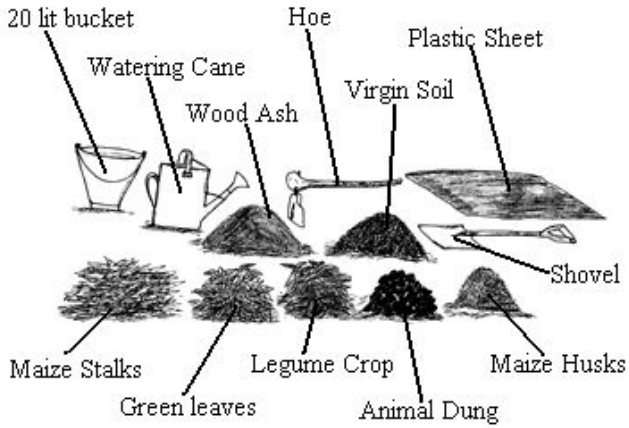
3 Farm Management and Agricultural Extension

3-1 Windrow Compost

Step	Process	Description	Remark
1		*1. Assemble the following equipment and materials for Windrow Compost.* *2. Normal heap size is 1m wide, 5m long and 1m high but it is not limited. Rather it depends on the materials available.* ***Equipments*** ▪ *20 lit bucket and watering can* ▪ *Shovels and hoes* ▪ *Black plastic sheets (polyethylene)* ***Materials*** o *Maize stover / rice straw both; chopped (at 10-15cm) & un-chopped* o *Green leaves and Maize husks* o *Animal dung* o *Ashes(fire wood ashes preferably)* o *Legume crop residues* o *Virgin soils and anthill soils*	***Required Quantities for heap size of 1m wide x 5m long x 1m high*** *- 1 oxcart of maize stover (un-chopped)* *- 1 oxcart of maize stover (chopped)* *- 1-2 oxcart of green leaves* *- 2 bags of 50 kg's maize husks* *- 1 oxcart of animal dung* *- 4 buckets of ashes* *- 1-2 oxcarts of legume crop residues* *- 1-2 oxcarts of virgin soils* *- 1 oxcart of ant hill soils* ***Note:*** *An oxcart size is 2m long, 1.5m wide. 0.5m high.*
2		*1. Flatten the soil surface (Working Area) not less than 8m in length and 3m width.* *2. Pour 4 cans/m² of water on the surface (20 cans of water per 1m x 5m area).* *3. Lay the maize stover for a height of about 30 to 40cm on 1m x 5m watered place (Rice straws can also be used).* *4. The thickness of maize stover will be reduced to about 15 to 20cm after compression.*	- *Application of water seals all the pore spaces and unveils all areas which might need soil filling before starting making the heap.* - *The amount of water might be reduced in wet season because of more wetness of soils.* - *Un- chopped maize stover is used to secure drainage for the heap in wet season while chopped one is laid to ensure faster decomposition in dry season.*

Step	***Process***	***Description***	***Remark***
3		*1. The step demonstrates how water should be added to most of the layers in the steps below.* *2. Pour about four cans of water each layer for one sq. meter following layers.*	- *Sufficient water application provides a conducive environment for microbial activities for the decomposition of materials.* - *Water content of 50% to 60% generally which may differ according to porous ness of the material (firmly grasped compost does not drip, remaining the shape of the compost block).* - *The amount of water could be reduced in wet season because of more wetness of materials and less evaporation.*
4		*1. Spread green leaves on top of maize stover up to a 30 to 40 cm green leaves-thickness. When long leaves like that of grass are used, they should be chopped into10 cm lengths.* *2. Pour water on top at the rate of 4 canes per square meter.* *3. Compress the layer by tramping on it. (The thickness should be reduced by half.)*	***<u>To exclude Following Tree Leaves</u>*** ▪ *Bamboo* ▪ *Mangoes* ▪ *Gmelina Arborea Roxb* ▪ *Hedge* ▪ *Ucaliptus* ▪ *Creaping grass* - *Most of the listed items contain fibres which can be hardly digested by microbes.*

Step	***Process***	***Description***	***Remark***
5		*1. Place 10cm chopped maize stover pieces on top of the green leaves up to 30 to 40cm thickness.* *2. Pour water on top at the rate of 4 canes per square meter.* *3. Compress the layer by tramping on it. (The thickness should be reduced by half.)*	- *Chopping of the materials insures faster decomposition of the heap because of the larger surface areas.*
6		*1. Thoroughly moisten all the 2 bags of maize husks in a bucket* *2. Spread them on top of the heap in step 5.*	- *To ensure that all the husks are moistened, make sure that this is done in a bucket or watering can.*

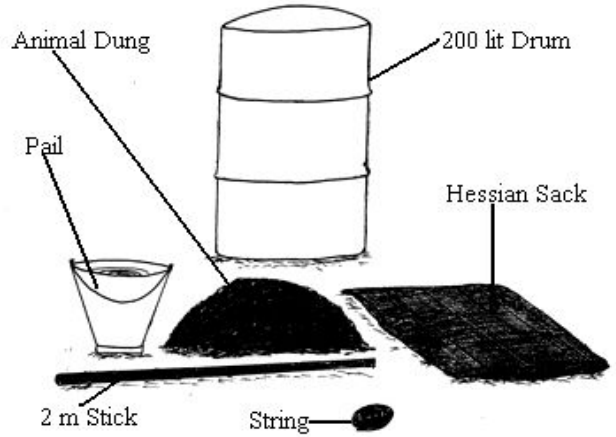
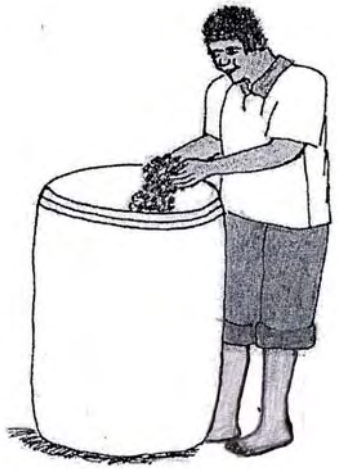
Step	***Process***	***Description***	***Remark***
7		*1. Apply one oxcart of either fresh or old animal dung (cattle, goat, or sheep, etc.) on top of the maize husks.* *2. Using the standard dimension of 1m x 5 m heap, approx 15cm thickness of animal dung is required.* *3. Pour water on top at the rate of 4 canes per square meter.*	- *The animal dung contains nitrogen for the development and multiplication of the microbes in the heap.* - *Fresh animal dungs are prefarable because they content much nitrogen and microbes.*
8		*1. Apply green legume crop residues up to 30 to 40cm heap thickness.* *2. Pour water on top at the rate of 4 canes per square meter.* *3. Compress the layer by tramping on it. The layer should shrink by 50% or less.*	- *Legume crop residues as well as green leaves of leguminous plants / trees will be used.* - *Leguminous residues contain a higher percentage of nitrogen.*

Step	***Process***	***Description***	***Remark***
9		*1. Thoroughly moisten four buckets of wooden ash in a bucket.* *2. Smear the ash paste on top of the heap in step 8.*	- *Ashes facilitate decomposition. The ingredient contains a lot of Potassium and other kinds of minerals, which are required by crops.*
10		*1. Spread virgin soils on top of the heap in step 9. Virgin soil should be more than 20 cm in thickness.* *2. Pour water on top till the soil is saturated.* *3. Compress the layer by tramping on it. The layer should shrink by 50% or less.*	- *Virgin soils have a lot of useful domestic microbes (living microorganisms) important for decomposition.*

Step	***Process***	***Description***	***Remark***
11		*1. Cover the heap with anthill soils and make a sinking basin on top of virgin soils and apply water.* *2. Make a hole in the centre of the heap to make regular temperature checks.* *3. Cover the heap with a polyethylene plastic paper. Where the plastic bag is not available, thatched grass can be used.*	- *The anthill soils retain the moisture content as well as ensure that the microbes build up the internal temperature.* - *If the temperature does not rise after 2 days, restart the compost making process.* - *The height of the heap should not be more than one meter.*
12		*1. Maintain for further 30 days.* *2. Check during the further 30 days. Particularly about moisture content.*	- *During wet season cover the heap with thatched grass, this can be used as a substitute to a plastic sheet.*

<table>
<tr><th>Step</th><th>Process</th><th>Description</th><th>Remark</th></tr>
<tr><td>13</td><td>  </td><td>1. Mix the heap of the windrow compost manure after 30 days.
2. Check it by removing the plastic sheet and mix the ingredients thoroughly with pouring of water.
3. Appropriate water content of about 50 to 60 % generally.
4. Cover the heap with a plastic sheet again.
5. Maintain the heap for further 30 days to decompose the heap materials further.
6. If the heap materials do not decompose fully, maintain it for further 15 to 30 days.</td><td>- Mixing of the ingredients (including the partially decomposed ones) at this stage ensures that all the outer materials and those that did not decompose to do so in the next phase of decomposition.
- Over watering leaves the heap with less aeration, which suppresses the work of micro organism for maturing of the compost.
- The fully decomposed compost has a fine tilth appearance with smaller particles and looks like soil.</td></tr>
<tr><td>14</td><td>  </td><td><u>Compost Application</u>
1. Apply two hands full per planting station in case of maize and such vegetables of tomato.
2. The compost can be kept in bags and kept under a shade without to minimize losses (mineralization). Duration should not be more than 6 months.</td><td><table><tr><th>Number of pails</th><th>Application Area (hectares)</th></tr><tr><td>266+</td><td>0.1</td></tr><tr><td>532+</td><td>0.2</td></tr><tr><td>1,064+</td><td>0.4</td></tr></table><u>Note:</u>
1. 1 pail approx equals to 20kg.
2. Assumed application is 2 handfuls per planting station, based on maize production planted at 25 cm apart, 90cm between ridges)</td></tr>
</table>

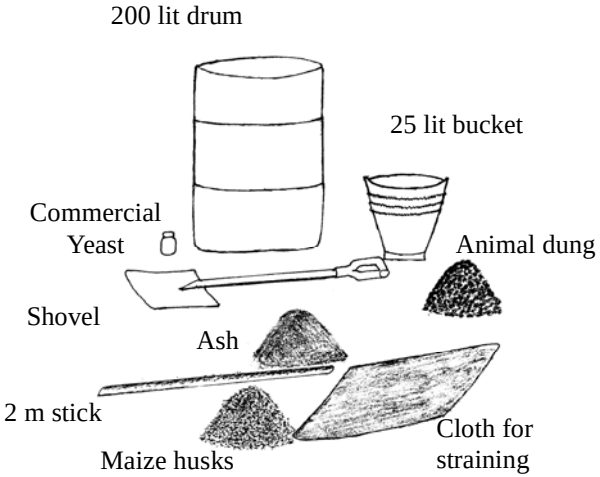
3-2 Liquid Manure

Step	***Process***	***Description***	***Remark***
1		***<u>Assemble the Following Equipment and Materials</u>*** <u>*Equipment required*</u> ▪ *200 lit drum* ▪ *2 m stick* ▪ *Hessian sack* <u>*Materials required*</u> ▪ *Animal dung (cow dung and chicken droppings are preferred)* ▪ *Water*	
2		*1. Fill the drum to a half full mark with animal dung.*	

Step	*Process*	***Description***	***Remark***
3		*1. Top the drum to the level mark 200 lit with water and thoroughly stir for 10 minutes.*	
4		*1. After 2 days stir once a day, early in the morning for 19 days.*	

Step	***Process***	***Description***	***Remark***
5		*1. Cover the drum for stocking.*	- *The drum can be stocked for 6 months.*
6		*1. Apply the diluted liquid manure.* *2. Dilution Ratio of the manure to water is 1:1 for cow dung and 1:3 for chicken dung liquid manures.* *3. Use a small tea cup (100ml) to apply the manure per station as a top dressing.* *4. Dig 10cm by stick and pour the liquid manure (wait for 10 to 15 min to allow the liquid to infiltrate and cover the hole with soil).*	***Situation for Maize;*** - *In an irrigation scheme. Make sure that you apply the top dress just after irrigation.* - *The diluted fertilizers can be applied 21 days after germination and every two weeks there after for three times at least.* ***Situation for Tomato;*** - *The top dressing can be done at an interval of 30 days and every two weeks there after.*

3-3 Liquid Bocashi

Step	***Process***	***Description***	***Remark***
1		***Assemble the Following Equipments and Materials for 3-3-1 to 3-3-3*** *Equipments Required* ▪ *200 liter plastic or steel drum* ▪ *Shovel* ▪ *25 litr bucket* ▪ *A piece of cotton cloth to be used as strainer* *Materials Required* ▪ *Maize husk one bucket* ▪ *Commercial yeast 80 g* ▪ *Firewood ashes one bucket* ▪ *Animal droppings one bucket*	- *Alternatives to Tephrosia Vogelli are; Mpungabwi (Mtsunyani), Neem tree leaves etc.*
2		*1. Top the drum with 170 liter of water.*	*- Straining is needed in case Liquid Bocashi is applied as Liquid Bocashi Pesticide*

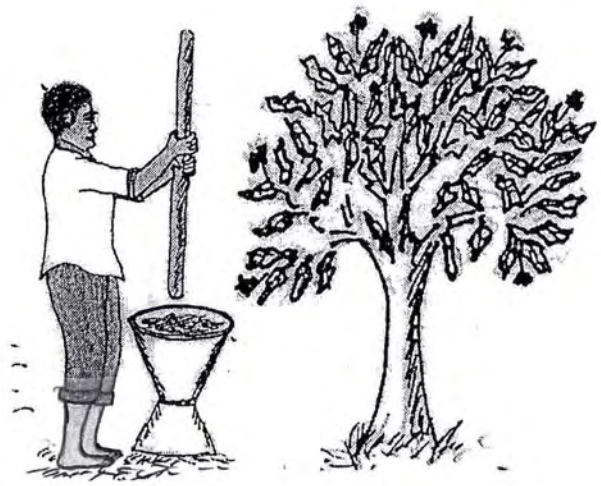
Step	***Process***	***Description***	***Remark***
3		*1. Mix 1 bucket of maize husks with 80 g commercial yeast in a 20 lit bucket.* *2. Moisten the mixture.*	- *Yeast helps and facilitates the process of fermentation.*
4		*1. Pour the mixture in step 3 into the drum of water and stir thoroughly.*	

Step	***Process***	***Description***	***Remark***
5		*1. Add 1 bucket of wood ashes.*	
6		*1. Add 1 bucket of chicken dung or 2 buckets of other animal dung (chicken or cow droppings are preferred).* *2. Stir the solution for 2-5 minutes.*	

Step	***Process***	***Description***	***Remark***
7		*1. Cover the drum with a Hessian sack and stir twice a day for ten days until they ferment.*	
8		*1. The Liquid Bocashi can be applied singly as nutrient supplier with rate of 100 ml per station once every two weeks for maize and fruit vegetables and once ten days for leaf vegetables as a general during crop growth period.* *2. The Liquid Bocashi made from chicken dung should be diluted in the ratio of 1:3 with water. The Liquid Bocashi made from other kind of animal dung may be diluted in the ratio of 1:1.* *3. The Liquid Bocashi is applied through making a hole (about 10cm depth) between planting stations with covering soils of about 3cm (10 to 15 minutes after application).*	

3-4 Liquid Bocashi Pesticide

3-4-1 Formation of Herbal Pesticide Extract

Step	Process	Description	Remark
1		1. Pound 1 pail of Tephrosia Vogelli or Mpungabwi (Mtsunyani) leaves in a mortar using a pestle. Blue gum leaves can be used sometimes. 2. Pounded 1 pail of leaves would give us about 5litres of solution, which in turn can cover about 100 planting stations.	- Instead of Tephrosia Vogelli, if it is scarce, a farmer can use Mpungabwi (Mtsunyani) even blue gum tree leaves. - Half-life of the solution in 20 degree cent water is less than one day and decomposable under sunshine. Therefore prepare this liquid just one day before application.
2		1. Sieve the solution using the cotton cloth.	

3-4-2 Application of Liquid Bocashi Pesticide

Step	***Process***	*Description*	***Remark***
1		*1. Strain the fermented Liquid Bocashi solution (refer to Step 7 in 3-3 Liquid Bocashi) and solution of Tephrosia vogelii extract are mixed before application.* *2. Dilution Ratio of Herbal Pesticide Extract to Liquid Bocashi Solution is 1:4.*	- *Solution of Mpungabwi (mtsunyani) or Tephorosia vogelii and others in 20 degree cent is decomposed to a half-life of elements within one day.* ***Note:*** *Dilute the Liquid Bocashi before being mixed with Tephrosia Vogelii and other Herbal Pesticide Extract (the raition of Bocashi Liquid to water is 1:3 for the Liquid Bocashi, which is made from chicken dunn and 1:1 for the Liquid Bpcashi, which is made from other animal dungs).* - *The Liquid Bocashi Pesticide should be applied throughout growth from nursery to maturity stage in main field before harvesting.* - *General frequency is once a week.* - *The Pesticide is a repellant to mostly worms and Aphids.*

3-5 Nursery (Vegetables)

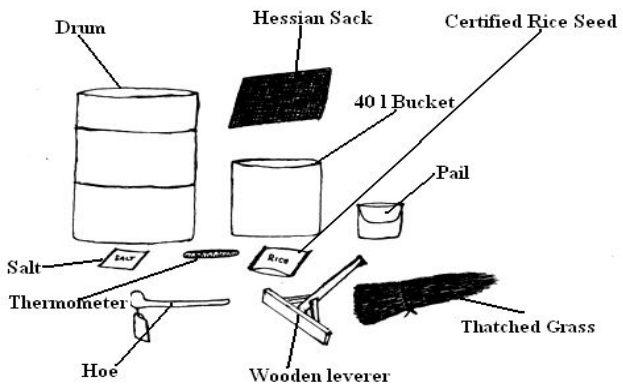
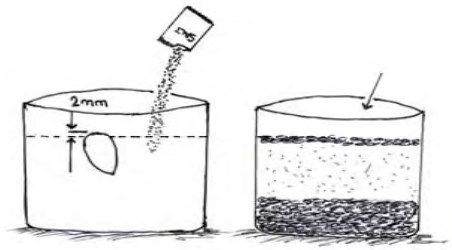
Step	***Process***	***Description***	***Remark***
1a		*1. To reduce harmful fungi, sterilize the soils to be used for seedbed by burning a pile of grass and others.*	- *Other way of the sterilization of the soils is shown in step 1b.*
1b		*1. Prepare soils which need to be treated and put them in transparent plastic sacks.* *2. Sterilize the seed bed soils by exposing the soils in the plastic sacks to sunshine. Before exposing, put water in the plastic sacks to saturate the soils with water.*	*-Expose the plastic sacks for about 20 days in sunny season.*

Step	***Process***	***Description***	***Remark***
2		*1. Till the nursery soils and prepare seedbed to a 20 cm height and one meter width.*	- *Size of nursery bed depends on the field area and spacing of the crops. This is determined by the number of seedlings that need to be raised. For instance 10 basins of drumhead cabbage requires 1.2 sq. meter of nursery bed.*
3		*1. Drill 0.5cm deep rows, 20cm apart.* *2. Place sand in the drills.* *3. Cover the sand with soils.* *4. Sow seeds along the rows.*	- *Sand is used to make sure that there is good drainage to enhance good germination.* - *Sandy clay can be used as an alternative.*

Step	***Process***	***Description***	***Remark***
4		*1. Place clean mulching materials (grass) during germination period from just covering the soils on the drills. The materials (grass) must be removed gently so as not to get the seedlings injury.* *2. Remove the mulching materials as soon as the seedlings are emerging so as not to disturb the seedlings.*	- *Germination time varies by crop but it is generally 3-5 days after sowing.* - *This protects the seedlings from being scorched by sunlight.*
5		*1. Provide a shade immediately after establishment of seedlings (Step 4). The shade height should be about 30 cm.* *2. Remove the shade roof one week after establishment.* *3. This is done 1 week after Step 4.*	- *This protects the seedlings from being scorched by sunlight at the same time giving in more room for aeration.*

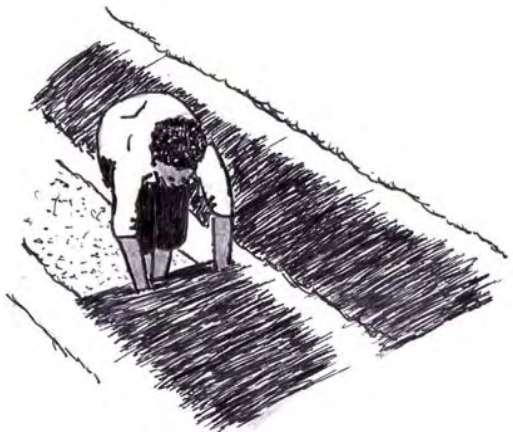
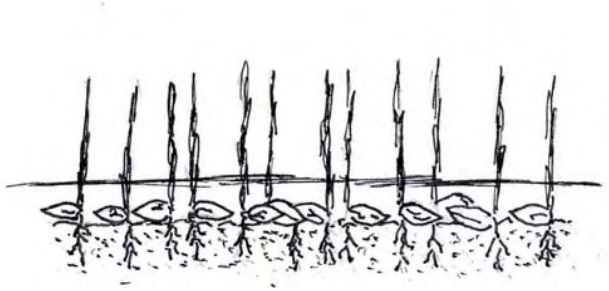
Step	***Process***	***Description***	***Remark***
6		*1. Remove the shading 1 week after shading and thin the seedlings.*	- *Thinning gives more room for root establishment.*

3-6 Nursery (RICE)

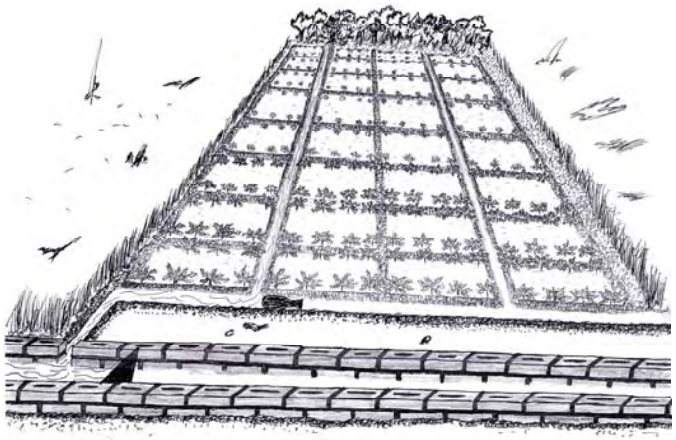
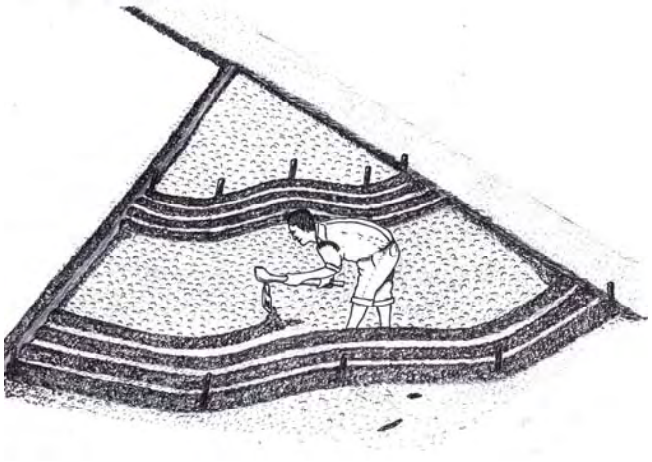
Step	Process	Description	Remark
1		***Assemble the Following Materials*** *Equipment and Materials* *1 Bucket (20 lit), 1 wooden leveler (rake), 8kg certified rice seeds, 2 buckets (40 lit), 2.4kg of salt, 50 lit of container, 5 piles of Elephant grass, 1 hoe, 1 polyethylene sack, vinegar and water*	- *Quantities listed in the description are based on a nursery bed of 50sq.m (1000sq.m of transplanting area). 5 piles of sun dried elephant grass should be free from diseases.*
2		*1. Soak seeds in salt (sodium nitrate solution) to eliminate empty seeds and seeds which are infested by pests.* *2. The solution should have a specific gravity of 1.10 and this can be achieved by mixing 2.4 kg of salt with 18 lit of water.*	- *Egg floats by 2mm above water surface. Wash the selected seeds with diseases free water (well water) after the seed selection.*
3		*1. Soak seeds in vinegar solution (0. 2%of actic acid) for 12hrs to disinfect the seeds from seed-born diseases.*	- *0. 2% of acetic acid is made with 600ml of vinegar in 18 lit of water in case of 4.2% of acetic acid in vinegar.*

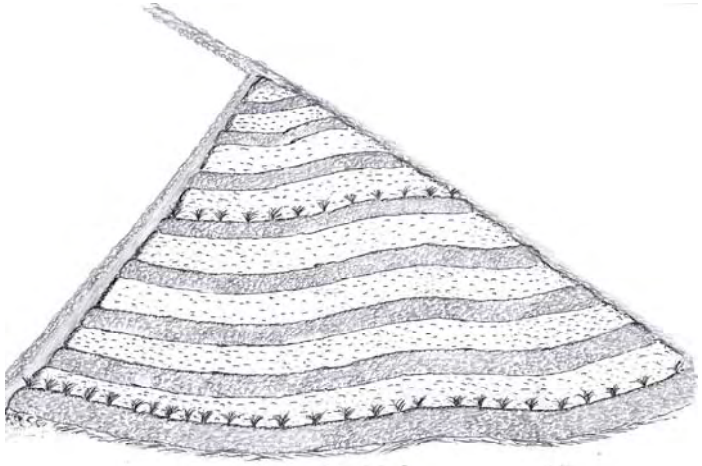
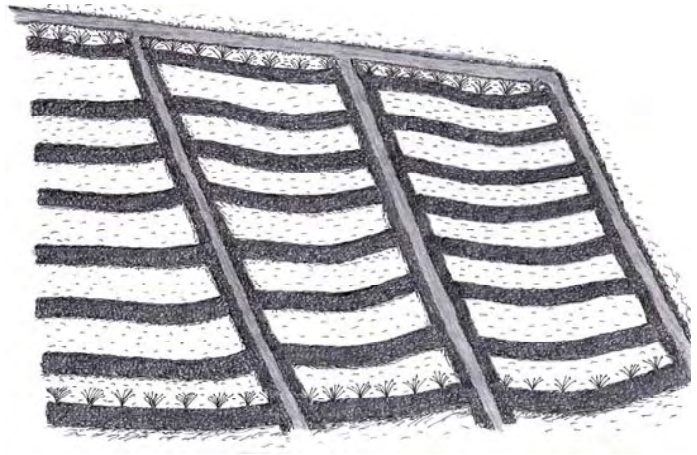
Step	***Process***	***Description***	***Remark***
		*1.Drain water.*	
5		*1. Soak the seeds for about 24 to 36 hours in well water, according to water temperature.*	- *The well water should be preferably used to avoid seed born disease contamination.*

Step	***Process***	***Description***	***Remark***
6		*1. Incubate the seeds in polyethylene bags for about 24 hours in case of air temperature at 30 to 32 degree cent for the seeds to germinate slightly.*	- *The sprout length should be just about 1 mm.*
7		*1. Level the seedbeds as much as possible by using wooden leveler and sow the germinated seeds(1mm of sprout).* *2. 50 sq.m of seedbed (70sq.m of gross area) is required to transplant 1,000 sq.m (selected seed requirement is 5kg of dry seed(8kg of row dry seeds) to transplant 1,000 sq.m).*	- *The seeds rate should not be more than 100 g per square meter of seedbed.* - *One meter width and 50 meter length of seedbed is required to transplant 1000sq.m. The width between seed bed is 30cm (field drainage).*

Step	***Process***	***Description***	***Remark***
8		*1. Mulch the beds for 2 to three days with diseases free Dambo straws.*	- *A thin layer of the mulch should be used i.e. the grass should be sparingly spread.*
9		*1. Apply water throughout for 12-18 days (14 to 20 days after sowing). After sprouting maintain water with depth of 2-3cm during nursery period.*	- *The 14days nursery period is preferably applicable to increase the number of effective tillers after transplanting. However, 20 days nursery period is applicable in case that land is undulating or subject to flooding damage.*

3-7 Farmland Conservation

Step	***Process***	***Description***	***Remark***
1		*1. To irrigate the gently undulating land (slope at less than four percent) during dry season, basin irrigation is applied for efficient and uniform water distribution. The irrigation ditches and step ditches are laid out alternatively.*	- *Size of basin is 3 m by 1.2m in undulated area and 5m by 1.2m in the sloping area without undulation.*
2		*1. To irrigate sloping land, the ridge alignment should be applied with preparation of marker ridges, using line level. The ridge alignment is made by using marker ridges to grow crop during wet season.*	

Step	***Process***	***Description***	***Remark***
3		*1. Plant Vetiver on marker ridges to maintain marker ridges and conserve the land from erosion.*	
4		*1. To irrigate sloping land, irrigate by using furrow irrigation system, where ridges are aligned.*	- *The length of furrow should not more than 10 meters. The feeder ditches are prepared for the water delivery. For the rain-fed cultivation, ridges are remade without limitation of the length of ridges.*

4 Management of Farmers Group

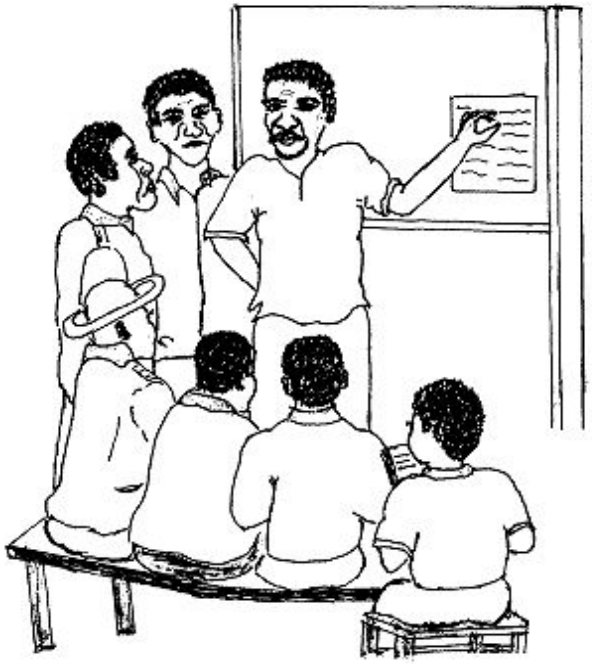
4-1 Process for Establishment of Farmer Organizations - Group Formation

Steps	Process	Description	Remarks
1	***Farmer Sensitization;*** *The process of creating awareness among the farmers for the agricultural development activities including irrigated agriculture.* 	***Procedure*** Contact the VH for permission of having meetings in the village ↓ Invitation of prospective farmers for meeting ↓ Farmers informed by AEDO / AEDC on various organizations necessary to run an irrigation scheme - advantages and disadvantages of forming a club, WUA or cooperative - how to form, etc. ↓ Choice of appropriate organization by farmers	***Expected participants*** -*Community leaders* -*Any farmer can attend the meeting* -*AEDO / AEDC* -*Other relevant stakeholders*

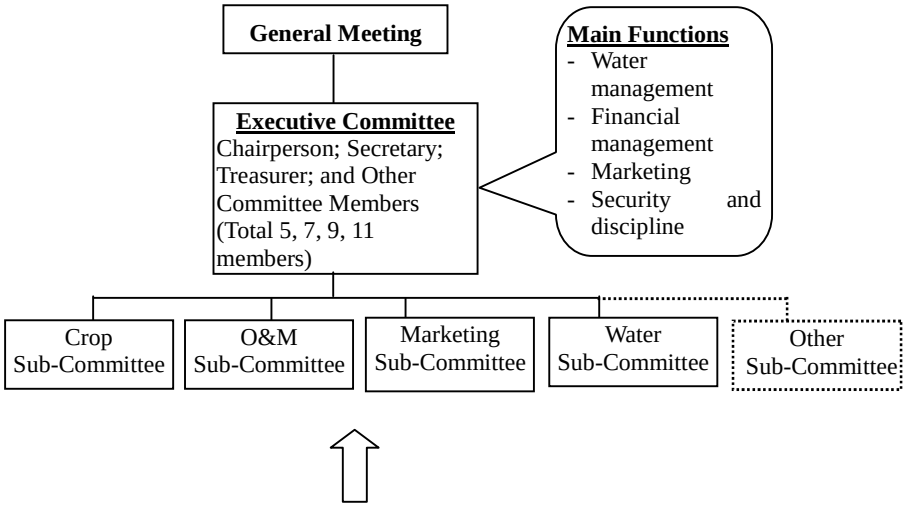
Steps	***Process***	***Description***	***Remarks***
2	***Farmer Mobilization*** *A process of activating interested farmers to meet, discuss and make positive decisions on the development idea.* 	Group discussions ↓ Presentation by each group ↓ Summarized by farmers under AEDO facilitation. - Number of interested farmers - Kind of organization - Objective of forming the organization - Area for potential crops ↓ Listing-up of group members	***Expected participants*** -*Community leaders* -*Interested Farmers.* -*AEDO / AEDC* *-Other relevant stakeholders* *The process strengthens the participants thinking to adopt the ideas raised in the sensitization*

Step	***Process***	***Description***	***Remarks***
3	***Committee Formation*** *The formation of a committee and the selection of the committee members will be made.* 	***Procedure*** Explanation by AEDO on the need for establishment of the management committee ⇩ Explanation on the roles and responsibilities of the committee members ⇩ Selection of the committee members	***Expected participants*** -*Community leaders* -*AEDO / AEDC* -*Interested farmers* -*Other relevant stakeholders* -

Step	***Process***	***Description***	***Remarks***
4	***<u>Training for the Committee Members (Initial training);</u>*** *Group dynamics and leadership training for the committee members* 	***<u>Training Items</u>*** <u>Group dynamics</u> □ Definition of a club, association or cooperative □ Reasons for formation of a club, association or cooperative □ Roles and responsibilities of group members □ Roles and responsibilities of the committee members <u>Leadership</u> □ Qualities of good leaders □ Leadership roles in groups <u>Group conflict management</u> □ Types of group conflict □ Causes of conflicts in groups □ Consequences of conflicts □ Ways of managing a conflict	***<u>Expected participants</u>*** -*Committee members* -*Candidate farmers for sub-committee members* -*AEDO / AEDC* -*Extension officers (DAO)* -*Other relevant stakeholders*

Step	***Process***	***Description***	***Remarks***
5	***Development of a Constitution/ Bye-Law for the Club / Association/ Cooperative;*** *Development of a constitution will be conducted through farmers' meetings under support from the relevant AEDO / DAO officers.* 	***Contents of the Constitution / By-law*** - *Name of Group* - *Postal address* - *Purpose of the club / association* - *Method of selection of leaders* - *Responsibilities of the leaders and members* - *The term of service of leaders* - *Etc*	***Expected participants*** - *Community leaders* - *AEDO / AEDC* - *Committee members* - *Scheme members*

4-2 Process for Strengthening of Farmer Organizations

Step	Process	Description	Remarks
1	***Capacity Development of the Committee Members (for existing committee);*** *The training on organization management will be conducted by relevant AEDO for the existing committee members under support of extension officers of DAO office.*		***Expected participants*** - *Committee members (executive committee, sub-committee and group committee)* - *AEDO / AEDC* - *Extension officers (DAO)* - *Other relevant stakeholders*
1.1	***Review of Group Structure***  *Sub-committees will be established according to the needs of the organization after review of the existing organizational structure.*	***Review of Group Structure*** □ Roles and responsibilities of the committee members □ Review of the existing group structure **Executive Committee** For overall management of the scheme activities **Sub-Committees** For supporting the Executive Committee	

Step	***Process***	***Description***	***Remarks***
1.2	***<u>Discussion on the Improvement of Organizational Structure</u>*** *Discussions among the participants on the setting up of the proper committee structure, i.e. appropriate number of committee members, appropriate number of sub-committees, etc.* 	***<u>Procedure</u>*** – Whether the number of existing executive committee members is appropriate? – Whether the existing sub-committees are suited for the purpose of the organization? – Whether the number of the existing sub-committee members is appropriate? ⇩ Establishment/ Dissolution of a new sub-committee and selection of new members, where necessary	***<u>Expected participants</u>*** - *Committee members* - *AEDO / AEDC* - *Extension officers (DAO)* - *Other relevant stakeholders*

Step	Process	Description	Remarks
1.3	***Review of the Constitution / By-laws*** *The existing Constitution / By-laws will be reviewed, and revised after discussions.* **KACHERE IRRIGATION SCHEME** **RULES AND REGULATIONS FOR THE CLUB** 1. Membership fee is MK500.00 2. Meetings to be conducted twice a month, on the 15th and on the 30th. 3. A fine of MK20.00 will be payable for members who are absent at meetings without giving a proper reason for their absenteeism. 4. A fine of MK10.00 will be payable for late comers at meetings. 5. Meetings are to commence at 10.00hours in the morning. 6. Members who wish to terminate their membership from their clubs will not be refunded their membership fee. 7. For members with offences like that of selling farming equipment, the equipment will be taken away from them and also being removed from their clubs. 8. For members who are ill, they should be assisted in their work. 9. If a member is found steeling from another member's land, he or she should be acquitted or being removed from the club. 10. If a member is being absent to work and is showing signs of laziness, he or she should be removed and replaced by another person who wishes to join the club. 11. Members are to contribute MK30.00 every month for paying a security guard who is looking after the engine.	**Review of the Constitution** - Purpose - Basic functions - Obligations of members - Method of amending the constitution **Review of the By-Law** - Rules for receiving new members - Number of committee members, periods of tenure in office - Rules for selection and removal of committee members - Rules and sanctions related to the water service - Procedure for conflict resolution - Duties of the executive committee members - Procedure for amending the by-law	*The Constitution or a Bye-Law should also focus on the positive basic services that a member can obtain from joining it. It should not only emphasize on the penalties* ***Expected participants*** - *Committee members* - *AEDO / AEDC* - *Extension officers (DAO)* - *Other relevant stakeholders*

Step	Process	Description	Remarks
1.4	***<u>Group Dynamics and Leadership Training for the Committee Members</u>*** *Group dynamics and leadership training will be conducted for the newly elected committee members.* ***Module 1: Group Dynamics*** ***Module 2: Leadership*** ***Module 3: Group Structure*** ***Module 4. Group Conflict Management*** 	<u>Module 1: Group Dynamics</u> 1) Importance of group dynamics 2) Indicators of group dynamics 3) Definition of a farmer club, association and cooperative 4) Reasons for formation of farmer organization <u>Module 2: Leadership</u> 1) Qualities of good leaders 2) Leadership roles in groups <u>Module 3: Group Structure</u> 1) Functions of committees 2) Roles and responsibilities of committee members 3) Roles and responsibilities of group members <u>Module 4: Group Conflict Management</u> 1) Types of group conflict 2) Causes of conflicts in groups 3) Consequences of conflicts 4) Ways of managing a conflict	***<u>Expected participants</u>*** - *Committee members* - *AEDO / AEDC* - *Extension officers (DAO)* - *Other relevant stakeholders*

Step	Process	Description	Remarks
1.5	***Farm Business Training for the Committee Members*** *Farm Business Training will be conducted for the Committee Members.* ***Module 1: Farm Business Planning*** ***Module 2: Marketing Planning*** ***Module 3: Financial Record Keeping*** 	Module 1: Farm Business Planning 1) Definition 2) Objectives of a Business Plan 3) Components of a Business Plan Module 2: Marketing Planning 1) Market Search 2) Channels for Marketing 3) Fixing Selling Price Module 3: Financial Record Keeping 1) Physical Record 2) Financial Records	***Expected participants*** - *Committee members* - *AEDO / AEDC* - *Extension officers (DAO)* - *Other relevant stakeholders*

Step	***Process***	***Description***	***Remarks***
2	***<u>Capacity Development for the Scheme Members</u>***		***<u>Expected participants</u>***
2.1	***<u>Defining Membership Fee/ Water Fee</u>***		- *Committee members*
	Discussions among the group members on the setting up of the proper membership fee and water fee		- *Scheme members*
			- *AEDO / AEDC*
		Membership fee to cover the administrative costs of the schemes	- *Extension officers (DAO)*
	Membership fee and water fee payment and collection		- *Other relevant stakeholders*
		Water fee (plot fee) to cover the operation costs of the schemes	
		⇩	
		Identification of a membership fee and water fee level acceptable for all members	
		Method of payment for the fees and penalties for non-payers	
	<u>Financially autonomous scheme</u> Operation and maintenance costs are directly recovered from the users		

<table>
<tr><th>Step</th><th>Process</th><th>Description</th><th>Remarks</th></tr>
<tr>
<td>2.2

2.2.1</td>
<td>
<u>Financial Record Keeping Training for the Scheme Members</u>
Training on financial record keeping will be conducted for the group activity and individual farmer record book for crop production and income.

<u>Physical Records</u>

<u>Daily Records</u>
<table>
<tr><td>Date</td><td>Activity</td><td>Output</td></tr>
<tr><td>12/04/2007</td><td>Made manure heap</td><td>1</td></tr>
<tr><td>13/04/2007</td><td>Made manure heaps</td><td>2</td></tr>
<tr><td>16/04/2007</td><td>Constructed basins/ridges</td><td>12</td></tr>
<tr><td>22/04/2007</td><td>Plant maize SC 403</td><td>22 basins</td></tr>
<tr><td></td><td></td><td></td></tr>
</table>
<u>Monthly Records</u>
<table>
<tr><td></td><td></td><td>Jan</td><td>Feb</td><td>Mar</td><td>Apr</td><td>May</td><td>Jun</td><td>Jul</td><td>Aug</td></tr>
<tr><td>1</td><td>Made manure heaps</td><td></td><td>2</td><td>4</td><td>5</td><td></td><td></td><td>5</td><td>5</td></tr>
<tr><td>2</td><td>Constructed basins/ridges</td><td></td><td></td><td>300</td><td>400</td><td></td><td></td><td>300</td><td>400</td></tr>
<tr><td>3</td><td>Basins/ridges planted - maize</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>
</td>
<td>
<u>Daily Record</u>
- All activities done in a day to be recorded by the farmer or secretary of the committee

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<u>Monthly Record</u>
- Aggregation of all daily records in a month
- All similar activities are added up to make one figure for the month's achievement
</td>
<td>
<u>Expected participants</u>
- Committee members
- Scheme members
- AEDO / AEDC
- Extension officers (DAO)
- Other relevant stakeholders
</td>
</tr>
</table>

<table>
<tr><th>Step</th><th>Process</th><th>Description</th><th>Remarks</th></tr>
<tr>
<td>2.2.2</td>
<td>
<u>Financial Records</u>
<table>
<tr><td rowspan="2">Date</td><td rowspan="2">Description</td><td rowspan="2">Income (MK)</td><td colspan="4">Summary</td></tr>
<tr><td>Cabbage (MK)</td><td>Maize (MK)</td><td>Sprayer (MK)</td><td>Tomato (MK)</td></tr>
<tr><td>01/07/2007</td><td>Balance brought forward</td><td>2300</td><td>800</td><td>1000</td><td>400</td><td>100</td></tr>
<tr><td>01/07/2007</td><td>Sold 16 heads Cabbage</td><td>320</td><td>320</td><td></td><td></td><td></td></tr>
<tr><td>02/07/2007</td><td>Sold 25 cobs green maize</td><td>250</td><td></td><td>250</td><td></td><td></td></tr>
<tr><td>04/07/2007</td><td>Sold 60 cobs green maize</td><td>600</td><td></td><td>600</td><td></td><td></td></tr>
<tr><td>04/07/2007</td><td>Sold 20 cobs green maize</td><td>200</td><td></td><td>200</td><td></td><td></td></tr>
<tr><td>17/07/2007</td><td>Sold 10 heads Cabbage</td><td></td><td>200</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>
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<td>
<u>Financial Record</u>

Writing down of all financial transactions (receipts, delivery notes, etc.)
Farm Inventory and valuation book: a list of all that a farming business owns and all that it owes
Cash book: recording of cash transactions including cash account and bank account
Sales book: showing total sales made in a given period
Purchase book: recording expenses on all enterprise inputs used

</td>
<td>
<u>Expected participants</u>

Committee members
Scheme members
AEDO / AEDC
Extension officers (DAO)
Other relevant stakeholders

</td>
</tr>
</table>