and fuel oil
	2	Low women participation	Gender dissemination	By conducting sensitization meeting in the villages	Gender equality is good	
	3	Logistical support	No allowances		No motivation to CEO, BEO and TSB	Allowances must be provided
	4	Poor communication to the community	Communication channel by leaders to members	Using villages headman to spread information	It is important to innovate local leadership every activity	
	5	Lack of protective clothes (field attire)	No allowances from the JICA team			Protective clothing must be provided

District	No.	Problems/Issues Arisen	Cause of the Problems	Countermeasures	Lessons	Countermeasures in the future, if not solved yet.
Mansa	1	Poor mobility	The District has no vehicle	By borrowing from other sections/combined trips	Sometimes chances are denied to carry out the implementation and the solution is temporal	Government/JICA project should partners in bring motorized means of transport
	2	Low food production at house hold level	Farmers produce only during rainy season	Sensitization and weir construction	Inputs are expensive	Government to subsidize input to small scale irrigation farmer
	3	No protective clothing	No allocation provided by GRZ	By using our own money	Budget inconvenienced at house hold level	Government and project should provide
Kawambwa	1	Lack of transport	Lack of motorized transport such as motorbikes (There has not been provision of either bicycle)	Shorter Distances have been covered on foot and sometimes we use motorbikes from the District	Use of initiative	Seeking the involvement of stakeholders (JICA and Government to provide efficient means of transport.
	2	Inadequate fuel allocation	Limited resources on JICA budget line	There has been supplementation from department of Agriculture and use hired or personal bicycle	Less input	More fuel allocation on the part of JICA
	3	Low motivation	Limited logistical support to officer	Personal sacrifice	Slow implementation of JICA activities	JICA must provide incentives

ATTACHMENT 8 ACHIEVEMENTS/EVENTS THE DISTRICT IS MOST PROUD OF

Kasama	**Achievements/events the district is the most proud of**	**Why and/or how it happened? With what efforts has it happened?**	**How can you share your experiences your colleagues who are not here**
1	Lunda Irrigation Group irrigating 1 lima of vegetables	Formation of Irrigation Groups	It is more effective to work with IGs than individuals (organize meetings)
2	Cultivated successfully a total of 1.75 ha of irrigated wheat	Capacity built farmers in wheat growing using irrigation	Encourage colleagues to set up demos for irrigated wheat.
3	Construction of a stone/masonry weir and heavy clay across the Lukupa River	Through commitment and determination of farmers and staff	**Expose them to the site.**
Mungwi	**Achievements/events the district is the most proud of**	**Why and/or how it happened? With what efforts has it happened?**	**How can you share your experiences your colleagues who are not here**
1	Targets for new development sites achieved	Hard work, coordination and team work	**During monthly meetings and field visits**
2	Trained all district staff	During monthly meetings and camp follow-ups	Through exposure visits to sites
3	Furrow able to cross the stream to reach more farmers in Nseluka	Constructed single line weir across the stream	**Exposure visits**
4	Construction of intake at Mungwi river bridge as well as use of 3 types weirs and road crossing at Chibile	Construction of water basket, use of trigonal, double line and inclined weir as well as material support from JICA study team	Exposure visits and training.
Mbala	**Achievements/events the district is the most proud of**	**Why and/or how it happened? With what efforts has it happened?**	**How can you share your experiences your colleagues who are not here**
1	49 temporal diversion weirs constructed (technology appreciated by local community)	Locally available materials used Local community participation and coordination Adoption of t he technology at a fast rate.	Organizing for **exposure visits** and training of fellow CEOS (TOTs)
2	Farmers able to organize the up fronts	Available materials coupled with technical support	Organizing for exposure visits and training of fellow CEOs (TOTs)
3	Increased area under irrigation	With construction of temporal weirs the gradient increased leading to increased command area.	Organizing for exposure visits and training of fellow CEOs (TOTs)
Mpika	**Achievements/events the district is the most proud of**	**Why and/or how it happened? With what efforts has it happened?**	**How can you share your experiences your colleagues who are not here**
1	We have beaten the target of constructing 6 new sites instead we have done 9 for 3 pilot camps	Through commitment of the implementing staff	Through trainings, with resources available
2	We have started facilitation of acquisition of Water Rights and registration of groups by the Registrar of Societies. One group had its file opened for water Rights at Water Board under the Ministry of Energy and Water Dev.	Through collaboration with Department of Water Affairs at district level	Through trainings
Mporokoso	**Achievements/events the district is the most proud of**	**Why and/or how it happened? With what efforts has it happened?**	**How can you share your experiences your colleagues who are not here**
1	Above target in improvements	Good commitment by CEOs/BEOs and TSB	**Conducting TOTs**

		Staff	
2	Good working relations by CEOs and TSB	Worked as a team in the district	Conducting TOTs
3	Improvement of participation by farmers	Sensitization of farmers by CEOs/BEOs team	Encouraging fellow CEOs/BEOs to be holding sensitization meetings in the camps and blocks
3	Trained 5 schemes in Bokashi Compost making	Commitment of farmers, staff and provincial office	Through trainings and exposure visits to irrigation sites
Luwingu	**Achievements/events the district is the most proud of**	**Why and/or how it happened? With what efforts has it happened?**	**How can you share your experiences your colleagues who are not here**
1	Exceeded the target of 7 to 9 sites	Commitment by Min. of Agriculture and Cooperatives/JICA staff	By inviting them for training at a constructed site
2	Response by farmers is improving	Trainings	
3	No land disputes amongst the farmers	Farmers learnt the importance of irrigation	To provide training in Bokashi making
Mansa	**Achievements/events the district is the most proud of**	**Why and/or how it happened? With what efforts has it happened?**	**How can you share your experiences your colleagues who are not here**
1	More farmers on board under irrigation : ✓ 19 improved weirs constructed ✓ 22 New weirs constructed	More sensitization done by conducting meetings, block shows and actual construction	Through **COBSI Weekly Bulletins** and site field days
2	Increased hectarage under irrigation	All weather cultivation due to impounded water with the TSB, CEOs and farmers	Reports, exchange visits, and bulletin magazines.
3	Crop diversification	Most farmers diversify crops during off season due to water availability	Field trips, reports/meeting and field days
Kawambwa	**Achievements/events the district is the most proud of**	**Why and/or how it happened? With what efforts has it happened?**	**How can you share your experiences your colleagues who are not here**
1	Managed to construct 10 temporal diversion weirs with improvements on existing ones	The officers were capacity built by JICA with community participation	By way of demonstration and training
2	Increased hectarage under irrigation	Availability of water and awareness on its usage	Exchange visits
3	Food security and income generation	Farmers are in production throughout the year with efforts from JICA, farmers and Government	Exchange visits

ATTACHMENT 9 COMMENTS ON ISSUES, LOGISTICS, THEORY, PRACTICE, PARTICIPATION

Item	COMMENTS	Respondent
Question 1	**Overall degree of satisfaction relative to the workshop contents as a whole.**	
	Very good	5
	Need to increase **duration** of training day to cover all topics planned	3
	Very much understood	2
	It has been good since it enabled us to share experience	2
	Need to improve on materials in every workshop e.g. note books, pens	1
	My expectation has been met	1
	More information be accorded regarding the issues to be discussed	1
	Districts figures were not realistic. More follow ups needed	1
	Money for incidentals should be given to participants on the first day	1
	Production has increased in the community hence increased food security	1
	Increase on the fuel allocation to see certain activities improve	1
	Excellent	1
	Fair	1
	Successfully achieved workshop objects	1
Question 2	**Overall degree of satisfaction relative to workshop logistics.**	
	Need to improve on the **water supply**	8
	Fair	5
	Need to conduct exchange visits. **Next workshop in Luapula for exposure**	4
	Need to increase the allowances	3
	Good	3
	Venue was okay	3
	Standards of the accommodation should be improved e.g. beddings	3
	Logistical support is very poor and model transportation has gone beyond the life span in the end officers will develop pneumonia.	2
	Transportation can improve by way of hiring a bus	2
	Give chance to participants to agree on the venue when conducting workshops	1
	Sub-allowance be paid on the first day to allow officers to buy daily needs	1
	Inform the participants in advance especially the supervising staff	1
	There is no problem with accommodation	1
	Transport refund not yet given	1
Question 3	**How much do you think the workshop program has met with what you have expected at the beginning of the training relative to *theory.***	
	Met my expectations	4
	There need to provide stationery	2
	Workshop needed more time and improve on the time keeping	2
	Good	2
	I have learnt a lot	1
	The workshop has been interesting because there has been sharing achievements and learning from failures	1
	Evaluation went on well though mistakes were made here and there. The job well done to northern and /Luapula provinces.	1
	Very much in that all the facilities were good	1
	There should be prior communication on tasks that are very involving	1
	Excellent	1
	Very little hand outs for the topics covered. All facilitators to prepare handouts	1
	Materials captured and expectation made	1
	Some officers appearing on schedule to handle certain sessions never did so	1
	When forms are to be administered it is advisable that they be sent to CEOs/BEOs	1
	Knowledge has been increased	1
	By construction, some of the weirs in the districts.	1
	Continuation of construction next year	1
	The program was practical and allowed everyone to participate	1
	Learn how to motivate the officers and encourage them to go on	1
Question 4	**How much do you think the workshop program has met with what you have expected at the beginning of the training relative to *practice.***	

	It has been okay	5
	The practical on compost making is well done	5
	Partly met	3
	Good	3
	100% implementation and Bokashi making practical is linked in the officers mates glands	1
	Did not do a practical exercise on Bokashi *(came late due to fuel shortage*)	1
	Follow ups need to verify outputs from districts	1
	The Bokashi demonstration should have been done in two or three different heaps at different times so that every stage involved could have been demonstrated	1
	Lessons missed by late comers should be somehow squeezed in order to move as a team	1
	Need to prepare adequately by facilitators	1
Question 5	**How much do you think the workshop program has met with what you have expected at the beginning of the training relative to your *participation.***	
	Participation has been very good as I was able to contribute freely	5
	All was fairly well	4
	Almost 100% participation by CEOs	3
	Excellent	2
	Interacted well with other staff participated from my district is a class beaten over the target though target present is cooked	1
	80% achieved or met	1
	Enough time is needed on practical and district participation	1
	There has been sharing of knowledge with other districts	1
	I promote team work with my group	1
Question 6	**How do you think this workshop program can be best improved *in future***	
	Change venue to Luapula province	14
	Time has been too short	10
	More learning materials to be provided to participants and box files to enable good record keeping e.g. note books, pens	7
	Improve allowance (285,000/night) the rate we are given below the recommendation rate.	6
	By timely preparation to ensure excellence.	2
	For districts far away should start off early to avoid delays	2
	Incorporate new participating CEO in the workshop	1
	More practical, provision of materials - money paid on the first day	1
	Giving information about the workshop will help us move together	1
	Give chance and respect to presenter to present their outcome	1
	Increase on the number of practical and field visits	1
	A lot be improved in the future	1

ATTACHMENT 10 PROJECT DESIGN MATRIX (PDM)

PDM (version 0) Pilot Project (Phase I)

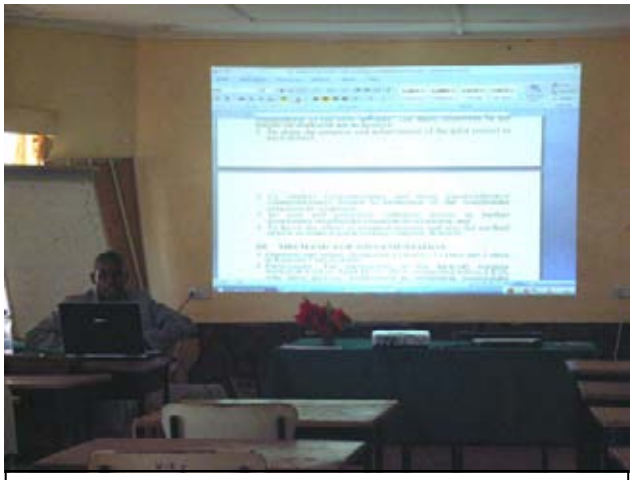
MAJOR ITEMS	INFORMATION
Project Name	Pilot Project under the Study on the Capacity Building and Development for Smallholder Irrigation Scheme in Northern and Luapula Provinces in the Republic of Zambia
Year	April 2009 to December 2009 (Phase I) April 2010 to December 2010 (Phase II)
Target Area/Group	Phase I: Potential area identified by the CEOs in eight districts (Kasama, Luwingu, Mbala, Mungwi, Mpika, Mporokoso in Northern province, and Kawambwa and Mansa in Luapula province) Phase II: TBN
Agencies	Technical Service Branch (TSB) of MACO
Cooperating Agency	JICA, Ministry of Water Affairs,

ITEM (PHASE I)		INDICATOR	EXTERNAL FACTOR
Overall Goal	- Livelihood of the farmers participating is improved. - Action plan on smallholder irrigated agriculture drafted by the Study is verified and finalized.	- Baseline survey - Final report of the Study	
Objectives	1. Knowledge and capacity of extension officers and farmers on smallholder irrigation schemes are developed. 2. Irrigated areas under smallholder irrigation schemes are increased and agricultural production during the dry season is increased.	Farmers can develop smallholder irrigation schemes with a help from TSB officers.	
Outcomes	1.1 Extension officers are trained on smallholder irrigation development 1.2 Pilot project action plan is formulated. 1.3 Extension materials are distributed to the trained extension officers. 1.4 Project activities are monitored and evaluated. 2.1. Irrigated area are newly developed through smallholder irrigation schemes 2.2. Irrigated area under existing smallholder irrigation schemes are expanded		―
Activities	1.1.1 Training of Trainers (TOT) on smallholder irrigation development is carried out to TSB officers in Northern provinces. 1.1.2 Participating Block Extension Officers (BEOs) and Camp Extension Officers (CEOs) are selected by the DACO or SAO of target districts. 1.1.3 Training on smallholder irrigation development is carried out to the selected extension officers by the Study team and preliminarily trained provincial TSB officers.	Inputs <u>Expert</u> - Study Team: 5 experts - Provincial TSB: 5 officers - Extension officers: 35 officers <u>Materials</u> - Tools - Manuals	―

	1.1.4 TOTs are carried out to fellow extension officers by the trained extension officers. 1.2.1 Target of each district is set by the extension officers in terms of number of site, length of canal, irrigated area, and number of TOTs to the fellow extension officers. 1.3.1 Extension materials are distributed to the participating extension officers, which include manual, measure tape, picture story, string, and line level. 1.4.1 Project activities are reported every month by a means of monthly monitoring report 1.4.2 Evaluation workshop is organized to report and share amongst the participants the achievement of and lessons learned through the pilot project activities. 2.1.1 Potential areas are identified by the extension officers. 2.1.2 Meetings are held between the extension officers and the farmers in the potential areas to outline participants and schedules 2.1.3 Simplified weirs and canals are constructed by the farmers. 2.1.4 Crops are cultivated under irrigation during the dry season. 2.1.5 Surplus productions are sold to the markets. 2.2.1 Existing smallholder irrigation schemes are identified by the extension officers. 2.2.2 Discussions between farmers and the extension officers are held to set improvement plans of existing site 2.2.3 Same as 2.1.3 to 2.1.5.	- Fuel for extension activities of the extension officers -	

ATTACHMENT 11 PHOTOS

Before starting, participants are asked to fill in the pre-workshop questionnaire.



Workshop starts with the opening remark and overview by the Senior Irrigation Engineer of Northern Province.

As a contribution from the JICA Study Team, the team leader makes a presentation on its findings in the study area.

Best practices found throughout the study are also introduced in the presentation.

Trainees listen to the presentation with earnest eyes. Some takes note and some asks questions.

Some of data the team leader presented are new for the trainees and drawn their attention.

A trainer explains how to make Bokashi compost: necessary materials, procedures, and tips.

Trainees check the temperature of the heap that was made a few days ago. Now, it reaches around 60 degree Celsius.

Let's try making actual heap of Bokashi compost. Mix, mix, mix, and mix thoroughly.

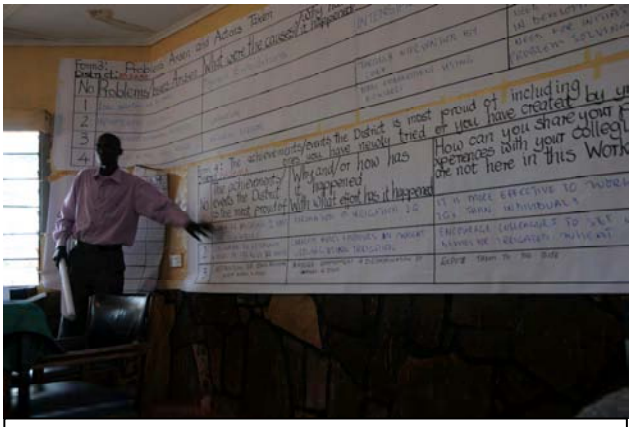
This group tries to mix by their own hand before adding any plant residues.

Participants from each district have a group exercise to fill up the form to report their achievements.

Let's recall what we have done; "do you remember how much hectare of land we opened in that scheme?"

Present achievements of all the districts: length of canal, command area, and No. of site. Which district is the best?

Now, discuss and present some lessons from the activities. What are you proud of the most?



He explains lessons district by district. Other participants become very busy asking a lot of questions.

Women also take a lead and make presentation.

The team leader give comments; “which do you think should be the first, request something or show your achievement?

The Principal Agricultural Officer of Northern Province makes a closing remark.

VI.4 Proceedings of Kick Off Training (May 2010)

MINISTRY OF AGRICULTURE AND COOPERATIVES
THE REPUBLIC OF ZAMBIA

THE STUDY ON THE CAPACITY BUILDING AND DEVELOPMENT FOR SMALLHOLDER IRRIGATION SCHEME IN NORTHERN AND LUAPULA PROVINCES IN THE REPUBLIC OF ZAMBIA

PROCEEDINGS OF KICK-OFF TRAINING

May 2010

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
SANYU CONSULTANTS INC., TOKYO, JAPAN

CONTENTS

PART I TOT FOR THE KICK OFF TRAINING

There are around 280 frontline extension officers, called Block Extension Officers (BEOs) and Camp Extension Officers (CEOs), in Northern and Luapula provinces (hereinafter, "CEO" represents both BEO and CEO). To promote smallholder irrigation schemes, these CEOs must be engaged. To disseminate the technology through the CEOs, they have to be equipped with necessary knowledge, skills, attitude, hand-on experiences, etc. This arrangement can be done through administering a training course to the CEOs. Then, before the training, what was required was a Training of Trainers (TOT).

The trainees of the TOT, were expected to be the trainers of the kick-off training in which CEOs were to gather from May 3-7, 2010. Therefore, trainees were required to have at least some experience on smallholder irrigation or irrigated agriculture. Taking this pre-condition into account, the JICA Study Team in consultation with the Provincial Irrigation Engineer (PIE) of Northern province selected the officers as the participants to the TOT:

1. Mr. Kelvin Simukoko Technical Service Branch (TSB), Northern Province
2. Mr. Freddy Banda TSB, Northern Province
3. Mrs. Annie Bulaya TSB, Northern Province
4. Mr. Frank M. Mwansa TSB, Northern Province
5. Mr. Rodgers Phiri TSB, Mbala District
6. Mr. Kaira Machua TSB, Mbala District
7. Mr. Collins Chilinga TSB, Mporokoso District
8. Mr. Francis B. Kangwa TSB, Kasama District
9. Mr. Kelly Nkandu TSB, Mansa District
10. Mr. Emmanuel Siwale PIE, Luapula Province

The TOT was carried out in 3 days from April 13-15 at Kasama Farm Institute. First, topics to be undertaken during the Kick-off training were proposed by the Study Team, and discussed and agreed between the Team and TOT participants. Basically, technologies to be taught to CEOs should be simple and easy so that farmers can apply, without engaging general contractors. An example is temporary diversion weir made out of locally available materials. Should the training course be undertaking concrete-like structure, realizing of what was taught in the training can hardly be done unless there is a contractor. With this in mind, following 14 topics were selected;

1. Identification of Potential Gravity Diversion Sites
2. A Diversion Weir; Inclined Weir
3. A Diversion Weir; Single-line Weir
4. A Diversion Weir; Double-line Weir
5. A Diversion Weir; Trigonal Prop Weir
6. A Diversion Weir; Clay Soil Masonry Weir
7. Canal Alignment and Construction
8. Ancillary Facilities
9. Water Management/ On-farm Irrigation Method
10. Organizing of Farmers
11. Cropping Pattern
12. Compost Making
13. Permanent Diversion Weir
14. Entry Planning

Then, next session was to train the participants by the above topics. The Team Leader, with his co-team leader and his agriculture expert took the role of the trainer. They explained the tips of those above technologies with some handy extension materials.

Next part of the TOT was to allocate all the above topics in 5 days. As the Kick-off training was scheduled in a net 5-days, all the topics were grouped in two, and topics 1-6 were allocated in Day-1, 7-12 were in Day-2, 13 was in Day 4, and 14 was in Day-5 in addition to the field practices in Day-3 and 4.. Field practices were scheduled for actual construction of a temporary diversion weir, probably single-line weir, and also canal alignment.

Having scheduled the 5-day Kick-off training, the participants started discussing who should undertake which topics. Discussion among the participants did not take much time to arrive the session assignment. Then, a bit of dry-runs, rehearsals were conducted. With a consensus for which they are to prepare explanatory materials on their own to be used during their sessions of the Kick-off training, the TOT was completed.

PART II KICK-OFF TRAINING

CHAPTER 1 RATIONALE AND WORKSHOP OBJECTIVES

The Fifth National Development Plan (FNDP) established in December 2006 puts an emphasis on poverty alleviation for resource poor smallholder farmers by a means of irrigation development. In nowadays context, however, the Government is no longer allowed to stay as the main entity in developing the irrigation but is regarded as a facilitator of the development thereby promoting self-dependency on the farmers. Irrigation development increases agriculture production and enhances the food security as well as income generation, which will ensure the livelihood of resource poor smallholder farmers.

Smallholder Irrigation Development involves an extensive process and various activities such as identifying potential site, organizing farmers, constructing irrigation facilities, irrigating farms and harvesting and marketing. For the success of the development, there is a due need to cultivate a culture of irrigation by using appropriate technologies. The Technical Service Branch under the Department of Agriculture (DOA) of MACO together with JICA now believe that relevant officers such as district TSBs, BEOs and CEOs, the frontline extension officers, should be equipped with necessary skills, knowledge, hands on experience and right attitude to pursue the development; hence, this 5-day TRAINING course.

By the end of the training program, the participants will be able to acquire the skills, knowledge and attitude necessary in discharging their duties and responsibilities of promoting smallholder irrigation development. Specifically, the participants are expected to be able to:

1. Internalize the concept of smallholder irrigation development being promoted under the JICA Study,
2. Enumerate and discuss smallholder irrigation facilities and structures (mainly for temporary diversion weir system),
3. Acquire the knowledge of basic on-farm irrigation methods,
4. Organize farmers in developing smallholder irrigation schemes,
5. Acquire basic ideas of extending irrigation benefit to most of the villagers,
6. Acquire basic knowledge of irrigated agriculture development including quick making compost,
7. Prepare a district basis entry programme for 2010 dry season, and
8. Discuss a way-forward for community based smallholder irrigation development in Zambia.

CHAPTER 2 PROGRAMME AND WORKSHOP MECHANICS

2.1 Workshop Programme

The training was a net tree-day activity held at Kasama Farm Institute (KFI) and the filed. Methodologies employed were lecture-interactive discussion, brainstorming, practices on the field such as weir construction and line-leveling practice, and small group discussion for the preparation of 2010 dry season entry program. Also, dissemination materials were provided to the participants: manual, leaflet, picture-story illustrations. Following are the modules undertaken (for the detail, see Attachment 1):

DAY 1 (May 3, Mon):

Module 1 - Program Orientation

8:00-8:30 Registration
8:30-9:00 Pre-Training Knowledge Inventory
9:00-9:45 Opening, Self Introduction, and Overview of the Training
10:00-10:30 Surfacing of Participants' Expectation

Module 2 – Overview of Community Based Smallholder Irrigation (COBSI) Development

10:30-11:30 Irrigation Development in Zambia, and Northern and Luapula P.
11:30-12:30 Introduction to the COBSI Development Study

Module 3 – COBSI Scheme (Temporary Diversion Weir)

13:30-14:00 Identification of Potential Gravity Diversion Sites
14:00-14:45 Weir Type and Construction Method (Inclined Weir)
15:00-15:45 Weir Type and Construction Method (Single-line Weir)
15:45-16:15 Weir Type and Construction Method (Double-line Weir)
16:15-17:00 Weir Type and Construction Method (Trigonal Prop Weir)
17:00-17:30 Weir Type and Construction Method (Others, e.g. Soil Masonry)

DAY 2 (May 4, Tue):

8:00-8:30 Recapitulation (Review and Clarification of Day 1 Activities)

Module 4 – COBSI Scheme (Canal, Ancillaries and On-farm Irrigation)

8:30-9:30 Canal Alignment by Sprit Line Level
9:30-10:00 Ancillary Facilities mainly for Canal
10:15-11:00 Irrigation Water Requirement and Water Management
11:00-11:30 On-farm Irrigation Method (Sunken bed and Furrow)
11:30-12:00 Organizing of Farmers
12:00-12:30 Recommended Cropping Patterns

Module 5 – Irrigated Agriculture Development

13:30-14:30 Bokashi Compost (A quick Making Compost)
14:30-15:00 Liquid Fertilizer
15:00-17:30 Practice of Making Bokashi Compost

DAY 3 (May 5, Wed):

7:30-8:00 Recapitulation (Review and Clarification of Day 2 Activities)

Module 6 – COBSI Scheme (Temporary Diversion Weir and Canal Alignment, Practice in Field)

8:00-13:00 Construction Practice of a Temporary Diversion Weir in Field
14:00-17:00 Practice of Canal Alignment with Sprit Line Level

DAY 4 (May 6, Thu):

7:30-8:00 Recapitulation (Review and Clarification of Day 3 Activities)

[For BEOs/CEOs]

Module 6 – COBSI Scheme (Temporary Diversion Weir and Canal Alignment, Practice in Field)

8:00-13:00 Construction Practice of a Temporary Diversion Weir in Field
14:00-17:00 Practice of Canal Alignment with Sprit Line Level

[For Provincial and District TSBs]

Module 7 – COBSI Scheme (Permanent Diversion Weir, TSB Officers Only)

8:00-10:00 Type of Permanent Weirs and Construction Method
10:15-12:30 Type of Permanent Weirs and Construction Method (con'd)
13:30-15:00 Selection Criteria, and Implementing Districts
15:15-17:00 Implementation Arrangement

DAY 5 (May 7, Fri):

8:00-8:30 Recapitulation (Review and Clarification of Day 4 Activities)

Module 8 – Entry Planning

8:30-9:30 Last Year's Achievement and Associated Problems
9:30-10:30 Entry Planning Orientation
Materials to be provided
Reporting Mechanics
Pro-forma of Monitoring, Site Profile, etc.
Logistics Support
10:45-12:30 Entry Planning by District
13:30-15:30 Entry Plan Presentation and Adjustment by District
15:45-16:15 Distribution of Dissemination Materials (Manuals, Posters, etc)
16:15-17:00 Reporting Mechanics (Confirmation)

Module 9 – Programme Evaluation and Closing

17:00-17:20 Training Programme Evaluation
17:20-17:30 Closing Programme

2.2 Workshop Participants

There were a total of 59 participants from 13 districts: 8 districts of Northern province and 5 districts of Luapula province. Those districts were selected at the end of first year Study based on the irrigation potential of each districts, which are described in Section 4.5.4 of Interim Report I. Particularly, Participants were selected based on three major criteria that have been decided by the trainers during the TOT held from April 13-15, 2010. The participants should:

1) Come from an area where potential streams for gravity water abstraction (perennial) exist;
2) Come from an area where irrigated agriculture is being practiced on a small scale; and
3) Not be those who attended the 1st kick-off training held in the last year 2009 (April 16-18, 2009).

Following table shows the summery of participants (for detail, see Attachment 2):

Table 2.2.1 Summary of the Participants for the Kick-off Training Course

Province/ District	Province	District TSB	BEO/CEO
Northern Province	4		
1. Mbala		2	3
2. Mungwi		2	3
3. Luwingu		1	3
4. Kasama		1	3
5. Nakonde		1	3
6. Isoka		1	3
7. Mpika		1	3
8. Mporokoso		2	3
Sub-total	4	11	24
Luapula Province	1		
1. Kawambwa		1	3
2. Mansa		1	3
3. Mwense		1	3
4. Milenge		1	3
5. Nchelenge		1	3
Sub-total	1	5	15
Total of Northern/Luapula	**5**	**16**	**39**
	60		
Western/North W. Provinces	10 (to be Selected by MACO HQs)		
Grand total	70		

Note: Trainers are included in the participants below

Trainers (included in the above table)

Name	Station
1. Mr. Kelvin SIMUKOKO	Northern P.
2. Mrs. Annie BULAYA	Northern P.
3. Mr. Frank Mporokoso MWANSA	Northern P.
4. Mr. Freddy BANDA	Mbala, Northern P.
5. Mr. Machua KAIRA	Mbala, Northern P.
6. Mr. Rodgers PHIRI	Mungwi, Northern P.
7. Mr. Collins CHININGA	Mporokoso, Northern P.
8. Mr. Kellys NKANDA	Mansa, Luapula P.
9. Mr. Kenneth ZULU	Northern P.
9'. Mr. Francis KANGWA	Northern P.
10. Mr. Emmanuel SIWALE	Luapula P.

At the beginning of the training, a questionnaire was distributed to all the trainees to identify their knowledge, experience and the view to irrigation development. This section of the proceeding describes the results of this survey: "Pre-Training Knowledge/ Experiences Inventory for the Training."

2.2.1 Participants' Service in Government

Figure 2.2.1 shows years of participants' experience in the government service. The majority, 62%, of the participants, or 28 officers, fell in the category of 1-5 years. The second most frequency can be found in the category of 16-20 years (13%). This figure simply shows that the majority of the participants were those who were newly recruited officers, who may not have much experience in irrigation development. An average year of experience among all the participants was 9.0 years.

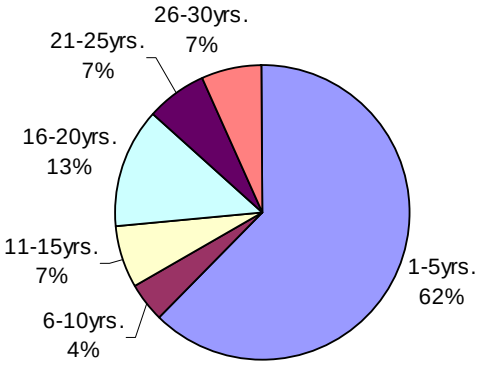


Figure 2.2.1 Distribution of Years in Government

2.2.2 Definition of Smallholder Irrigation

Participants had different views of what the smallholder irrigation is. As shown in Table 2.2.2, 37% of respondents thought smallholder irrigation as "small scale farmers, community based," which was followed by "simple, low cost, and local resource" at 28%. Those two definition shares more than half of the participants' definition. From the first definition, it was implied that participants define this type of irrigation scheme by the agent who implement it, while the second definition suggest that it was defined based on the composition, cost and type of weirs. The third most frequently answered was "agricultural sustainability, food security, and livelihood;" seems to be so broad concept. Other two definitions "gravity furrow," and "dry season" also did not seem to be distinguished from other irrigation schemes. In any case, the majority of the participants shared common idea of what the smallholder irrigation development is that the Study Team also agrees.

Table 2.2.2 Definition of Smallholder Irrigation

Definition	Number	%
Small scale farmers, Community based	17	37%
Simple, Low cost, Local resources	13	28%
Agricultural sustainability, Food security, Livelihood	5	11%
Gravity furrow	3	7%
Dry season	2	4%
Others	6	13%
Total	46	100%

Source: JICA Study Team, from the Kick-off Training for FY 2010

2.2.3 Experience in the Past Irrigation Projects Operated by Farmers

In terms of the experience of the participants in irrigation developments which are facilitated by the government of Zambia, NGOs, or donors and mostly operated and maintained by farmers, more than half of the participants did not have any experience. As shown in Table 2.2.3, a total of 22 out of 48 respondents had some experience in such irrigation project, while 25 participants did not have. Similar tendency can be found in each province, 12 respondents had such experience in Northern province, while 18 did not and 10 and 7 in Luapula province respectively. For around half of the participants, therefore, this pilot project will be the first experience of irrigation development to be managed by farmers.

Table 2.2.3 Experience in the Past Irrigation Project Operated by Farmers

Items	Northern			Luapula			Total
	Province	District	Camp	Province	District	Camp	
Yes	2	4	6	0	3	7	22
No	1	4	13	0	1	6	25
N/A	0	0	1	0	0	0	1
Total	3	8	20	0	4	13	48

Source: JICA Study Team, from the Kick-off Training held from May 3-7, 2010

2.2.4 Types of Irrigation System under Smallholder Irrigation

Participants of the training had knowledge or experience to see some types of irrigation systems under smallholder irrigation projects. Among the ones listed in Table 2.2.4, the most popular one was furrow and treadle pump at 24.1%, which were followed by motorized pumping irrigation at 14.8%. Gravity river diversion with temporary facilities came to the next, which was less than the Study Team expected as around 70% of the participants in the last year's kick-off training had knowledge about gravity river diversion regardless of temporary or permanent. Therefore, it can be said that participants in this year had relatively less knowledge in irrigation systems.

Table 2.2.4 Types of Irrigation System Observed/Known under Smallholder Irrigated Projects

None	Furrow	Gravity w/ Permanent	Gravity w/ Temporary	Treadle Pump	Motorized Pump	Dam	Others	Total
1	13	6	7	13	8	5	1	54
1.9%	24.1%	11.1%	13.0%	24.1%	14.8%	9.3%	1.9%	100.0%

Source: JICA Study Team, from the Kick-off Training held from May 3-7, 2010

2.2.5 Problems to the Government Officers as Extension Agents

As government's technical officers or extension officers, participants may face a range of problems. For example some complain that they do now have enough technical know how to teach farmers, while others point out that they do not have enough funding for the activities. These problems are summarized in Table 2.2.5.

Table 2.2.5 Problems to Extension Agents

Definition	Number	%
Lack of Transportation, Logistics, Funding	30	63%
Lack of knowledge (both officer and farmer)	13	27%
Water shortage in dry season (seepage, stream water)	3	6%
Others	2	4%
Total	48	100%

Source: JICA Study Team, from the Kick-off Training for FY 2010

Needless to say, lack of means of transportation, logistics and funding came to the primary problem; out of 48 respondents, 63% of the officer pointed out this issue as their problems. Although more motorbikes have been provided to extension officers in the Study Area, majority of extension officer still face the lack of means of transportation in a broad sense including spare parts, and fuel. It's been a big issue since the beginning of the Study. In the pilot project, therefore, fuel is to be provided to provincial/ district TSB officers, BEOs and CEOs, including some for their fellow BEOs/CEOs.

In addition, lack of knowledge came second; 27% of the respondents have this problem. Knowledge is an essence of what extension workers are supposed to provide for farmers. Without the knowledge, they may loose the loose the value of themselves. Now, their awareness to this problem is a good starting point for them to learn technologies of smallholder irrigation development.

2.2.6 Countermeasures Taken by the Participants to Deal with the Problems

Government officers are not always reconciled to leave the problems as they are; they are making their best efforts to tackle with those problems. Table 2.2.6 shows major countermeasures they are taking. The most popular countermeasure was "training/ organizing farmers," to which 39% of the respondents answered. Attending any training should be able to improve their skills and by organizing farmers, extension officers should be able to

Table 2.2.6 Countermeasures to the Problems

Definition	Number	%
Training, Organizing farmers	17	39%
buying fuel by myself, using my means, borrowing bikes from others	16	36%
Report to Dist office	5	11%
Attending WS to get knowledge	2	5%
Others	4	9%
Total	44	100%

Source: JICA Study Team, from the Kick-off Training for FY 2010

deal with more farmers at once. The second popular one was "buying fuel using my means/ borrowing bikes from others," that shared 36% of the respondents. It was also observed during the phase I pilot project last year. Many, if not at all, are struggling to reach out their service using their own spending. The third one (11%) was "reporting to district office." This is legitimate path way to let the organization understand the real situation.

2.2.7 Best Practices

Aside from the difficulties and the struggle against those problems, participants, as government officers, have successful or memorial experience as the best practices. To the question what the best experience is for them, 33% of the respondents answered that it was a best time when observing farmers' good performance. Yes, consequence of extension officers' every effort is only materialized by the performance of farmers. Thus, it must be a pleasurable moment for them to see a good performance of farmers. As the second most popular answer was "completion of the task." Given all the difficulties of transportation and lack of knowledge, it must be a happy moment for them to complete what might have been a big challenge. Best practices they have ever experienced are shown in Table 2.2.7.

Table 2.2.7 Best Practices of the Participants

Definition	Number	%
Observing farmers' good performance	15	33%
Completion of the task	12	27%
Training farmers	6	13%
Co-working with farmers	4	9%
Others	8	18%
Total	45	100%

Source: JICA Study Team, from the Kick-off Training

2.2.8 Knowledge on Compost Manure

As the training addressed some aspects of agricultural practice, BOKASHI compost making, their understanding on compost manure was confirmed. First, it was asked what kind of compost manure they know and what kinds of compost manure they have ever demonstrated. As shown in Table 2.2.8, pit compost (25%) and heap compost (24%) shared nearly half of the respondents who had knowledge of any types of compost manure. As such, pit compost (24%) and heap compost (24%) were also the most popular types of composts among the others that participants had ever demonstrated.

To our great delight, there were some officers who said they had knowledge on BOKASHI compost (11 respondents) and who actually had ever carried out demonstrations of BOKASHI making (7 respondents). They were the participants to the phase I pilot project during 2009 dry season. Unexpectedly, this pre-training knowledge inventory showed a good outcome of the pilot project.

Table 2.2.8 Type of Compost Participants Know and Demonstrated

Type of compost	Have Knowledge		Demonstrated	
	No.	%	No.	%
Pit Compost	25	25%	14	24%
Heap Compost	24	24%	14	24%
Animal Manure	12	12%	10	17%
Green Manure	11	11%	7	12%
Liquid manure	10	10%	2	3%
Bokashi	11	11%	7	12%
Others	7	7%	5	8%
Total	100	100%	59	100%

Source: JICA Study Team, from the Kick-off Training for FY 2010
Note: results of multiple answer question

Furthermore, it was asked what the participants think of the function of compost. As shown in Table 2.2.9, 89%, majority of the respondents, defined the function of compost as to "improve the soil condition." Some also defined as to "grow crops well." So, it was confirmed that the participants had a proper knowledge on the basic function of compost. As extension officers are usually general agriculturalists, not irrigation engineers, who graduated from agricultural college, they are usually equipped with the knowledge on basic agricultural practice.

Table 2.2.9 Function of Compost Defined

Definition	No.	%
Improve the soil	42	89%
Grow crops well	5	11%
Total	47	100%

Source: JICA Study Team, the Kick-off Training

Lastly to the agricultural aspect, it was asked what the participants think of as difficulty of disseminating the technique of any types of compost manure. As shown in Table 2.2.10, 30% of respondents raised "lack of knowledge/ legacy that farmers maintained" as the difficulty. As repeated many times, lack of necessary knowledge continued to be a dreadful state that extension officers need to avoid. Next most popular difficulty was the "long process required to compost making." Especially for dry season agriculture, farmers do not have much time to prepare compost. This result suggested that quick method was needed for a practical use of the compost. It was a preferable analysis for the Study Team as BOKASHI compost was the one that requires relatively less period of time for the preparation process.

Table 2.2.10 Difficulty in Disseminating Compost Manure

Definition	No.	%
Lack of knowledge, legacy (Farmers side)	12	30%
Long process to mature	11	28%
Much material & labor needed	8	20%
Relying much on chemical	5	13%
Transportation (Officer side)	4	10%
Total	40	100%

Source: JICA Study Team, from the Kick-off Training for FY 2010

2.2.9 Expectation from the Training

End of this section describes what the participants were expecting from the training. It was quite important to clarify what this opportunity was for before starting without clear direction. Now, what the participants were expecting from the training the most was to improve knowledge in irrigation; 20 participants chosen it. The second most popular expectation was to know how to construct temporal weirs with 11 respondents. As shown in Table 2.2.11, it seemed clear what the training was for; majority of the participants were expecting knowledgeable experience related to irrigation in general and some typical skills in construction including temporal and permanent weirs.

It was also noted that some participants were willing to share their experience with the others. In the Study Area where population density is quite low, they do not have much opportunity to meet and discuss with their colleagues what the others are doing. For instance, a CEO confessed that he had not met one particular colleague for a year. Thus, for such officers who are looking for a peer-to-peer learning opportunity, kick-off training was the one what they wanted. Interestingly, on the other hand, one officer answered that he/she was expecting DSA to be provided. As the level of their salary is not always preferable, DSA plays a very important role in their financial arrangement. It was good to know for the Study Team that the participants were so open to the team members about their feelings.

Table 2.2.11 Expectation from the Training

Expectations	No.
Improve knowledge in irrigation	20
To know how to construct temporal weirs	11
To share knowledge, skills and ideas	8
To learn how to construct a permanent weir	6
To know how make BOKASHI practically	5
To know different methods of irrigation	5
Training materials to be given	3
to go and implement leasons learnt	3
To go and train farmers in SHI Development	2
Learn how to peg a furrow	2
Learn more on site selection for temporal weir construction	1
DSA to be given	1
Learn what JICA is doing in SHI Development	1
To know officers from different districts	1
Provision of protective clothing	1

Source: JICA Study Team, from the Kick-off Training for FY 2010

CHAPTER 3 ACHIEVEMENT OF THE TRAINING OBJECTIVES AND THEIR SATISFACTION

3.1 Achievement of Training Objectives

At the end of the training, participants were asked to how much level they have achieved the objectives with a range from "the least" to "the most" showing with a level from 1 (least) to 5 (most). As shown in Figure 3.1.1, there were no participants who chosen level one and two. And there are only a few participants who gave a neutral score of "3." To each of the eight objectives set in the training, level "5" shared the majority.

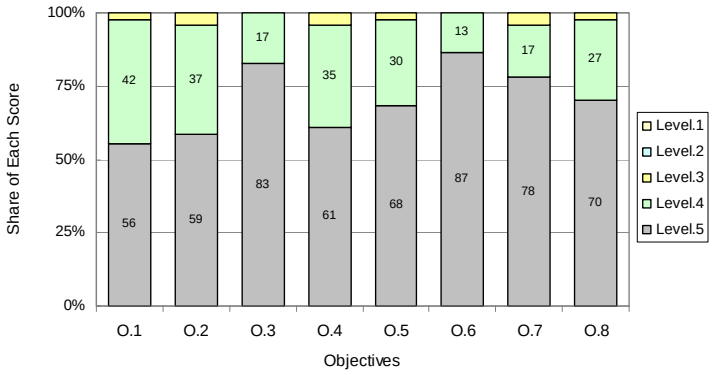


Figure 3.1.1 Level of Achievement by Objective

Source: JICA Study Team, from the Kick-off Training for FY 2010

The percentage of the participant who gave level-5 achievement ranges from 56% in objective 1 to 87% in objective 6. Specifically, objective 6 "Acquire basic knowledge of irrigated agriculture development (+Bokashi)," received the highest share. As shown in Table 3.1.1, average score to each objective was from 4.5 to 4.9, averaging 4.7 as a whole. It can be concluded that participants generally achieved the objectives at high rate and there were no particular objective participants achieved less.

Table 3.1.1 Level of Achievement to Each Objective

Objectives to Achieve	Number of Respondents to Each Score						Ave.	Min.	Max.
	L.1	L.2	L.3	L.4	L.5	Total			
O.1 Internalize the concept of smallholder irrigation development	0	0	1	19	25	45	**4.5**	3	5
O.2 Enumerate and discuss smallholder irrigation facilities and structures	0	0	2	17	27	46	**4.5**	3	5
O.3 Acquire the knowledge of basic on-farm irrigation methods,	0	0	0	8	38	46	4.8	4	5
O.4 Organize farmers in developing smallholder irrigation schemes,	0	0	2	16	28	46	4.6	3	5
O.5 Acquire basic ideas of extending irrigation benefit to most of the villagers,	0	0	1	13	30	44	4.7	3	5
O.6 Acquire basic knowledge of irrigated agriculture development (+Bokashi),	0	0	0	6	39	45	**4.9**	4	5
O.7 Prepare a district basis entry program for 2010 dry season, and	0	0	2	8	36	46	4.7	3	5
O.8 Discuss a way-forward for COBSI development in Zambia.	0	0	1	12	31	44	4.7	3	5
						Ave.	4.7	3.3	5.0
						Min.	4.5	3.0	5.0
						Max.	4.9	4.0	5.0

Source: JICA Study Team, from the Kick-off Training held from May 3-7, 2010
Note 1: Level of satisfaction is the lowest with "Level 1" and the highest with "Level 5"
Note 2: Numbers of effective responses are different among the objectives

3.2 Participants' Satisfaction by Session

Participants' level of satisfaction to each session was also monitored. At the end of each session, participants were asked of what extend he/she was satisfied ranging from the level 1, satisfied the least, to the level 5, satisfied the most. Table 3.2.1 shows the list of training modules/items carried out during the 5-day training: a total 29 training modules.

In conjunction with the table, the levels of their satisfaction to each training module are shown in Figure 3.2.1. Generally, all the training modules were given level 3-5 from more than 90% of the respondents and thus it can be said that all the training modules were generally satisfactory. However, there were some variations in the share of level 3, 4 and 5 in each module. For instance there are some training modules which received level-5 from majority of the respondents, while the others were given level-5 from only a limited number of the respondents.

The most satisfied module was "8.1 Last year's achievement and associated problems" that was given level 5 from 83% of the respondents. The second popular module was "5.4 Practice of Bokashi" that was given level 5 from 72% of the respondents, and the third was "8.5 Dissemination materials," with 71%. As it was a time just about to start this year's pilot project, lessons from the last year seemed most valuable for the participants.

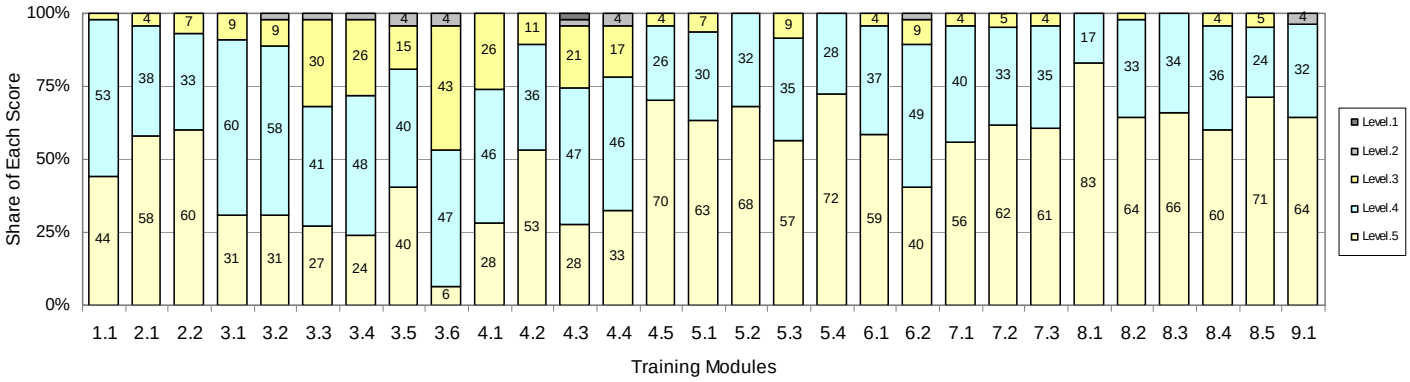
Concerning the high score in Bokashi practice, the background of the participants well explains it; most of participants were not necessarily "irrigation engineer" but general agriculturalist. They usually cover a wide range of topics in agricultural practices. Therefore, it is quite understandable why participants got higher satisfaction from the practical training of compost making. And, finally, it is needless to say that participants felt high level of satisfaction when they received materials necessary for the promotion of smallholder irrigation development in the pilot project.

Table 3.2.1 List of Training Modules/Items

Training Module/ Item
1.1 Program orientation (Opening, Expectation, etc.)
2.1 Irrigation development in Zambia (Mr. Zulu)
2.2 JICA presentation (Introduction to COBSI)
3.1 Identification of potential gravity diversion sites
3.2 Weir type & construction method (Inclined weir)
3.3 Weir type & construction method (single line weir)
3.4 Weir type & construction method (double line weir)
3.5 Weir type & construction method (trigonal prop)
3.6 Weir type & construction method (soil masonry)
4.1 Canal alignment by sprit line level
4.2 Ancillary facilities mainly for canal
4.3 Irrigation water requirement & water management
4.4 On-farm irrigation method (sunken-bed & furrow)
4.5 Organizing of farmers
5.1 Recommended cropping patterns
5.2 Bokashi compost (lecture)
5.3 Liquid fertilizer (lecture)
5.4 Practice of Bokashi
6.1 Practice of temporary diversion weir
6.2 Practice of canal alignment by sprit line level
7.1 Type of permanent weir and construction
7.2 Selection criteria and implementing districts
7.3 Construction arrangement
8.1 Last year's achievement and associated problems
8.2 Entry planning orientation
8.3 Entry planning by district
8.4 Entry plan presentation and adjustment by district
8.5 Dissemination materials
9.1 Training programme evaluation

Source: JICA Study Team, from the Kick-off Training

On the other hand, some training modules were given less number of level-5. For instance, training module "3.6 Weir type & construction method (soil masonry)" was given level-5 only from 6% of the respondents. In this module, 47% and 43% were level-4 and 3 respectively. As participants tended to give higher scores in the evaluation, this result can be interpreted that the module was relatively less satisfactory. Other modules that were found less favored were "3.4 Weir type & construction method (double line weir)" in which 24% of the respondents give level-5. And "3.3 Weir type & construction method (single line weir)" also got relatively low score, resulting in 27% of level-5.



Source: JICA Study Team, from the Kick-off Training held from May 3-7, 2010

Figure 3.2.1 Participants' Satisfactory Level by Training Module (Level 1-5)

Lower share of level-5 were found mostly in the trainings coded with 3.X and 4.X. Those training starting with the code number 3 and 4 are associated with weir construction methods (3.2-3.6) and

other irrigation technologies (4.1-4.4). There could be two ways of interpretation of these results. First, those training were too technical for them to fully understand the contents and thus the level of satisfaction was kept moderate. In the second scenario, participants did not appreciate so much about simplified structures. To be sure, results in other modules give further implication; 59% of the respondents gave level-5 to the training module "6.1 Practice of temporary diversion weir." It suggest that temporary weir structures were given relatively low score in theory but given high score in practice.

In short, all the training modules were given good satisfaction level from the participants. However, the level of their "excitement" had some variations among the modules. Especially, participants showed higher level of their satisfaction to the entry planning sessions.

3.3 Participants' Satisfaction by as a Whole, Logistics, Theory, Practice, and Own Participation

1) Overall Result of Category-wise Evaluation

In addition to direct evaluation of each training module, the training was evaluated based on five categories: as a whole, logistics, theory, practice, and own participation. As shown in Figure 3.3.1, level 3-5 shared more than 95% of the respondents. Except logistics, more than 90% of respondents answered level 4 or 5.

The category that enjoyed the biggest share of level-5 was "participation;" 63% of the respondents satisfied the most (level-5). The category "theory" and "practice" were almost the same in which 62% and 59% gave level-5. The category "as a whole" received slightly lower share (51%) of level-5. In any case, those four categories were quite satisfactory.

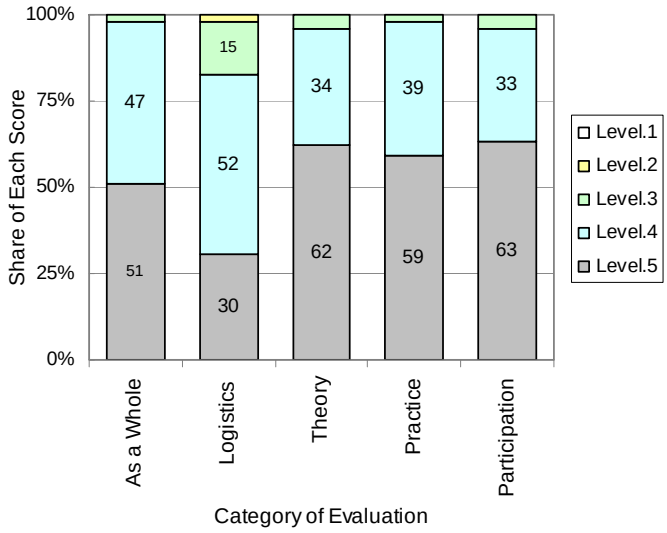


Figure 3.3.1 Level of Satisfaction by Category

Source: JICA Study Team, from the Kick-off Training for FY 2010

Those scores were also shown in Table 3.3.1. Three categories of "theory," "practice," and "participation" resulted in the weighted average score of 4.6, while "logistics" was 4.1. Although those scores were generally preferable, it seemed there were some problematic issues associated with logistics. As to see background of these results, the following introduces some typical comments from the participants.

Table 3.3.1 Participants' Satisfaction Level by Category

Module/ Item	Number of Respondents to Each Score						Ave.	Min.	Max.
	L. 1	L. 2	L. 3	L. 4	L. 5	Total			
C.1. As a Whole	0	0	1	23	25	49	4.5	3	5
C.2. Logistics	0	1	7	24	14	46	**4.1**	2	5
C.3. Theory	0	0	2	17	31	50	**4.6**	3	5
C.4. Practice	0	0	1	19	29	49	**4.6**	3	5
C.5. Participation	0	0	2	16	31	49	**4.6**	3	5
						Ave.	4.5	2.8	5.0
						Min.	4.1	2.0	5.0
						Max.	4.6	3.0	5.0

Source: JICA Study Team, from the Kick-off Training held from May 3-7, 2010
Note 1: Level of satisfaction is the lowest with "Level 1" and the highest with "Level 5"
Note 2: Numbers of effective responses are different among the objectives

3.4 Participants' Comments to Improve

1) As a Whole

Participants' comments on the overall evaluation of the training are summarized in Table 3.3.2. The most frequently described comments were "well organized/ presented;" 13 participants responded something like this. The second most common comments, five respondents, were summarized as "learned a lot/ it was educative." Most of the comments were generally preferable but there were also several issues to be improved: "material for practice was not enough/ delayed." This comment was probably related to the practical training of trigonal prop weir, in which farmers did not prepare woods and grasses. A bit discouraging comments was "at least handouts were given." If this person really meant it, preferable outcomes would not be expected from him/her.

Table 3.3.1 Participants' Satisfaction Level by Category

Comments "as a Whole"	No.
Well organized/ presented	13
Learned a lot/ it was educative	5
Good/ excellent	3
Satisfactory	3
Some topics were too fast	3
Contents were good	2
Okay with theory and practices	2
It was practical	2
Materials for practice was not enough/ delayed	2
Facilitators should be more active	1
More participation needed	1
More time was needed for some session	1
Some were very summarized	1
At least handouts were given	1
Others	3
N/A	8

Source: JICA Study Team, from the Kick-off Training for FY 2010

2) Logistics

There were two major comments on logistics: "satisfactory" and "venue should be changed." In terms of the venue, there may be two different implications. First, it may be about location. There were a number of officers who traveled all the way from Luapula province. Those officers recommended changing the location of the next workshop to Mansa or anywhere in Luapula province. Another reason of change probably may have come from the lower satisfactory level of the facility. As four respondents pointed out, toilet had a problem in their accommodation that may have created a negative feeling to the venue. Some comments also addressed the quality of meals; some asked to change the menu every time. These comments should be taken into account when evaluation workshop is held in November 2010.

Table 3.3.2 Participants' Satisfaction Level by Category

Comments on "Logistics"	No.
Satisfactory	13
Venue should be changed	12
Meal should be improved	6
Excellent/good	5
Facilities were old/ not enough	5
DSA and meal allowance should be increased	4
Toilet had a problem	4
Transportation arrangement should be improved	3
Need entertainment	2
Others	6
N/A	6

Source: JICA Study Team, from the Kick-off Training FY 2010

3) Theory

Comments on "theory" are summarized in Table 3.3.3. Major comments were: "beneficial," "expectations were achieved," and "well organized and presented." From those comments it can be said that participants generally enjoyed the lectures and gained something. On the other hand, five respondents pointed out that "facilitation skill should be improved."—TOT should be improved more for the next time. Timing of handout

Table 3.3.3 Participants' Satisfaction Level by Category

Comments on "Theory"	No.
Beneficial	9
Expectations were achieved	8
Well organized and presented	8
Facilitation skill should be improved	5
Knowledgeable/ understandable	3
More time should be allocated	2
Timing of handout distribution should be changed	2
It was difficult to understand some of the topics	1
Need follow-up	1
Others	2
N/A	10

Source: JICA Study Team, from the Kick-off Training FY 2010

distribution was also raised as an issue. In fact, it was discussed during the preparation meeting among the trainers if the teaching materials should be distributed first or later. Trainers were afraid that if trainees have manuals in their hands, they may not listen carefully to the lecture. Then, it was decided to distribute the teaching materials first so that trainers can refer to the manual during the lecture.

4) Practice

As shown in Table 3.3.4, there were several different comments on the level of participation. First, "well organized/presented" got the highest number of respondents, which was followed by "interesting/educative," excellent/good," and "preparation should be improved." The comments were generally preferable but preparation was not always satisfactory for them. As stated earlier, preparation of construction materials was not well organized. So, for the next time, more careful discussion should be carried out with farmers prior to the training.

Table 3.3.4 Participants' Satisfaction Level by Category

Comments on "Practice"	No.
Well organized/ presented	7
Interesting/ educative	6
Excellent/good	5
Preparation should be improved	5
Expectation was achieved	4
Satisfactory	4
Well participated	3
Others	9
N/A	8

Source: JICA Study Team, from the Kick-off Training FY 2010

4) Participation

The last comments were on participation. Majority of the participants were proud of their full and active participation in the training; 25 respondents commented "fully participated, which was followed by "excellent/ good. Other comments categorized in "others" were somehow not directly related to "participation."

Table 3.3.4 Participants' Satisfaction Level by Category

Comments on "Participation"	No.
Fully participated	25
Excellent/ good	4
Satisfactory	1
Others	9
N/A	10

Source: JICA Study Team, from the Kick-off Training FY 2010

CHAPTER 4 TARGET SET FOR YEAR 2010 DRY SEASON FOR TEMPORARY SMALLHOLDER SCHEMES

The 5-day training was completed with the formulation of action plan for each district. Based on the knowledge and experience gained through the training, the participants set their own target of smallholder irrigation development schemes in their districts. A session “entry-planning” commenced with an orientation by Mr. Zulu, explaining the objective of the action planning and contents of the plan to be formulated. Reporting mechanics, format of site profile, and logistical arrangement. After the plenary session, participants had a group discussion with the members of their own districts to set targets on: 1) number of TOT to be carried out at district level, 2) number of sites for improvement of existing schemes, or “Improvement,” and 3) number of sites for construction of new schemes, or “New Development.”

Targets of sites were set in accordance with two different categories: improvement of existing irrigation scheme and construction of new irrigation scheme. As it has been discussed, there are a number of existing smallholder irrigation sites established by farmers. Most of the facilities withdraw stream water to their canals by gravity without diversion structure. Thus, amount of water withdrawn to the canal can hardly meet crop requirement especially during the late dry season. Taking this situation into account, the participants decided to improve those existing facilities by introducing temporary diversion facilities made out of locally materials.

As for smallholder irrigation schemes at the district level, targets were set separately for district TSBs, CEOs, and fellow CEOs. First of all, district TSB is to develop their own sites exclusive of what are to be developed by the CEOs and fellow CEOs in the same district. CEOs who participated in this kick-off training are to develop their own sites. Furthermore, those CEOs are also responsible to carry out TOTs for their fellow CEOs. Fellow CEOs are then expected to develop their own sites. After the group discussion, all the targets were then placed on the front wall of the conference room and presented to all the participants for comparison and adjustment. In fact, some CEOs reduced their target number of sites after observing the others’ targets; they might have though they were too ambitious.

4.1 Target for TOT

Table 4.1.1 summarizes the targets of TOT by district, showing how many times trained CEOs are to carry out TOT and how many fellow CEOs are to be trained. As a whole, 113 times of TOT was set as a target of year 2010 with a total of 133 fellow CEOs to be trained. The maximum number of TOT among all the districts, 13 times, was set in Kasama and Mwense, while the minimum, three times, was set in Nchelenge. The targeted number of trainees was also largest in Kasama at 15 and the second largest was in Mwense at 13. The smallest number of trainees was set in Nchelenge. On the other hand, number of expected trainees per time was averaged at 1.1 CEOs per time with a range of 1.0 to 2.2 CEOs. As compared to the results in the last kick-off training for the year 2009, number of target trainees per time decreased from an average of 3.0 to 1.1. As the achievement in the year 2009 did not reach the target, it can be concluded that the participants in this year is more realistic.

Table 4.1.1 Planned TOT (Training of Trainers; fellow CEOs) by District

District	No. of TOTs (times)	No. of Trainees (trainees)	Trainees/time
Northern Province			
ISOKA	5	11	2.2
KASAMA	13	15	1.2
LUWINGU	9	9	1.0
MBALA	9	9	1.0
MPIKA	6	12	2.0
MPOROKOSO	8	9	1.1
MUNGWI	10	11	1.1
NAKONDE	8	8	1.0
Sub Total	**68**	**84**	**1.2**
Luapula Province			
KAWAMBWA	10	10	1.0
MANSA	11	11	1.0
MILENGE	8	9	1.1
MWENSE	13	13	1.0
NCHELENGE	3	6	2.0
Sub Total	**45**	**49**	**1.1**
Total/ Average	**113**	**133**	**1.1**

Source: JICA Study Team, from the Kick-off Training held from May 3-7, 2010.

4.2 Target for Improvement of Existing Sites

Table 4.2.1 summarizes the target number of improvement sites. A total of 38 CEOs who participated in the training set a target to improve 75 sites, or 2.0 sites per CEO. In addition, through the TOTs to the expected 133 fellow CEOs, another 122 sites, or 0.9 sites per fellow CEO, are to be improved. Furthermore, district TSBs of the 13 districts are to carry out the improvement scheme a total of 20 sites or 1.5 sites per TSB office, totaling 215 sites to be improved in the year 2010 dry season.

Note that no target was set in Milenge and Nchelenge as of the improvement site. It was probably because they did not have any particular existing sites in their minds. Given this discouraging number of target, some participants from the other districts criticized and finally it was accepted with a condition that the officers from those two districts try identifying potential sites and do the improvement at their best effort.

Different from the last year's kick-off training, irrigated area, canal length, and expected number of beneficiaries were not set as a target. Because it took so much time to discuss several sets of targets. For the participants to concentrate to the most important items, the Study Team suggested them to focus only on the number of the sites this year. Based on the achievement accomplished in the last year, an average of 0.27 km of canal length per site was improved, suggesting that a total canal length to be extended can be estimated at 58.1km for a total of 215 sites this year.

As of the irrigated area, an average of 0.98 ha/site was improved last year and thus a total of 210.7 ha can be expected from the improvement of 215 sites this year. Similarly, number of beneficiary farmers can be also estimated based on the last year's achievement. As an average of 40.6 farmers per site benefited last year, expected number of beneficiary farmers can be 8,729 this year.

Moreover, economic impact from those targets can be roughly estimated. Farming economy survey carried out in 2009 estimated the expected benefit of major crops on average 20 million ZMK per ha, although it was estimated based on very limited data source and thus it still needs to be confirmed. Applying this tentative figure, economic impact derived from 210.7 ha of newly irrigated area can bring about around 4,214 million ZMK, or US$860,000 at 4,900ZMK/US$.

Table 4.2.1 Target Number of Improvement Sites for the Year 2010 Dry Season

CEOs/District	KSM	MBL	MPK	MRK	MGW	LWG	NKD	ISK	Total	MNS	KWB	MLG	NCG	MWS	Total	Grand Total
CEO 1	2	2	1	3	2	3	3	1	17	2	3	0	0	2	7	24
CEO 2	1	1	1	3	4	2	2	2	16	2	3	0	0	4	9	25
CEO 3	2	2	2	3	2	1	2	3	17	1	3	0	0	3	7	24
Sub Total	5	5	4	9	8	6	7	6	50	5	9	0	0	9	23	73
Fellow CEOs	18	8	11	18	26	3	5	6	95	8	6	0	0	13	27	122
District TSB (D)	2	2	2	2	2	2	3	0	15	2	1	0	0	2	5	20
Total (A-D)	25	15	17	29	36	11	15	12	160	15	16	0	0	24	55	215

Source: JICA Study Team, from the Kick-off Training held from May 3-7, 2010.

Average per district (CEO only)	5.62
Average per district (Fellow CEO only)	9.38
Average per district (district TSB only)	1.54
Average per district (total)	16.54

Table 4.2.2 Estimated Outputs from the Improvement Sites for the Year 2010 Dry Season

Items	Achievement in the Year 2009	Targeted No. of Site For the Year 2010	Estimated Outputs for the Year 2010
Canal Length	0.27km/site	215	58.1 km
Irrigated Area	0.98ha/site		210.7 ha
No. of Beneficiaries	40.6 farmers/site		8,729 farmers
Expected Net Income	20 million ZMK/ha	210.7ha	4,214 million ZMK (US$860,000)

Source: Target: JICA Study Team, from the Kick-off Training held from May 3-7, 2010.

4.3 Target for New Development Sites

Table 4.3.1 summarizes the target of new development sites in simple diversion schemes for the year 2010 dry season. A total of 38 CEOs/BEOs who participated in the training are to develop 80 new sites, another 127 new sites by the fellow CEOs, and 31 sites by the district TSBs, totaling 238 sites for the 2010 dry season. That is, 2.1 sites per trained CEO, 1.0 site per fellow CEO, and 2.4 sites per TSB officer.

Although the number of beneficial farmers was not set as a target, it is estimated roughly 4,236 farmers based on the last year's actual average numbers per site as shown in Table 4.3.2. In addition, expected irrigated area can be also estimated; as 0.55 ha per site was newly irrigated last year, approximately 130.9 ha can be expected for the year 2010, respectively. If the target is to be fully achieved, the estimated economic impact would reach 2,618 million ZMK from the new development of smallholder irrigation scheme this year.

Table 4.3.1 Target Number of New Development Sites for the Year 2010 Dry Season

CEOs/District	KSM	MBL	MPK	MRK	MGW	LWG	NKD	ISK	Total	MNS	KWB	MLG	NCG	MWS	Total	Grand Total
CEO 1	2	3	2	2	3	2	3	1	18	1	2	1	2	1	7	25
CEO 2	2	3	2	2	2	2	2	2	17	3	2	2	2	2	11	28
CEO 3	1	2	2	2	4	2	3	2	18	3	2	3		1	9	27
Sub Total	5	8	6	6	9	6	8	5	53	7	6	6	4	4	27	80
Fellow CEOs	10	9	12	8	20	9	10	10	88	11	9	7	4	8	39	127
District TSB (D)	4	1	2	2	2	2	3	2	18	2	2	2	2	5	13	31
Total (A-D)	19	18	20	16	31	17	21	17	159	20	17	15	10	17	79	238

Source: JICA Study Team, from the Kick-off Training held from May 3-7, 2010.

Average per district (CEO only)	6.15
Average per district (Fellow CEO only)	9.77
Average per district (district TSB only)	2.38
Average per district (total)	18.31

Table 4.3.2 Estimated Outputs from the New Development Sites for the Year 2010 Dry Season

Items	Achievement in the Year 2009	Targeted No. of Site For the Year 2010	Estimated Outputs for the Year 2010
Canal Length	0.76 km/site	238	180.9 km
Irrigated Area	0.55 ha/site		130.9 ha
No. of Beneficiaries	17.8 farmers/site		4,236 farmers
Expected Net Income	20 Million ZMK/ha	130.9	2,618 million ZBK (US$534,000)

Source: Target: JICA Study Team, from the Kick-off Training held from May 3-7, 2010.

4.4 Logistical Arrangements

1) JICA Study Team

After the presentation and discussion of the action plans, logistical arrangement was explained to the participants. First of all, fuel is entitled to the CEOs to mobilize their activities on the ground: 105 litters per CEO, totaling 4,095 litters in the 13 districts for a period of six months from May to October 2010[1]. Same amount of fuel per CEO was allocated to the CEOs for the purpose to further allocate to the fellow CEOs he/she trains. Note that amount of fuel for fellow CEOs was set regardless of its numbers; the trained CEOs are responsible in the allocation and distribution of that fuel to his/her fellow CEOs.

In addition, fuel is to be distributed to the district and provincial TSBs: 300 litters per district and 600 litters per province respectively. The total amount of the fuel to be distributed is therefore 13,290 litters for the mobilization of the pilot project in the year 2010 dry season.

The amount of fuel per person changes month by month; for CEOs, for example, 20 litters per person is allocated for the first three months, and it will reduce to 15 litters per person for the last three months. For district TSB officers, for another example, 60 litters are allocated per person for the first three months and then it reduces to 40 litters. While diesel is given to TSB officers and CEOs, gasoline is to be distributed to the provincial officers as they use vehicles. The set amount of fuel for the provincial office is 120 litters for the first three months and 80 litters for the last three.

Table 4.4.1 Fuel Distribution Plan by the JICA Study Team

Item	May	June	July	August	September	October	Total
1.Northern							
Provincial TSB	120	120	120	80	80	80	600
Kasama	180	180	180	130	130	130	930
Mbala	180	180	180	130	130	130	930
Mpika	180	180	180	130	130	130	930
Mporokoso	180	180	180	130	130	130	930
Mungwi	180	180	180	130	130	130	930
Luwingu	180	180	180	130	130	130	930
Nakonde	180	180	180	130	130	130	930
Isoka	180	180	180	130	130	130	930
Sub-total	1,560	1,560	1,560	1,120	1,120	1,120	8,040
2. Luapula							
Provincial TSB	120	120	120	80	80	80	600
Mansa	180	180	180	130	130	130	930
Kawambwa	180	180	180	130	130	130	930
Milenge	180	180	180	130	130	130	930
Nchelenge	180	180	180	130	130	130	930
Mwense	180	180	180	130	130	130	930
Sub-total	1,020	1,020	1,020	730	730	730	5,250
TotaL	2,580	2,580	2,580	1,850	1,850	1,850	13,290

Note 1: Actual provision is to be done with a monetary term based on a fixed unit price.
Note 2: Provincial TSB will be given with a unit price of gasoline, while the districts will be based on a diesel price.

[1] Although there was an absent of CEO in Nchelenge, the same amount of fuel was allocated to the one with the condition that the district TSB officer district conduct TOT to that CEO.

2) Zambian Government

Zambian side also is also committed to support the pilot project. Specifically for the pilot project of this Study during the year 2010, the GRZ officially allocated some budget for mobilizing their officers. Items to be covered by the GRZ are "Meal Allowance (MA)," "Daily Subsistence Allowance (DSA)" "fuel for PACO and PAO" for the monitoring, and "servicing of motorbikes and vehicles." Originally, a total of 107,550,000 ZMK for Northern province and 73,270,000 ZMK for Luapula were requested as shown in Table 4.4.2. Thereafter, those budgets were officially allocated with some amendments. Final budget are 97,050,000ZMK, or US$19,800, for Northern province and 70,000,000 ZMK, or US$14,200 for Luapula province; 90% and 96% of requested budgets have been pledged.

Table 4.4.2 Budgetal Plan of GRZ for Smallholder Irrigation Development

Activities	Unit Cost	Quantity	Total, ZMK
Northern Province			
Meal allowance for TSB/CEOs	50,000	900	45,000,000
	50,000	360	18,000,000
DSA for Provincial TSB Officer	300,000	30	9,000,000
DSA for Provincial TSB JTO (Junior Technical Officer)	290,000	30	8,700,000
DSA for PACO & PAO	300,000	20	6,000,000
DSA for Driver to PACO & PAO	275,000	10	2,750,000
Fuel for PACO & PAO	6,200	500	3,100,000
Servicing of Motor Bike/Counterpart Vehicle		1LS	15,000,000
Total Requested for Northern Province			**107,550,000**
Actually Allocated			**(97,050,000)**
Luapula province			
Meal allowance for TSB/CEOs	50,000	600	30,000,000
	50,000	240	12,000,000
DSA for Provincial TSB Officer	300,000	24	7,200,000
DSA for Provincial TSB JTO (Junior Technical Officer)	290,000	24	6,960,000
DSA for PACO & PAO	300,000	12	3,600,000
DSA for Driver to PACO & PAO	275,000	6	1,650,000
Fuel for PACO & PAO	6,200	300	1,860,000
Servicing of Motor Bike/Counterpart Vehicle		1LS	10,000,000
Total Requested for Luapula Province			**73,270,000**
Actually Allocated			**(70,000,000)**
Grand total Request for the Two Provinces		**ZMK**	**180,820,000**
Grand total Actually Allocated for the Two Provinces		**ZMK**	**167,050,000**

Source: MACO TSB office (2010)

4.5 Dissemination of Materials

After the planning session, necessary materials were distributed to the individual CEOs, and district and provincial TSB offices. The materials distributed were shown in Table 4.5.1. These materials were distributed for the purpose of extension and dissemination of the technologies. To this end, for example, participants were required to use the poster or the technical guideline to well explain the technologies to the fellow CEOs and farmers. Also, line level and string are to be used for the actual implementation of canal alignment.

Table 4.5.1 Materials Distributed to the Participants at the Kick-Off Training

Item	CEO		Provincial TSB	District TSB
		Fellow		
1. Technical Manual	2	-	2	2
2. Picture story with manila paper	4	3	1	4
3. Leaflet	7	-	7	7
4. Line level	4	3	10	10
5. Rope for Line Level	1	-	1	1
6. Glue for putting posters on manila paper	1	-	1	1
7. Measuring tape (50m)	0	-	2	2
8. Clear File Bag	1	-	1	1
9. Chinese Bag	1	-	1	1
10 Gum Boot	1	-	1	1

Note: Number of materials provided to BEO/CEO is inclusive of the portion for their fellows.

CHAPTER 5 PRACTICE ON A SIMPLIFIED IRRIGATION SCHEMES

The day three of the training was allocated for the actual practice of weir construction and canal aligning as well as observation of on-farm irrigation at an existing irrigation scheme.

5.1 Measuring Water Flow

Just before starting construction work, measurement of water flow was demonstrated by the trainers. At the narrowest point of the stream where just below the natural drop, a wooden board which has a V-notch on an edge was installed, putting the notch-side above. Then, both sides of the board were reinforced by the sand bags to stop the water flow, by which water flows only through the V-shape. As shown at the right corner of the picture, by measuring the height of the water from the apex of the V-notch, water flow can be easily estimated: approximately 14.5 litters per second. As leakage cannot be completely stopped, it was likely that nearly 20 litters could be flowing.

Explain how much of water is flowing each second, using a pack of empty bottles to let participants get some sense of the volume.

5.2 Single Line Weir Construction

1) Site Selection

Prior to the kick-off training, the location was selected by the trainers and the Study Team. It was basically at the same village as last year's practice site: Kalupa village, Mungwi district, Northern province. In this year, however, specific site was set around 150m upstream to the previous site where more suitable conditions were observed: width of the stream is narrow; and located just before the natural drop.

2) Construction of Single-line Weir

Construction of single line weir started with driving the wooden poles across the stream. Necessary materials for the construction were prepared by the villagers in advance. As the trainers had gained a lot of experience in this type of weir constructions last year, instruction was proper and straightforward, resulting in very smooth progress. On site practices, such as driving wooden poles, weaving grasses, and putting mad, had been carried out mostly by the trainees, while the necessary materials were carried with villagers. From the village, a total of 45 villagers participated in the work, composed of 18 women, 17 men and 10 children (8 boys and 2 girls). As often observed last year, women and men tended to have different roles; men cut grasses and dig soils, while women carry those materials. In two to three hours time, basic weir construction was completed, raising water level 30-40 cm.

A lot of things are going on at once. Weir construction is definitely a collaborative activity

3) Aligning a Canal (furrow)

Before the completion of the weir itself, a group of participants started canal alignment activity. First, in accordance with the technical manual, distance was set 5 m in between two poles. Then, canal aliment was drawn little by litter. However, it appeared that canal alignment kept almost same distance to the stream even after it went around 200 m. The team leader of the Study Team had been waiting where he expected the alignment to reach. But the canal alignment did not reach his point at all. Thus, he instructed them to try increase the distance of two poles to be 15 m or more. Then, the aligning practice was restarted from the beginning with 15m length. After all, the alignment reached almost at the same place the team leader was originally standing at. Given the fact, it was learned that if the area is open and flat, distance of the two poles should be increased up to 15 m or 20 m. Also, this arrangement is also recommendable as the longer the distance of two poles, the faster aligning should be. By the end of the day's session, canal alignment reached around 400 m from the starting point.

When change the distance between the poles, the string must be re-adjusted.

5.3 Observation of On-Farm Irrigation

Near from the practice site, there spread existing farmlands under irrigation. Making the best use of this opportunity, participants visited the site to learn on-farm irrigation methods. At farmers' actual farmlands, two types of on-farm irrigation methods were explained and demonstrated: basin irrigation and furrow irrigation. For example, Mr. Banda and Mr. Kaira, officers in charge, explained how to keep the basin flat and how to avoid leaching of chemical fertilizer, which was followed by the explanation of appropriate length and inclination of on-farm furrow.

A trainer explains how to manage the basin irrigation using an existing farm plot

5.4 Trigonal Prop Weir Construction

1) Weir Construction

The day four was scheduled for BEOs and CEOs to practice trigonal prop weir construction, while lecture on permanent diversion weir development was provided for the provincial and district TSB officers at the Kasama Farm Institute. The weir construction practice was carried out at Milima village, Kasama district where relatively large volume of water flows. Same as the case of single-line weir construction, location was identified by the trainers and the Study Team.

Although materials were supposed to be collected by the farmers, not enough materials were ready for the construction and thus participants had to wait for a moment, suggesting how important it is to carefully organize preliminary discussion with farmers. After gathering logs, wooden poles, and barks, participants were divided into three groups; each group was responsible to assemble one trigonal prop. The trigonal props were assembled far bigger than usual: more than a man's height. It was because

participants expected the water level would rise significantly.

After finishing structuring the props, each group started installing it into the stream. At this time of the process, participants realized that the props would not fit perfect to the slope of the river bank; inclined props looks so unstable. To stand the prop upright, therefore, they dug the river bank. Another issue discussed in the course of the installation was the specific order of the logs to be combined at the apex of the prop. In other word, they discussed which one of the three corners should be placed toward the downstream.

According to the technical manual, it is highly recommended to put the log coming to the downstream side on the top of other two logs. Or, set the corner of the trigonal prop, log of which is on the top of other two logs, toward the downstream. One of the groups realized their prop would not be suited to the location and therefore they re-assembled the prop to be more suitable.

The group members changed the order of logs to be more suited to the site.

After the installation of the props, the progress became smoother. Participants together with farmers composed of 15 women and 17 men collaborated in the construction. In one to two hours time, quite strong and tight weir was constructed. Water level was increased 76cm from 68cm to 144cm and, as a result, small pond was newly created.

2) Aligning a Canal

Just after observing water level rose up, a group of participants started measuring the canal alignment. Reflecting the lesson learned at the previous day's practice, distance between the poles was set 15m. Although they had a little hard time to go through the early part where topography was slightly angulated, it went with a good pace, confirming that the distance between the two poles should be as longer as possible. As a result, canal alignment was pegged for around 350 m toward farmers' land. It will be further taken care of by the CEO in charge; he promised to come back soon.

3) Observation of Other Site

After wrapping up the whole practice of the day, participants moved to other village, Chipompo village. In that site, there had been constructed a huge trigonal prop weir by the villagers. Because of quite strong water flow of the river, the size of those trigonal props was far bigger than what the participants just constructed, although it was also bigger enough compared to common size. The participants learned that the type, size and the shape of the weir structures should be adjusted in accordance to physical characteristics of the site.

ATTACHMENT 1 MODULES (SCHEDULE OF ACTIVITIES)

DATE / TIME	ACTIVITIES	RESPONSIBLE
Day 0 (May 2, Sun): Gathering to the training institute		
Day 1 (May 3, Mon): Officer of the Day; Mr. Simukoko		
Module 1 - Program Orientation		
8:00-8:30	Registration	Mrs. Banda
8:30-9:00	Pre-Training Knowledge Inventory	Mrs. Banda
9:00-9:45	Opening, Self Introduction, and Overview of the Training	Mr. Zulu
9:45-10:00	Tea Break	Mrs. Banda
10:00-10:30	Surfacing of Participants' Expectation	Mr. Nkanda
Module 2 – Overview of Community Based Smallholder Irrigation (COBSI) Development		
10:30-11:30	Irrigation Development in Zambia, and Northern and Luapula P.	Mr. Zulu/Siwale
11:30-12:30	Introduction to the COBSI Development Study	Mr. Hashi
12:30-13:30	Lunch Break	Mrs. Banda
Module 3 – COBSI Scheme (Temporary Diversion Weir)		
13:30-14:00	Identification of Potential Gravity Diversion Sites	Mr. Phiri
14:00-14:45	Weir Type and Construction Method (Inclined Weir)	Mr. Phiri
14:45-15:00	Tea Break	Mrs. Banda
15:00-15:45	Weir Type and Construction Method (Single-line Weir)	Mr. Kaira
15:45-16:15	Weir Type and Construction Method (Double-line Weir)	Mr. Kaira
16:15-17:00	Weir Type and Construction Method (Trigonal Prop Weir)	Mr. Banda
17:00-17:30	Weir Type and Construction Method (Others, e.g. Soil Masonry)	Mr. Chininga
DAY 2 (May 4, Tue): Officer of the Day; Mr. Phiri		
8:00-8:30	Recapitulation (Review and Clarification of Day 1 Activities)	
Module 4 – COBSI Scheme (Canal, Ancillaries and On-farm Irrigation)		
8:30-9:30	Canal Alignment by Sprit Line Level	Mr. Mporokoso
9:30-10:00	Ancillary Facilities mainly for Canal	Mr. Kaira
10:00-10:15	Tea Break	Mrs. Banda
10:15-11:00	Irrigation Water Requirement and Water Management	Mr. Simukoko/Kangwa
11:00-11:30	On-farm Irrigation Method (Sunken bed and Furrow)	Mr. Banda
11:30-12:00	Organizing of Farmers	Mr. Siwale
12:00-12:30	Recommended Cropping Patterns	Mrs. Bulaya
12:30-13:30	Lunch Break	Mrs. Banda
Module 5 – Irrigated Agriculture Development		
13:30-14:30	Bokashi Compost (A quick Making Compost)	Mrs. Bulaya
14:30-15:00	Liquid Fertilizer	Mrs. Bulaya
15:00-17:30	Practice of Making Bokashi Compost	Mrs. Bulaya
DAY 3 (May 5, Wed): Officer of the Day; Mr. Nkanda		
7:30-8:00	Recapitulation (Review and Clarification of Day 2 Activities)	
Module 6 – COBSI Scheme (Temporary Diversion Weir and Canal Alignment, Practice in Field)		
8:00-13:00	Construction Practice of a Temporary Diversion Weir in Field	Mr. Mporokoso/Kaira
13:00-14:00	Lunch Break	Mrs. Banda
14:00-17:00	Practice of Canal Alignment with Sprit Line Level	Mr. Mporokoso/Kaira
DAY 4 (May 6, Thu): Officer of the Day; Mr. Kaira/Banda		

7:30-8:00	Recapitulation (Review and Clarification of Day 3 Activities)	

For BEOs/CEOs (Mr. Kaira)

Module 6 – COBSI Scheme (Temporary Diversion Weir and Canal Alignment, Practice in Field)

8:00-13:00	Construction Practice of a Temporary Diversion Weir in Field	Mr. Mporokoso/Kaira
13:00-14:00	Lunch Break	
14:00-17:00	Practice of Canal Alignment with Sprit Line Level	Mr. Mporokoso/Kaira

For Provincial and District TSBs (Mr. Banda)

Module 7 – COBSI Scheme (Permanent Diversion Weir, TSB Officers Only)

8:00-10:00	Type of Permanent Weirs and Construction Method	Mr. Simukoko/Kangwa
10:00-10:15	Tea Break	Mrs. Banda
10:15-12:30	Type of Permanent Weirs and Construction Method (con'd)	Mr. Simukoko/Kangawa
12:30-13:30	Lunch Break	Mrs. Banda
13:30-15:00	Selection Criteria, and Implementing Districts	Mr. Zulu
15:00-15:15	Tea Break	Mrs. Banda
15:15-17:00	Implementation Arrangement	Mr. Siwale

DAY 5 (May 7, Fri): Officer of the Day; Mrs. Bulaya

8:00-8:30	Recapitulation (Review and Clarification of Day 4 Activities)	

Module 8 – Entry Planning

8:30-9:30	Last Year's Achievement and Associated Problems	Mr. Hashi
9:30-10:30	Entry Planning Orientation Materials to be provided Logistics Support Pro-forma of Monitoring, Site Profile, etc. Reporting Mechanics	Mr. Simukoko
10:30-10:45	Tea Break	Mrs. Banda
10:45-12:30	Entry Planning by District	by District
12:30-13:30	Lunch Break	Mrs. Banda
13:30-15:30	Entry Plan Presentation and Adjustment by District	Mr. Simukoko
15:30-15:45	Tea Break	Mrs. Banda
15:45-16:15	Distribution of Dissemination Materials (Manuals, Posters, etc)	Mr. Ieizumi
16:15-17:00	Reporting Mechanics (Confirmation)	Mr. Simukoko

Module 9 – Programme Evaluation and Closing

17:00-17:20	Training Programme Evaluation	Mr. Siwale
17:20-17:30	Closing Programme	Mr. Zulu/Hashi

Day 6 (May 8, Sat): Home Sweet Home

ATTACHMENT 2 PARTICIPANT LIST

Venue: Kasama Farm Institute Date: May 3-7, 2010

District	No.	Name	Title	Camp
NORTHERN				
Provincial TSB	1	Kenneth Zulu	P I E	
	2	Kelvin Simukoko	S T O	
	3	Francis Bwalya Kangwa	P T O	
	4	Annie Bulaya	J T O	
	5	Frank M Mporokoso	Campus man	
Isoka	6	Patrick Mwape	C E O	Nansala
	7	Blackwell A. Simukonda	B E O	Isoka cetral
	8	Phiri Nelson L	T O	
	9	Kaluma Collins	C E O	Lualizi
Kasama	10	Wilson Ngosa	A A	Kasondechisuna
	11	Stephen Musonda	T O	
	12	Elizaberth Nakamanga	B E O	Kasama central
	13	Prudence Kanda	J T O	
Luwingu	14	Wellington Masika	J T O	
	15	Bwembya Chilesh	A A	Mapulanga
	16	Bertha Kaumba Mwansa	A A	Mfungwe
	17	Bwalya Giles	AA	Luwingu
Mbala	18	Simposo Etepher	A A	Maule
	19	Julius Mulenga	A A	Tanzuka
	20	Freddy Banda	C T O	Mbala
	21	Kaira Machua	J T O	Mbala
	22	Francis K Kasonde	A A	Masamba
Mpika	23	Simbaya Kalolo	J T O	
	24	Deodatus Mwewa	C E O	Chitu
	25	Josephine Ngulube	C E O	Chalwe
	26	Beatrice N. Malama	J T O	Mpika
Mporokoso	27	Collins Chininga	J T O	
	28	Crispus Chikasa	C E O	Sikapila
	29	Litepo Chomba	J T O	
	30	Gift Malumo	C E O	Emwala
	31	Brighton Mweemba	C E O	M Mapesa
Mungwi	32	Rodgers Phiri	T O	
	33	Mwenya Reuben	A A	Malola South
	34	Beauty Chisanga	A S	Nseluka
	35	Simasiku Stephen	J T O	
	36	Ng'uni Suzgo	A A	Rosa
Nakonde	37	Kellies Sakajila	T O	
	38	Thaddeus Mwamba	A A	Old fifa
	39	James Simbeye	A A	Mwenzo
	40	Grace Mwape	A A	Ilola
LUAPULA				
Kawambwa	41	Hendrix Ntalasha	J T O	
	42	Julius Kazembe	A A	Chibote
	43	Webby Sikaonga	A A	Folotiya
	44	Patrick Mpongwe	A A	Chisheta
Mansa	45	Hafwiti Lloyd	A A	Mabumba
	46	Nkandu Kelly	T O	
	47	Nondo Micheal	A A	Chifula
	48	Mbao Betty	A A	Malamba
Milenge	49	Besa Philip	C E O	Lwimbe
	50	Abel Sichamba	J T O	
	5	Mwamda Brian Bwalya	C E O	Mupita
	51	Ponde Jestone	B E O	Kapalala
Mwense	52	Dickens Chikwekwe	T O	
	53	Numbwa Juvenile	A A	Lupososhi
	54	Kananda Christine Malama	A A	Mwense central
	55	Ng'uni Dickson	A A	Mubende
Nchelenge	56	Lovemore Mukwanje	J T O	
	57	Bonaventure Mupeteka	BEO	Kenani
	58	Kaunda Lauson F.	BEO	Nshinda

ATTACHMENT 3 LEVEL OF SATISFACTION TO EACH TRAINING MODULE

Module/ Item	Number of Respondents to Each Score						Ave.	Min.	Max.
	1	2	3	4	5	Total			
1.1 Program orientation (Opening, Expectation, etc.)	0	0	1	23	19	43	4.4	3	5
2.1 Irrigation development in Zambia (Mr. Zulu)	0	0	2	17	26	45	4.5	3	5
2.2 JICA presentation (Introduction to COBSI)	0	0	3	15	27	45	4.5	3	5
3.1 Identification of potential gravity diversion sites	0	0	4	27	14	45	4.2	3	5
3.2 Weir type & construction method (Inclined weir)	0	1	4	26	14	45	4.2	**2**	5
3.3 Weir type & construction method (single line weir)	0	1	13	18	12	44	3.9	**2**	5
3.4 Weir type & construction method (double line weir)	0	1	12	22	11	46	3.9	**2**	5
3.5 Weir type & construction method (trigonal prop)	0	2	7	19	19	47	4.2	**2**	5
3.6 Weir type & construction method (soil masonry)	0	2	20	22	3	47	**3.6**	**2**	5
4.1 Canal alignment by sprit line level	0	0	12	21	13	46	4.0	3	5
4.2 Ancillary facilities mainly for canal	0	0	5	17	25	47	4.4	3	5
4.3 Irrigation water requirement & water management	1	1	10	22	13	47	4.0	**1**	5
4.4 On-farm irrigation method (sunken-bed & furrow)	0	2	8	21	15	46	4.1	2	5
4.5 Organizing of farmers	0	0	2	12	33	47	4.7	3	5
5.1 Recommended cropping patterns	0	0	3	14	29	46	4.6	3	5
5.2 Bokashi compost (lecture)	0	0	0	15	32	47	4.7	4	5
5.3 Liquid fertilizer (lecture)	0	0	4	16	26	46	4.5	3	5
5.4 Practice of Bokashi	0	0	0	13	34	47	4.7	4	5
6.1 Practice of temporary diversion weir	0	0	2	17	27	46	4.5	3	5
6.2 Practice of canal alignment by sprit line level	0	1	4	23	19	47	4.3	**2**	5
7.1 Type of permanent weir and construction	0	0	1	10	14	25	4.5	3	5
7.2 Selection criteria and implementing districts	0	0	1	7	13	21	4.6	3	5
7.3 Construction arrangement	0	0	1	8	14	23	4.6	3	5
8.1 Last year's achievement and associated problems	0	0	0	8	39	47	**4.8**	4	5
8.2 Entry planning orientation	0	0	1	15	29	45	4.6	3	5
8.3 Entry planning by district	0	0	0	15	29	44	4.7	4	5
8.4 Entry plan presentation and adjustment by district	0	0	2	16	27	45	4.6	3	5
8.5 Dissemination materials	0	0	2	10	30	42	4.7	3	5
9.1 Training programme evaluation	0	1	0	9	18	28	4.6	**2**	5
						Ave.	4.4	2.8	5.0
						Min.	3.6	1.0	5.0
						Max.	4.8	4.0	5.0

ATTACHMENT 4 COMMENTS AS A WHOLE, ON LOGISTICS, THEORY, PRACTICE, AND PARTICIPATION

Comments on the Training as a Whole
Well organized/ presented
1. Progress has been done
2. Well organized
3. Well facilitated
4. The training was well organized and there was full participation. Facilitators well trained.
5. Well organized and done.
6. well presented
7. Training was very well organized both theory and practical as the contents of the course were smart
8. Well organized
9. Well organized
10. Well conducted
11. Well presented and prepared
12. The training was well organized facilitators were live
13. It was excellent organized especially on time, topics well presented but for practical farmers were no fully organized, food was just the same.
Learned a lot/ it was educative
14. I have learnt a lot from this workshop
15. Nothing more than this. The workshop was educative
16. I have learnt a lot from this workshop
17. Very educative and well facilitated.
18. It was okay and interesting and educative
Good/ excellent
19. It was good
20. The presentation was good in all
21. Excellent
Satisfactory
22. well done, keep it up, and satisfactory
23. Learning was okay and very understanding
24. Fully satisfied
Some topics were too fast
25. some topics were very fast done
26. Some topics were presented very fast especially those who happen to confuse the participants.
27. Some topics were presented very fast.
Contents were good
28. The contents were okay
29. The contents were well formulated
Okay with theory and practices
30. The training was okay both theory and practical (2)
It was practical
31. Successfully and practical
32. The program contents as a whole was good since all participants had a practical feel on irrigation methods (Temporal)
Materials for practice was not enough/ delayed
33. Very useful materials but all the requirements should be available when it comes to practice[yeast was not provided
34. It was well arranged but materials at the site should be confirmed in advance
Others
35. At least the hand outs were given
36. some topics were very summarized
37. More time is needed to be apportion to some session
38. Participants should be encouraged to be involved in doing practical.
39. Should advise all facilitators to be active and live.
40. Identification of potential gravity diversion sites and weir type and contraction methods.
41. Always exceed your expectation
42. Keep it up

Comments on Logistics
Satisfactory 43. Everything okay but I would suggest we go to Luapula province next time when there is a workshop (relish should not be the same for all days) 44. It was well satisfactory 45. Everything was up to my expectation. 46. Logistics were okay every thing was arranged nicely 47. Venue was okay but holding should be improved. 48. Good but the diet at KFTC was too much of meat. Despite, I propose change. 49. The venue was okay, transport and lodging. 50. Venue was okay. Lodging okay, no transport arranged for officers who traveled by private transport (To Musa) 51. Venue convenient, transport good , toilets should be improved 52. Lodging and venue are quite good but entertainment should be in place. 53. Well arranged 54. Well organized but with lodging the only problem was with toilets there is need to improve water system **55.** Well organized
Venue should be changed 56. Venue has to be changed 57. Everything okay but I would suggest we go to Luapula province next time when there is a workshop (relish should not be the same for all days) 58. Venue rotation 59. The rate should be known to allowances. The venues should be changing. Transport should be available at the lodging site. 60. Just change maybe Luapula province 61. To be changing the venue 62. The venue should be changed may be Mansa 63. In terms of venue, please I would love to say the next workshop to be conducted in Luapula Province in November 2010 64. Change of venue. The next w/shop to be held in Luapula Province. 65. Change the venue to Luapula Province. 66. The rates for DSA have to be revisited as well as meal allowance for field officers in order to motivate them. Venue to be changed. 67. The place is far from town rooms were a bit okay but need to change venue 68. Meal should be improved 69. improving on relish alteration 70. everything okay but I would suggest we go to Luapula province next time when there is a workshop (relish should not be the same for all days) 71. The institute should improve on the meals there has been too much of some relish 72. Good but the diet at KFTC was too much of meat despite. I propose change. 73. There was no variety of relish all in all very well **74.** The only complaint was on diet we had been merely given relish chicken beef, chicken beef throughout the week.
Excellent/good 75. Excellent 76. Wonderful place, rooms, meals and transport. Keep it up. 77. Transport, venue, lodging, was all good except logistics in terms of money be increased. 78. Excellent **79.** Excellent and well received despite some rooms and toilets had power problems and toilets not enough respectively.
Facilities were old/ not enough 80. They were fairly okay bur the beddings for the lodging must be improved 81. F T I to buy new bedding and paint the buildings mosquitoes to be controlled 82. The venue is loosing its value should be changed next time 83. To increase of buckets for bathing. **84.** Excellent and well received despite some rooms and toilets had power problems and toilets not enough respectively.
DSA and meal allowance should be increased

Comments on Logistics
85. The rates for DSA have to be revisited as well as meal allowance for field officers in order to motivate them. Venue to be changed. 86. Transport, venue, lodging, was all good except logistics in terms of money be increased. 87. Government rates should be followed **88.** It was good, we only hope the meal allowance will be honored without any problems
Toilet had a problem 89. But at times no water in the toilets 90. Venue convenient, transport good , toilets should be improved 91. well organized but with lodging the only problem was with toilets there is need to improve water system **92.** Excellent and well received despite some rooms and toilets had power problems and toilets not enough respectively.
Transportation arrangement should be improved 93. The rate should be known to allowances. The venues should be changing. Transport should be available at the lodging site. 94. Venue was okay. Lodging okay, no transport arranged for officers who traveled by private transport (To Musa) 95. Transport to town should be readily available
Need entertainment 96. Lodging and venue are quite good but entertainment should be in place. 97. There should be some facilities provided for entertain participants in evenings
Others **98. Fuel** should **be allocated according to the number of activities targeted per each camp** **99.** Logistics **should be first discussed on the first day before the training starts** 100. F T I to buy new bedding and paint the buildings mosquitoes to be controlled 101. To be improved next time 102. The rate should be known to allowances. The venues should be changing. Transport should be available at the lodging site. **103.** Venue convenient, transport good , toilets should be improved

Comments on Theory
Beneficial 104. It has helped to improve my extension service towards the community I am serving 105. it has been an eye opener - good 106. It has been very beneficial to the participants 107. Better and improved 108. The training has given as the needed skill l and knowledge to implement COBSI 109. Enjoyed very much because it was the first time I saw a trigonal temporal weirs being constructed using local materials available (affordable) 110. The theory was okay and I have learnt something important 111. There is need of canals in my camp as where there are potentials farmers so that is a good start. **112.** Theory was good
Expectations were achieved 113. I have met my expectation e.g. making bokashi 114. Almost all my expectations were achieved 115. The training was going well and met the expectations 116. Most of the things I expected have been learnt 117. My expectation has been meet 118. About 80percent of my expectation have been met 119. It started with knowledge hunger and ended with a proper satisfaction. keep it up please **120.** The program was met and understood all what was thought
Facilitation skill should be improved 121. Some facilitators should improve on language handling and elaboration 122. There is need for some trainers to be topic specific rather they going through the same thing over and over. **123.** Facilitators to stop confusing participants.

Comments on Theory
Some times confused by arguments among facilitators
124. some facilitators/trainers could not clearly elaborate points
It was difficult to understand some of the topics
125. Theoretically it was difficult to understand some of the intensity on practical.
Knowledgeable/ understandable
126. Very knowledgeable
127. Because of the practices I am able to understand and able to implement.
128. The skills which were through be met has gone beyond what I expected
More time should be allocated
129. More time should be allocated.
130. More days are needed for such workshops
Need follow-up
131. A follow up should be done to ensure successful implementation.
Timing of handout distribution should be changed
132. Handouts should be given upon arrival or during registration. so as to be provided with full information
133. Handouts should be given at the end and not at the begging
Well organized and presented
134. Clearly explained of course some topics after asking for clarification.
135. well organized and presented
136. well explanatory and every thing was clear
137. Activities were done practically nicely done
138. Well presented
139. All was well done
140. Theory was presented as expected
141. Well presented material and notes
Others
142. Good organization of farmers during practical
143. Just individual improvements otherwise there has been great improvement.

Comments on Practice
Well organized/ presented
144. The practices were done in a realistic manner.
145. The practical were conducted well after some collection.
146. well conducted
147. The practices where well conducted
148. Clear demonstration was done and weir construction was done nicely
149. Well done
150. Practices were conducted after theory which was good and was involved
Interesting/ educative
151. Was very interested and educative participate fully
152. This has equipped me with more knowledge than thought
153. All that was in theory was exciting in the field.
154. It was nice and encouraging I have learnt more
155. It was an interesting venture but really enjoyed being in the field
156. I have known how to construct different types of weir practically, the trainers are okay
Excellent/good
157. it was excellent
158. It was wonderfully done so intensify on practical (especially being in the filed).
159. Excellent
160. This has been met since we had that time of doing it practically. This is excellent.
161. Excellent
Preparation should be improved
162. Good and well participated but there was need to nform farmers fully on the practices because some farmers did not prepare adequately like at Milima
163. Materials to be used at selected sites should be provided the day before construction.
164. Weir construction went on well but canal alignment had some problems. It's better to identify the

Comments on Practice
starting point in advance.
165. Excellent but for bokashi should start at the start of the training for participants to see the results
166. There I need for a follow up before a practical field is done to ensure that material is at site.
Expectation was achieved
167. more than expected
168. what I was expecting has been meet and I have learnt more skills
169. All what was expected was well covered.
170. My expectation has been met
Satisfactory
171. Very satisfied because of practices
172. It started with knowledge hunger and ended with a proper satisfaction. keep it up please
173. Practices were okay
174. These kinds of programs are vital and should be encouraged.
Well participated
175. The practices are participatory and achievable by the participants
176. Practices were okay as we were also involved as participants
177. Participated actively
Others
178. More references should be provided for practices.
179. Everyone should participate in practices
180. Practices should be allocated with more time
181. I expected one permanent weir practice to be done.
182. There is need for a study tour to Malawi.
183. A lot
184. To improve on field organization especially the benefit
185. Practices should be given first priority.
186. Protective clothes to be included in practices

Comments on Participation
Fully participated
187. has been involved in all activities
188. it was nice everyone participating fully
189. I actively participated.
190. Because I participated fully
191. I participated evenly throughout.
192. All the participant were participating fully
193. People participated and facilitated in making or constructing weir
194. I am satisfied since I participated fully including practical
195. Participation was okay for me throughout the program especially in practices
196. I was fully involved all practices and hoping that I will deliver
197. In full force participation and interaction with others (fellow participants)
198. I have participated well
199. I have participated fully and gained skill. Participant should give respect to one another views
200. Participated fully in practices and our group was the one which made the bokashe and Trigonal prop
201. JOTs undermined us as they were the first to attend such a workshop hence them seemed to be fully participating.
202. I participated fully every one should take part please
203. Participation by individual participants.
204. The participation was good
205. The participants were hard working
206. All participants were engaged in various activities
207. 99.5 per cent participated!
208. full predication
209. I was fully involved and a feel even in the field I will be able to record what I did practically
210. Participation was okay
211. Participation was encouraging especially in practices despite lots of supervisors.
Excellent/ good

Comments on Participation
212. Good 213. Very good work done. 214. It was good most facilitators liked teaching instead of facilitating **215.** Very good indeed especially on practices work I have enjoyed the training very much.
Need Improvement 216. I could not participate full especially on theory because most of the topics were new but for the practical participated fully. **217.** Involve more experienced officers.
Satisfactory 218. Great improvement and satisfactory
Others 219. I am able to implement what I learnt in the field 220. The program had clarified updated me 221. all my expectations met 222. The program was following time every thing was done according to what was planned 223. I am able to change or exceed my expectation because I am imparted with full knowledge 224. I have grasped the knowledge which I didn't know in terms of weir construction. 225. Some facilitators need to prepare adequately. 226. I have benefited much that now the camp operation will be digestively done may you keep it up **227.** All my expectations have been met because the environment was good enough in terms of participation and I did it all.

ATTACHMENT 5 COMMENTS ON TEMPORARY DIVERSION WEIR

No	Comments from the Participants
1	• COBSI (Temporary Diversion weir) Entry method makes it easy to identify serious communities as far as irrigation is concerned and avoid wastage of resources to uninterested communities as the time of RIFF. • Bob Marley song 'in the abundant of water man is thirsty' COBSI says in abundant of local building material man can construct irrigation facilities cheaply
2	• COBSI actually sincerely will and can change people's livelihood pertaining food security pack and income generation throughout. Thank you for its introduction and personally promise to put hands together to support the initiative and double efforts to improve people's lives in my area.
3	• With regard to smallholder irrigation with due to temporal structures. • This is a good initiative in the sense that most scale farmers can benefit because the resources are locally found. • Not much is involved in terms of monitory, and structures can be constructed within a short time. Also, no skilled labor needed
4	• The community based smallholder irrigation will prevail only if there is ample support to officers in case of fuel, stationery and allowances. • And to those interested farmers who understand the importance of irrigation farming it will help as the technology is simple and cheaper and this will contribute to increased food security in our country. This would just be need to have measures to improve marketing also as most farmers tend to reduce their hectare if they have nowhere to sell or no people or organization to buy their produce.
5	• By encouraging small scale farmers on the importance of taking irrigation as culture in order to increase their production and productivity and income at household levels, which will reduce even their poverty levels.
6	• The project has a potential to improve the standard of living of Zambian by 10 – 15% by 3-4 years of improvement is done by motivation extension workers by introducing sustained subsistence allowance.
7	• The project will do well especially that the approach taken is to satisfy the farmers and change their mindset by using the locally available resources to change their lines.
8	• COBSI Development has brought good livelihood to small farmers those who are practicing irrigation in terms of income generation after the sale of their produce.
9	• Personally my feelings are that this will improve living standards of community in terms of food security. • Sustainability and income generation (Economic development) can be established.
10	• Community based smallholder irrigation scheme with the knowledge I have acquired from this workshop, I will implement what I have learnt. • Explain to farmers and intended persons. Concerning these technologies I have learnt.
11	• The community based smallholder irrigation system is a very important project, I feel it will work well because it is cheaper and we are helping our community to realize that they can develop their lives by using their existing local resources. • A journey of 10,000 mile starts with a step.
12	• These temporary weirs will increase production and reduce poverty at house hold level. • This should continue because there will be water throughout the year and more farmers will engage themselves in farming as result farming will be throughout the year.
13	• COBSI is working well and it has started improving the living standard of small farmers who cannot afford to construct permanent weirs for their irrigation to sustain their living through I.G.As like gardening and also fish farming.
14	• Personally I feel this program is very important to the community because it's helping a lot of people to improve on their standards of living through food security. • COBSI development irrigation system for smallholders is very vital because it's cheaper in terms of constructing temporary weirs since only available materials are being used to have enough money. • Besides, it's good because its targeting small holder who can't manage to be any building materials for the permanent on, MACO vision will be achieved soon.
15	• COBSI from all what has been imparted will improve tremendously and it will boost up the community in my camp, through agriculture production and sustainability

No	Comments from the Participants
16	• Community based small holder irrigation has improved in our operating area but more is needed for sustainability.
17	• The project is a viable on in that most of the farming communities in Zambia can afford to make temporal weirs as this innovation is cheap and requires only personal commitment.
18	• A very well intended program that has a seemingly misunderstood entry point i.e. it is as if the temporary weirs are the only way a District can earn the construction of the much desired permanent weirs.
19	• COBSI is very important in our country because it will improve the livelihood of our farmers out there. • It will also help farmers to take their children to school because their outcome is high if well managed and utilized. • It has also helped me learn different things i.e. Bokashi making.
20	• COBSI is a very helpful technology with regard to rural based communities, which mainly rely on rain fed crop farming only if well adopted. • I personally would like it to be adopted or introduced to the rest of the provinces especially where economy is lugging behind and introduced some capital handouts to farmers.
21	• Farmers should be involved in all stages for the programme to be sustainable. • Farmers tend to abandon the projects, if at all they were not involved at the initial stage. • Community leaders should be also involved in these projects to be sustainable. Village headmen, chiefs should be sensitized
22	• From my personal view the temporal diversion weir are appropriate and simple technologies which can improve the living standards of our farmer. • As from my profession, I have found it very easy to construct most of temporal diversion weirs but with a big challenge with trigonal to develop my own confidence and also encourage the farmer.
23	• To let the program go well please consider lunch allowances since the job of weirs construction is too involving just for the officers since the day can be spent at the sites. • This is a very good training since it enhance food security at house hold level and it will improve the income status of our local farmers during the lean months.
24	• Personally this is very important project which can help the rural persons farmers upgrade their standards of living. • Professional comment this will increase our usefulness for the farmers as Camp Extension Officers and Block Extension Officers 'cause it will provide the farmers topics discuss with us irrigation, crop production, fish production, etc.
25	• The communities received have overwhelming interest of construction of temporal weir. However participation to some community is poor due to lack of facilitation.
26	• Temporally diversion cold be very and shall continue being useful to farmers in that they shall be able to diverge/tap water which is one of the most important resources for human development. If such water is fully utilized, farmers will improve their food security status as well as increasing their income to supplement income from rain fed crops. • After realizing more income from the temporal structures they would be able to construct permanent structures with less help from the government or donors.
27	• This is likely to improve the standards of living in the rural community because the community itself has proved that they can earn money and improve their standard of living through sales from their produces.
28	• One facilitator was trying to get involved in everything not learning chance to others fellow, only commanding, giving orders even where we should have lunch (site) during our practice in the field. Controlling the drivers' looks etc. let him change and respect other officer. • This program needs support from our provincial TSB team to be visiting every time they are called and provide block Extension Officer/Camp Extension Officers, TSB district officers, meal allowance to encourage or motivate them.
29	• This program is well organized and to enforce the implementation. It is important to work hand in hand with the district officers as in most cases some program like this one fail not because there is no transport, or allowance but due relationship. • So as the COBSI, see to that official related to this program are in line.
30	• I see a progress regarding COBSI in my camp because there a lot of rivers and farmers are eager for

No	Comments from the Participants
	gardening but lack technology. • With regard to fuel being provided to officers' work will be done and COBSI will be adopted.
31	• The COBSI is moving forward, meaning that the set goals are being achieved despite the challenges that were mentioned during the course of the training.
32	• The structure are supported, be encourage and promoted in village as frames are able to start their irrigation operation within a short period of time. In fact within hours this completed and ready to use. COBSI based type of irrigation calls for constant visit and monitoring. As these visits motivate farmers and demonstration (on farm) demos should be promoted us farmers still rely on bucket irrigation no matter how much water they have.
33	• Professionally staffs from districts are capacity bulk and farmers are appreciating this innovation of motivation because they do improve their standards. Personally JICA would have motivated the officers in the fields by giving theme some meal allowances than waiting to claim from the Government allowances which are neither there or inadequate.
34	• COBSI is a success as it targets the poor who are visited really proved that food security issue and income generation can be achieved.
35	• The background not known. This is when we are experiencing it. In any case farmers we interacted with showed some kind of change in terms of technology and gained some kind of new experience heading to improving in vegetable production as a result of some new techniques in irrigation system.
36	• JICA should support other programs apart from irrigation in future, i.e DSA to be given in full rage as Government.
37	• Personally I have gathered enough knowledge from this training that will help me and my family to participate fully in irrigation programme. I will be able to construct a one line weir and be able to irrigate crops for both home use and for sale. Smallholder irrigation farmers will be very happy to receive these irrigation knowledge through me. The difficulties that they had in the past will be solved. Their standard of living will be improved.
38	• COBSI in Northern and Luapula is doing well and it has been well organized both by MACO and JICA. Hoping the project to be extend to 2012 so that more area (or rather they cover more Provinces in Zambia. For my own good, I have learn more and the information passed to me by the same project has advance more in the department as well as in irrigation schemes.
39	• Personally and professionally, I fill it is high time we move from temporal structure to permanent ones if irrigation systems has to be improved in Zambia. Temporal structure will take us nowhere as will be revaluing in the same circle all the time.
40	• The community based smallholder irrigation for temporal diversion is better because this involves the community as the users which will enable them improve their standard of living hence more food and income through there is tactious work. On repair, it is cheaper • The permanent diversion is expensive but last longer.
41	• The Community definitely is going to benefit and it will enhance the livelihood of our poor farmers.
42	• COBSI will improve the livelihood of small scale farmer through improved irrigable areas and soil fertility improvement by Bokashi compost. Increased hectare, improve income and food security by high productivity of irrigated agriculture in addition to rain fed crops.
43	• COBSI on smallholder irrigation can only be well achieved with the comment from implementing officers otherwise has been a success because it has opened and changed peoples mind set through practical on temporal weir construction.
44	• The COBSI is the best entry if we have to build social capital in our farmers so that the country can move forward in term of achieving the NIP.
45	• Generally the project is doing fine in smallholder irrigation system since results are physically seen on the ground. On the part of a farmer adequate time is required to change their mindset, for example yesterdays community was not well organized.
46	• With equipped skills the programme will be successful especially if the administrative part gives support to the implementing team (Block extension officers and Camp extension officers). The support is in terms of providing necessary logistics on time.
47	• The smallholder irrigation scheme with farmers will be encouraged to adopt especially with the construction of temporal weirs, farmers will increase food security and income. This reduces poverty in the rural areas.
48	• COBSI the most important is that it can be achieved by small-scale farmers because of the use

No	Comments from the Participants
	natural resources which are locally available with their reach. The temporary weirs are easy to make by the farmers themselves through sensitization and hence sustainable agriculture practically.
49	• The project is good but one entry point was missed at the beginning because of the selection criteria of pilot areas. Now that a lot of Districts are involved, the progress will be seen. With a lot of data and material and practices I will be able to perform.

VI.5 Proceedings of Follow up Training (November 2010)

MINISTRY OF AGRICULTURE AND COOPERATIVES
THE REPUBLIC OF ZAMBIA

THE STUDY ON THE CAPACITY BUILDING AND DEVELOPMENT FOR SMALLHOLDER IRRIGATION SCHEME IN NORTHERN AND LUAPULA PROVINCES IN THE REPUBLIC OF ZAMBIA

PROCEEDING OF FOLLOW UP TRAINING

NOVEMBER 2010

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
SANYU CONSULTANTS INC., TOKYO, JAPAN

CONTENTS

CHAPTER 1 RATIONALE AND TRAINING OBJECTIVES

Upon completion of the kick-off training workshop on smallholder irrigation development held from May 3 to 7, 2010, the pilot project, as part of the titled Study, has been carried out by the participants of the said training workshop as well as their fellows in the prioritized 13 districts in Northern and Luapula provinces (8 in Northern and 5 in Luapula).

For the successful implementation of smallholder irrigation development in future, there was a due need to review and share experiences that the CEOs/BEOs and TSB officers gained on the field so that the dissemination mechanism of smallholder irrigation development can be further improved. The lessons learned during the pilot project implementation will be reflected to the master plan of the smallholder irrigation development to be submitted to MACO at the end of the Study. In this regard, a three-day training workshop, namely the follow-up workshop, had been organized from November 16 to 18 as outlined below:

The workshop was a good opportunity for the participants to present what they have achieved in implementing the pilot project since the kick-off training and to prove their commitment as civil servants. The main objectives of the follow-up workshop were as follows:

1. To share the progress and achievement of the pilot project activities in each district,
2. To identify issues/problems and those causes/effective countermeasures related to promotion of the smallholder irrigation development, and
3. To gain and internalize collective lessons to further disseminate smallholder irrigation development.

CHAPTER 2 TRAINING PROGRAMME AND THE PARTICIPANTS

2.1 Training Programme

The workshop was a net three-day live-in and out-activities at Kasama Farm Institute. Methodologies employed were participatory assessment of their achievement, peer-to-peer learning through interactive presentation and discussion, brainstorming, and lecture-interactive discussion. Following are the programme and major topics of the workshop:

Day 1 (Nov. 16, Tue):

Module 1 – Program Orientation
- Registration and Pre-WS Questionnaire
- Opening, Self Introduction, and Overview of the WS
- Surfacing of the Participants' Expectation

Module 2 – Site Observation and Learning
- Site Visit (e.g. Chipompo site)
- Site Visit (e.g. Nselka, Chabukila)

DAY 2(Nov. 17, Wed):

Module 3 – Output Presentation of Smallholder Irrigation Development
- Recapitulation
- Output Preparation by District (Temporary/Permanent)
- District Crossover Comparison (Temporary)
- Output Presentation by Permanent Scheme

Module 4 – Lessons Sharing among Participants

Problems arisen & Actions taken

DAY 3(Nov. 18, Thu):

Problems arisen & Actions taken

Proud Achievements and Events

JICA & CP's Contribution

COBSI Programme Evaluation

Module 5 – Training Evaluation

Training Workshop Evaluation

Closing

2.2 Training Participants

In the follow up workshop, those who invited were the officers who had participated in the kick-off training, together with some new ones. They are fellow CEOs who have been actively participating in the smallholder irrigation development, and TSB officers at districts. Table 2.2.1 shows the summary of participants (for detail, see Attachment 2):

Table 2.2.1 No of Participants

District	No. of Participants
NORTHERN	
Provincial TSB	4
Isoka	3
Kasama	4
Luwingu	6
Mbala	6
Mpika	4
Mporokoso	6
Mungwi	5
Nakonde	6
LUAPULA	
Provincial TSB	1
Kawambwa	6
Mansa	7
Milenge	4
Mwense	6
Nchelenge	4
TOTAL	**72**
Back Support (JICA ST)	4

Source: JICA Study Team.

2.3 Pre-training Questionnaire Result

At the beginning of the training, a questionnaire was distributed to all the participants to study their expectations to the training, experiences during the activities of smallholder dissemination and the view to improving farmers' livelihood, etc. This section of the proceeding describes the results of the questionnaire.

2.3.1 Expectation from the Training

The questionnaire asked the participants what they expect from the follow up training with up-to two multiple answers. As shown in Table 2.3.1, the most frequent expectation was "to share success and challenges in COBSI implementation" with 17 responses, which is definitely in line with the objective of the workshop. The second frequent answer was "to learn what others have done in different districts" with 15 responses. Both answers are aiming at the information sharing among the participants. The third frequent answer was "to know the way forward to extend the program for another two years (13 responses)," which well indicates the high motivation of the participants who really want to continue the program in the future. A whole set of their answer is shown in attachment.

Table 2.3.1 Expectations to the Training Suggested by Participants

No	Expectations	Responses
1	Share successes and challenges in COBSI Implementation	17
2	Learn what others have done in different districts	15
3	Know the way forward to extend the program for another 2 years	13
4	To learn and find solutions to constraints experienced that led to low achievements	6
5	To review COBSI	5
6	Know whether everyone was successful or not in weir construction.	5
7	See progress on those weirs constructed	4
8	To learn from each other	4

No	Expectations	Responses
9	Earn more skills in weir construction	4
10	To know about smallholder irrigation	3
11	To have reports on the improvements	3
12	To see if the program has been adopted by farmers	3
13	Others (items not more than 2 responses)	23

Source: JICA Study Team, Pre-training questionnaire survey, November 16, 2010

2.3.2 Felt-Needs in Assistance from the Government

In the pre-training questionnaire, it was asked "*What assistances do you need from the Government in implementing smallholder irrigation? List two assistances.*" Figure 2.3.1 summarizes the necessary assistance they claimed. The first ranked was "Funding (84 responses)" with significantly high score. It was composed of "transport/ fuel (42)," "allowance (26)," "funding for irrigation program/ permanent weirs (15)," and "sponsoring for further studies (1)," as listed in the attachment hereafter. "Funding" was followed by "goods/equipment (9)," "training (8)," "monitoring/supervision (7)," "program/ coordination (4)," and "assistance for farmers (4)."

Given the fact that extension officers deal with a wide range of area, it is compelling needs for them to be equipped with a means of transport as well as allowance for their active mobilization. In addition, it is worth mentioning that some extension officers pointed out monitoring and supervision as their vital needs. It implies that they might be feeling they are left alone in the field, by which they are not sure if they are doing what they are supposed to do.

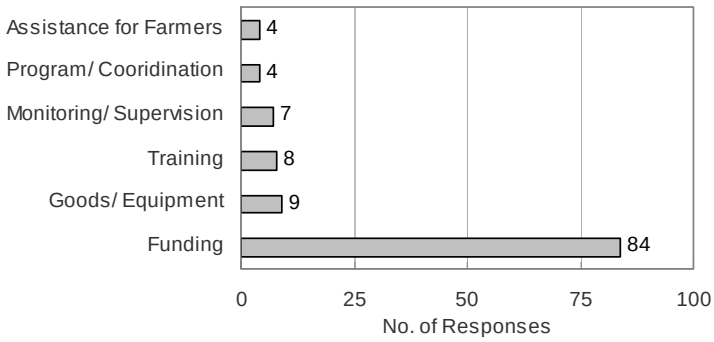


Figure 2.3.1 Necessary Assistance from the Gov. for COBSI

Source: JICA Study Team, Pre-training questionnaire survey, November 16, 2010

2.3.3 Problems Encountered during the Pilot Project

Problems that participants encountered during the pilot project were also addressed with a question "*Please describe the problem(s) you have faced or are facing in implementing COBSI this season.*" Figure 2.3.2 shows the typical problems that the front-line extension officers often face. The first ranked was "funding/ equipments (53 responses)," which is nearly twice as much as the responses to the second ranked problem "farmers participation/ attitude (28)." This tendency corresponds to the result of the previous question: type of assistance they need. In details, problem of funding/equipment was composed of several issues: "no/ inadequate allowance (16), lack/ breakdown of transport (16), "inadequate fuel and oil (15)," "inadequate funding (3)," "no protective cloths (3)," as listed in the attachment.

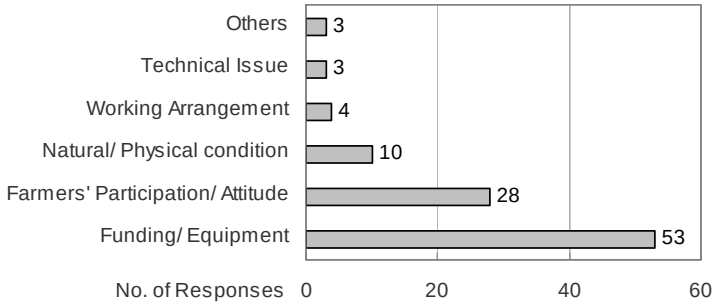


Figure 2.3.2 Problems Encountered during the Pilot Project

Source: JICA Study Team, Pre-training questionnaire survey, November 16, 2010

The third ranked was "natural/physical condition (10)," followed by "working arrangement (4)," and "technical issue (3)." From this result, it can be assumed that extension officers have seen difficulty in

organizing farmers and had challenges finding a good site for gravity irrigation—quite a realistic opinion from the field.

In conjunction with the problems above, participants were also asked to "*describe what kind of efforts you have done to solve the problem(s) above*." To cope with the lack of funding/ goods, for example, extension officers used their own fund/ resources (15 responses), cloths (2), and skip the lunch (3), resulting in the "sacrificing (22)" to be the first ranked countermeasure to the problems. Second ranked was "facilitating farmers (20)." Farmers' participation is sometimes not so active and their attitudes are not what extension workers really expect, but the officers do not necessarily give up promoting COBSI but try facilitating farmers.

To this end, help from colleagues are vital. As shown in Figure 2.3.3, extension officers reportedly collaborate with colleagues (15 responses) and get help from others (12) to tackle with the problems in working arrangement and technical issues even with a limited supervision. The detailed responses from the participants are shown in the attachment.

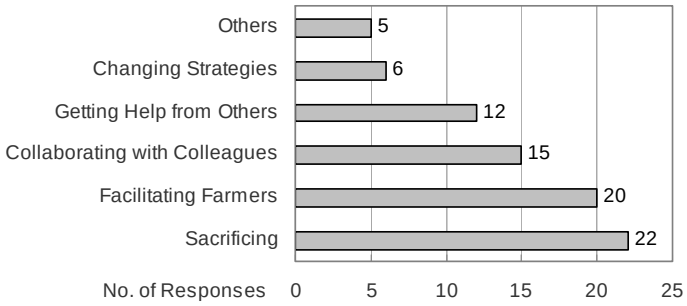


Figure 2.3.3 Effort Made to Solve the Problems

Source: JICA Study Team, Pre-training questionnaire survey, November 16, 2010

2.3.4 Best Experiences in Implementing Smallholder Irrigation Development

On the course of promoting smallholder irrigation schemes, extension officers encountered many problems and then dealt with those problems. As a consequence, they were able to enjoy the best experiences. What they were proud of the most was "change in farmers attitude/performance and lifestyle (36 responses)."

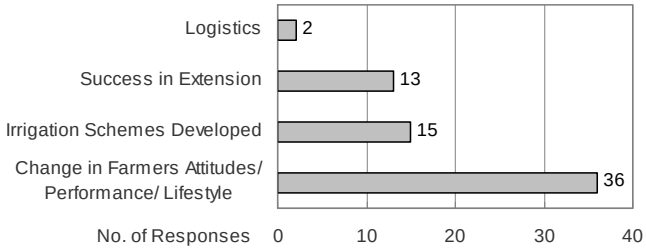


Figure 2.3.4 Best Experiences in COBSI

Source: JICA Study Team, Pre-training questionnaire survey, November 16, 2010

Among others are, for example: "Although community thought that all their inputs were a waste of time and water cannot be tapped, it was completed at last, and used by even others too.;" "targeted farmers are appreciating since they are benefiting from the crops grown under irrigation;" and "farmers appreciate the knowledge, technologies, and assistance."

Second ranked was the "irrigation schemes developed (15 responses)," in which physical output of smallholder irrigation development was appreciated. For example, "when constructed a four-trigonal weir on a very big river, which farmers did not expect." It well describes how much proud the officer is to have been able to bring about a great outcome for the farmers he/she is serving for.

"Success in extension," as a process of being able to change the farmers' attitude and make COBSI in practice, was also valued by the officers (13 responses). An officer remarked that "the technologies have been good for community to implement within the limits of resources and know-how." He/she surely addressed the essence of COBSI approach, quick, easy and inexpensive. Detailed comments of extension officers are listed in the attachment.

2.3.5 Way Forward to Improving Livelihood of the People

1) Activities/ Project needed to improve the livelihood of the smallholders

To come up with the better idea how to improve the livelihood of smallholders in the area, a question was asked to the participants: "*What activities/ projects do you think are needed to improve the livelihood of the smallholders, list two.*" There are a total of 123 responses to 39 types of project/ development activities. As shown in Table 2.3.2, the most popular item was "construction of permanent weir (16 responses)," implying that participants do not think it is a good idea to end these schemes with just "temporal structures."

Next common idea was "distribution of agricultural input (14)," which might reflect their major role as extension officers; BEOs/CEOs spent most of time for distribution of agricultural inputs through Farmer Input Support Program (FISP) in their ordinal task in addition to the buying up of rain-fed maize with Food Reserve Agency (FRA). Therefore, they may have some mind set in which extension workers main task is to distribute agricultural inputs and surely it helps farmers to improve their livelihood.

The third frequent answer was "establishment of fish farming." Making fish ponds seems a good option to make better use of tapped water through COBSI mechanism. In fact, through the pilot project activities in 2010, a total of 163 fishponds have been newly established, suggesting fish culture is a potential activity related with smallholder irrigation schemes.

Table 2.3.2 Project to Improve People's Livelihood

Comments	No.	Comments	No.
Construction of permanent weir	16	Lining of furrow	3
Distribution of agricultural inputs	14	Construction of dam	3
Establishment of Fish farming	12	Conservation farming	3
Conduct training (topic was not specified)	8	Conduct training on crop diversifications	3
Provision of small scale loan /link with loan provider	7	Installation of demonstration plot	3
Conduct training on irrigation	7	Meeting with farmers regularly	2
Selection of marketable crops to grow	5	Increase agriculture production	2
Development of market	4	Facilitate good farming practice	2
Increase the simple weir	4	Animal raising	2
Poultry / Chicken farming	3	Others	20

Source: JICA Study Team, November 15, 2010

2) What Extension Officers Have to Do

It was asked what extension officers themselves have to do to improve the livelihood of smallholder farmers. As Table 2.3.3 summarizes, majority of the participants suggested providing farmers new faming knowledge/technologies (10 responses) and, to this end, conducting necessary trainings (also 10 responses). The responses less popular were also somehow related to the technology dissemination and promotion. Also indicated was related to the behavior of the extension officers like "to work hand in hand with farmers (3 responses)" and "to visit farmers more often (2)."

Table 2.3.3 What Extension Officers Have to Do

Comments	No.
To provide farmers (new) farming knowledge / technology	10
To conduct necessary training / give appropriate advices (topic was not specified)	10
To impart knowledge on irrigation / water utilization and practice irrigation	8
To encourage farmers to increase area /production	5
To facilitate farmers in the process of the project	4
To work hand in hand with farmers	3
To encourage farmers' participation	3
To visit farmers more often to share ideas	2
To promote integrated farming	2
Others	17

Source: JICA Study Team, November 15, 2010

3) What Farmers Themselves Have to Do

Participants had an opportunity to state their opinion what their client farmers have to do to improve farmers' livelihood. As shown in Table 2.3.4, the most frequent opinion was "to adapt the knowledge technology learned" from the extension officers (20 responses). As extension officers, they strongly believe that what they are promoting should help farmers improve their livelihood. Issues related to the smallholder irrigation development can be found in third and fourth ranks "to embark on furrow irrigation," and "to commit the irrigation activity." With concern to the irrigation development, it was also suggested "to take irrigation as business," which is in line with the current government policy "agriculture as business."

Table 2.3.4 What Farmers Themselves Have to Do

Comments	No.
To adapt the knowledge / technology leaned	20
To work hard to increase production/area	9
To embark on furrow irrigation	6
To commit the irrigation activity	5
To participate in the activity	3
To have village development plan	2
To work as group	2
To get interest what they were taught	2
To work hand in hand with officers	2
To find out own problems	2
To take irrigation as business	2
To understand project concept well	2
Others	7

Source: JICA Study Team, November 15, 2010

4) What Government Has to Do

There should be something the government has to do to improve peoples' livelihood in the area. Participants think the government should "provide necessary support (logistics/ allowance) for the activities of CEOs/TSBs," which received 26 responses from the participants. There were actually several of issues that request the government to increase the support to extension officers or farmers. In addition, the second ranked was "to provide funding for irrigation schemes (8 responses)," a reasonable opinion in the workshop that features smallholder irrigation schemes. Furthermore, the issues suggested include the provision/development of: agricultural inputs, market, loan, and training opportunities.

Table 2.3.5 What Government Has to Do

Comments	No.
To provide necessary support (logistics, allowance) for CEO/TSBs' activities	26
To provide fund for irrigation schemes	8
To support agricultural input for farmers	7
To provide necessary support to farmers	7
To develop /find market	3
To provide farmers small loan	3
To take agricultural /irrigation more seriously	3
To improve policy which can boost agriculture production	2
To support fish fingering	2
To give training for officers and farmers	2
To fund the project	1
To hold workshop to know farmers' need	1
To provide CEO good accommodation	1

Source: JICA Study Team, November 15, 2010

5) What Donors Have to Do

Lastly, it was also asked what donors should do to improve peoples' livelihood. The most frequent answer was "to do necessary financial/ technical supports for the government," which received 43 responses. It was followed by "to assure logistics (13)," "to assure the allowance (10)," and "to conduct the trainings for officers and farmers (10)." Even in this category, there were some issues of logistics and allowance, suggesting that extension officers are so much frustrated by the lack of allowances they conceive.

Table 2.3.6 Donors Have to Do

Comments	No.
To do necessary financial / technical supports for Government	43
To assure logistics	13
To assure the allowance	10
To conduct the trainings for officers and farmers	10
To provide agricultural input for farmers	2
To support market development	1
To monitor the activity	1

Source: JICA Study Team, November 15, 2010

It is also noteworthy that the market development was stated in several categories and so was training opportunities for extension officers and farmers. It implies that extension officers on the ground recognize the necessity of developing market for improving the livelihood of farmers in the area.

CHAPTER 3 ACHIEVEMENTS IN 2010 DRY SEASON

Numerical targets were set during the kick-off training, held in May 2010 at the beginning of 2010 dry season. The targets were set as follows: 1) a total of 113 times of TOT (training of trainers: training from BEO/CEO who participated in the kick-off workshop to the fellow BEOs/CEOs who did not); 2) 215 sites to be improved, and 3) 238 sites to be newly developed. Followings present the achievements in comparison with the targets.

3.1 Achievement in TOT

Table 3.1.1 summarizes the achievement in TOT in comparison with the target. It shows the targets in the left column and the actual achievement in the right in terms of the number of TOTs they have carried out and the number of fellow CEOs trained.

As a whole, a total 88 TOTs have been carried out comparing to 113 TOTs planned, resulting in 78% of the original plan. Specifically, in terms of achievement-per-target comparison, Mpika district marked the best with 133% (8 TOTs against 6). The least progress rate is found in Nakonde district with 25%. In terms of the actual number of TOTs, Kasama district demonstrated the most: 13 times of TOTs, which is followed by Mansa and Kawambwa with 10 TOTs in both districts. Relatively speaking, the least number is found in Nakonde as the progress rate was also the worst.

On the other hand, number of officers trained returned different results. In terms of the numbers of officers, Mbala district marked the best with 33 officers, which is much greater than the other district; even the second best district (Mungwi) resulted in 19 officers. The least number of officers trained was found in Luwingu with 6 officers as the number of officers trained per TOT was only one, while it was more than 8 officers in Mbala.

In terms of the progress against the target, Mbala district also enjoyed the best achievement at 367%, while Nakonde marked the second at 225%. It is noteworthy that Nakonde district was ranked the worst in the progress rate in the number of TOTs, however, it was second best in the progress in terms of the number of officers trained, suggesting efficient arrangement of the TOTs in this district.

Table 3.1.1 Planned TOT and Actually Implemented TOT by District

District		TOT (Training of Trainers)					
		Time			No. of Officers Participated		
		Target	Achievement	Progress	Target	Achievement	Progress
Northern	Kasama	13	13	100%	15	17	113%
	Mbala	9	4	44%	9	33	367%
	Mpika	6	8	133%	12	13	108%
	Mporokoso	8	9	113%	9	10	111%
	Mungwi	10	7	70%	11	19	173%
	Luwingu	9	6	67%	9	6	67%
	Nakonde	8	2	25%	8	18	225%
	Isoka	5	4	80%	11	11	100%
	Total	68	53	78%	84	127	151%
Luapula	Mansa	11	10	91%	11	11	100%
	Kawambwa	10	10	100%	10	11	110%
	Milenge	8	5	63%	9	9	100%
	Nchelenge	3	3	100%	6	9	150%
	Mwense	13	7	54%	13	13	100%
	Total	45	35	78%	49	53	108%
Total of the 2 Provicnes		113	88	78%	133	180	135%

Source: JICA Study Team, from the Kick-off Training on May 3-7, and Follow up workshop on Nov. 16-18, 2010.

3.2 Achievement in Improved Sites

In the area, there are existing smallholder irrigation schemes established by farmers in the past. Most of the facilities, however, do not have diversion structure, and simply withdraw stream water to their canal by gravity. Therefore, amount of water withdrawn to the canal can hardly meet crop requirement especially during late irrigation season when water level gets lower. Taking this situation into account, improvement of these existing temporary irrigation schemes have been undertook as one of the major activities in the pilot project in 2010 dry season. Table 3.2.1 summarizes the achievement in the number of improved sites in comparison with the targets.

Table 3.2.1 Achievement in No. of Improvement Sites

District		Improvement No. of Site		
		Target	Achieve-ment	Progress
Northern	Kasama	25	15	60%
	Mbala	15	26	173%
	Mpika	17	12	71%
	Mporokoso	29	31	107%
	Mungwi	36	26	72%
	Luwingu	11	13	118%
	Nakonde	15	17	113%
	Isoka	12	9	75%
	Total	160	149	93%
Luapula	Mansa	15	4	27%
	Kawambwa	16	15	94%
	Milenge	0	3	N/A
	Nchelenge	0	1	N/A
	Mwense	24	21	88%
	Total	55	44	80%
Total of the 2 Provicnes		215	193	90%

Source: JICA Study Team, Follow-up Workshop, November 18, 2010

In terms of the number of site, 90% of the target was achieved as a whole; to the target of 215 sites, a total of 193 sites have been improved. Among the districts, furthermore, Mbala achieved 173% of its target (26 sites out of 15). On the other hand, Mansa reached only 27% of the target. The reason behind may be that TSB officer was too busy to deal with two permanent schemes in the district and was not able to supervise/ encourage the extension officers on the ground. In terms of the number of the sites, Mporokoso demonstrated the most, 31 sites in total. Although the achievement against target did not reach 100%, it was far better than what the Study team originally expected, to which the target seemed too ambitious.

In addition, Table 3.2.2 shows the whole set of project result in improvement schemes, in which followings are concluded.

- ✓ In terms of the numbers of farmers, a total of 3,490 farmers participated composed of 2,236 male and 1,254 female. Of all the members having participated, 716 farmers, 58% of the whole members, are actually irrigating their farmland. It can be summarized that typical improvement site has 18 member farmers composed of 12 male and 6 female, 11 farmers of which are actually irrigating. In addition, average number of landowner per site was only 4 members, suggesting those members usually share their farmland by mutual agreement.

- ✓ Canal length of existing site before improvement was found a total of 257.56 km, 1.33km per site, by which 205.42 ha, or 1.06 ha per site were originally being irrigated. By the improvement of those irrigation schemes, 85.09 km of canal have been additionally dug, 293.92 ha have been newly opened as agricultural field and then 191.97 ha have been newly irrigated by the end of the 2010 dry season. This is interpreted that typically 0.44 km have been newly dug per site, 1.52 ha per site newly opened, and 0.99 ha newly irrigated. As a result, the total irrigated area is now 397.38 ha or 2.06 ha per site.

- ✓ Number of farmers who practiced compost making was reported a total of 530, 2.7 farmers per site. By which, a total of 98 compost heaps, or 0.5 heaps per site, have been made. Still, concerning the number of heaps made, it seems those heaps were made for demonstration purpose, not for the actual application of those composts to the farmland of individual farmers.

- ✓ Through the COBSI pilot schemes, fish ponds have been also constructed. In addition to the total 180of existing fishponds in the target site, 36 fishponds have been newly constructed, suggesting

another beneficial aspect of COBSI scheme to improve the livelihood of smallholder farmers.

- ✓ As per beneficiary farmers, as a whole who actually started irrigation (irrigators), 0.14 ha of farmland have been newly opened and 0.09 ha have been newly irrigated, resulting in the total irrigated area of 0.19 ha including the original one.

Table 3.2.2 Summary of Improvement for Existing Sites in 2010 Dry Season (Simple Scheme)

District	No. of Sites	Started in 2009	No. of member farmers			No. of farmers who irrigated	No. of Land Owners	Original		Additional by Improvement in 2010			Original + Newly Irrigated, ha	Original + Opened, ha	Compost Making		No. of Fish Pond	
			Total	Male	Female			Original Canal Length, km	Originally irrigated Area, ha	Canal Length newly dug, km	Opened Area in 2010, ha	Area newly irrigated in 2010, ha			No. of farmers	No. of heaps	Original	Newly Constructed
Kasama	15	2	330	242	88	142	20	20.90	10.70	7.40	21.70	6.45	17.15	32.40	60	14	11	3
Average			22	16	6	9	1	1.39	0.71	0.49	1.45	0.43	1.14	2.16	4.0	0.9	0.7	0.2
Mbala	26	0	330	218	112	330	87	21.75	20.45	12.50	24.64	19.00	39.45	45.09	12	4	7	3
Average			13	8	4	13	3	0.84	0.79	0.48	0.95	0.73	1.52	1.73	0.5	0.2	0.3	0.1
Mpika	12	8	280	182	98	190	146	28.60	66.25	6.90	31.75	11.75	78.00	98.00	18	0	11	0
Average			23	15	8	16	12	2.38	5.52	0.58	2.65	0.98	6.50	8.17	1.5	0.0	0.9	0.0
Mporokoso	31	0	584	362	222	421	31	53.20	32.25	26.50	70.75	52.20	84.45	103.00	3	1	46	7
Average			19	12	7	14	1	1.72	1.04	0.85	2.28	1.68	2.72	3.32	0.1	0.0	1.5	0.2
Mungwi	26	0	454	306	148	268	136	44.00	21.94	8.90	20.65	17.90	39.84	42.59	0	0	12	3
Average			17	12	6	10	5	1.69	0.84	0.34	0.79	0.69	1.53	1.64	0.0	0.0	0.5	0.1
Luwingu	13	13	338	220	118	135	13	11.88	2.25	9.30	23.75	18.25	20.50	26.00	25	2	0	0
Average			26	17	9	10	1	0.91	0.17	0.72	1.83	1.40	1.58	2.00	1.9	0.2	0.0	0.0
Nakonde	17	0	127	95	32	94	27	3.98	7.80	1.75	16.72	13.74	21.54	24.52	32	2	8	3
Average			7	6	2	6	2	0.23	0.46	0.10	0.98	0.81	1.27	1.44	1.9	0.1	0.5	0.2
Isoka	9	0	195	94	101	136	77	13.84	8.80	0.70	15.75	11.75	20.55	24.55	113	60	17	1
Average			22	10	11	15	9	1.54	0.98	0.08	1.75	1.31	2.28	2.73	13	6.7	1.9	0.1
Mansa	4	3	71	44	27	37	17	1.68	2.75	1.40	2.19	2.18	4.93	4.94	3	3	1	1
Average			18	11	7	9	4	0.42	0.69	0.35	0.55	0.55	1.23	1.24	1	0.8	0.3	0.3
Kawambwa	15	0	251	156	95	109	64	10.78	13.05	3.99	13.75	11.00	24.05	26.80	11	6	13	8
Average			17	10	6	7	4	0.72	0.87	0.27	0.92	0.73	1.60	1.79	0.7	0.4	0.9	0.5
Milenge	3	0	27	20	7	8	5	1.60	0.90	0.55	5.50	3.70	4.60	6.40	0	0	1	0
Average			9	7	2	3	2	0.53	0.30	0.18	1.83	1.23	1.53	2.13	0.0	0.0	0.3	0.0
Nchelenge	1	0	15	12	3	8	8	4.50	1.00	0.00	0.50	0.50	1.50	1.50	0	0	0	0
Average			15	12	3	8	8	4.50	1.00	0.00	0.50	0.50	1.50	1.50	0.0	0.0	0.0	0.0
Mwense	21	0	488	285	203	160	85	40.85	17.28	5.20	46.28	23.55	40.83	63.55	253	6	53	7
Average			23	14	10	8	4	1.95	0.82	0.25	2.20	1.12	1.94	3.03	12.0	0.3	2.5	0.3
Grand Total	193	26	3,490	2,236	1,254	2,038	716	257.56	**205.42**	85.09	293.92	**191.97**	**397.38**	**499.34**	530	98	180	36
Per Site			18	12	6	11	4	1.3345	**1.0643**	0.4409	1.5229	**0.9946**	**2.0590**	**2.5872**	2.7	0.5	0.9	0.2
Per Member								0.0738	**0.0589**	0.0244	0.0842	**0.0550**	**0.1139**	**0.1431**	0.2	0.0	0.1	0.0
Per Irrigator		Ratio of Irrigators ag/ members				58%		0.1264	**0.1008**	0.0418	0.1442	**0.0942**	**0.1950**	**0.2450**	0.3	0.0	0.1	0.0
Last Year Started		26	644	420	224	317	139											
New Members			2,846	1,816	1,030	1,721	577											

3.3 Achievement in New Development Sites

Table 3.3.1 summarizes the achievement in the number of newly developed COBSI schemes in comparison with the target. To the target of 238 new sites, BEOs/CEOs with district TSB officers altogether developed as many as 181 sites in the 2010 dry season, which account for 76% of the target.

Table 3.3.1 Achievement in No. of Improvement Sites

District		New Construction No. of Site		
		Target	Achieve-ment	Progress
Northern	Kasama	19	11	58%
	Mbala	18	14	78%
	Mpika	20	15	75%
	Mporokoso	16	17	106%
	Mungwi	31	18	58%
	Luwingu	17	14	82%
	Nakonde	21	16	76%
	Isoka	17	7	41%
	Total	159	112	70%
Luapula	Mansa	20	11	55%
	Kawambwa	17	24	141%
	Milenge	15	8	53%
	Nchelenge	10	7	70%
	Mwense	17	19	112%
	Total	79	69	87%
Total of the 2 Provicnes		238	181	76%

Source: JICA Study Team, Follow-up Workshop, November 18, 2010

Among the districts, Kawambwa district is outstanding, having 24 new sites, which is followed by Mwense (19 sites), Mungwi (18) and Mporokoso (17). In terms of the achievement rate against the target of each district, again, Kawambwa showed the best performance (141%). The least performed per target was reported Isoka (41%). This significant difference may attribute to several different factors including irrigation potential of the district, topography, and area to be covered per extension officer and/or availability in the means of transportation. Therefore, this difference does not necessarily represent the commitment of the extension workers in those districts.

In addition, Table 3.3.2 shows the whole set of project result in new development schemes, in which followings are concluded.

- ✓ Of a total of newly developed 181 sites, irrigation has not started in 35 sites due to still continuing digging work, resulting in a total of 146 sites being irrigated. There were on the other hand a total of 16 sites in which farmers started COBSI schemes by their own by seeing a poster or by observing the neighbors implementing the COBSI schemes.
- ✓ As of the number of member farmers, it reached 3,381 farmers composed of 2,247 male and 1,134 female. It accounts for 12 male and 6 female per site, totaling 19 member farmers per site. Of those member farmers, number of farmers who actually started irrigation was reportedly 1,296 farmers (38.3% of the total): 7 farmers per site. Among those member farmers, 841 farmers (24.9% of the total) are landowners—5 farmers per site.
- ✓ The total length of the canal newly developed reached 162.9 km (0.9km per site) and newly opened agricultural area was 261.9 ha (1.45 ha per site). In addition, actually irrigated area under new development reached 131.3 ha (0.73 ha per site). As the digging works are, in many sites, still incomplete, most of the sites aims to expand more in the next season. The plan reported in the workshop indicates that another 254.8 km of canal is to be dug; additional 289.1 ha of area to be irrigated; and thus a total of 420.4 ha is to be irrigated as a sum of the two-year implementation.
- ✓ Compost making was also carried out in the new development sites. In the 2010 dry season, a total of 734 farmers implemented the compost making and 193 heaps have been made. That is, 4.1 farmers per site made 1.1 heaps of compost on average.
- ✓ Taking the advantage of water withdrawn from the new development sites, fish ponds have been also constructed. As a total, 127 fish ponds have been constructed, which is 0.7 fish ponds per site. Outstandingly, in Mwense, the number of fish ponds reached 40 as compared to 19 sites.

Table 3.3.2 Summary of New Development in 2010 Dry Season (Simple Scheme)

District	No. of Sites	Own Start	Not Irrigated Yet	No. of member farmers			No. of farmers who irrigated	No. of Land Owners	Done in This 2010 Dry Season			Plan for Next 2011 Dry Season			Compost Making		No. of Fish Pond Constructed
				Total	Male	Female			Canal Length dug in 2010, km	Opened Area in 2010, ha	Irrigated Area in 2010, ha	Canal Length to be dug, km	Additional Area to be irrigated, ha	Total Area to be irrigated, ha	No. of farmers	No. of heaps	
Kasama	11	3	2	188	119	69	102	39	21.80	14.20	6.20	12.30	8.00	14.20	82	14	3
Average				17	11	6	9	4	1.98	1.29	0.56	1.12	0.73	1.29	7.5	1.3	0.3
Mbala	14	0	0	265	192	73	195	84	20.60	44.70	11.35	11.95	6.95	18.30	0	0	6
Average				19	14	5	14	6	1.47	3.19	0.81	0.85	0.50	1.31	0.0	0.0	0.4
Mpika	15	2	6	328	215	113	89	124	27.00	43.50	18.00	41.60	34.50	52.50	6	1	7
Average				22	14	8	6	8	1.80	2.90	1.20	2.77	2.30	3.50	0.4	0.1	0.5
Mporokoso	17	2	2	421	270	151	106	17	21.96	45.88	16.38	25.50	36.00	52.38	0	0	22
Average				25	16	9	6	1	1.29	2.70	0.96	1.50	2.12	3.08	0.0	0.0	1.3
Mungwi	18	2	3	397	294	103	210	135	23.15	10.30	10.05	26.90	12.20	22.25	23	23	0
Average				22	16	6	12	8	1.29	0.57	0.56	1.49	0.68	1.24	1.3	1.3	0.0
Luwingu	14	0	6	354	235	119	83	17	11.27	11.08	7.28	18.65	32.50	39.78	0	0	0
Average				25	17	9	6	1	0.80	0.79	0.52	1.33	2.32	2.84	0.0	0.0	0.0
Nakonde	16	0	1	196	153	43	84	30	7.69	13.83	10.50	12.35	9.30	19.80	260	23	4
Average				12	10	3	5	2	0.48	0.86	0.66	0.77	0.58	1.24	16.3	1.4	0.3
Isoka	7	0	2	140	89	51	58	21	1.13	17.70	7.65	6.54	16.75	24.40	190	117	4
Average				20	13	7	8	3	0.16	2.53	1.09	0.93	2.39	3.49	27.1	16.7	0.6
Mansa	11	3	7	140	88	52	45	17	2.68	4.38	3.19	9.15	36.50	39.69	4	2	14
Average				13	8	5	4	2	0.24	0.40	0.29	0.83	3.32	3.61	0.4	0.2	1.3
Kawambwa	24	4	4	417	255	162	118	163	6.71	13.35	12.60	33.40	57.00	69.60	6	1	3
Average				17	11	7	5	7	0.28	0.56	0.53	1.39	2.38	2.90	0.3	0.0	0.1
Milenge	8	0	1	115	79	36	49	70	1.75	8.25	5.35	16.50	7.70	13.05	78	0	16
Average				14	10	5	6	9	0.22	1.03	0.67	2.06	0.96	1.63	9.8	0.0	2.0
Nchelenge	7	0	0	74	47	27	27	23	3.95	8.50	5.00	18.90	20.25	25.25	0	0	8
Average				11	7	4	4	3	0.56	1.21	0.71	2.70	2.89	3.61	0.0	0.0	1.1
Mwense	19	0	1	346	211	135	130	101	13.25	26.25	17.75	21.05	11.50	29.25	85	12	40
Average				18	11	7	7	5	0.70	1.38	0.93	1.11	0.61	1.54	4.5	0.6	2.1
Grand Total	181	16	35	3,381	2,247	1,134	1,296	841	162.93	**261.91**	**131.28**	254.79	289.15	**420.43**	734	193	127
Per Site				19	12	6	7	5	0.9002	**1.4470**	**0.7253**	1.4077	1.5975	**2.3228**	4.1	1.1	0.7
Per Member									0.0482	**0.0775**	**0.0388**	0.0754	0.0855	**0.1244**	0.2	0.1	0.0
Per Irrigator			Ratio of Irrigators ag/ members				38%		0.1257	**0.2021**	**0.1013**	0.1966	0.2231	**0.3244**	0.6	0.1	0.1
		19%	35	not irrigated yet at all in 2010 dry season out of the total 181 sites													
		81%	146	actually irrigated in 2010 dry season out of the total 181 sites							**0.8992**						

3.4 Evaluation of COBSI Program

In the workshop, it was asked to the groups of each district how effective COBSI program can work for 14 issues by the score from the badly effective "level 1" to the most effective "level 5;" Here, level 3 means neutral. The detailed result is also shown in the Attachment.

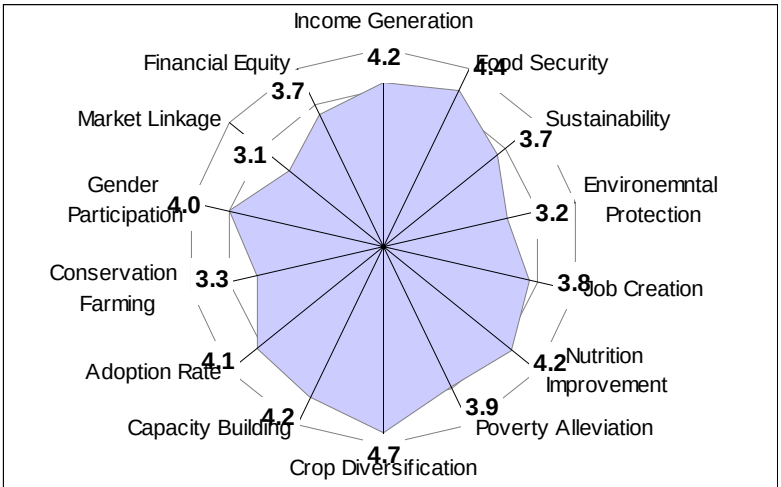


Figure 3.4.1 Evaluation of COBSI Program by Category

Source: JICA Study Team, Follow-up Workshop, November 16-18, 2010

As shown in Figure 3.4.1, COBSI program is effective for crop diversification at the average point of all the districts 4.7. Surely, the water resource became newly available through the COBSI schemes can provide farmers with the choice of crops. The second highest score was given to the item "food security." By increasing the crop production through COBSI schemes, farmers can improve the food security situation.

On the other hand, the least score was given to "market linkage" with an average score of 3.1, which was followed by "environmental protection (3.2 point)." Surely, COBSI scheme itself may not be directly related to improving market linkage. As for the environmental protection, there might be some opposition saying that, to construct the irrigation system in the area, trees are to be cut down, which probably led to a lower score. However, the average did not result in the lower score 1 or 2 that imply negative effect. Therefore, as a whole, they do not necessarily think of COBSI schemes harmful to the environment. Rather, they might consider it concerted with the natural environment. In fact, there are some report showing that, after starting COBSI schemes, some farmers stopped *Chitemene* slush and burn agriculture that is more destructive to the environment under a certain population density.

3.5 Felt Thought in Implementation of COBSI Program

Participants were asked to elaborate whatever they have felt, thought and touched on through the implementation of COBSI. As shown in Table 3.4.1, 10 extension officers stated that "COBSI helped improve livelihood of farmers," which was followed by "the concept is very good, farmers are changed and they appreciated it; the program should be continued (4 responses)." What was encouraging to the member of the Study team was the opinion that "COBSI technology made us easy to involve farmers because materials were locally available and technology was easily introduced," suggesting not only did they appreciate the materialistic inputs from the donor, but also did they appreciate the concept of COBSI scheme, which have been introduced from Japan.

On the other hand, there were relatively negative opinions too. For example, eight (8) participants commented that they could have been better if more logistical support was provided and another eight (8) mentioned the same on allowance. In this Pilot Project, however, it was the MACO's responsibility to provide necessary allowances to each extension officers as necessary. And to this end, a certain amount of government budget was officially allocated to both provinces. However, comparing to the budget mentioned in the government's budget inventory (so called "yellow-book"), not much have been actually disbursed. As a result, extension officers resulted complaining about the allowance in the workshop.

Table 3.4.1Felt Thought in Implementation of COBSI Program

Comments	No.
i) Positive Opinions	
COBSI helped to improve livelihood of farmers.	10
The concept is very good, farmers are changed and they appreciated it, the program should be continued	4
COBSI technology made us easy to involve farmers because materials were locally available and technology was easily introduced.	3
Others	20
ii) (Rather)Negative Opinions	.
I could have been better if enough logistic support (fuel) was given.	8
It could have been better if allowance was given.	8
Duration is rather short, if more time, it would be better.	3
It could have been better if motorbike was given.	2
It could have been better if supportive items (not specified).	2
Our farmers face problems when constructing the weir because they did not receive any support such as protective clothing and tools and any money.	2
Others	8

Source: JICA Study Team, Follow-up Workshop, November 16-18, 2010

3.6 Difficulties facing the BEOs/CEOs

Participants were randomly divided into six groups, and asked to report what problems/issues they have faced during the extension of smallholder irrigation development, causes of the problems, measures taken, lessons, etc. Table 3.5.1 summaries the problems by category; and major ones are as follows:

- ✓ "Inadequate/ erratic fuel supply" was amongst the major problems. It was pointed out that, in addition to the inadequate funding for the fuel, there have been an issue of fuel distribution problem in the country; a lot number of gas station run out of fuel due to the failure of national supply system and also the high price followed the issue. To cope with these problems, most of the participants used their own resources.
- ✓ "Inadequate motorbikes" was also another issue of their mobility. Although the government is purchasing more numbers of motorbikes, it is still not enough for the current number of extension officers deployed. As a result, they borrow motorbikes from colleagues and other offices, or sometimes just failed to achieve the target.
- ✓ In the field activities, extension officers recognize protective cloths as a due need to enable safe and easy work. The lack of protective cloths was therefore pointed out as a central problem to work for COBSI promotion activities.
- ✓ Lack of and/or low level of allowance has been always the problematic issue for extension officers and then it has been claimed once in a while. Without allowance, they do not feel "motivated" and thus it is "difficult to work." It was also claimed that it hinders the active participation of fellow CEOs and farmers.
- ✓ In addition, one suggested "money for fuel and allowances should come in personal accounts" instead of sending it to the representatives' account. In the pilot project, fuel budget was sent to the representative of each district for quick delivery purpose as well as being able to adjust at the district level.
- ✓ It is noteworthy that to deal with low participation of fellow CEOs and farmers, seeking audience of MACO or JICA Study team would work, a group suggested. Someone's acknowledgement would better motivate the people; no monetary infusion is necessary.

✓ Furthermore, there are some practical issues arisen during the pilot project. Included here were conflicts over landownership and weir vandalism. Upon the completion of irrigation schemes, the beneficial land suddenly becomes highly valuable and thus difference of interest would come up. Sometimes, landowner refuses to let others to use and some destroys the weir due to jealousy. Possible solution suggested is to involve traditional leaders/ chiefs. They work as mediators.

Table 3.5.1 Difficulties BEOs/CEOs have Faced and Suggestive Solutions

Problems/ Issues Arisen	Causes	Solution	Lessons learnt from solving the problems	Countermeasure for Future, if not yet solved
Inadequate and erratic fuel supply	Services station run out of fuel	Using own resources	Sometimes you need to sacrifice to achieve a goal.	
	Poor planning Inadequate funds	Use of personal resources	Personal budgets, affected other programs suffer.	
	High fuel prices for long distances	Sacrificing	Failure to meet targets	Quantity should be increased
Inadequate of motorbikes	JICA did not supply	Sacrifice and initiative	Unable to meet the targets.	JICA to buy motorbikes.
	Government JICA did not supply	Sacrifice and use of initiative	Unable to meet the target	JICA to buy motor bikes
	Governments failed to procure motorbikes.	Borrowing motorbikes from others sources.	No smooth achievements of goal	Effective planning to be in place
	No provision by JICA	Borrowing	Delay of work	JICA should provide motorbikes
Lack of protective clothes (to fellow CEOs)	Not budgeted for by JICA.	Not yet solved	Not safe and easy to work without protective clothing's.	JICA to budget for fellow CEOs.
	Not budgeted for	Not yet solved	Not safe and easy to work without protective clothing's	Budget for fellow CEOs
No allowances/ low motivation	Government and JICA failed to provide	Not yet solved	Difficult to carry out duties without motivation.	JICA to handle the issue.
	No funding (counterpart GRZ)		Poor performance	Partners JICA / Government should move at some pace
	No funding	Not solved		Money for fuel and allowances should come in person accounts
	Government JICA did not provide	Not yet solved	Difficult to work without motivation	JICA Hand letter issue
Low participation by fellow CEO/ farmers	Lack of incentives(food allowances protective clothing's)	Sensitization and meeting	Improved participation by fellow CEO/ farmers.	Cost sharing (farmers and JICA)
	Lack of motivation			Seek audience MACO and JICA team.
Declining level of interest by farmers.	Conflict over land			To involve traditional leaders Headmen and Chiefs
Conflict over land owners	Jealous ignorance	Involvement of local authorities	Sensitization to local authorities and the community	
Weir Vandalisms.	Multiple use, Jealously.	Formation of operation and maintenance	Sustainability is assured and ownership enhanced.	
Dependency syndrome by farmers.	Other programs give handouts	Sensitization on ownership of Cobsi	Through sensitization farmers cooperated.	
Lack of Agric input for irrigation crops.	No deliberate policy on irrigated crops	Enough farmers to resourceful.	Low production level irrigation crops	
Lack of collaboration with other NGO stake holder.	Different approaches by NGOs	Still a challenge.	Progress hindered.	Harmonization of objectives

Source: JICA Study Team, follow up training held on November 16-18, 2010

3.7 Proud Achievement

A group of participants reported their proud achievements, reason and the ways to disseminate such achievement to other fellow officers. As shown in Table 3.6.1, there were four major achievements they proud of: 1) construction of temporary/ permanent weir, 2) increase in the level of production throughout the year, 3) improved livelihood, income, and health, and 4) capacity built.

Construction of weirs was the direct objective of the COBSI scheme and, at the same time, a proud achievement for them. They accredited some issues which served for the achievement, including: 1) use of local materials, 2) combination JICA and MACO staff, and 3) government and community participation. In the future, it can be further promoted through exposure visit and/or TOTs.

As for the increased production, training and monitoring was given credit as well as availability of water and introduction of COBSI itself. Through field/farmer visit, it can be shared with their colleagues in the future. Similarly, for improvement of farmers' livelihood and capacity development, exposure visits and TOTs were recommended as a tool for sharing those proud experiences.

Table 3.6.1 Proud Achievement

The achievements/ events	Why and/or how has it happened?	How can you share your proud experiences with your colleagues who are not here in this workshop?
Construction of temporal/ permanent weirs	✓ Demand driven use of local material ✓ Combination JICA and MACO technology facilitation ✓ Government and community participation ✓ Financial support from JICA and effort by MACO staff ✓ Through commitment and sensitization	✓ Exposure to sites and provision ✓ Through TOT exposure visits to the sites ✓ Exposure visits to weirs sites ✓ Exchange visits
Increase in the level of production throughout the year	✓ Through training and monitoring ✓ Availability of water and technical advice ✓ Through COBSI introduction	✓ Through field and farmer visits ✓ Demonstration and fields days ✓ By inviting them to sites and show them the progress
Improve farmers livelihood income and health	✓ Cooperation between JICA MACO Farmers ✓ Through hardworking by fellow CEOs /farmers	✓ Exposure visit/ reports communication ✓ Through discussion and visits to progressive farmers ✓ Through meeting and reports
Capacity built	✓ TOT and demonstration to empower staff and community with knowledge and skills JICA and MACO	✓ TOTs

Source: JICA Study Team, follow up training held on November 16-18, 2010

CHAPTER 4 ACHIEVEMENT OF THE TRAINING OBJECTIVES AND THEIR SATISFACTION

4.1 Achievement of Training Objectives

At the end of the workshop, participants were asked how much they have achieved the objectives of the training in a range of level 1 to 5; level-1 is the least achieved while level-5 is the most. As shown in Figure 4.1.1, level 4 and 5 together shares more than 90% of the responses, suggesting majority of participants satisfied their achievement of training objectives.

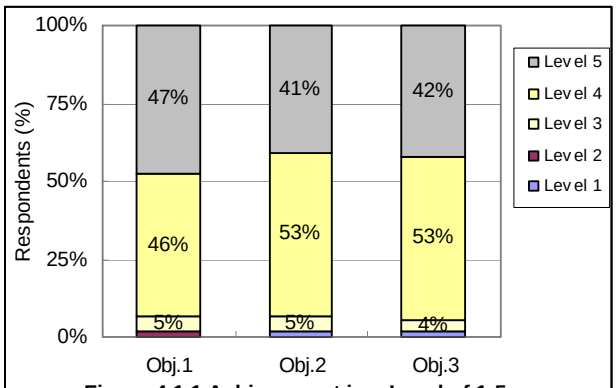


Figure 4.1.1 Achievement in a Level of 1-5 by Objectives

Specifically, the higher share (47%) of level 5 was observed to the objective 1, "to share the progress and achievement of the pilot project activities in each district."

On the other hand, there was one person who

scored level 2 to the objective 1 and level 1 to the objectives 2 and3. This person generally did not get satisfied in the level of his/her achievement to the three objectives unless he/she misunderstood the meaning of levels.

Objectives of the training, the participants are able to:

1. To share the progress and achievement of the pilot project activities in each district,
2. To identify issues/problems and those causes/effective countermeasures related to promotion of the smallholder irrigation development, and
3. To gain and internalize collective lessons to further disseminate smallholder irrigation development..

4.2 Participants' Satisfaction by Session

At the end of each session, the participants were asked of what extend he/she was satisfied: level 1 is the least satisfied while level 5 is the most satisfied. Table 4.2.1 shows the sessions undertaken during the training with the average score given by the participants. Figure 4.2.1 summarizes the level of satisfaction of the participants.

Table 4.2.1 Sessions Undertaken by the Training

Sessions		Ave. Score
1.1	Program orientation	4.6
2.1	Site Visit	4.1
3.1	Output Preparation by District (Temporary/Permanent)	3.9
3.2	Output Presentation by District (Temporary)	4.0
3.3	District Crossover Comparison (Temporary)	3.8
3.4	Output Presentation by Permanent Scheme	4.0
4.1	Problems arisen & Actions taken (Group Preparation)	4.3
4.2	Problems arisen & Actions taken (Group Presentation)	4.5
4.3	Proud Achievements and Events (Group Preparation)	4.6
4.4	Proud Achievements and Events (Group Presentation)	4.6
4.5	JICA & CP's Contribution	4.6
4.6	COBSI Programme Evaluation	4.3
5.1	Training Workshop Evaluation	4.4

On average, the highest score 4.6 was found in four sessions: "1.1: program orientation," "4.3: proud achievements and events (group preparation)," "4.4: proud achievements and events (group presentation)," and "4.5: JICA Study Team and Counterparts' contribution." While, the lowest score 3.8 was given to "3.3: district crossover comparison."

In terms of the share of satisfaction levels in each section, as shown in Figure 4.2.1, section 4.5 demonstrated the biggest share (73%) of level 5, while it was the smallest (13%) in section 3.1 output preparation by district. This might have caused by the difference of performance among the districts; while some districts have implemented a lot number of simple weir schemes, while some others have not with the same amount of fuel provided by JICA.

Although level 1 and 2 were rarely given, there were some sections that have received quite a share of level 3. For example, level 3 shared 38% in the section 3.3 "district crossover comparison." By comparing their performance, some might felt bad from showing relatively low achievement of their districts. Although there was a time to explain the story behind the final consequence, they were not happy about it. On the other hand, it is exactly what the Study team originally aimed; this kind of opportunities can motivate the extension officers to work harder not to loose their face in front of the colleagues.

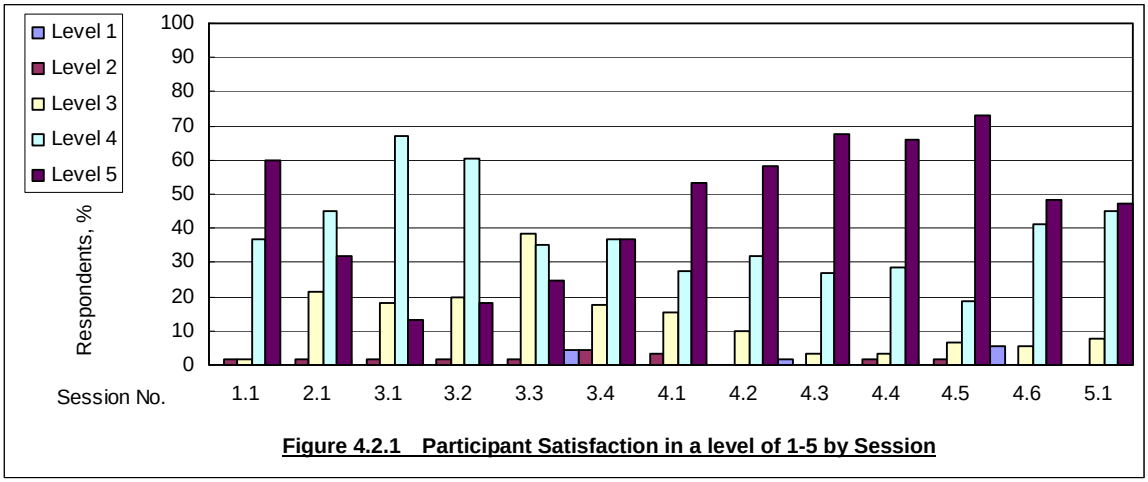


Figure 4.2.1 Participant Satisfaction in a level of 1-5 by Session

4.3 Participants' Satisfaction by as a Whole, Logistics, Theory, Practice, and Own Participation

Satisfaction level to "as a whole," "logistics," "theory," "field activities" and "own participation" were also surveyed in a level of 1-5. Figure 4.3.1 shows the share of each satisfaction level in each category. The highest share (50%) of level 5 was found in the category of "own participation." As the level 4 and 5 share 95% of the total score of this category, it is likely that they were satisfied with the level of their own participation.

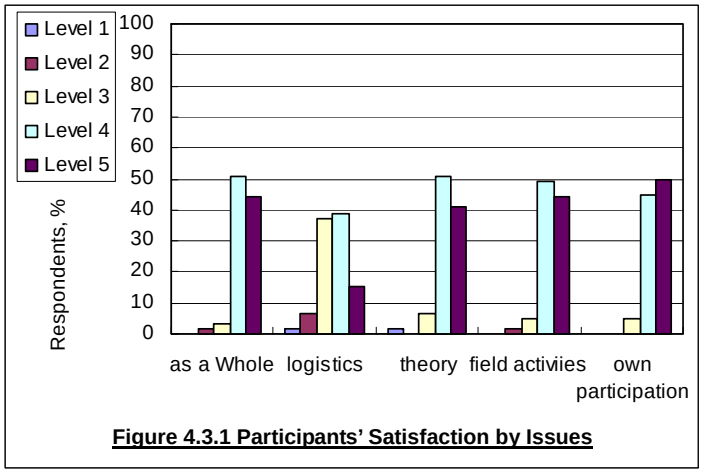


Figure 4.3.1 Participants' Satisfaction by Issues

On the other hand, the level of satisfaction was relatively lower in the "logistics;" level 5 shared only 15%, while level 4 shared 39% and level 3, 37%. Looking at the specific comments on it, there found were some specific problem in water supply system at a part of the lodging. Also, it was requested that the participants from Luapula province would like to have this kind of meeting in their province in stead of traveling for long distance.

4.4 Participants' Comments to Improve

In addition to rating the satisfaction above, the participants were asked to make comments to improve if any with respect to: 1) as a whole, 2) logistics, 3) theory, 4) field activities, 5) own participation, and 6) how to best improve the training course in future. Following are the excerpt of the comments and probable measures to take for future trainings:

- ✓ Nine (9) officers suggested that the venue be changed or altered especially to Luapula province. For the next occasion, therefore, workshop should be held both in Luapula and Northern provinces separately.
- ✓ Six (6) participants recommended increasing the days of the training workshop so that necessary topics can be fully covered and thus level of understanding can be improved.
- ✓ There were four (6) officers who proposed to have exposure visits, which include the farmers' participation for the exchange of mutual opinions.
- ✓ Leaning materials were also requested to improve the training. The materials requested are such as pen, notebook, and box files. Box files in fact facilitates good keeping of record and materials provided, e.g. handouts. Therefore if there are enough budgets, it should be considered.
- ✓ Allowance issue was also raised; e.g. to raise the amount to the government recommended level, give some down payment upon the arrival of the participants.
- ✓ There were four (4) officers who required continuing this program regardless of whether there is a support from JICA, of which one officer apprehended the termination of the program as the JICA Study Team withdraws next year.

ATTACHMENT 1 SCHEDULE OF THE WORKSHOP

DATE / TIME	ACTIVITIES	RESPONSIBLE
Day 0 (Nov. 15, Mon): Gathering to the training center (Kasama Firm Institute)		
Day 1 (Nov. 16, Tue): Officer of the Day; Mr. K. Simukoko/ Mr. F. Mporokoso		
Module 1 – Program Orientation		
7:30-8:30	Registration, and Pre-WS Questionnaire	Ms. Banda
8:30-9:30	Opening, Self Introduction, and Overview of the WS	PACO/PAO/PIE
9:30-10:00	Surfacing of the Participants' Expectation	Mr. Simukoko
10:00-10:15	Tea Break	Ms. Banda
Module 2 – Site Observation and Learning		
10:15-12:30	Site Visit (e.g. Chipompo site)	Mr. Mporokoso
12:30-13:30	Lunch Break	Ms. Banda
13:30-17:00	Site Visit (e.g. Nselka, Chabukila)	Mr. Mporokoso
DAY 2(Nov. 17, Wed): Officer of the Day; Mr. F. Mporokoso/ Mr. Simukoko		
Module 3 – Output Presentation of Smallholder Irrigation Development		
8:00-8:30	Recapitulation (2 from the participants)	TBN
8:30-10:00	Output Preparation by District (Temporary/Permanent: F1, 2, 3, 4)	Mr. Simukoko
10:00-10:15	Tea Break	Ms. Banda
10:15-12:30	Output Presentation by District (Temporary: F1, 2, 3)	Mr. Simukoko
12:30-13:30	Lunch Break	Ms. Banda
13:30-14:30	District Crossover Comparison (Temporary)	Mr. Simukoko
14:30-15:30	Output Presentation by Permanent Scheme (Form 4)	Mr. Simukoko
15:30-15:45	Tea Break	Ms. Banda
Module 4 – Lessons Sharing among Participants		
15:45-17:00	Problems arisen & Actions taken (Form 5, group preparation)	Mr. Simukoko
DAY 3(Nov. 18, Thu): Officer of the Day; Mr. F. Mporokoso/ Mr. Simukoko		
8:00-8:30	Recapitulation (2 from the participants)	TBN
8:30-10:00	Problems arisen & Actions taken (Form 5, group presentation)	Mr. Simukoko
10:00-10:15	Tea Break	Ms. Banda
10:15-11:30	Proud Achievements and Events (Form 6, group preparation)	Mr. Simukoko
11:30-12:30	Proud Achievements and Events (Form 6, group presentation)	Mr. Simukoko
12:30-13:30	Lunch Break	Ms. Banda
13:30-15:00	JICA & CP's Contribution	JICA/CPs
15:00-15:15	Tea Break	Ms. Banda
15:15-16:15	COBSI Programme Evaluation (Workshop)	Mr. Simukoko
Module 5 – Training Evaluation		
16:15-16:45	Training Workshop Evaluation	Mr. Simukoko
16:45-17:00	Closing	PACO/PAO
DAY 4 (Nov. 19, Fri): Home Sweet Home		

ATTACHMENT 2 PARTICIPANT LIST, Venue: Kasama Farm Institute Date: April 16 – 18, 2009

District	No.	Name	Title	Camp
NORTHERN				
Provincial TSB	1	Kenneth Zulu	SIE	
	2	Kelvin M. Simukoko	STO	
	3	Annie Bulaya	JTO	
	4	Frank Mporokoso	CM	
Isoka	5	Phiri Nelson		
	6	Patrick Mwape		Nansala
	7	Kaluma Collins		Lualizi
Kasama	8	Stephen Musonda	TO	
	9	Kanda Prudence	JTO	
	10	Elizabeth Nakamanga	BEO	Kasama Central
	11	Wilson Ngosa	CEO	Kasonde Chisuna
Luwingu	12	Fredson Mukaiwa	JTO	
	13	Bwembya Chileshe	CEO	Mapulanga
	14	Bertha Kaumba	CEO	Luwingu Main
	15	Mwiya Kakenenwa	CEO	Mucheleka
	16	Jackie Nyambi	CEO	Chungu
	17	Bwalya Giles	CEO	Mufili
Mbala	18	Banda Freddy	CTO	
	19	Kaira Machua	JTO	
	20	Simposo Etepher	CEO	Maule
	21	Julius Mulenga	CEO	Tanzuka
	22	Kafula Cliff	CEO	Kasesha
	23	Francis K. Kasonde	CEO	Masamba
Mpika	24	Kalolo Simbaya	JTO	
	25	Beatrice N. Malama	JTO	Mpika
	26	Josephine Ngulube	CEO	Chalwe
	27	Deodatus Mwewa	CEO	Chintu
Mporokoso	28	Collins Chininga	JTO	
	29	Litepo Chomba	JTO	
	30	Chrispas Chikasa	BEO	Shibwalya Kapila
	31	Gift Malumo	CEO	Chiwala
	32	Oscar Musowa	CEO	Mukupa Kaoma
	33	Brighton Mweemba	CEO	Mulenga Mapesa
Mungwi	34	Simasiku Stephen	JTO	
	35	Chanda Olivia	JTO	
	36	Beauty Chisanga	BEO	Nseluka
	37	Mwenya Reuben	CEO	Malole South
	38	N'guni Suzyo	CEO	Rosa
Nakonde	39	Kellies Sakajila	TO	
	40	Thaddeus Mwamba	CEO	Old Fife
	41	James Simbeye	CEO	Mwenzo
	42	Cholwe Hambwaza	CEO	Shemu
	43	Muyunda Mukelabai	CEO	Kantongo
	44	Grace Mwape	CEO	Ilola
LUAPULA				
Provincial TSB	45	Emmanuel Siwale	SIE	
Kawambwa	46	Hendrix Ntalasha	CTO	
	47	Patrick Mpongwe	CEO	Chisheta

	48	Julius Kazembe	CEO	Chibote
	49	P.C.Lombe	CEO	Musungu
	50	Joel Kasonde	CEO	Munkanta
	51	Webby Sikaonga	CEO	Folotiya
Mansa	52	Mayson Saila	AS	
	53	Kelly Nkandu	TO	
	54	Betty Mbao	CEO	Malamba
	55	Michael Nondo	CEO	Chifula
	56	Llyd Hafwiti	CEO	Mabumba
	57	Melody Shakambwa	CEO	Kapyata
	58	Changwa Kasangula	CEO	Kaole
Milenge	59	Abel Sichamba	JTO	
	60	Besa Philip	CEO	Lwimbe
	61	Mwanda Brian Bwalya	CEO	Mupita
	62	Ponde Jeston	BEO	Kapalala
Mwense	63	Dickens Chikwekwe	TO	
	64	Numba Juvenile	CEO	Lupososhi
	65	Kananda Christine M.	CEO	Mwense Central
	66	Bwalya Mukupa	CEO	Musalango
	67	WItika Kunda	CEO	Kashiba
	68	N'guni Dickson	CEO	Mubende
Nchelenge	69	Lovemore Mukwanje	JTO	
	70	Bonaventure Mupeteka	BEO	Kenani
	71	Brian Siwale	JTO	
	72	Kaunda Lauson F.	BEO	Nshinda
JICA Study Team	1	K. Hashiguchi		Team Leader
	2	T. Ieizumi		Co-Team Leader
	3	H. Hiruta		Member
	4	T. Nishigaki		Member

ATTACHMENT 3 PARTICIPANT PRE-TRAINING QUESTIONNAIRE RESULT

1) Expectations to the Training Workshop

No	Expectations	Responses
1	Share successes and challenges in COBSI Implementation	17
2	Learn what others have done in different districts	15
3	Know the way forward to extend the program for another 2 years	13
4	To learn and find solutions to constraints experienced that led to low achievements	6
5	To review COBSI	5
6	Know whether everyone was successful or not in weir construction.	5
7	See progress on those weirs constructed	4
8	To learn from each other	4
9	Earn more skills in weir construction	4
10	To know about smallholder irrigation	3
11	To have reports on the improvements	3
12	To see if the program has been adopted by farmers	3
13	Know the way forward of the constructed temporary weirs	2
14	Assess/evaluate activities done by CEO/TSB	2
15	Know how challenges from other districts were solved	2
16	Clarify on unpaid allowances encored during the operation of COBSI	2
17	Learn how the programme is going to be effective	2
18	Learn more on the implementation of community based projects	2
19	Exposure visits to newly constructed sites (weirs constructed)	2
20	To know how to improve the project in terms of ALLOWANCES	2
21	To know my strengths and weaknesses	1
22	Get experience in the permanent weir construction	1
23	Get reports on construction of permanent weirs	1
24	To learn about technical aspects of irrigation	1
25	To if we will be funded more money for the construction of permanent	1
26	To get allowances	1
27	Setting foundation/base for future programs and proposals	1

2) Necessary Assistance from the Government

Items	Response	Percentage
Funding	**84**	**79%**
Transport/ fuel	42	39%
Allowance	26	24%
Funding for irrigation program/ permanent weirs	15	14%
Sponsoring for further studies	1	1%
Goods/ Equipment	**9**	**8%**
Equipment for smallholder irrigation	3	3%
Protective cloths	3	3%
Timely logistical support in place (as agreed)	2	2%
Stationary	1	1%
Training	**8**	**7%**
Training (incl. fellow CEO at district level)	5	5%
Irrigation course for farmers	2	2%
Learning materials for farmers in local languages	1	1%
Monitoring/ Supervision	**7**	**7%**
Backstopping/ support (incl. district)	4	4%
Strengthen monitoring sheet	1	1%
Provision of full data even to those who are in remote area	1	1%
Physical monitoring	1	1%
Program/ Cooridination	**4**	**4%**
Cooridnation with agencies	1	1%
COBSI to continue	1	1%
Harmonize program to avoid interfieerance	1	1%

Items	Response	Percentage
Inclusion of the program in activity plans	1	1%
Assistance for Farmers	**4**	**4%**
Grants to farmers	2	2%
Input for farmers	2	2%
Total	**107**	**100%**

3) Problems Encountered during the Pilot Project

Items	Response	Percentage
Funding/ Equipment	**53**	**52%**
No/ Inadequate allowance	16	16%
Lack/ breakdown of transport	16	16%
Inadequate fuel and oil	15	15%
Inadequate funding	3	3%
No protective cloths	3	3%
Farmers' Participation/ Attitude	**28**	**28%**
Farmers' poor participation	9	9%
Land ownership dispute among farmers	4	4%
Farmers' poor understanding	4	4%
Difficult to organize farmers	2	2%
Farmers did not want to provide labor	2	2%
Too much reliance on the donors' support	2	2%
Conflict among farmers	1	1%
Farmers complained over marketing of produces	1	1%
Food arrangement to the farmers during work	1	1%
Difficult to find committed people	1	1%
Farmers were not in group	1	1%
Natural/ Physical condition	**10**	**10%**
Long distance (also related to fuel needs)	3	3%
Wide coverage area	3	3%
Inadequate water in streams	2	2%
Few streams in the area	1	1%
Difficulty in identifying the site due to narrow and slope streams	1	1%
Working Arrangement	**4**	**4%**
Conflict with other government activities (ex. FRA marketing)	2	2%
COBSI activity throughout the year	1	1%
Needed much time for site survey	1	1%
Technical Issue	**3**	**3%**
Livestock problems on crops	2	2%
Lack of resources to demonstrate BOKASHI compost	1	1%
Others	**3**	**3%**
Fellow CEOs did not concentrate	2	2%
High expectations by CEOs	1	1%
Total	**101**	**100%**

4) Best Experience in the Pilot Project

Comments by the Respondents
Change in Farmers Attitudes/ Performance/ Lifestyle (Total 36 Responses)
- More farmers are adopting irrigation farming to increase food production.
- Most farmers are now willing to put into practice on what I have taught.
- Seeing farmers starting to grow different types of crops.
- Seeing farmers raising income from the furrow I pegged.
- Farmers also have vast knowledge on site selection and group work promoted cooperation among farmers.
- Farmers already made money out of irrigation where I supported.
- Most of the farmers have been willing to improve their irrigation system.
- More farmers have started irrigating and they are also happy.
- Farmers welcomed the project very well and are willing to do better in the next season.

Comments by the Respondents
- Farmers have known how to construct a weir on their own.
- Farmers have known the goodness/ advantages and disadvantages of COBSI and it has been implemented.
- Temporal weirs were coming true to farmers and very happy for COBSI.
- Farmers thought the weirs are for the government; now they know that weirs are their properties.
- By improving smallholder irrigation, farmers have increased the area of irrigation from 1/4 lima to a lima.
- Managed to convince farmers that permanent structures could come forth if they utilize temporal structures effectively to improve their living
- Farmers appreciates the knowledge, technologies, and assistance (e.g. for permanent weirs).
- To see my group have constructed furrow and made weir, also have finished vegetables.
- Community experienced to undertake projects with minimum supervision.
- In some newly constructed sites, farmers are already using water and marketing the produces.
- After farmers have started benefiting, they became very happy about this project.
- High level community participation where vegetables are growing and fish farming is taking place
- Through sensitization, farmers took the project as their own and farmer driven.
- Farmers were happy to learn how to block stream and be able to channel water to garden areas.
- Five farmers have earned more income though the use of the weir and more are going to be involved in the next dry season.
- Although community thought that all their inputs were a waste of time and water cannot be tapped, it was completed at last, and used by even others too.
- Constructed weirs which are being used by farmers
- High adoption rate by farmers
- Community members gradually received the benefits of irrigation and fish pond
- Farmers have water for irrigation and fish farming
- Small scale farmers have increased the irrigable areas.
- Farmers were interested in physical assistance from JICA, not just knowledge on how to construct weirs.
- What farmers were being taught is being put into practice and also seeing better result in their productions
- Weir has been used by the farmers without water shortage.
- Most farmers are engaged in irrigated farming and they are doing very well.
- Targeted farmers are appreciating since they are benefiting from the crops grown under irrigation.
- When I saw whole portion of land being irrigated.
Irrigation Schemes Developed (Total 15 Responses)
- Managed to tap water and refill a pond which was abandoned by JSPR due to a lack of funds.
- There is an increase in area under irrigation.
- Construction of a trigonal weir where it was impossible due to strong water current.
- Some sites were well constructed.
- Managed two furrows and two improvement sites.
- At least, we have managed to construct one permanent weir as a district.
- Successful finish of a weir with 10 trigonal props despite the damage made by some community mamebers later.
- Managed to mobilize farmers and constructed 3 new sites and 3 improvement sites
- When constructed a four-trigonal weir on a very big river, which farmers did not expect.
- Construction of a permanent weir.
- COBSI is the best. Constructed 2 permanent weirs and a temporal weir were successfully constructed.
- Construction of a single line weir.
- Managed a permanent weir and installed 4 new sites and 4 improvement sites and was able to peg a canal on my own.
- Constructing a weir and having a furrow up to the expected area.
- Constructed the weirs in Mpulungu district; the spill over effect of COBSI.
Success in Extension (Total 13 Responses)
- Being able to organize farmers and demonstrate BOKASHI without struggle.
- Learning new technologies of constructing weirs and formation of compost.
- I felt good to have experienced to manage the work myself.
- When the COBSI team visited my camp and found that I have just finished one new site.
- I have gained more knowledge and experience.
- The technologies have been good for community to implement within the limites of resources and know-how.
- I have learned how to construct temporal and permanent weirs and canal alignment.
- Program was good and very helpful for farmers.
- Learned a lot especially on weir construction, making furrows, etc.

Comments by the Respondents
- Reached my target.
- Most targets were met.
- Experienced how to make temporal weirs as well as furrow pegging.
- I now know how to construct their weir together with my farmers.
Logistics (Total 2 Responses)
- COBSI has added a power of extension service provision.
- Fuel came on time.

ATTACHMENT 4 EVALUATION OF COBSI PROGRAM BY CATEGORY

Items	Northern									Luapula				Ave.
	Mungwi	Kasama	Mporokoso	Luwingu	Mpika	Mbala	Isoka	Nakonde	Ave.	Mansa	Kawambwa	Mwense	Milenge	Nchelenge	Ave.	
Income Generation	4	4	4	4	4	4	4	4	4.0	4	5	5	4	4	4.4	4.2
Food Security	4	3	4	4	4	4	4	5	4.0	5	5	5	5	5	5.0	4.4
Sustainability	3	5	4	3	4	4	3	4	3.8	4	3	3	4	4	3.6	3.7
Environmental Protection	3	3	3	3	4	3	4	3	3.3	4	3	3	3	3	3.2	3.2
Job Creation	3	3	4	3	5	4	4	3	3.6	5	4	3	4	4	4.0	3.8
Nutrition Improvement	4	4	5	3	4	4	5	4	4.1	4	4	4	4	5	4.2	4.2
Poverty Alleviation	4	3	4	4	4	4	4	3	3.8	4	4	4	4	5	4.2	3.9
Crop Diversification	5	5	5	4	5	4	5	5	4.8	5	5	3	5	5	4.6	4.7
Capacity Building	4	5	5	3	4	3	4	5	4.1	4	5	3	5	5	4.4	4.2
Adoption Rate	4	4	4	3	4	4	5	5	4.1	4	4	4	4	4	4.0	4.1
Conservation Farming	3	3	3	3	4	3	3	4	3.3	5	3	3	3	3	3.4	3.3
Gender Participation	5	5	4	4	5	4	4	3	4.3	4	4	3	4	3	3.6	4.0
Market Linkage	3	3	3	3	3	3	3	4	3.1	3	3	3	3	3	3.0	3.1
Financial Equity	3	4	3	3	4	4	4	5	3.8	4	4	3	3	4	3.6	3.7
Average	3.7	3.9	3.9	3.4	4.1	3.7	4.0	4.1	3.8	4.2	4.0	3.5	3.9	4.1	3.9	3.9

ATTACHMENT 5 COMMENTS BY ISSUES

1) As a Whole

No.	Comments As a Whole
1	Almost everything was clear and understood.
2	It was well presented
3	Highly taken and helping to refresh our mind.
4	Training contents was very good and educative
5	Fairly prepared
6	Well explained
7	Not well done
8	The program or time table was not clear until it was explained
9	Satisfactory
10	All lessons and presentations done according to the rationale Good
11	Very good
12	Excellent
13	More topics as part of COBSI to be included on nutrition, Gender, Environment and HIV and AIDS
14	Contents were well prepared
15	It was nice training and it should take a long way
16	The presentation was clear. Contents were comprehensible
17	That's what I Expected
18	Very compacted and educative
19	Accept exposure
20	Satisfied
21	Presentation were well prepared how ever hand outs can be better given from reference cases
22	Training contents has been fully satisfactory
23	This is good acquired knowledge of furrow irrigation using the calculated materials
24	Some district were incorporated late in the project
25	The training is okay and much satisfied with relationship with other participants
26	Achieved my personal objectives and expectation for coming to the workshop.
27	All the modules has been followed
28	Training programs achieved more exposure visits required
29	Fully satisfied
30	The training was okay and fair
31	Satisfied
32	It was good
33	The workshop was good but number of days should be increased
34	Well organized and the presentation was good
35	Satisfied
36	Good
37	Satisfied. Change of venue
38	Topics well arranged with good facilitation skills from facilitators
39	Fair
40	Training has been very educating because we have learnt on challenges
41	At least most of the things were understood
42	Good
43	Even if I was not there for the kick-off training I have gained knowledge in this follow up workshop
44	Training was well handled because there was interaction from other districts and hope next time it will be more than that
45	The workshop has rekindled morale and the desire for great achievement.
46	Training contents were fully planned for
47	It was well organized
48	Farmers are able to irrigate and they are proud of their canals
49	The set objectives were met through the program

2) Logistics

No.	Comments on Logistics
1	Venue water has been a problem
2	Feel to have been kept safe, cared for. Keep it up please.
3	It was the best
4	Water for washing our bodies had been a problem
5	Venue was okay but lacked water in the ablution blocks most of times
6	Venue was okay but lacked water in the ablution blocks most of times
7	Next trainings venue be changed to other province improvement required in lodging and water
8	Transport to town was a problem
9	Poorly done
10	Venue okay, lodging water problem, mosquitoes, dining hall too small for a large group
11	Venue for lodging was very bad. Usually no water. Even the conference was too small
12	There is need to improve on water supply to the Ablution blocks
13	We need continuously flow of water in both rooms. Out side toilets to be cleaned
14	Good
15	Good but the venue was too congested and facing water problem

No.	Comments on Logistics
16	We need a better place because sometime there is no water
17	Need to improve on water availability in dining, buckets with taps should be used
18	Food though generally good need is there especially for a full buffet
19	Water problem (as water is life) it can cause out break of diarrhea
20	Need to improve on water supply during gathering like this
21	Good arrangements were made
22	Inadequate water erratic water supply for bathing, toilets not cleaned with toilet cleaners
23	Water situation to be improved especially in ladies ablution block
24	lodging should be improved as the institute did not have enough water and the place too small
25	Fairly arranged
26	Need for D wash buckets, Venue good, transportation good, lodging good
27	JICA should improve on the logistics, allowances, motorized transport and full rates to officers
28	Venue should be changing
29	Lodging as usual no complaints but sanitation is poor
30	well arranged through sanitation was not up to the standard due water problems
31	All well logistics has been well prepared
32	Cash to be given so that lodging is paid for ourselves
33	Good but toilets were not all that clean even shortage of water
34	Venue and lodging was okay
35	Toilets not clean, beddings not good, rooms was dirt
36	Lodging was not okay no water in the toilets during the day and it was bad
37	Transportation, lodging was okay but next time we should change the venue the toilets dirt
38	Lodging was really a problem because of water e.g. bad toilets
39	Beddings were full of dust need to wash before arrival date
40	The rooms are not very clean and water has been a problem to the extent of keeping toilets very dirt
41	Good
42	Change venue the place should be changed we have it in some places
43	Venue is good but sanitation should seriously improved, transportation fine, lodging fair
44	Ensure that the institute where workshop is to be conducted is adequately prepared ablution blocks congested
45	Water problem
46	Rooms have dirty need to clean, water a problem need to improve, transport used was comfortable
47	Though water was a problem
48	Good
49	It was okay but lodging should be improved (beddings and beds)
50	Hygiene poor, change pump to single phase
51	Up keep was not impressive in that, water for bathing was out of supply in the evenings
52	Should improve on sanitation there was no water
53	Change to where water can be readily available
54	Water was not flowing hence we were unable to bath at night
55	Fair
56	Venue should be changed in future to Mansa

3) Theory

No.	Theory
1	The training has met with my expectation at least about 80%.
2	Well arranged
3	I have understand clearly and helping very much in understanding
4	Presenters should keep it up.
5	More time should be given to practical work
6	Okay
7	Training has been fair. Information and content was too brief.
8	Theory was fantastic and educative
9	Well done
10	Allowance inadequate let the Govt give all project money easy things shall continue to be bad
11	Expectation was met
12	It was good
13	Good
14	Well explained
15	Good
16	All the expectation particularly sharing of experiences had been met
17	Visual aid has a lot in this training
18	Detail may be required on some topics but another workshop maybe required
19	Fully met my expectation
20	All my expectations have been met
21	More material to provided
22	Expectation fulfilled
23	Objectives of Cobsi has been met and sharing of experiences from other districts
24	Training program has been fairly
25	Need more time (days)
26	Should improve on practical party, theory were presented nicely

No.	Theory
27	Because the practical part involved in relation to theory the program has met my expectations
28	There was no problem, the speaker has a good and loud voice all were able to hear him
29	My objective and expectation met
30	Theory part of the program has been explained in relation to what is expected to be done in the field
31	Expectation fully met
32	Good
33	We need handouts at the end of the workshop
34	My expectations were met
35	It has met my expectations
36	It has fully satisfied my expectation
37	Was okay
38	One item was not presented (Permanent weirs per district)
39	Satisfied
40	Good
41	Well presented
42	Almost 100%
43	The training exceeded my expectation
44	It has met what I did not even expect to learn
45	It has been excellent
46	Good
47	It had been good
48	I was trained on the theory part by the T O Ts and I really wanted to see the practical I saw it at the camp and also during the follow up workshop during site visit so are related
49	Almost all expectations are fully met.
50	It should continue
51	Good
52	Quite apprehensive
53	Well done

4) Field Activities

No.	Comments on Field Activities
1	It has met with what I Expected almost 100% of my expectations covered.
2	It well done
3	Fully met
4	One field activity is enough than too many for a day
5	Good, we saw a great work in the field
6	Field Activities were interesting though tiresome.
7	The Practical was not fully reached; improve on duration of course not 2days but weeks.
8	Change as started with farmers in terms of adoption
9	Not well done
10	Room for improvement. Practices required to build confidence
11	The workshop was more consultative than training.
12	Satisfactory
13	Fantastic and satisfactory
14	very good
15	very good
16	More than expected
17	All was well but enough time should be given in town to buy essential items say 45 minutes
18	Excellent to see farmers who have benefited from Cobsi fairly
19	Saw what was going in the field. Activities need to be extended.
20	The training fully depicted what way on the ground and field
21	Vegetable beds at Chipompo should be lowered for flood irrigation like, that it is laborious
22	Expectation of learning and finding solution to construct fulfilled
23	Field exposure
24	Well understand and learnt
25	Field activities on the sites visited are well but only that we
26	with the field exposure the program has met expectations
27	The field activities were successfully visited and other learnt from the sites viewing
28	Expectation met that I was able to see what farmers are doing where weirs have been constructed
29	Practical part of the program was done by visiting 2 sites.
30	Expectation met in field activities though erosion has to be considered
31	Good,
32	We learn much more when we visit sites
33	it was interesting although the other site was not visited
34	Good but allowances should be budgeted for next time
35	Not fully satisfied because most of fields visited were not fully utilized
36	Work was encouraging especially on permanent weirs
37	There was not enough preparation on the part of farmers
38	We saw water that was just flowing without being utilized poor managed
39	Exactly what is discussed in class theoretically is what is practiced in the field

No.	Comments on Field Activities
40	More than expected
41	Satisfied
42	Most successful gardening sits would have exporting enough
43	Areas of weakness was identified and counter measures that will help promote irrigation schemes
44	I learnt a lot because I was able to see physically the permanent weir and other temporal types of weirs
45	It has been excellent but field officers should encourage farmers to be fully involved
46	It has touched all my areas
47	It has been excellent
48	The field activities has met with what was in the theory part so it was good
49	It was well presented I fell to see more on what others are doing on irrigation
50	Satisfactory
51	Didn't visit one site due to inadequate time
52	We should be visiting all the arranged fields
53	Excellent t

5) Participation

No.	Participation
1	Have participated fully
2	Fantastic arrangement.
3	Good
4	Deliberations must be participatory always
5	The days are short for the training, We need more days
6	Okay
7	Fair
8	Change of the venue to a well ventilated room
9	Well done
10	Good
11	The workshop was more consultative than training. As stated above
12	Good
13	Good and fully participation
14	very good
15	Good
16	More than expected
17	I attended all the group discussions and presentations
18	It is excellent to feel it practically
19	Participation was live and sometimes heated debate. Keep it up
20	I was given ample time to contribute
21	Very good since we have been breaking in to groups
22	Well participated
23	It has done me good
24	The program has been well from the beginning up to the end
25	Gender was considered during the training both make female were allowed to participate
26	All pilot districts should start at same time
27	It seems like all participants were interested in the review programs
28	Participated well in class as well as group work
29	Both theory and practical parts of the program has been implemented
30	participation I did as I made some contribution
31	Good
32	Participation was okay because most of participants contributed positively
33	Participation from participants was good all participants were participating
34	Good
35	Fully satisfied
36	Good participation was done
37	Venue should be changed after a few workshops at the same venue
38	Satisfied
39	My expectation has bee satisfied
40	More than expected
41	Satisfied
42	Gave me full participation
43	Training was done through group district and the finding were brought into plenary discussion hence 100% participated
44	Participation have helped officers from different districts to interact b so doing knowledge has been shared
45	Good
46	There been good participation
47	Well very interesting and educative at the same time because I got ideas from both C E Os and JICA team
48	The participation was good from all the participants because they contributed what they thought to be discussed
49	Different facilitators to be assisting
50	Satisfactory
51	The participation was high
52	Excellent
53	A chance was given to each participant to bring out his or her idea

6) Participation

No.	Future
1	Make a tour to some sites in Luapula and in the Western part to change the venue.
2	I see it to be already good what is needed is to maintain.
3	Arrange for insatiability
4	Increase training days and notes to be provided
5	To increase the days for training, more field visits, study tour to other places.
6	By taking into consideration of participating views suggestions on improvements
7	Duration of training be at least from 1 week to 2 weeks
8	To unveil what has to be discussed at the seminar before starting
9	Change of venue of meetings to a prestigious place
10	Incorporate exposure visits both for officers and farmers
11	There should be inclusion of farmer exchange visits to and from different areas
12	Invitation of farmers from different areas for exchange exchange skills with others
13	I think Cobsi should only improve in inputs provision to farmers
14	Just good
15	Extending more days of training as same issues are not tackled fully
16	There is need for the Government to currently get involved with JICA
17	This program should be encouraged with or without the support of JICA
18	Including technical training on irrigation practice various crops districts don't have staff handle
19	Before the workshop training the study team should go flat out in the field to do the assessments
20	Include other officers on facilitation in case one falls sick than other can take charge
21	By regularly interacting with all stake holders Cobsi and Maco staff
22	Training program to include practical revision and more time to be allocated on the results
23	Include more exposure visits and farmers testimony
24	Training program can be improved by full allowances for the participants
25	More days and if the program is April evaluation in same month November within first week
26	Transport has to provided, Money for fuel to be deposited in officers a/c allowance to paid
27	The program should involve all stake holder from the start to the evaluation time
28	The B E Os and C E Os and T S B staff should be involved in facilitating they know Cobsi program
29	Rehearsing, tabling issues of logistical support Implementers with partners, regular review, workshops monthly
30	When such a workshop is conducted let some handouts be prepared and give to every one
31	Written down notes, printed one to be referring to in the fields
32	By continuing with the same program
33	This program can be best in future if it continue but if it stops am afraid
34	By making sure that logistics and other materials needed are put in place
35	To share ideas and learn new ideas
36	By having planning meetings for example C E Os and T S B staff
37	The organizers should continue the good work especially with workshops a lot has been learnt
38	To my judgment and my under people, staff, involved in the preparation of the workshop are experienced expert you doing extremely very well keep it up
39	Better place where there is a well ventilated conference room for better concentration
40	Change of venue, There is water problem. More days for the trainings
41	It should intensify monitoring of progressive cases together with the government should improve on logistical support
42	Training should next year or at one point in time be held in Luapula province in order for get exposed to what MACO staff in Luapula are doing
43	By involving a lot of officers from MACO. By changing the training venue
44	By providing all the logistics needed
45	may be providing more time by starting earlier
46	Include written down notes, printed
47	More capacity building and exposure visits within, outside districts, outside province and out side country
48	Venues to be alternated in order to give a wide experience in terms of sites and structure unlike the same venue
49	Training program well planned but change venue and field visits and sites
50	Targets for field visits should be met
51	So far so good
52	Water system to be improved because water is cardinal in human life
53	Find a spacious room to hold meetings or workshops

ATTACHMENT 6 PHOTOS

Before starting, participants are asked to fill in the pre-workshop questionnaire.

Workshop starts with the opening remark by the acting PACO of Northern Province.

Overview presentation is made by the Senior Irrigation Engineer of Northern Province.

As a contribution from the JICA Study Team, the team leader makes a presentation on its findings in the study area.

Site visit is organized to see one of the biggest types of simple weirs constructed during the pilot project.

Participants also visit a site with permanent structure. Facilitator explains how it was constructed.

From the second day, workshop starts always with the recapitulation by a couple of two officers.

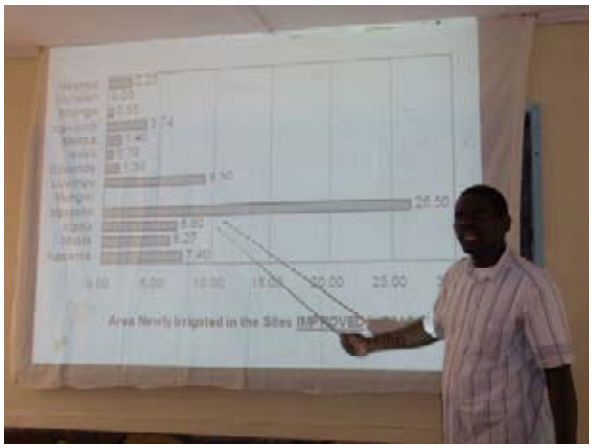
In the day-2, main work is a group discussion to compile how much has been done in each district.

A group compiles the achievement in temporary weir construction for new and improvement sites.

At the beginning of afternoon session, ice-breaking activity is organized; it is absolutely a line of extension officers.

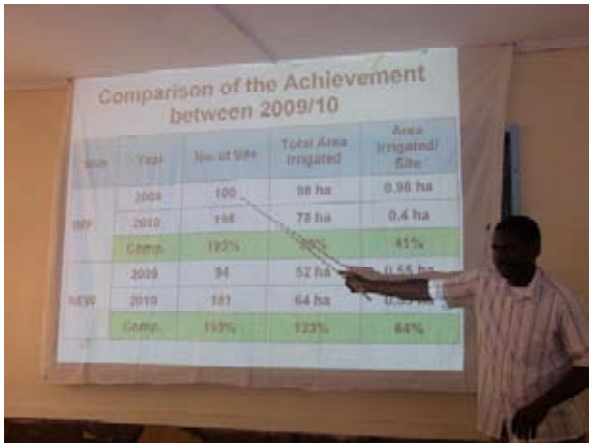
Each group present how many sites they have developed and explains what was the main contributors/ challenges.

To acknowledge the presenter as well as the achievement, audiences give her/him a big clap in each way.



Achievement of each district is compared to each other to see the comparative performance.

In-depth discussion is made. To a issue of inadequate allowance, Irrigation Engineer explains the reasons.



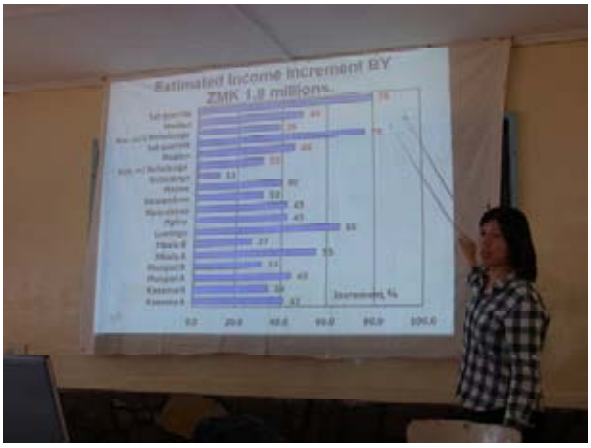
Facilitator show the achievement of this is as compared with the performance in last year.

Another set of group discussion is facilitated. Participants discuss problems and countermeasures they had.

Result of group discussion is presented by the representative of each group.

Workshop is organized with very active participation of the officers.

Study team also contributes to review the essence of COBSI technology.



A team member gives a presentation on impact of COBSI scheme derived from quantitative and qualitative surveys.

A provincial TSB officer of Northern province also contributes on on-farm irrigation method.

Overall evaluation of COBSI approach is made in accordance to impact to food security, income generation, etc.

The closing remark is made by principal of the Kasama Farm Institute.

Certificate of he evaluation workshop is conferred to all the participants. It can be a motivation for tomorrow.