



Mazingira Bora



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ENGLISH VERSION

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The International Small Group and Tree Planting Program (TIST)

An Environmental, Sustainable Development and Community Forestry Program.



TIST Small Group Members from Kairuni Cluster during one of their monthly Cluster meetings

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Remember to attend your month of September Cluster Meeting



TIST: Building Leadership Capacity Through Rotational Leadership.

What is rotational leadership?

Rotational leadership is where each group member takes it in turn to lead and co-lead the group meeting. There is no one single leader. There is a new leader and co-leader for each weekly meeting. The responsibility is equally shared amongst all group members.

Why rotational leadership?

Each person has different ways of leading, and each person has different gifts. Rotating the leadership means group members can all learn from each other about leadership.

If everyone is supportive and encouraging, even shy group members will have the chance to grow in confidence and leadership abilities. We are able to learn something from everyone.

Rotating leadership also reduces the stress of one person being responsible all the time. Because the responsibility is equally shared, no one person should be overly burdened or tired by the job.

Rotating the leadership means there will be fewer problems if one person likes to dominate the conversations and be in charge all the time. Each person will have his / her own chance to lead the meeting.

What you should do when practicing rotational leadership?

- Begin rotating leadership as soon as possible.
- At the end of each meeting decide who will be a leader and co-leader next time.
- Everyone should get a chance to lead and co-lead.
- If a group member does not want to lead, or is shy, the group can let him or her watch others lead first. Then they can co-lead before leading next time.

- Pass any teaching materials on to the next leader.
- Remember to wait for people to speak after asking a question.

What makes a good servant leader?

- ✓ The leader should be humble, patient, accepting and honest.
- ✓ The leader should show the same acceptance and respect for every group member, regardless of what they do outside the group.
- ✓ The leader should speak very little. He or she should encourage all members to share ideas and have the chance to speak.
- ✓ Leaders should make sure they properly listen to the group members. Encourage people when they have made a contribution.
- ✓ Don't pretend you know all the answers!
- ✓ Even if you do know the answer, it is better to let the group discuss the question themselves. If someone asks a question, offer it to the rest of the group to discuss.
- ✓ Try to recognize the gifts that each person has, and to encourage them in the things they do well.
- ✓ Accept people and statements without criticism or judgment.
- ✓ Acknowledge and demonstrate respect for the person with whom you may not agree.
- ✓ Don't debate! Acknowledge even the most unusual statement with: "That's an interesting view. Does anyone else have any thoughts on that?" Throw it back to the group so others may contribute.
- ✓ Remember to share your own stories, strength and weaknesses with the group. An honest leader makes others feel comfortable to share themselves.

Partnering with other Institutions to train farmers bearing fruits

By Peter M. Mithiru, TSE partner Nyahururu.

In our clusters, since we have a regular, planned schedule, we have seen experts and trainers from other organizations coming to address small group members. This has been a Godsend for us, and many people benefited a lot.

Salama and Muruku clusters received Fisheries and Agriculture officials who taught a lot on activities to increase incomes. TIST farmers have learned from this and put it into action: fifteen fish ponds have been built and more are expected to be built in the course of this year. Small Group members in Muruku received better beans seeds and mango fruit seedlings. This improved type of mango grows quickly, produces fruits that are larger in size and fetch more cash at market.

Ministry of Public Health officials led by Mr. Alex Kibore have worked tirelessly to teach about the dangers posed by trachoma disease, waterborne diseases and malaria. He also explained how interested TIST members could pay to receive

mosquito nets from International Population Services. We are working to organize for this, and expect five hundred households to benefit.

Another helpful player has been the Rumuruti Forest Association. Since clusters are adjacent to the Forest, many TIST Small Group members are members of this association. They have been busy encouraging all to plant various tree species and manage this natural resource to benefit this and future generation.

The Nyahururu TSE is proud to say that this has been done very well. Members got information first hand. Because we have people come to our meetings from other organizations, and because we have a regular cluster meeting schedule, Small Group members are learning how to improve their livelihoods, stay healthy, and improve our forests and farms. Attending meetings leaves everyone with new ideas and information to help you first, and to help others as well.



Seed collection and seedbed preparation Best Practices

- 1. Which tree species should we grow in our area?**

The best ones are those growing naturally in the area. Select ones that meet your needs. TIST particularly encourages fruit and indigenous trees, and others that will remain in the ground for 20 years or more.
- 2. Are all trees good?**

Not necessarily! Some may be difficult to control, be poisonous to your animals or use too much water. Choose ones you know will benefit your area.
- 3. Do trees produce seeds every year?**

Most trees do, but observe your local trees to be sure. Some may only produce good quality seeds every 2-3 years.
- 4. Which is a good mother tree to collect seeds from?**
 - Collect seeds from healthy trees that are good seed producers.
 - Avoid isolated trees. In this case the seed is likely to have been self-pollinated which leads to poorer quality seeds.
 - Avoid unproductive trees and ones with a bad shape.
 - It is better to choose a tree in the middle of a healthy group of trees of the same species. Seeds will be higher quality from trees with flowers that are spread out rather than packed closely together.
 - The exact type of tree depends on what you want to use the tree for. For example, good trees for timber are straight, few branches and fast growing. Good trees for fodder should be fast-growing, many branches with multiple stems, and fast growing leaves with the ability to recover after being pruned. Good fruit trees should obviously have good quantities of healthy fruit!
 - Try to choose seeds from a tree growing at the same altitude and soil type as where you want to plant.
 - Choose a mature tree, not a young one.
- 5. When do we collect the seeds?**
 - Learn the time of the year when the seeds are ripe.
 - Ask other local people or observe the tree yourself.
 - Sometimes seeds are ripe when the fruit or pods change color, become dry, or break easily from the branch.
 - Most seeds are ready for collection when they fall from the tree naturally.
- 6. How do we collect the seeds?**
 - It is helpful to clear the area around the bottom of the tree first. Many seeds can be collected from the ground. Inspect the seeds for insect damage.
 - The tree can be climbed to collect the seeds, but take care!
 - Some fruit dry open and disperse their seeds without falling to the ground. These are hard to collect if the seeds are small. Collect the fruit or pods after they are ripe but before they have split or fallen to the ground. Then dry the fruit or pod in a clean, sheltered place to obtain the seeds.
 - Some seeds can be knocked from the tree with a long stick.
 - Try putting a sheet under the tree and gently shaking the tree.
 - For tall trees a simple tool can be made by attached one end of a pair of shears to a long, strong stick. The other handle can be attached to a rope.
 - Note that some seed species cannot be collected from the ground and have to be collected as *wildlings*. These are newly germinated seedlings found growing under mature trees. These can be transplanted to pots in your nursery. This is often the best method for trees that are hard to grow in a nursery or whose seeds are hard to collect.
 - All seeds must be removed from their fruit or pods. This can be done by hand, or putting the fruit/pod in the sun and waiting for it to dry and split.
- 7. How can we tell if the seed is good?**
 - Firstly look at the seed. Discard ones that are smaller, lighter or a different color than the others. Some may be damaged by insects.
 - For some hard-coated species floating in water is a good test. Normally the good seed sinks and the bad seed floats.
 - You can do a simple germination test. Take a small counted number of seeds (20-100). Do any pre-treatment needed. Put the seeds on a damp cloth in a bowl. Cover with another fold of the cloth, moisten it thoroughly and put in a warm (not hot) place. Check the seeds daily for signs of germination and keep the cloth moist. When germination begins keep a record of the day and number. The test usually lasts about two weeks depending on the species. Germination of over 50% means you have good seed. Small-seeded species having only 5% germination are still worth keeping.
- 8. Do we plant or store the seeds?**
 - Some seeds do not store and should be planted straight away (especially soft, fleshy seeds, fruit tree seeds or seeds with high oil content).
 - For seeds with harder coats the basic rule is to keep the seed clean, dry and cool.
 - Seeds should be removed from the fruit/cone and dried thoroughly. To dry the seeds put them in the sun for 2-3 days.



- Storing in a paper bag or metal container out of the sun is good (avoid plastic bags as this makes the seed sweat and rot). Make sure the container is clean and air-tight.
- Label the container with the name of the seeds and the collection date.
- Remember that the germination ability of the seeds will decrease with time. If seeds have been stored for too long they may expire.

9. Do all seeds germinate?

The percentage of seeds which germinate varies greatly between species. Some seeds require some form of pre-treatment.

10. What kind of pre-treatment might be needed?

- If the seeds have a very small or thin coat often no treatment will be needed.
- Seeds that have thick coats will need some form of pre-treatment. Some need to have their seed coat cracked with a hammer or a stone. Seeds should be planted immediately after cracking.
- Some seeds just require a small cut in the seed coat to help water infiltrate (nicking). Do not cut the part that was attached to the pod or capsule as this part contains the baby plant.
- Others need to be soaked in mild acidic solutions for 5-20 mins before sowing.
- Another method for hard-coated seeds is to boil them in water for 5-10 minute. Then put the seeds in cool water. This weakens the coat and helps water to enter.
- Some seeds can be soaked in normal water for 12-24 hours.
- All seeds, once pre-treated, need to be planted straight away.

11. How do we plant the seeds?

- Some seeds that germinate readily can be sown directly into the field or into pots. Species that require special conditions to germinate are sown into a seedbed first.
- The time taken for germination depends on the seed type, the temperature, the amount of water available and the age of the seed.
- Generally sowing is done just before the rainy season starts.
- As a general guide, for direct sowing seeds should be planted at a depth two to three times their diameter and should be covered firmly with soil. The soil should then be kept moist.
- Details on seedbeds are to follow.

12. Do seedlings grow only from seeds?

Some tree species produce root suckers (young plants growing from the mother plant's roots). These can be cut and transplanted.

Cuttings can be taken of a young tree branch with at least three nodes or buds. Choose a long, healthy branch and make a clean, angled cut. Strip off the leaves. Plant the cutting into soil at least two nodal

lengths deep, with at least one exposed. Keep it watered until sprouting occurs. Seedlings grown in this way will have the same characteristics as the parent tree and can be useful for making sure a productive fruit tree is grown.

Seedbed Preparation

Seed sowing

- Some seeds that germinate readily can be sown directly into the field or into pots. Species that require special conditions to germinate are sown into a seedbed first.
- Remember that some seeds will require pre-treatment, as discussed last month.
- The time taken for germination depends on the seed type, the temperature, the amount of water available and the age of the seed.
- Generally sowing is done just before the rainy season starts.
- As a general guide, if seeds are being sowed directly into the field they should be planted at a depth two to three times their diameter and should be covered firmly with soil. The soil should then be kept moist.

Seedbeds

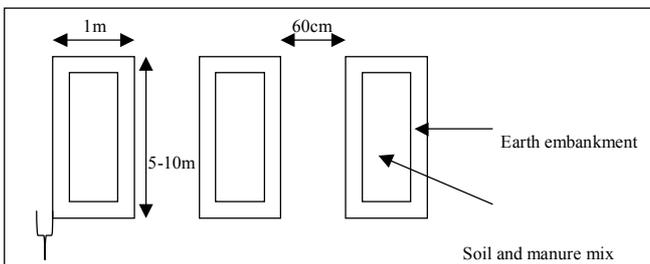
A. Use

Seedbeds provide a carefully controlled environment for seeds needing special care in order to germinate successfully. They are rectangular areas of prepared soil that can be covered and watered according to the seed's requirements.

B. Preparation

- Collect and sieve manure
- Prepare the soil that will go in the seedbeds. Mix the soil and manure together. Some people find a good soil mixture for nurseries is 3 parts of topsoil from forest areas, 2 parts of sand and 1 part of manure. You could use other natural fertilizers too (e.g. compost manure).
- If the soil is very sticky and heavy (clayey) add some more sand.
- Prepare the area for the seedbeds: each seedbed should be 1m wide (a good width for watering and weeding) and 5-10m long depending on how many seedlings will be grown. There should be 60cm paths between each bed.
- Mark out the seedbed with straight lines using string and break up the soil
- Make a low earth embankment around each seedbed to prevent water running off and causing erosion. The embankment can also be made of bricks or stones.
- Fill the bottom of the seedbed with a layer of stones about 5 cm thick (or put a layer of nylon material at the bottom). This is to prevent long roots from penetrating too deep.
- Fill the seedbed with the prepared soil, but make sure the height is less than that of the embankments so that water will not run off.

- Make sure the final seedbed is level.
- The distance between seed rows should be 15cm apart.
- The depth of sowing the seeds should be equal to the diameter of the seeds.
- The spacing between seeds along the row should be 5 cm.
- Cover the seeds with fine soil.
- The seedbed can be covered by mulching. In mulching, use litter that does not rot quickly to avoid ants, termites and other pests.
- For seeds that need shading from the sun during germination, make a cover from local materials e.g. bamboo and grass. Raise the cover as the seedlings grow so as not to deform the shoots.
- When possible water the seeds in the morning (e.g. 6am-9am) and the evening (e.g. 5pm – 7pm).



Pot-bed Preparation

Pot beds

A. Use

When the seeds have germinated (showing 3-4 leaves) they can be transplanted into plastic bags filled with soil (pots). The size of the pots vary according to the seed requirements and the resources you have.

B. Preparation

- Most seeds will use a 6”x4” or 8”x5” polythene bag. However, these can expensive and so you can use:
 - Tin cans
 - Banana leaves
 - Plastic bags – cut the plastic to the size you require and seal using heat to melt the plastic to stick the sides together. Remember to punch holes in the bottom of the bag too.
 - Used plastic water bottles
- Cut the lengths of these pots to 5 or 6 inches and make sure there are some small holes in the bottom of the pot.
- Prepare the soil by mixing in the ratio of 5:2:1
 - 5 parts sieved forest topsoil
 - 2 parts sand
 - 1 part manure
- Sieve the topsoil soil to remove stones and coarse material. A sieve can be made by fitting mesh wire (1.5cm) to a 1m by 1m wooden frame.
- Mix the soil thoroughly.
- Moisten the soil to make it stick together.
- Fill the soil into the pot slowly, gently compacting at each stage to avoid air pockets. You can use a funnel to make filling easier.
- Leave a space at the top where the seedling will be

put.

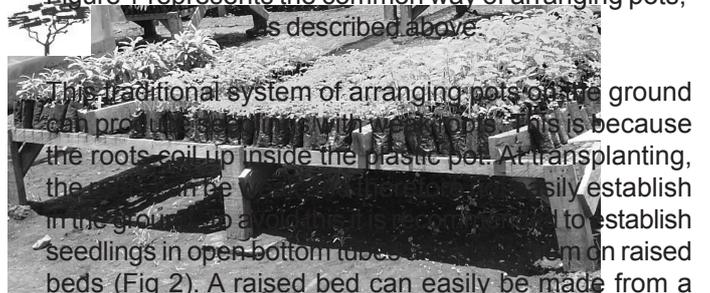
- Transplant seedlings into the pots by making a hole and inserting the seedling without twisting the roots. Fill the hole in with soil again.
- The pots can be arranged in rows to form beds for easy maintenance and placed either in the sun or shade according to the seed requirements.
- Arrange the pots in lots of 100 seedlings each. Similar to the seedbeds, the beds are easier to manage if they are 1m wide and 5-10m long.
- Arrange the seedlings according to species so that it will be easier for Quantifiers to record data by species.

New best practice: Raised pot beds

In TIST nodes trainings, Small Groups are encouraged farmers to try raised pot beds. We encourage Small Groups to try them and to report back on whether the design makes a difference or not.



Figure 1 represents the common way of arranging pots, as described above.



This traditional system of arranging pots on the ground can produce a problem with weeding. This is because the roots coil up inside the plastic pot. At transplanting, the seedling has to be pulled out of the pot to establish in the ground. To avoid this, seedlings can be established in open bottom tubes on raised beds (Fig 2). A raised bed can easily be made from a wooden frame and wire mesh (see photo). These allow automatic root pruning because when the roots get to the container bottom they naturally drop off (called air root pruning). This means that roots do not get injured through normal root pruning methods. The roots then tend to strengthen without growing further. This produces a healthy root system and the seedling has higher chances to establish faster in the field. It also eliminates the need for labour to do root pruning, a practice that is often forgotten or done too late with serious damage on the roots. Weed control under the raised beds is also easier.

Fig 2: Seedlings of various species arranged in stacks on a raised bed.



The raised beds might appear to raise the amount of water used in nurseries. However, nursery operators have devised innovations to deal with this constraint. A good innovation observed in Tanzania is digging a trench, placing planks of wood or wire mesh across it and placing the seedlings on the planks or wire mesh. The seedlings thus appear to be on the ground level but the trench under

them provides the space which aids air root pruning. The water is trapped in the trench and will moisturize the seedlings through evaporation and reduce the need for very frequent watering. A polythene sheet can also be placed in the trench to ensure water does not seep into the ground.

Protecting rivers and planting indigenous trees.

By Jennifer

TIST Small Groups are taking specific action steps to protect and improve land along river banks. By taking these steps, they will improve the quality & quantity of water in rivers, streams, and prevent erosion along the riverbanks. Groups in some clusters will also receive an additional incentive for planting indigenous trees in qualifying groves.

Steps for protecting our rivers, streams and springs.

- 1) Plant water friendly indigenous trees along the riverbanks. Some good choices are Syzygium Guineense (waterberry), Acacia Xanthophloea (fever tree), and Ficus Sycomorus (Strangler fig), but see what grows well in your area!
- 2) Do not remove shrubs along the riverbanks or existing indigenous trees.
- 3) Do not plough the edge of the river within 30 metres of the waterway.
- 4) Do not plant eucalyptus within 100 m of the river. It takes a lot of water from the ground.
- 6) Do not graze along the river.

When members plant indigenous trees, they will benefit by improving water, increasing biodiversity, and producing useful food for their animals, as well as fruit, medicine, and timber., while removing carbon from the atmosphere for sale. Ask your cluster representatives about the indigenous tree

initiative in TIST. Share your success stories with your cluster, and with Jennifer at Tel: 0726 319 539 so we can share in the Mazingira Bora learn and celebrate together!

Important benefits of planting indigenous trees along the riverbanks.

- 1) Roots catch and retain soil.
 - 2) Trees retain soil fertility.
 - 3) Trees reduce soil erosion and flooding.
 - 4) Trees help retain water in the soil.
 - 5) Trees help to clean water in rivers, streams, and wells.
 - 6) Trees help clean air.
- It is late for seed collection for some species, but some may be ready now, or may be prepared in other ways. Some, like many Ficus (fig) species, produce roots from cuttings. You can cut & root young tree branches in your nursery, and transplant later. Other species have fast growing seeds.
- Our farmers! Let us protect our rivers, streams, and wells so that our children and grandchildren will have fertile soil, good quality & quantity of water, and a beautiful environment and they will enjoy.