



Horizontal learning package

Farmer to Farmer Exchange on Field Level Water Management

1. Introduction

In using the water diverted and controlled by Water Spreading Weirs and Dry Stone Measures the proper use of the water on the plots is important. It determines the yield from the plot and can also improve the quality of the land. This instruction note describes how to engage farmers in learning about better field level water management. It systematically uses farmer to farmer learning.

2. Organizing a farmer to farmer learning event

The use of field level water and soil management in many areas will be new. This is because there is no long experience with diverting flood with water spreading weirs and dry stone measures. Adequate field water management however makes the difference between low and high yield.

To introduce better field level water management, resource material is available: posters and videos. These should be used in organizing local farmer to farmer learning events. Annex 1 describes some proven good water management practices from different flood based areas around the world.

It is proposed that a group of key farmers is formed from each water spreading weir in a cascade. The group of each cascade select the field plot that they assess as being the best from their area in terms of production and in terms of best making use of the water.

The groups of farmers from each water spreading weir in the cascade then visit each other's areas, in particular inspecting the best plot from that area. This is best done two or three weeks before the harvest is starting.



Figure 1: Farmers' exchange meeting.

In inspecting the plot there are two sets of questions to discuss: performance and actual land and water management.

These are the questions on field performance:

Performance	What is the performance? Good or poor?
How is the yield of the standing crop? Is it more than earlier years? Better than neighbouring plots?	
How is the patchiness of the standing crop? Is there uniform good yield or are there important differences within the field? How would these be caused?	
What does the land preparation look like? Where special measures taken to make sure that water enters the soil and is stored properly in the soil? What were these	
What is the overall impression of the plot?	
Other	

These are the questions on water and land management:

Land and Water Management	Was it done? Is it a useful practice to consider?
<p>Making sure water stays in the field:</p> <ul style="list-style-type: none"> • What measures are taken to make sure that water stays in the field long enough to infiltrate? • Is there erosion in the field? • Is there protection against such erosion? • Is the field surrounded by elephant grass ridges? Do they help retain water in the field? • Have other bunds been made surrounding the fields? What do such bunds look like? • Did the community makes regulations on regulating the flow of water from one field to the other? 	
<p>Make sure water infiltrates in the soil adequately</p> <ul style="list-style-type: none"> • Were special measures taken to make sure water infiltrates in the soil adequately? • Was the land prepared before the flood was diverted? • Was the field level or uneven? • Were measures taken to guide the flood water over the field? 	

<p>Make sure water stays in the soil</p> <ul style="list-style-type: none"> • Were special measures taken to make sure that water stays in the soil for a long time and is available to the crop for a long time? • Was special ploughing practiced after the floods to store moisture deeper in the soil? • Has planking been done? 	
<p>Building up fertile soils?</p> <ul style="list-style-type: none"> • Is the sediment that is carried with the water used to improve the soil in the field plots? • Are there signs of too much soil being deposited and lands getting too high? 	
<p>Other points</p>	

It is useful that in the inspection of the field enough time is taken to discuss the performance of the selected plot in each area. It is important that each visiting group can express their points and that the host group can explain.



Figure 2: Farmers' discussion.

If all plots are visited the best plot may be selected collectively and a special sign maybe put up there for recognition.

The groups that were part of the farmer to farmer learning should also be encouraged to discuss what they saw and learned with other farmers in their area.

Annex 1: Good water management at field level: overview of good practices in flood based systems

There are four important main practices to properly manage water at field level

1. Make sure water stays in the field long enough to infiltrate in the soil
2. Make sure water infiltrates in the soil adequately
3. Make sure water remains in the soil
4. Use the sediment in the water to improve the quality of the soil

1. **Make sure water stays in the field long enough to infiltrate in the soil**

It is important for water to stay in the field long enough to wet the soil. If the flood water enters the field it should not immediately rush out, because in that case the water can not properly wet the soil.

Special measures may be taken to make sure water stays in the field long enough, especially when the land is a slopy. These should be discussed.

One is to avoid erosion and gully in the plot. If this happens it may take water out and also prevent that water spreads uniformly over the field.

Another possible is to take some measures that keep water in the field, like having bunds with elephant grass. These are particularly useful at the lower part of the fields.

In some areas that use flood water a low soil bund is prepared around the field so to retain the flood water. This is not common in the Ethiopian lowlands yet, but has brought benefit in other flood based lowland areas. The bunds can be made of the local soil. Their minimum height should be 30 centimetre. It can be made higher if the land is on a slope. The field bund may be broken once enough water has infiltrated. By breaking the bund water is releases to adjacent fields. Breaking of the bund may cause erosion as the water gushes out. To prevent this stones may be placed where the water gushes out. In addition a stone overflow structure may be considered.

Within the community one may make rules on the distribution of water between adjacent fields. If water moves from one field to the other, agreements should come in place how that is done, so that water is not retained too long in one field, or erosion is caused because water gushes out from one field to the others.

2. **Make sure water infiltrates in the soil adequately**

There are a number of good practices that help to ensure that water enters the soil properly. If the soil is hard and closed the water may not much enter into the land. Where soils are soft, the land may be ploughed before the flood season. This may break the soil layers and will make it possible for water to enter the land.

It is also important that the land is not very uneven. If the land is uneven and not levelled, many parts of the land will not be served with water.

To guide the water over the land small bunds may be made inside the plots to guide the water all over the field.



Figure 3: Ploughing to break the soil layers and allow infiltration.

3. Make sure water stays in the soil

It is important that after the field is wetted that the moisture remains in the soil. The weather will be hot and one wants to avoid that the soil dries out quickly. The temperature maybe too high directly after the flooding season to grow a crop. Therefore it is important to store the moisture inside the soil.

To store the water in the soil in some areas farmers do some ploughing after the wetting of the land. In this way the moist soil is moved down deeper where it is less exposed to the heat.

The second method to preserve moisture in the soil is to 'plank' the soil. A flat board with persons standing on it to add weight is pulled across the field by oxen or a tractor to seal the soil. By sealing the soil moisture cannot escape from it and is preserved. This is particularly effective in sandy-loam soils.



Figure 4: Planking to conserve the moisture in the soil until the planting time.

By storing moisture in the soil it is possible to start cultivation one or two months later when temperatures are more favourable.

4. Building up of fertile soils

The floodwater that is diverted by the water spreading weirs and the dry stone measures carries sediment. This sediment is often very fertile and can also be used to build up high quality soil.

To make sure that the sediment stays on the land it is important that bunds are built around the fields. This was explained earlier. The soil will settle down when the water is standing still in the field.

Water can be diverted to areas where the land is still barren and over time new fertile land can develop.

One also needs to take care that the land does not rise too high and that the water diverted with the water spreading weirs and the dry stone measures no longer reaches it. To prevent that land levels become too high, one can push up bunds around the fields with the soil that is deposited.



Figure 5: Creating soil bunds to allow storage of more water.

