

# Mazingira Bora



# TIST

The International Small Group & Tree Planting Program  
www.tist.org

**English Version**

An Environmental, Sustainable  
Development and Community Forestry  
Program.



**Members of Giaki TIST Cluster during their monthly meeting last month.**

## ***Inside:***

**Thinning your trees for successful growth avoid clear-cutting. Page 2**

**Small Group Techniques: Group interaction. Page 3**

**How to practice Conservation Farming. Page 4**

**Preparing Compost Manure - a natural fertilizer. Page 5**

**Deforestation and forest land degradation are serious problems.  
What can we do? Page 6**



# Thinning your trees for successful growth avoid clear-cutting.

**W**e are very proud that almost all TIST members are following the TIST Values and living by the contract that they signed. Many TIST members have continued to adhere to the Green Gas House contract which allow them to sustainably thin their trees and do harvesting of 5% of their trees when they are 10 years and older.

The purpose of having regular thinning is to achieve maximum growth and value of the trees that are left standing. The cuttings also provide firewood, poles, building materials, and other benefits directly to the TIST participant. That is the reason that we have the policy of creating a sustainable forest by only harvesting a maximum of 5% of the trees per year after the trees are 10 years old.

When an occasional TIST member decides to clear cut their grove, they harm all the rest of the TIST members in their Small Group, in their Cluster and in all of Kenya. The actions of very few people can cause big problems for everyone. We expect other small group members and members of the Cluster to pay attention and make sure that no one cuts trees before they are supposed to.

The LC is going to work with some of the participants who made a mistake and cut the trees to work out a proper plan for those people to reinvest some of their profits into the TIST Program so they are able to help other farmers rather than hurt them.

When we signed the GhG Agreement, we committed to maintain the trees we plant for TIST to let them grow for 30 years before harvest. This is one reason it's so important to think carefully about what kinds of trees we want to grow on our farms. Thinning and pruning can help keep trees healthy and provide useful products while the trees grow.

The purpose of thinning and pruning trees is to improve individual tree health, as well as overall forest health. This is done by protecting the "best" trees in the forest and thinning the others. For many species like grevillea, eucalyptus and cypress, the trees to thin around are the largest trees, each with a single, straight stem. Trees may have different needs for space depending on species, site, planting style (woodlot, incorporated into crop fields, or windbreak), and climate, but some general principles apply.

To grow strong, healthy trees, a spacing of two meters or more is recommended. This spacing works for many TIST trees (i.e. grevillea and cypress), but remember some trees require more space like mango and macadamia. Giving trees

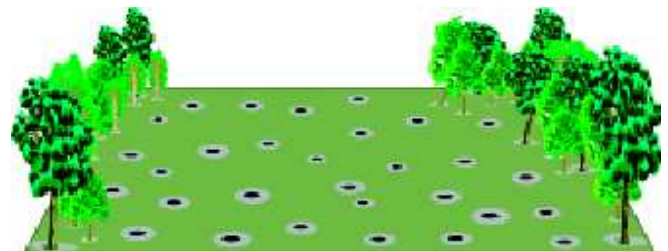
proper spacing helps them get enough water and nutrients to grow to their full potential. Closer spacing is acceptable when trees are young. As the trees begin to mature, some trees will be larger and more robust than their neighbors. These are the trees that should be kept. In determining which trees should be removed, look at the best trees and determine if they are appropriately spaced. If they are not, you should remove some nearby trees.

When making thinning choices, remember that growth rate varies greatly by species. If a mango tree is growing near lots of eucalyptus, the mango may be far smaller and slower growing than the fast-growing eucalyptus, but it certainly should not be cut simply because it is smaller! A mango tree is of great importance due to its usefulness in producing fruit for food and sale.

## Best Practices while Thinning

- Allow crop trees to grow to maturity.
- Thin to proper stocking (number of trees per acre). In TIST, we can select up to 5% of our trees, after 10 years, thinning by selecting as they grow, and providing income.
- Remove dying, diseased, decaying, and poor quality trees.
- Protect trees from logging damage.
- Use low-impact logging methods.
- Promote tree species diversity.
- Monitor your forest for insect and disease outbreaks.
- Cooperate with government agencies in controlling forest insect and disease outbreaks.
- Prevent wild fire.

## DO NOT do this



Clear cutting

## DO THIS



Single tree selection



## Small Group Techniques: Group interaction.

**a) What is the best way to arrange people during a small group meeting?**

A small circle is the best. Don't have a table because it creates barriers between people. Don't have a chair and a large seat for the most important person. In TIST, we all sit the same way. We either all sit on the ground, or we all sit on chairs.

**b) What do you do if more than twelve people want to join your group?**

If there are more than twelve people interested in joining your group it is best to form a new group. The group can split in two, or three or four members of the original group form the core of the new group. This is better than one member trying to start a group alone. Remember to start using rotating leadership straight away.

**c) What techniques can you use if the group energy is low?**

Split up the group into pairs and get each pair to talk about the task. Dramas also help. Sometimes stopping and each person saying something good that their group is doing can also motivate people again. Also remember to keep the meeting from becoming too long. By having a co-leader who is keeping time, you can focus the group's energy to making sure the work gets done in the agreed upon time period.

### Meeting Schedule.

To manage time well, a Small Group should have a well-organized meeting schedule. This is important because it will help you keep focus on your agenda and the most important activities. It is also important because in TIST, we commit to work together for the long-term to grow and maintain our trees for the carbon market. We need to know our fellow Small Group members well, since each person's actions impact our whole group and all of TIST.

It is important, too, for your Small Group to have regular meetings, preferably once a week or once in two weeks. This will give all members in your group an opportunity to strengthen your group and share and learn new ideas.

During your meeting, it is necessary to focus on important issues. Many TIST Small Groups have found the process below as a best practice for successful meetings:

**Step I. Greetings and introductions for any new members (5 – 15 minutes):**

Make sure everyone feels welcomed. Make it brief but let each person introduce him or herself.

**Step II. Opening prayer (2 minutes):**

A short word of prayer can help the group unite.

**Step III. Songs (5 minutes):**

These could be songs written by your group, or songs that encourage people such as religious songs.

**Step IV. Agreement on task and time (5 minutes):**

The leader explains what will be done in the meeting and the group members agree to do the task. The time spent on each task or discussion should be agreed so that the co-leader can help keep the meeting on time.

**Step V. Group work on tasks (1 hour):**

Ideally, tasks should have been discussed at the end of the last meeting. Tasks might include sharing what each person has done to help TIST activities, sharing best practices, training on some subject of interest, and any other important issue that will help your Small Group to prosper.

**Step VI. Kujengana (5 minutes):**

Each group member makes one positive, specific statement to that week's leader about his or her observable leadership of the meeting. In addition, anyone may identify a gift seen in the leader.

**Step VII. Closing prayer (2 minutes):**



## How to practice Conservation Farming.

**A**fter the harvest, do not burn the crop residues. Instead, leave them on the ground. The more residues left on the ground the better because they enrich the soil, making it more fertile. A layer of crop residue around the bottom of trees and seedlings will help increase the amount of moisture in the soil which prevents trees from getting too dry. Remember that crop remainders can also be used for compost manure.

- Try to stop animals from grazing on the area. If they graze there will be less crop remainders left covering the ground.
- Conservation farming holes have to be dug before the rains come. It is therefore vital to start digging them early.
- Mark out where you are going to dig your holes, and get a long piece of rope or string and squeeze bottle tops on to it 70cm apart. Stretch the rope across the width of your field. Each bottle top marks the centre of a hole and makes sure that the holes are correctly spaced out. Mark out the rows of holes using a hoe. Each row should be 90cm apart. Just mark out the rows and holes you think can be completed that day.
- On the same day as you mark a block of holes, dig the holes. The holes need to be oblong. They should be between 15cm wide, 35cm long and 15cm deep.
- When you are ready to plant the grain, it is important to put some very fertile soil into the holes to help the crop to be stronger. Take some manure and good topsoil and mix it together, or use compost manure. Fill the hole with the mixture up to 5cm from the surface. That space will help capture more rain.
- If you are planting maize, soak the seeds in some water for 6-7 hours before planting them. This speeds up germination and ensures that more will survive. When you plant the seeds, plant 4 seeds in the soil across the hole. Cover them with 2.5cm of the rich soil and manure mixture. After this, the soil in the hole should be about 2.5cm below the surface of the field. It should never be more than this. Clods (big lumps of soil) should always be broken up so that the soil makes good contact with the seed.
- If you are planting sorghum, plant 5-6 seeds at each end of the planting hole after a good shower of rain. Cover the seeds with 2.5 cm of the rich soil and manure mixture.
- The space at the top of the hole enables water to get to the plants when the rains come. Without this space the rain will just run off the land, taking a lot of the soil nutrients with it.
- Weed around the holes regularly and each year you will find there will be fewer and fewer weeds.
- Don't be discouraged! Digging the holes now will mean they are ready for this year and you will not have to dig them next year.



## Preparing Compost Manure - a natural fertilizer.

**C**ompost manure is a natural fertilizer that helps your crops grow. It is better than chemical fertilizer because it is natural, free, and will not damage crops and the environment as some chemical fertilizers can. There are many ways to make compost manure, but the following method has been useful in some areas. Ask your neighbors in your Cluster what has worked well for them.

### Preparation of compost:

1. Choose an area for your compost pit measuring 4m by 4m.
2. Clean the area.
3. Dig a hole of diameter 3 - 4m and 1.5m deep.
4. Collect all the remains of the crops you have (e.g. leaves and stalks of maize, millet, beans) and cut these remains into small pieces.
5. Put these crop remains into the hole up to a depth of 0.5m.
6. Add 5 liters of ash.
7. Next add about 30cm (or as much as available) of animal dung (e.g. dung from pig, cow, goat or chicken).
8. Put another layer of crop leaves and stalks (0.5m).
9. Add another 5 liters of ash.
10. Repeat adding the leaves and stalks again until the hole is almost filled.
11. Finally add a layer of soil until the hole is filled.
12. While filling the hole with soil, put a long stick in the middle of the hole so it reaches the bottom.
13. Leave the compost pit for 90 days (3 months).
14. During this period use your dirty water to water the compost pit. For example, after cleaning your house or clothes, empty the used water over the compost pit. If you have animals, you can also pour animal urine over the pit.
15. This adds extra nitrogen to the compost.
16. Try to water the compost pit in this way every day, or whenever water is available.
17. After 90 days the manure will be ready.

Use the stick as a thermometer – when the compost is ready it should be hot and you may even see steam coming from the stick after you have removed it.

### Use of compost:

When you have dug your holes for planting maize, millet or other crops, add one handful of your compost manure to each hole. Watch for the results!



# Deforestation and forest land degradation are serious problems. What can we do?

*Deforestation is the removal of trees and other woody vegetation cover.*

Forests and woodlands cover about a third of the world's land surface. They regulate climate, protect water resources, provide forest products (e.g. timber, medicine, fruit, and more) worth billions of dollars and support a tremendous variety of plant and animal species. Yet they are being destroyed at a rate of 20 million hectares per year. Half of the world's population depends on these forests for fuel, yet roughly 100 million people do not have enough fuel for minimal energy requirements.

## Major causes of deforestation:

- Deforestation occurs when vegetation is cleared for activities like farming or grazing and uses such as: firewood, brick making, fish smoking, tobacco curing, tea drying, construction, and timber.
- Forest degradation is when a forest becomes less diverse and resilient due to poor use and management (for example, when old trees are all cut, leaving mainly brush, or when a useful species is all harvested so that it disappears from the forest, or when forest is heavily grazed, so that trees can't grow to replace those that die).
- Much of deforestation and forest land degradation results from a lack of awareness of the full value of trees.
- In some cases, the value of trees may be known but poverty and the idea that there are no good alternatives lead people to clear trees.

## Consequences of Deforestation:

- **Soil erosion:** lack of tree cover and root binding exposes soil to erosion.
- **Lack of forest resources:** removing trees destroys habitats, reduces biodiversity, removes

food and medicinal resources, and increases competition for construction materials. People will have to walk further for firewood, and if forest products are being bought, prices will rise.

- **Deforestation also means we lose the many other benefits of trees:**

Trees act as a windbreak, retain moisture, add oxygen to the air, and add nutrients to soil. Hence without trees the local climate will become drier with increased risk of flooding, wind erosion, decreasing soil fertility and diminished air quality.

## What can we do to prevent deforestation and forest degradation?

- Establish tree nurseries and distribute or sell seedlings to the community.
- Use energy-saving cook stoves that use less firewood and charcoal.
- Use alternative sources of energy and fuel when possible (e.g. heating from the sun, sawdust, coffee and risk husks, grass, weeds, crop wastes, animal waste).
- Carry out tree planting activities. Become a successful, effective TIST group! Encourage your neighbors and friends to join TIST as well.
- Do not cultivate land bordering a river or swamp. Leave trees and vegetation to grow to protect these waters.
- Be careful to not over-graze land. Limit animals' access to tree seedlings that they may destroy to give the forest a chance to regrow.
- Encourage agro-forestry or the use of woodlots. Having trees on your land provides good access to forest products and helps protect nearby forest.

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## **Inside:**

**Caa miti kenda ikura bwega na turigirie kuriika buru. Page 2**

**Njira cia ikundi bibinini: Gukaranira gwa gikundi. Page 3**

**Njira ya Urimi bubwega. Page 4**

**Kuthithia mboleo yaku gwengwa – fertilizer itiongeri into bia kuthithua ni muntu. Page 5**

**Niatia tuumba kuthithia? Ugiti miti na uthukia bwa miunda ya miitu ni thiina inene. Page 6**



# Caa miti kenda ikura bwega na turigirie kuriika buru.

**I**tukwiguna mono tontu akui amemba bonthe ba TIST ibakuthingaatira maritano ja TIST gukurukiira gucaina gwa contract. Ni amemba bakai ba TIST batiumbite gwika wirane, bagitite miti buru na bendia niuntu bwa ngugi ingi. Amu nthiguru ya imwe kiri igana (1%) ya tumwitu 40,000 twa TIST ndene e Kenya nitugiti igitene ria miaka inana iria TIST ithiritwe ikiritaga ngugi Kenya.

Gitumi gia gucaa miti nikenda miti iria itigarite ikura bwega. Gucaa igutethagiria na nkuu, ikingi, into bia bwaka na ibitethagiiria amemba ba TIST. Kiu nikio gitumi twithagirwa turina policy ya kugita miti gacunci ka ithano kiri igana (5%) o mwaka miti yakinyia ukuru bwa miaka ikumi keenda tumwitu tutikathire.

Riria mumemba umwe wa TIST abangaga kugiita miti yonthe, ugwati ibutonyaga kiri amemba bangi bonthe ndene ya gikundi, ndene ya cluster na Kenya. Li mma tumantu tuu tutuniini ituretaga thiina kiri muntu wonthe. Itukwirigiira amemba ba cluster na ikundi bakathingatiira uju na gutiwe ukagiita miti riria itibati.

OLC niitite gwita ngugi na amemba baria beeirie na kugita miti kenda boomba kubanga uria bagatethia antu bau gutumira baita yao kiri mitarata ya TIST ya gutethia arimi. Riria twacainire gwitikaniria kwa GhG, twaciejanire kumenyeera miti iria twandite ya TIST na kumirekeria ikura kagita ka miaka mirongo ithatu mbere ya gutemwa. Giki nikiabata kenda tuumba kumenya miti iria tukaanda miundene yetu. Gucaa na gukuura igutethagia miti gukura bwega.

Gitumi kia gucaa na gukuura miti nikenda o muti gukura bwega amwe na mwitu. Bubu buthithagua na njira ya kumenyeera miti iria miega na gukuura ingi. Kiri mithemba imingi ja miti imiumo, giriberia, mibao mauta na cypress, iria ikuuragwa ni imenene na itamburuki. Miti irina mobataru mwanya gukurukiira mithemba, aria yaandi, uria iandi na naria yaandi indi mantu jangi ijabati kuthingatirwa.

Gukuria miti irina na inya, waarii bwa mita ijiri ibu bubati. Waarii bubu ibubujaira mono miti ya TIST i.e. giriberia na cypress indi riikana miti ingi ta miembe na mikandania yeendaga waarii nkuruki. Kwaa miti waarii bubwega ibutumaga ikoona ruuji rwa kung'ana na ruuji nkuruki kenda ikura uria ibaterie. Gukuiianiiria kwa miti kwendekanaga miti iri micanchaana. Miti yaambiriiria gukura, imwe

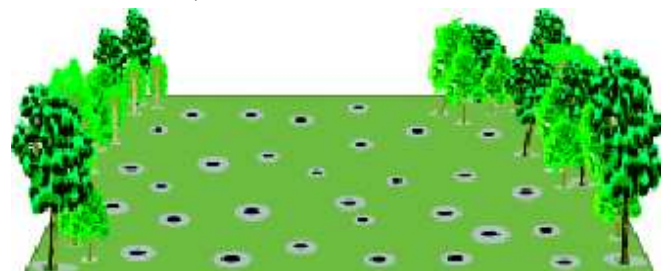
ineneaga nkuruki ya ingi, iji nio ibati gukurua. Kenda umenya ni miti iriku ubati gukuura, tega miti iria miega na wone kethira irina waarii buria bwagirite. Kethira tiu, kuura miti iria iri akui.

Riria ugucaa menya, miti ikuraga mwanya kuringana na muthemba mwanya. Kethira muembe ijugukurira akui na mubau mauta, jugakura mpaari nkuruki ya mubau mauta, indi jukagitwa nontu I muniini! Li mma muembe jwina bata mono nontu ijuciaraga matunda ja kuria na kwendia.

## Njira injega ya gucaa

- Eteera miti ikure buru.
- Chaa kuringana na wingi (kuringana na miti kiri acre). Kiri TIST, tuthuuraga gacunci ka ithano kiri igana (5%) kiri miti yetu, nyuma ya miaka ikumi tugicaaga kuringana o uria igukura na gutwaa baita.
- Kuura miti iria ikwora, ikunyaara, irina murimo na iria itigukura bwega.
- Rigiiria miti ityakarikwe.
- Riika na njira iria yaagirite.
- Anda miti ya mithemba imingi.
- Menyeera mwitu jwaku nontu bwa mang'inyo na mirimo.
- Gwatanira na thirikari niuntu bwa kumenyeera mang'inyo na mirimo.
- Rigiiria mianki ya mwitu.

## Ukathithia uju.



Kugiita miti buru

## Thithia uju.



Kugiita muti jumwe jumwe.





# Njira cia ikundi bibinini: Gukaranira gwa gikundi.

**a) Ni njira iriku iri injega buru ya kubangania antu mucemanione jwa gikundi gikinini?**

Kithiururi gikinini ni njira iria njega buru. Gukethirwa kurina metha niuntu nitumaga gukagia kigitaria gati gati ka antu. Gukethirwa kurina giti kana giti gikinene kia muntu uria urina gitio kiria kinene buru. Ndene ya TIST, twinthe tukaraga nthi na njira imwe. Twinthe tukaraga nthi muthetune kana tugakarira iti

**b) Niatia buumba kuthithia kethira antu nkuruki ya ikumi na bairi ibakwenda gutonya gikundine kienu?**

Kethira kurina antu nkuruki ya ikumi na bairi baria bakwenda gutonya gikundine kienu, ni bwega nkuruki kwambiria gikundi gikieru. Gikundi nokigaane jairi, kana amemba bathatu kana banna ba gikundi kiu gikuru baambie gikundi gikieru. Iji ni njira injega nkuruki ya mumemba umwe kugeria kwambiria gikundi wenka. Ririkana kwambiria utongeria bwa kithiuruko orio.

**c) Ni njira iriku umbu gutumira kethira inya ya gikundi iri nthiguru?**

Gaana gikundi kie antu bairi bairi na antu bau bairi baririe ngugi iria irio. Matinda kinya jo nijatethagia. Rimwe na rimwe kurungamithia na kuuria o muntu auge gintu kimwe gikiega kiria gikundi kienu gikuthithia o gutethia gwekira antu motisha ingi. Ririkana kinya kumenyeera ati mucemanio jutarea mono. Na njira ya kwithirwa kurina muthetheria wa mutongeria wa gwika mathaa, bukomba kwerekeria inya ya gikundi kiri kumenyeera ati ngugi ikathithika ndene ya mathaa jaria ibangiri.

**Mubango jwa mucemanio.**

Kenda mathaa jatumika bwega, gikundi gikinini nikibati kwithirwa kiri na mubango jubangi bwega jwa gwitithia mucemanio. Bubu burina bata niuntu bugatetheria kumenyeera ati mathuganio nijerekerete mantu jaria jabangiri na mantu jaria jarina bata nkuruki. Kinya burina bata niuntu ndene ya TIST, nituciritahira gwitaniria ngugi amwe kenda igitene riraja tukura na twika miti yetu bwega niuntu bwa thoko ya ruugo. Nitugwitia kumenya amemba ba gikundi gietu gikinini bwega niuntu mathithio ja o muntu nijathithagia mwanya kiri gikundi na TIST yonthe.

Kairi burina bata gikundi giaku kinini gwita micemanio ya igita nyuma ya igita, mono o kiumia kana rimwe ndene ya biomia biiri. Bubu bukaa amemba bonthe ndene ya gikundi giaku kanya ga gwikira gikundi inya na kugaana na kuthoma mantu jameru.

Mucemanione, kurina bata kwerekeria mathuganio mantune jaria jarina bata nkuruki. Ikundi bibinini bibingi bia TIST nibionete njira iji iri mwitire juria mwega buru kiri kuthithia micemanio ya bata:

**Itagaria ria mbele. Gukethania na gucimenyathia kwa amemba baaberu (Dagika ithano gwita ikumi na ithano):** Menyeera ati muntu wonthe nakwigua ang'anirite. Dagika inkai itumirwe indi umenye ati o muntu nakwimenyithania wengwa.

**Itagaria ria jairi. Iromba ria kwambiria (Dagika ijiri):** Iromba ririkui noritethia kureta gikundi amwe.

**Itagaria ria jathatu. Ndwimbo (Dagika ithano):** Iji nociithirwe ciandiki ni gikundi kienu kana ndwimbo cia gwikira antu inya ta ndwimbo cia kidini.

**Itagaria ria janna. Gwitikaniria ngugi na mathaa (Dagika ithano):** Mutongeria naugaga jaria jakathithua mucemanione na amemba ba gikundi bagetikaniria kurita ngugi iu. Mathaa jaria jagatumika kuthithia o ngugi kana kwaraniria nijabati gwitikanirua nikenda mutetheria wa mutongeria agatetheria gwika mathaa ja mucemanio.

**Itagaria ria jatano. Gikundi gikarita ngugi iria irio (Ithaa rimwe):** Kiri njira iria bwega buru, ngugi nicibati kwithirwa ciaariritue mucemanio jugikinya muthia. Ngugi nociithirwe ciri amwe na kugaana jaria o muntu athithitie gutethia mantu ja TIST, kugaana mitire iria miega buru, kuritana kwegie mantu jaria antu bakwenda na gintu kingi kiria kirina bata na kiria gigatethia gikundi giaku gwita na mbele.

**Itagaria ria jatantatu. Gwakana (Dagika ithano):** O mumemba wa gikundi auge gintu kimwe gikiega kiri mutongeria wa kiumia kiu kwegie utongeria buria bwonekete ndene ya mucemanio. Kwongera, muntu omba kuuga kiewa kiria oonete ndene ya mutongeria ou.

**Itagaria ria mugwanja. Iromba ria kuthiria (Dagika ijiri):**



## Njira ya Urimi bubwega.

**W**arikia guketha utibati kuithia matigari ja imera. Antu a kuithia, jatige nthi. Wajatiga jamaingi nthi nibwega nkuruki niuntu jakanoria muthetu nikenda jugia maciara nkuruki. Matigari ja imera akui na miti iminene na iminene jagatethia kwongera ruuji muthetune untu buria bumenyagiira miti itiume. Rikana Matigari ja imera nojatumirwe kuthithia kinya mboleo.

- Geria kumenyeera nyomoo itareta kuriao niuntu ciarea ni imera bibikai bigatigwa nthiguru.
- Marinya ja CF nijabati kwinjwa mbele ya kuura na kurina bata kwambiria kujeenja kurio.
- Maka aria ukeenja marinya jaku, riu ucue murigi na uoge nkuniki cia cuba citarenie na centimita mirongo mugwanja. Kucia murigi kugitania munda jwaku nikenda o nkuniki ithirwa iri gati gati ga kirinya na ikamenyeera ati marinya jaku nijatarenie uria jabati. Tumira gicembe kumaka milaini ya marinya nikenda o milaini ithira itarenie na centimeta mirongo kenda. Maka milaini na marinya jaria ukomba kuthiria ntuku iu.
- O ntuku iu ukamaka marinya, jeenje jarina nteere inya intamburuku. Nijabati kwithirwa jarina warie bwa centimita ikumi na ithano, uraja bwa centimita mirongo ithatu na ithano na kwinama centimita ikumi na ithano.
- Riria waa tayari kuanda mbeu, burina bata gwikira muthetu jumunoru nkuruki ndene ya marinya nikenda jutethia gwikira imera biaku

inya. Ungania na mboleo inkai na muthetu jwa iguru jumuthongi, kethira urina lime kana fertilizer, ikira ndene kirinyene na ujurie o kirinya na muunganio juju mwaka gutigare centimita ithano.

- Kethira urianda mpempe, riinda mbeu ruujine mathaa jatantatu kana mugwanja mbele ya kuanda. Bubu nibutumaga ikauma ntuti na inyingi cikomba gutura. Riria ukuanda mbeu, anda mpindi inya ndene ya muthetu kugitania kirinya na wikunikire na centimita ijiri na nusu cia muthetu jumunoru juungene na mboleo. Muthetu ndene ya kiriinya jubati kwithirwa jutigeria centimita ijiri na nusu kirinya kiujura. Ithumbwa bibiumu bia muthetu nibibati kuunangwa rionthe nikenda muthetu jukinyira mbeu bwega.
- Kethira ni mwere ukuanda, anda mpindi ithano kana ithanthatu kiri o muthia jwa kirinya gia kuanda kwarikia kuura bwega na ukunike mpindi na centimita ijiri na nusu cia muthetu jumunoru jungene na mboleo.
- Kanya kau kari iguru kirinyene nigatethagia ruuji gukinyira imera riria kwaura. Gutina kanya kau, ruuji rwa ngai rugakamatwa iguru ria muthetu na rukamate unoru bubwingi bwa muthetu.
- Rimira kuthiuruka kirinya o igita. O mwaka gukethirwa kurina maria jamakai na jamakai nkuruki.
- Ukagituka moyo! Kwinja marinya nandi nikuuga jakethirwa jari tayari gutumirwa mwaka juju na utitia kwinja kairi mwaka jou jungi.



## **Kuthithia mboleo yaku gwengwa – fertilizer itiongeri into bia kuthithua ni muntu.**

**M**boleo ya kuthithia na imera ni fertilizer ya kuumania na into bitina ugwati ya gutethia imera biaku bikura bwega. Ni injega nkuruki ya fertilizer cia nduka niuntu icithithitie yongwa na itina ugwati kiri imera na kiri naria kuthiurukite. Kurina njira inyingi cia kuthithia mboleo, indi njira iji ithingatite nitethetie ndene ya guntu kumwe. Uria muturi waku ndene ya cluster yaku jaria jabatethetie nkuruki.

### **Kuthithia mboleo:**

- 1) Taara antu aria ukeenja kirinya giaku kia warie bwa mita inya na uraja bwa mita inya.
- 2) Theria antu au
- 3) Inja kirinya kirina warie bwa mita ithatu gwita inya na mita imwe na nusu kwinama.
- 4) Uthurania matigari ja imera biaku jaria urinajo na ugitange tue tunini. ( mung'uanano mathangu na mati ja mpempe, miere na ming'au)
- 5) Ikira matigari jaja kirinyene mwanka gitigare nusu mita.
- 6) Ongeera lita ithano cia muju
- 7) Riu wongere centimita mirongo ithatu (kana o iria ikwoneka) cia mburi kana nguku).
- 8) Ongerera matigari ja imera nusu mita
- 9) Ikira lita ingi ithano cia muju

- 10) Ongerera matigari ja imera kairi mwanka kirinya kiende kuujura
- 11) Muthia, ikira muthetu mwanka kirinya kiujure
- 12) Ukiujuria kirinya na muthetu, tonyithia muti jumuraja gatigati ga kirinya mwanka jukinye nthiguru buru.
- 13) Tigana na kirinya giki ntuku mirongo kenda (mieri ithatu)
- 14) Igitene riri tumira ruuji rwaku rwa ruko gwikira bolelo. Mung'uanano, warikia kuthambia nyomba kana nguo ciaku, ituura ruuji ruru ugutumagira kirinyene. Kethira urina ndithia ituura maumago jacio iguru ria kirinya.
- 15) Untu bubu nibwongagira nitrogen kiri mboleo yaku
- 16) Geria wikagire kirinya kiu ruuji na njira iji ntuku cionthe kana oriria ruuji rurio.
- 17) Ntuku mirongo kenda ciathira, mboleo ikethira iri tayari.

Tumira muti kuthima mwanki – mboleo yayia no mwanka ithirwe irina mwanki mwanka toi yoneke ikiumaga mutine wajurita ku.

### **Utumiri bwa mboleo:**

Warikia kwinja marinya jaku ja kuanda mpempe, muya na imera bingi, ongerera nkundi ya mboleo yaku kiri o kirinya. Etera wone uria gugakara!



## Niatia tuumba kuthithia? Ugiti miti na uthukia bwa miunda ya miitu ni thiina inene.

**Ugiti miti ni amwe na uriti bwa miti na imera bingi biria bikunikirite nthi.**

Miitu na ithaka nibikunikagira gicunci kimwe kiri bithatu kia nthi yonthe. Niithongomagira rera, igakaria nduui, ikaejana into kuumania na miitu (ta mpao, ndawa, matunda na bingi) bia mbeca inyingi na ikagwatira imera na nyomoo cia mithemba imingi. Na gintu gia kurigaria no ikuthukua miitu iri miundene ya hectare milioni mirongo iiri o mwaka. Nusu ya antu ndene ya nthiguru yonthe nibatumagira miitu ta nkuu nakurigaria akui antu milioni igana batina nkuu ing'ani cia utumiri bwa nthiguru buru.

**Itumi biria binene bia kugiita miti:**

- Ugiti miti bukarikaga riria imera bigitagwa nikenda miunda irugurwa gutumirwa mantune jangi ta kurima kana kurithia na mootumiri jangi ta: nkuu, kuthithia maiga ja gwaka, gutogia makuyu, kuithia mbaki, kunyaria majani, gwaka na mpao.
- Uthukia bwa miunda ya miitu ni riria mwitu juniyagia mithemba ya imera na nyomoo na uumiria bwaju niuntu bwa utumiri na umenyeeri bubuthuku (mung'uanano, riria miti imikuru yagitwa yonthe gugatigwa na miti iminini aki, kana riria muthemba jurina bata jwagitwa junthe mwanka jukathira mwitune, kana riria mwitu jwarithua nainya mwanka miti ikaremwa kuuma antua iu ikuite).
- Ugiti miti na uthukia bwa miunda ya miitu buria bwingi buumanagia na kwaga umenyo kwegie bata ya miti.
- Rimwe na rimwe, bata ya miti noithirwe iijikene indi ukia na kwithirwa gutina kingi gia gutuumira nigutumaga antu bakagiita miti.

**Mantu jaria jaumanagia na ugiti miti:**

- **Gukamatwa kwa muthetu:** kwaga miti ya gukunikira na kugwata muthetu nigutumaga muthetu jugakamatwa.

- **Kwaga into biria biumanagia na miitu:** Kurita miti nikwinyangagia ikaro, gukanyia gukaranira kwa nyomoo na imera bia mithemba imingi mwanya, gukarita biumo bia irio na ndawa na gukaingiyia gushindanirwa kwa into bia gwaka. Antu bakaa bageeta kuraaja nkuruki gucua nkuu na kethira into bia kuumania na miitu kabikugurwa, uguri bugaitia.
- **Kugiita miti kinya ni kuuga tukaaga baita ingi cia miti:** Miti niritaga ngugi ya kunyiyia ruugo, gwika ruuji, kwongera ruugo rurwega, na kwongera irio bibiega muthetune. Kwou gutina miti rera ikooma nkuruki na kuumbika gwa kuigara kwa ruuji, gukamatwa kwa muthetu ni ruugo, kunyia kwa unoru bwa muthetu na kunyia kwa utheru bwa ruugo ruria tugukucia gukongereka.

**Niatia tuumba kuthithia nikenda tutigithia ugiti miti na uthukia bwa miunda ya miitu?**

- Ambia minanda ya miti na wenderie miti ntuura yaku.
- Tuumira mariko ja nkuu kana makara jamakai.
- Tuumira into bingi riria gukuumbika( ta mwanki jwa riuu, sawdust, mati ja kauwa na muchele, maria, matigari ja imera na ja nyomoo)
- Andeni miti. Eeni gikundi gia TIST gigwita ngugi na gikumbana! Ikira moyo aturi na acore baku gutonya kiri TIST.
- Ukarima muunda juankene na ruuji kana irimba. Tigana na miti na imera biume bimenyeere nduui iji.
- Menyeera utikarithie nkuruki ya uria ubati. Ukenda nyomoo ikuiiria miti iminini ciija kuthukia kana gwata mwitu kanya ga gukuura kairi.
- Ikira moyo antu kurima imera amwe na miti kana kuanda miti ithiurukirite miunda. Kwithirwa urina mitimuundene jwaku nigukuejaga into bionthe kuumania na mwitu na gugatethia kumenyeera miitu iria iri akui.

# Mazingira Bora



## TIST

The International Small Group & Tree Planting Program  
www.tist.org

**Kikuyu Version**

An Environmental, Sustainable  
Development and Community Forestry  
Program.



**Amemba a Giaki TIST Cluster kigomano-ini kia o mweri, mweri muthiru.**

### **Thiini:**

**Guceha na gutagania miti yaku niguo ikure wega. Page 2**

**Maundu ma ikundi: Uikarania wa ikundi. Page 3**

**Uria wagiriirwo ni gwika riria ugutumira urimwi mwega wa Conservation Farming. Page 4**

**Kuhariria thumu wa mborera – bataraita ya kimerera. Page 5**

**Utemi wa miti na uthukangia wa migunda ya mititu ni thina munene, tungika atia? Page 6**



# Guceha na gutagania miti yaku niguu ikure wega.

**T**hiini wa TIST, nitwirutagira guturia miti iria twahanda na tukatreke ikure miaka itanyihiire 30 mebre ya gutemwo. Giki nikio gitumi kinene giagutuma twicirie muno mithemba ya miti iria turahanda migunda-ini iitu. No ona kuri o uguo, guceha na ggutagania miti niguteithagia miti gukura ii na hinya na kuheana umithio mwega riria irakura.

Hamwe, gitumi kia guceha na gutagania miti ni kwongerera ugima wa muti kiumbe na wa mutitu uri wothe. Uu wikikana kuhitukira gucchagura miti iria miega thiini wa mutitu. Kuri mithemba miingi, hamwe na miti iria itagwo hardwoods, grevilea na mibau na mithithinda, niyo muno ikoragwo iri minene gukura iria ingi iri mitungu wega. Miti niibatara muigana wa mugunda ngurani kuringana na muthemba waguo, kuria uri, muhandire na riera no maundu mangi nimatumaga.

Niguu muti ukure uri na hinya, utaganu wa 2 mtrs niwagiriire. Utaganu uyu wagagirira miti miingi (ta grevilla na cypress), no uririkane miti ingi niibatara utaganu munenanene (ta maembe, macadamia). Riria wahee miti utaganu muiganu nigutumaga miti ikinyirwo ni maai na unoru wa tiiri ni igakura wega na iri na hinya. Utaganu munini wa miti nimwitikiriku riria miti iri minini. Na riria yambiriria kugimara, miti ingi niigukorwo iri miraihu gukura iria ingi. Ino niyo miti iria yagiriirwo gutigwo mugunda. Niguu umenye miti iria ugutema, rora miti iria miraihu na wone kana niitaganitio wega na angikorwo timitaganu no uteme imwe yayo.

Thutha wa kumenya miti iria ugutema, mitemere haria gitina-ini. Thutha wa ciumia na mieri, imwe yayo niithudukaga. Na niguu ndigakure ringi, tinia mahuti maria marathunduka kuma githuki-ini.

Njira imwe ya iria huthu ya kumenya muti kana niwagiriirwo nigutemwo nikurora unene wayo uringithanitie na iria iriganitie nayo iri ya riika na mutemba umwe. Gukura kwa miti nogukorwo kuri na utiganu kuringana na tiiri na maai na mangi maingi. Angikorwo miti ya muthemba umwe mwena umwe iri na ukuru uiganaine, miti iria minene niyagiriirwo ni gucagurwo niguu ikure. Njira ingi ya kumenya ugima wa miti ni kurora mururi waguo. Miti iria iri na mururi muraihu gukura iiria ingi noihote kwamukira utheri muiganu na ikure na ihenya. Na muthia, miti yagiriirwo gukura na mwahu umwe, na itari na mirimu minene kana ironda. No ona kuri o uguo, uu tikuga ati miti yothe minii niyagiriirwo nigutemwo! Tigirira utaganu niwa 2-3mtrs niguu miti ikure iri minene niguu ihote kugucia carbon nyingi.

Ugitua matua ma gutagania, ririkana mukurime wa muti ningurani kuringana na muthemba wa muti. Angikorwo miti ya maembe irakuranira na mibau,

maembe nomakure mari manini na ikure kahora muno gukira mibau iria ikuraga na ihenya, na ndiagiriirwo nigutemwo tondu niminini! Muti ta muembe niwabata niundu wa matunda maria ukuragia na makendio.

Maembe nimakuranagira na indo ingi migunda-ini. Mibau ndirekaga muti kana mumera ungi ukure hakuhi. Niwega kuririkana uguo riria uracagura miti ya gutagania.

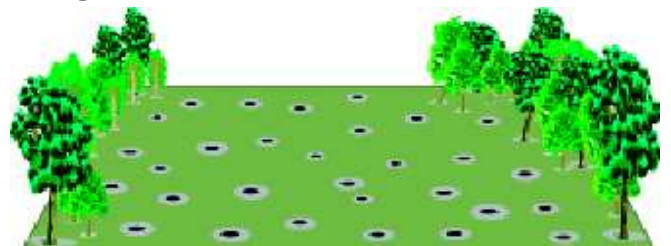
Miti niikoragwo na mabata maingi kuringana na muthemba waguo. Kwa muhiano, nowende muti niundu wa kiruru. Niundu wa uguo, niwagiriirwo kuhe muti mweke muiganu niguu utheremie mahuti.

Angikorwo urenda gukuria muhari wa miti niundu wa kunyihia ruhuho, tigirira miti niyakuhaniriria no wehutie iria itari mahariini niguu ndugathondeke githaka.

## Mitaratara ya gutagania.

- Reke miti ikure nginya igimare.
- Korwo na namba ya miti iratwarana na muigana wa mugunda waku. Thiini wa TIST, noucagure gicunji kia miti kia 5%, thutha wa miako 10, gutagania miti o igikuraga na kurehe umithio.
- Eheria miti iria irakua, iri na mirimu na itari na ugima mwega.
- Gitira miti kumana na utemi utari mwitikiriku.
- Tema miti na njira itakuhukia mutitu waku.
- Handa miti mithemba miingi.
- Rora mutitu waku ndugatharikirwo ni tutambi.
- Nyitanira na honge cia thirikari niguu kugitira mirimu.
- Gitira miaki.

## Ndugeke uu



## Kuheria gutheria

## Ika uu



## Guthuraniria miti



## Maundu ma ikundi: Uikarania wa ikundi.

**a) Ni njira iriku njega ya kubanga andu mucemano-ini wa ikundi?**

Githiururi kinini nikio kiega. Mutigakorwo na metha tondu niikoraga mikira andu-ini. Mutigakorwo na giti kinene kuri iria ingi kia mutongoria. Thiini wa TIST, ithuothe tuikaraga andu umwe. Tuikaraga thi kana tugaikarira iti.

**b) Twikaga atia riria andu makiria ma 12 magia na wendi wa kuingira gikundi?**

Riria kwagia na andu makiria ma 12 marena kuingira gikundi, niwega guthondeka gikundi kingi. Gikundi giki nokigayanio maita 2 kana 3 ona kana 4 na niwega andu a tene gikundu mambiririe icio ingi mari o. njira ino ni njega gukira amemba eru makigeria guthondeka gikundi kieru mari oiki. Ririkanai guthiururukia utongoria.

**c) Ungika atia riria hinya wagikundi wathii thi?**

Gayania amemba eri eri na umere mariririe uhoro ucio. Geriai guthaka mithako ya ngerekano tondu niiteithagia. Maita maingi riria mundu umwe arugama kuga maundu maria mega muhotete gwika niguteithagia muno na gugekira hinya ringi. Na ningi ririkana ndukareke micemano inenehe muno. Riria muri na muteithia wa mutongoria uria uraiga mathaa, nouhote kuhuthira mucemano wega na mukaiguithaniria.

### **Mutaratara wa mucemano.**

Niguo kuhuthira mathaa wega, ikundi ciagiriirwo nigukorwo na micemano mibang wega. Njira ino niya bata tondu niigutuma murumirire mutaratara na muhote kwaririria maundu maria ma bata. Nangingi niyabata tondu thiini wa TIST nitukoragwo twiheanite gukiria na gutungata miti gwa kahinda kanene niundu wa thoko ya carbon. Nitwagiriirwo nikumenya arimi othe a ikundi wega, tondu ciiko cia I mundu nicia bata kuri gikundi.

Niundu wa bata, na makiria kuri gikundi gukorwo na micemano ya o hindi na mungihota o wiki. Uu niukuhe amemba thiini wa gikundi kamweke ga gwikira gikundi hinya.

Riria muri na micemano, niwega murore maundu maria ma bata. Ikundi nyingi niconete mutaratara uyu ukimateithia muno.

**Ikinya ria I: Kugeithania na kumenyithania amemba eru(Ndagika 5-15):**  
tigirira o mundu niaigua amukiritwo wega. Mutikoe kahinda kanene no utigirire andu nimemenyithania.

**Ikinya ria II. Mahoya ma kuhingura (Ndagika 2):**  
Mahoya manini nimateithagia kunyitithania giundi.

**Ikinya ria III Ruimbo(Ndagika 5):**  
Ici nocikorwo iri nyimbo citungitwo ni gikundi kana ciagwikira andu hinya na cia kugooa Ngai.

**Ikinya ria IV. Kuiguithania kiria gikwariririo na mathaa(Ndagika 5):**  
Mutoingoria agatariria maundu maria makwariririo nao amemba magetikaniria. Mahidam a r i a makuhuthirwo kwaririria makaiguithanirio niguo muteithia wa mutongoria akahota kuiga mathaa.

**Ikinya ria V. Kwaririria maundu (ithaa I):**  
Niwega maundu maria makwariririo makoragwo mathondeketwo mucemano-ini urcio ungi. Maundu maya nita uria andu mahotete gukuria TIST, guthomithania maundu na mitaratara bata iria iguteithia gikundi gukura wega.

**Ikinya ria VI. Kujengana(ndagika 5):**  
O memba wa gikundi niaheanaga kaundu kega ka wiki iyo na akauga uria onete utongoria thiini wa mucemano. Na makiria, mundu o wothe akauga kiheo kiria onete hari mutongoria.

**Ikinya ria VII. Mahoya ma kuhinga (Ndagika 2):**



## **Uria wagiriirwo ni gwika riria ugutumira urimwi mwega wa Conservation Farming.**

**T**hutha wa kugetha, ndugacine mabebe kana matigarino mothe. Wagiriirwo ni kureka mahuti macio matuike thumu nigetha muganda waku uthii na mbere na kunora. Thumu ucio niutethia mimera yaku kana on miiti igie na ugunyu wa kuigana. Ririkana na mabebe macio niuhuthire guthondeka thumu.

- Niwagiririo ni kugitira mugunda waku hari kurithia mahiu. Riria mahiu mathie mugunda niguthukia mathukagia tiiri na kuria mahuti maria mangithondekire unoru
- Enja marima maku ma CF mbere ya mbura yurite
- Ithimi cia marima maku ciagiriirwo ni gutigana kuuma irimwe nginya riria ringi ta uu. 70 cm mwena wa ukigie na 90 cm mwena wa guikuruka. Geria uhuthire rurigi wohereire mbota
- Githimi kia irima riria ukuhanda mbembe ni 15cm warie, 35cm uraihu and 15cm uriku.
- Hindi ya kuhanda tukania tiiri wa iguru uria munoro na thumu waku. Ikiria irima na utigie

mweke wa 5cm . Koguo ndukaiyurie irima riaku biu.

- Angikorwo ni mbembe urahanda, niwega ucirindi maaini gwa kahinda ka mathaa matandatu nginya muganya. Gwika uguo ni guteithagia mbegu ciaku imera na ihenya na gucigitira kurio ni tutambi. Wagiriirwo ni kuhanda mbembe inya o hari irima. Mbegu ihando hakuhi na kona ya irima iri imwe.
- Angikorwo ni muhia urahanda, no uhanda mbegu 5 nginya 6 o hari irima thutha ya mbura kuura. Ota irima ria mbembe, tukania tiiri wa iguru na thumu waku wega.
- Mweke uria tutigirie hari irima twaga kuihuria tiiri na thumu ni getha ria mbura yaura , mweke ucio ugakorwo ukiiga maai . Mumera waku niugorwo na ugunyu gwa kahinda karaya. Hamwe na uguo, thumu wa mumera ukagitiro gukuo ni kiguo.
- Hindi ya kurimimira wa giriirwo ni gukonya ria hau irimaini na kuuu kungi utugute. No ndukarime na icembe kana kahu.
- Ambiria kwibanga riu.





## Kuhariria thumu wa mborera – bataraita ya kimerera.

**T**humu wa mborera ni bataraita ya kimerera iria iteithagia mimera gukura wega. Bataraita ino ni njega gukira ya nduka tondu I ya kimerera, ndiri thogora, ndithukagia mimera hamwe na maria maturigiciirie ta uria bataraita imwe cia nduka ciikaga. Kuri njira ngurani uria unghota gwithondekera thumu waku wa mborera. Hari njira imwe iria tuguthomithia iria ikoretwo igitumirwo ni andu aiangi. Niwega urie arimi aria angi muri mucemanio wa cluster ni njira iria matumagira.

### Kuhariria guthondeka thumu:

1. Chagura handu haria ikwenja irima riaku ria mita inya kwa inya.
2. Theria handu hau.
3. Haririria kana uchimbe irima ria warie wa mita ithatu nginya inya na iriku wa mita imwe na nuthu.
4. Cokeria hamwe maragara maku moth eta mahuti, mabebe , maboco kana muhia na umatinangie tuchunji tunini.
5. Ikia maragara macio irima-ini riaku kwa uriku wa nuthu mita.
6. Ongerera lita ithano cia muhu.
7. Thutha ucio, ongerera thumu wa ng'ombe kana mburi kana nguku kana nguruwe kwa uriku ta fiti imwe.
8. Ongerera maragara mangi inguru ta nuthu mita.
9. Ongerera lita ithano cia muhu.
10. Ongerera maragara maku nginya irima riaku rikirie kuiyura.
11. Wa muthia, humbura na tiiri nginya iria riyyure
12. Hindi iria urahumbira na tiri, handa kamuti nginya kahutie irimariaku gitina.
13. Eterera gwa kahinda ka thiku 90 kana mieri itatu.
14. Gwa kahida gaaka korwo ugitiriria thumu waku maai maku ma giiko. Ungikorwo ni ukuhota ona mathugumo ma mahiu maku uitiririe.
15. Mathugumo ni mateithagia kuongera nitrogen.
16. Geria guitagiriria maai na muthugomo kwa mahinda makuhi.
17. Thutha wa thiku mirongo kenda, thumu waku ugakorwo uri muhiu.

Tumira kamuti karia uhandire ta githimi giaku. Hindi iria thumu waku wahia, wagiririrwo gukorwo wi muhiu na wacomora kamuti niwagirirwo ni kurata ndogo ya urugari.

### Uhuthiri wa thumu waku wa mborera:

Warikia kuhariria marima maku ma mbembe kana muhia kana o mimera iria ingi urahanda, ikira thumu muigana wa m oko maku o hari o irima. Eterera wone maciaro!



## Utemi wa miti na uthukangia wa migunda ya mititu ni thina munene, tungika atia?

**Kuheria mititu ni gutema miti na mimera iria ingi niundu wa gwatura mbao.**

Mititu ikoragwo ihumbirite gicunji kia imwe hari ithatu gia thi. Niyo inyitagirira riera, kugitira ihumo cia maai, gutuhe mbau, dawa na matunda iria ni cia goro muno na gutuma nyamu na andu maturue. Na noirathii na-mbere na guthukangiona njira nene muno. Nuthu ya muingi wa thi ukoragwo wihokete mititu, na andu ta 100 milion matiri na ngu ciakuigana.

**Itumi nene cia utemi wa miti:**

- Utemi wa miti wonekaga riria kwoneka nokurimike kana kuriithio mahiu na njira ingi ta gutema ngu, ucini wa maturubari, utegi ucini wa thamaki, ucini wa mbaki, umithia wa macani waki na waturi wa mbau.
- Uthukangia wa mititu ni riria mititu yanyiha niundu wa kuhuthirwo uuru na kwaga kumenyererwo(muhiano ta riria miti minene yatemwo gwatigara miti itari miraihu kana miti ya bata riria yatemwo ona kana kuriithio mahiu)
- Uthukangia na nutemi wa mititu muingi umanaga na kwaga umenyo wa bata munene wa miti.
- Njira-ini ingi, bata wa miti noumenyeke no ukia na andu gwiciria gutiri na njira ingi nigueumaga mititu ithire.

**Maciaro ma uthukangia wa mititu.**

- **Gukuuo gwa tiiri ni maai:** kwaga kindu kihumbirite tiiri

- **Kwaga mawega maria maumanaga na miti** ta nyamu, dawa irio, andu mathiaga kundu kuraihu gucietha.
- **Kwaga mawega maria marehagwo ni miti:** miti ni huthikaga kunyihanyihia ruhuho, kuiga ugunyu na gutheria riera o hamwe na kwongerera tiiri hinya. Tutari na miti riera riitu niriguthuka na tukorwo ugwati-ini wa wa ng'aragu.

**Niatia tungika kugitira uthukangia wa mititu?**

- Ambiriria tuta na uheane kana wendie mimera ya miti.
- Huthira riiko ritarahuthira ngu nyingi. huthinra njira ingi ya kuruga na kuhiuhia maai (ta kuhiuhia maai na riuu, mhanda mitiura, makoni ma kahua nyeki na mai ma ng'ombe).
- Handa miti kwa uingi, ingira TIST na uingiria angi.
- Ndukarime mugunda hakuhi na ruui. Reke miti na mimera ingi cikure na ugitire maai.
- Ndukariithie mahiu mugunda muno. Ndukareke ng'omb irie kuria kuri na mimera ya miti.
- Handa miti mugunda-ini uria uria urahanda irio. Riria wahanda miti mugunda niuhotaga kwigwatira mawega ma mutitu.

# Mazingira Bora



# TIST

The International Small Group & Tree Planting Program  
www.tist.org

**Kiswahili Version**

An Environmental, Sustainable  
Development and Community Forestry  
Program.



**Wanachama wa Giaki TIST Cluster wakati wa mkutano wao wa kila mwezi mwezi uliopita.**

## ***Ndani:***

**Kupunguza miti yako ili ikue vizuri, jiepuche na kukata miti yote. Ukurasa 2**

**Mbinu za vikundi vidogo: Mwingiliano wa kikundi. Ukurasa 3**

**Jinsi ya kulima kwa njia ya kilimo hai. Ukurasa 4**

**Kutengeneza mbolea kutokana na mimea – mbolea ya kiasili. Ukurasa 5**

**Ukataji miti na kuzorota kwa mashamba yenye misitu ni shida kubwa sana. Tunaweza kufanyeje? Ukurasa 6**



## **Kupunguza miti yako ili ikue vizuri, jiepushe na kukata miti yote.**

**T**unajivunia sana kuwa wanaTIST wote wanafuatilia maadili ya TIST na kuishi wakizingatia kandarasi walivyotia saini. Ni wanaTIST wachache waliovunja mkataba huo, wakakata miti yote na kuiiza kutumika vinginevyo. Kwa kweli ni chini ya asilimia moja ya mashamba elfu arobaini katika Kenya imekatwa katika miaka nane ambayo TIST imekuwa Kenya.

Madhumuni ya kupunguza miti ni ili miti iliyobaki ikue na dhamani yake ipande inavyofaa. Miti hii iliyokatwa pia hutupa kuni, fito, vifaa vya ujenzi na faida nyinginezo kwa mshiriki wa TIST. Hii ndio sababu tuna sera ya kuanzisha msitu endelevu kwa kuvuna miti isiyopitisha asilimia tano baada ya miti kufikisha miaka kumi.

Wakati mwanaTIST mmoja napoamua kukata shamba lote, wanadhuru wanaTIST wote katika kikundi chao, katika cluster yao na katika Kenya yote. Kwa kweli, matendo ya wachache hao yaweza kuletea shida kila mmoja. Tunatarajia wanakikundi wengine na wanacluster kuwa makini na kuhakikisha kuwa hakuna anayekata miti kabla ya wanapopaswa.

Kikundi cha OLC kitafanya kazi na baadhi ya washiriki waliofanya kosa na kukata miti kufanya mpango wa hao watu kurudisha sehemu ya faida yao katika mradi wa TIST ili waweze kusaidi wakulima wengine badala ya kuwaumiza.

Tulipotia saini mkataba wa makubaliano wa GhG, tuliahidi kutunza miti tunayopanda katika TIST na kuiacha kukua kwa muda wa miaka thelathini kabla ya kuvuna. Hii ni sababu moja ya kwa nini ni muhimu kufikiria kwa makini kuhusu ni miti ya aina gani tunayotaka kukuza katika mashamba yetu. Kupunguza miti na kupogoa kwaweza kusaidi kuweka miti ikiwa yenye afya na kutupa vitu vinavyotumika miti bado ikikua.

Kwa ujumla, maana ya kupunguza na kuipogoa miti ni kuboresha afya ya kila mti, pamoja na ya msitu wote. Hili litafanyika kupitia kuichagua miti iliyo bora zaidi katika msitu. Kwa aina nyingi za miti, pamoja na miti ya mbao, grevillea, mikaratusi na cypress, miti hii san asana huwa miti mikubwa zaidi, kila mti ukiwa na shina moja lililonyooka. Miti yaweza kuwa na mahitaji mbalimbali ya nafasi kulingana na aina, mahali, ilivyopandwa (miti iliyo mashambani ya mimea ya vyakula ama miti iliyopandwa ili kupunguiza upepo) na tabia nchi, lakini kuna kanuni zingine za kijumla hutumika.

Kukuza miti iliyo na nguvu na afya, nafasi ya mita mbili hupendekezwa. Nafasi hii ni sawa kwa miti mingi ya TIST (grevillea na cypress), lakini kumbuka kuwa miti mingine huitaji nafasi zaidi (miembe na mikandamia, kwa mfano). Kuipa miti nafasi inayofaa huisaidia kupata maji na virutubisho tosha vya kuikuza hadi panapowezekana. Nafasi ndogo zaidi inaruhusiwa miti ilipo michanga. Miti inapokua, miti mingine itakuwa mikubwa kuliko majirani.

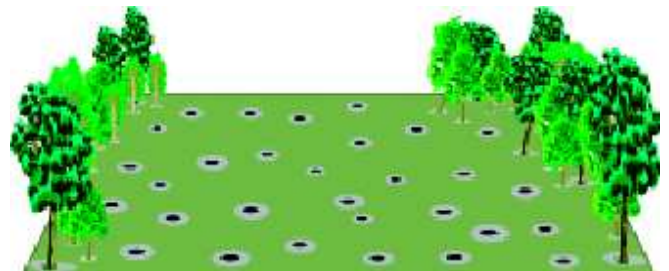
Hii ndiyo miti wapaswa kuacha. Kuchagua ni miti gani ya kukata, angalia miti iliyo bora zaidi na ujue kama ina nafasi ifaayo. Kama haina, wafaa kutoa miti mingine iliyo karibu.

Unapofanya uhamuzi wa kupunguza miti, kumbuka kuwa kiwango cha ukuaji hutofautiana kulingana na aina ya mti. Kama mwembe unakua karibu na mikaratusi mingi, mwembe unaweza kuwa mdogo na unaokua pole pole zaidi ya mikaratusi inayokua haraka, lakini kwa uhakika haupaswi kukatwa kwa sababu ni mdogo zaidi! Kwa kweli, mti kama mwembe ni wenye umuhimu mkubwa kwa sababu ya matumizi yake katika kupeana matunda ya kula na a kuuza.

### **Mazoezi bora unapopunguza miti**

- Iruhusu miti kukua hadi ukomavu.
- Punguza hadi inavyofaa (nambari ya miti katika ekari). Katika TIST, twaweza kuchagua hadi asilimia tano ya miti yetu, baada ya miaka kumi, kupunguza kupitia kuchagua inavyokua na kutuletea pesa.
- Kata miti inayokufa, iliyo na magonjwa, inayooza na isiyo na ubora.
- Linda miti kutokana na uharibifu kutakana na ukataji wa magogo.
- Tumia njia za ukataji magogo zenye athari chache inapowezekana.
- Himiza wingi wa aina za miti.
- Fuatilia msitu wako ili kujua kukizuka wadudu na magonjwa.
- Shirikiana na kampuni za serikali katika kudhibiti kuzuka kwa wadudu na magonjwa.
- Zuia mioto ya msitu.

### **USIFANYE hivi**



**Kukata miti yote**

### **FANYA hivi**



**Chagua mti mmoja mmoja.**



## **Mbinu za vikundi vidogo: Mwingiliano wa kikundi.**

**a) Ni njia gani bora zaidi ya kuwapanga watu wakati wa mkutano wa Kikundi kidogo?**

Msiwe na meza kwa sababu inajenga vizuizi kati ya watu. Msiwe na kiti cha kukaliwa na mtu aliye na muhimu zaidi kati yenu. Katika TIST, sote twaketi kwa njia iliyofanana. Sote hukaa chini udongoni au sote kukalia viti.

**b) Mtafanyaje kukiwa na watu zaidi ya kumi na wawili wanaotaka kujiunga na kikundi chenu?**

Kama kuna zaidi ya watu kumi na wawili wanaotaka kujiunga na kikundi chenu ni vizuri zaidi kuanzisha kikundi kipya. Kikundi chaweza kujigawanya na kuwa vikundi viwili, ama wanakikundi asili watatu au wanne wawe msingi wa kikundi kipya. Hii ni vizuri kuliko mwanakikundi mmoja kujaribu kuanzisha kikundi peke yake. Kumbuka kuanza uongozi wa mzunguko kutoka mwanzo.

**c) Ni mbinu zipi mwaweza kutumia ikiwa nishati ya kikundi iko chini?**

Gawanya kikundi kiwe wawili wawili na uulize kila jozi kujadiliana kuhusu kazi iliyopo. Michezo ya kuigiza husaidia pia. Mara kwa mara kuwasimamisha na kila mtu kusema kitu kizuri ambacho kikundi chao kinafanya husaidia kuwapa watu motisha nyingine. Pia kumbuka kuuachisha mkutano usiwe mrefu. Kwa njia ya kuwa na msaidizi wa kiongozi anayesaidia kuweka masaa, unaweza kuelekeza nishati ya kikundi kuhakikisha kazi inafanyika katika muda uliopangiwa.

### **Ratiba ya mkutano.**

Kutumia muda vizuri, kikundi kidogo chapaswa kuwa na ratiba ya mkutano iliyopangika vizuri. Hii ni muhimu kwa sababu itakusaidia kuzingatia yaliyo katika ajenda na mambo yaliyo muhimu zaidi. Ni muhimu pia kwa sababu katika TIST, tunajitolea kufanya kazi pamoja kwa muda mrefu ili kukua na kudumisha miti yetu katika soko la hewa. Tunahitaji kujua wanakikundi wenzetu vizuri, kwa sababu matendo ya kila mtu hushikilia kikundi chote na TIST yote.

Ni muhimu pia, kwa kikundi chako kidogo kuwa na mikutano ya mara kwa mara, ikiwezekana mara moja kila wiki au mara moja kila wiki mbili. Hili litawapa wanakikundi chenu nafasi ya kuimarisha kikundi na kugawana na kujifunza mafunzo mapya.

Wakati wa mkutano, ni muhimu kuzingatia mambo yaliyo muhimu. Vikundi vingi vya TIST vimeona utaratibu unaofuata ukiwa mwenendo bora zaidi ili kuwa na mikutano ya kufanikiwa:

**Hatua ya kwanza. Salamu na kujijulisha kwa wanakikundi wapya ( dakika tano kufika kumi na tano):** Hakikisha kila mtu anajisikia nyumbani. Hakikisha ni fupi lakini muache kila mtu ajijulisha.

**Hatua ya pili. Maombi ya kuanza (Dakika mbili):**

Ombi fupi laweza kusaidia kuunganisha kikundi.

**Hatua ya tatu. Nyimbo (Dakika tano):**

Hizi zaweza kuwa zilizoandikwa na kikundi chako, au nyimbo zinazowatia watu nguvu kama nyimbo za kidini.

**Hatua ya nne. Kuitikiana kuhusu kazi na masaa (Dakika tano):**

Kiongozi anaeleza yatakayofanyika mkutanoni na wanakikundi waitikie kufanya kazi hiyo. Masaa yatakayotumika kwa kazi hiyo au mjadala yakubalianwe ili msaidizi wa kiongozi aweze kuweka masaa ya mkutano.

**Hatua ya tano. Kazi ya vikundi (saa moja):**

Ili kufanya vizuri zaidi, kazi yapaswa kujadiliana mkutano wa mwisho ukiisha. Kazi zaweza kuwa pamoja na kugawana ni nini kila mtu amefanya ili kusaidia kazi za TIST, kugawana mienendo bora zaidi ya kufanya mambo tofauti, kufunza kuhusu vitu fulani na jambo lingine lolote la maana litakalosaidia kikundi chenu kukua .

**Hatua ya sita. Kujengana (Dakika tano):**

Kila mwana kikundi anasema jambo moja nzuri kwa kiongozi wa wiki hiyo kuhusu uongozi wake ulioonekana katika mkutano. Kuongezea, mtu yeyote aweza kusema ni zawadi gani katika uongozi ameona katika kiongozi huyo.

**Hatua ya saba. Ombi la kufunga (Dakika mbili):**



## Jinsi ya kulima kwa njia ya kilimo hai.

**B**aada ya kuvuna, usiyachome mabaki ya mimea, badala yake yaache chini. Jinsi unavyoacha mabaki zaidi chini ndivyo unavyorutubisha udongo na kuufanya kuwa wenye rutuba. Safu ya haya mabaki yakizunguka chini ya mti au miche husaidia kuongeza kiwango cha maji katika udongo jambo ambalo huzuia miti kutokana na ukavu mingi. Kumbuka kuwa Mabaki ya mimea yanaweza pia kutengeneza mbolea.

- Jaribu kuweka mifugo mbali kwani mifugo ikila itaacha mabaki machache yakifunika udongo.
- Mashimo ya kilimo hai yafaa kuchimbwa kabla ya mvua kuja na ni muhimu kuanza kuyachimba mapema.
- Tia alama utakapochimba mashimo yako, halafu utafute kamba ndefu na ufungie vifuniko vya chupa vikitengana na centimita sabini. Nyoosha kamba kuvuka shamba lako ili kila kifuniko kiwe kati kati ya shimo ili kuhakikisha kuwa mashimo yana nafasi inayofaa kati yao. Tumia jembe kutia alama ya kuonyesha mistari ya mashimo ili kila mstari uwe centimita tisini kutoka kwa huo mwingine.
- Siku hiyo hiyo unapotia alama, chimba mashimo yaliyo na umbo la mvingo. Yafaa kuwa na upana wa centimita kumi na tano, urefu wa centimita thelathini na tano na centimita kumi na tano kwenda chini.
- Unapokuwa tayari kupanda mbegu, ni muhimu kuweka udongo wenye rutuba shimoni ili kusaidia kutia mimea nguvu. Changanya mbolea na udongo mzuri wa juu, au utumie mbolea ya mimea. Ikiwa una saruji na mbolea ya viwanda, iweke shimoni na ujaze kila shimo na mchanganyiko huo hadi centimita tano chini ya ardhi ya kawaida.
- Ikiwa unapanda mahindi, lowesha mbegu kwa maji masaa sita kufika saba kabla ya kupanda. Jambo hili hufanya mbegu kuota haraka na kuweza kuishi. Unapopanda mbegu, panda mbegu nne udongoni kuvuka shimo na ufunike na mchanganyiko wa udongo mnono na mbolea sentimita mbili na nusu. Udongo katika shimo utakuwa sentimita mbili na nusu chini ya ardhi ya kawaida. Mavimbe makubwa magumu ya udongo yanafaa kuvunjwa ili udongo ufikie mbegu vizuri.
- Iwapo unapanda mtama, panda mbegu tano au sita katika kila mwisho wa shimo baada ya mvua nzuri halafu ufunikie mbegu na centimita mbili na nusu za udongo wenye rutuba uliochanganyika mbolea.
- Nafasi inayoachwa juu husaidia maji kuingia kwa mimea wakati mvua inapofika. Bila nafasi hii maji ya mvua yatabebwa juu ya ardhi na kubeba virutubisho vingi.
- Toa magugu karibu na mashimo kila baada ya muda na kila mwaka hutapata kutakuwa na magugu machache na machache zaidi.
- Usife moyo! Kuchimba mashimo sasa kutamaanisha yatakuwa tayari mwaka huu na hutachimba tena mwaka ujao.



## **Kutengeneza mbolea kutokana na mimea – mbolea ya kiasili.**

**M**boleo ya majani ni mbolea ya kiasilia ya kusaidia mimea yako kukua. Ni bora zaidi ya mbolea za viwanda kwani ni ya kiasili na haina athari za kuumiza mimea na mazingira. Kuna njia nyingi za kutengeneza mbolea, lakini njia ifuatayo imekuwa saidifu katika baadhi ya maeneo. Uliza majirani zako katika cluster yako ni gani imewaonekana.

### **Utayarishaji wa mbolea:**

- 1) Chagua eneo lenye upana wa mita nne na urefu wa mita nne la kuchimba shimo lako la taka
- 2) Fagia sehemu hiyo
- 3) Chimba shimo la mduara lenye upana wa mita tatu au nne na mita moja na nusu kina.
- 4) Kusanya masala yote ya mimea uliyo nayo na uyakate kuwa sehemu ndogo ndogo ( kwa mfano majani na mashina ya mahindi, mtama, maharagwe)
- 5) Weka masala haya ya mimea katika shimo ilo hadi kina cha nusu mita.
- 6) Halafu ongeza lita tano za jivu
- 7) Halafu uongeze centimita thelathini (ama kiwango kilichopo) za kinyesi cha mifugo (kwa mfano kinyesi cha nguruwe, ng'ombe, mbuzi au kuku).
- 8) Ongeza safu nyingine ya majani ya mimea na mashina (nusu mita)
- 9) Ongeza lita zingine tano za jivu.

- 10) Ongeza majani na mashina tena hadi shimo likaribie kujaa.
- 11) Hatimaye, ongeza safu ya udongo hadi shimo lijae.
- 12) Unapokuwa ukiweka udongo shimoni, ingiza fimbo ndefu katikati mwa shimo hadi ifike chini ya shimo.
- 13) Liache shimo la taka kwa miezi mitatu (siku tisini).
- 14) Katika kipindi hiki tumia maji yako machafu kuweka katika shimo hili. Kwa mfano, baada ya kuosha nguo au nyumba, yamwage maji uliyotumia juu ya shimo. Ikiwa una mifugo waweza pia kumwaga mikojo ya mifugo juu ya shimo.
- 15) Jambo hili litaongeza naitrojeni kwa mboleo yako.
- 16) Jaribu kuweka maji kila siku kwa njia hii, ama wakati maji yapo.
- 17) Baada ya siku tisini mbolea itakuwa tayari.

Tumia fimbo kama kipima joto – mbolea inapokuwa tayari lazima iwe na joto na waweza kuona mvuke ukitoka kwa fimbo hiyo baada ya kuitoa.

### **Matumizi ya mbolea hii:**

Ukishachimba mashimo yako ya kupanda mahindi, mtama au mimea mingine, ongeza mboleo kiwango kinachotoshea katika kiganja chako katika kila shimo. Angalia ili kujua matokeo!



# Ukataji miti na kuzorota kwa mashamba yenye misitu ni shida kubwa sana. Tunaweza kufanyeje?

**Ukataji misitu ni kutolewa kwa miti na mimea mingine yenye mbao.**

Misitu na vichaka hufunika sehemu moja juu ya tatu ya ardhi. Miti hubadilisha tabianchi, hulinda maji, hutupa vitu vinavyotokana na misitu (kwa mfano, mbao, dawa, matunda na vingine) vinavyo ughali mkubwa na huruhusu mimea na wanyama wengi tofauti kuishi. Hata hivyo inakatwa kwa mwendo kasi; hectare milioni ishirini kila mwaka. Nusu ya wanaoishi kwa hii dunia hutumia misitu kama nishati, hata hivyo watu kama milioni mia moja hawana nishati tosha kutumia kwa matumizi madogo madogo.

## Sababu za ukataji misitu

- Ukataji miti hufanyika wakati mimea inakatwa ili kufungua shamba kutumika kwa njia nyingine kama kufungua shamba ili liweze kulimwa au kwa matumizi mengine kama kutumika kama kuni, kutengeneza matofali, kukausha samaki, kukausha majani chai, kujenga na kama mbao.
- Kuzoroteka kwa shamba lenye msitu ni wakati msitu unakuwa na miti ya aina chache na unashindwa kuyavumilia mabadiliko yanayokuja kwa sababu ya utumizi na usimamizi mbaya (kwa mfano, miti mizee inapokatwa, ikiachwa midogo, ama aina fulani ikikatwa yote, hadi inapotea kutoka msituni, ama msitu unalishwa wanyama zaidi ya inavyoruhusiwa, hadi miti inashindwa kukua badala ya iliyokufa).
- Ukataji miti na uharibifu wa shamba lenye msitu mwingi hutokana na kutokuwepo kwa ujuzi kuhusu thamani kamili ya miti.
- Wakati mwingine, thamani ya miti yaweza kuwa inajulikana lakini umaskini na kutambulika kusio sahihi kuhusu ukosefu wa lingine la kufanya hulazimisha watu kukata miti.

## Shida zinazojitokeza kufuatilia ukataji wa misitu

- **Mmomonyoko wa Udongo:** Ukosefu wa miti ya kufunika ardhi na mizizi huacha udongo hatarini na huruhusu mmomonyoko wa udongo.

- **Ukosefu wa rasili mali ya msitu tunayohitaji:** kukata miti huharibu mahali pa wanyama pa kuishi, hupunguza viumbe hai/bioanuwai, hutoa rasili mali ya chakula na dawa na huongeza ushindani ili kupata vifaa vyz ujenzi. Watu wanahitajika kutembea mbali zaidi ili kupata kuni, na bei za bidhaa zinazotoka misituni zinapanda juu sana.
- **Ukataji misitu unamaanisha ukosefu wa faida nyinginezo za miti:** miti hupunguza upepo, uhifadhi unyevu, huongeza hewa safi hewani, na huongeza virutubisho udongoni. Kwa hivyo bila miti hali ya anga ya mahali hapo itakuwa kavu zaidi na kuongeza hatari ya mafuriko, mmonyoko wa udongo unaosababishwa na upepo, kupunguzwa kwa rutuba ya udongo na kupunguzika kwa usafi wa hewa.

## Tunaweza kufanyeje ili kuzuia ukataji wa miti?

1. Kuanzisha vitalu vya miti na kukuza miti ya kupanda na kupeana au kuuza miti kwa wanajamii. Twafaa kutia moyo wengine kupanda miti pia, na kujiunga na TIST!
2. Tumia meko ya kuokoa nishati, ambayo hutumia kuni na makaa chache
3. Tumia nishati badala inapowezekana (kwa mfano, joto la jua, machujo ya mbao, maganda ya kahawa, nyasi, magugu, mabaki ya mimea, taka za wanyama).
4. Kujihusisha na shughuli za upandaji miti za jamii. Kuweni kikundi kizuri cha TIST chenye mafanikio!
5. Himiza majirani na marafiki yako pia kuingia katika TIST
6. Usilime shamba lililopakana na mto. lache miti na mimea kumea ili kulinda maji haya
7. Kuwa mwenye macho usije ukalisha mifugo shamba kuliko inavyoruhusiwa. Usitake mifugo ikaribie miche isije ikaharibu na kunyimu msitu nafasi ya kukua mara ya pili.
8. Himiza kilimo mseto na matumizi ya mashamba madogo ya miti. Kuwa na miti shambani mwako hukupa vitu vinavyotokana na msitu na husaidia kulinda msitu ulio karibu.



# Mazingira Bora



# TIST

The International Small Group & Tree Planting Program  
www.tist.org

**Kikamba Version**

An Environmental, Sustainable  
Development and Community Forestry  
Program.



Members of Giaki TIST Cluster during their monthly meeting last month.

## **Inside:**

**Kutaanisya miti kwa kwiana kwailu kwa miti, ndukenge.** Page 2

**Nzia ila itumiawa ni tukundi tunini: Ta kulikangana na kukwatangana.** Page 3

**Undu nima ya kusuvia yikawa.** Page 4

**Kuseuvya vuu wa yiima -Vuu ute na kemikoo.** Page 5

**Kwanangwa kwa mititu na kwanangika kwa itheka sya mititu ni withiitwe wi thina munene. Nata tutonya kwika?** Page 6



# Kutaanisa miti kwa kwiana kwailu kwa miti, ndukenge.

Ithi nthini wa TIST vakuvi ithyoothe nituatiiaa mawalany’o na nzia nzeo sya tist tuatiie na kwikala kuatiiana na wiw’ano ula tweekie saii. Ni andu anini ala matulile wiw’ano uu na meenga miti yoo yonthe na mamita kutumiwa nziani ingi.. kwa w’o ni anini kwi kilio kya 1% kati wa miti ila ivanditwee nguumoni syi mbee wa 40,000 sya TIST nthini wa Kenya ila syengetwe myakani 8 ila TIST yithiitwe iithukuma vaa Kenya.

Kitumi kya kutaanisa miti kila ivinda ni kuvikia kwa miti kwiana vya vate kuvingiisana na ingi na vaita wa muti ula watiwa kwongeleka. Kutaanisa kuu nikunenganae ngu, miti ya kwaka, na moseo anga ala maumaas mutini muteme kwa ene TIST. Kii nikyo twithiawa na walany’o museo wa kwikalya mititu kwa kuketha iyingiva 5% ya miti ila twinayo kwa mwaka ethiwa yina myaka ikumi kwambata no ti itheo wa myaka isu.

Yila memba wa TIST waamua kwenga miti yake ,ni uumiasya kakundi kake kala ke nthini wa ngwatanio ya tist nthini wa Kenya. Kwa w’o wiko uu wa andu asu anini nuetae nthina munene kwa kila umwe. Twiikwata tukundi tunini na a member oothe kumanya na kuikiithya vaiumwe unatemanga miti yake itavikiite ivinda ya utemwa.

OLC nikuthukuma vamwe na amwe ala meekie makosa ma kutema miti yoo yoonthe na kusisya walany’o ula matonya utumia kuikiithya andu asu nimavanda ingi ukwati woo nthini wa walany’o wa TIST nikana methiwe matonya kutethya aimi vandu wa kumaumisy.

Yila tweekie saii wiw’ano wa GhG Agreement, twithwaa tweekyuma kwikalya miti yitu ila tuvandite ta ya Tist vandu va myaka 30 mbee wa kumiketha. Kii nikimwe kati wa itumi ila twaile usisya mbee wa kuvanda miti ni miti yiva tukwenda nthini wa miunda yiotu na ikwithiwa itonya kwikala kwa ivinda yiu iteudemwa. Kusea na kutaanisa miti ni useo nundu niku nengae miti kwiana nesa na kuitunenge vaita wa utumia usyao wa miti o iendee na kwiana.

Kwa vamwe vata wa kusea na kutaanisa miti ni kwailya uima wa muti na mutitu w’ontho. Uu wikawa kwa kusuvia miti ila miseo mutituni kwa kuveta ila itena uima museo na ila itonya kutuma uyu museo uteana nesa. Kwa mithemba mingi ya miti ta mikuvulya, minyoonyoo, misanduku miti ya kuveta ni ila minene ila yina muthamba umwe mulungalu. Miti niyithiawa na mawendi kivathukany’o ya mwanya kwianana na muvai wa muti na niva ivanditwe na ivandiwe ki (ta miti ivandaniw’e na liu kana ya kusii nzeve), uvinduku wa nzeve onakau mawendi amwe methiawa kwa kila muvai.

Kumea yina vinya, na yaile miti kaingi niyendaa utaanuu wa matambya eli kana maingi. Mwanya uyu wa matambya eli kaingi uthukumaa kwa miti ta mikuvulya na misanduku. lilikana ka miti ingi niyendaa mwanya munenange ta miembe na mikandania. kunenga miti mwanya ula waile ninengae miti ivuso ya kukwata kiw’u nesa na unou kuma muthangani na kwiana undu vaile. Kuvanda miti uthunganie vanini nikwitikilikaa kwa miti

yi mini indi oundu miti iendee na kwiana imwe niyonekaa yi minene kwi ingi. Miti ino minene kwi isu ingii niyo yaile kuekwa na ila minini iteanite nesa kuvetwa, Sisy miti ila minene na miseo yila usakua miti ya kutia uendee na utaanisa miti. Ethywa yothe no miseo sisy uole imwe nikana ivikie utaanuu ula waile na yithiwe itonya kwiana nesa.

Yila usakua miti ya kuveta lilikana, kwiana kwa miti kuendanasy na muvai wa muti nundu mithemba imwe niyianaa kwi ingi. Ethywa ni kiembe kimeete vakuvi na musanduku, kiembe nikyonekaa ta kite kwiana nundu musanduku wianaa mituki, kii ti kitumi kya kuveta kiembe nundu ni kinini anyee. Sisy useo na vaita wa muembe ni mwingi kwi wa musandu nundu muembe no utumike ta liu na no ukunenge mbesa wata matunda maw’o.

## Mawiko maseo yila utaanisa miti

- Eka miti ila ya liu yiane nginya ivike
- Ola miti yanie ila yaile uyiatiia walany’o wa miti ila yaile kwithiwa nthini wa eka umwe. Nthini wa TIST no tusakue nginya 5% ya miti yitu itina wa myaka ikumi,
- Kutaanisa oundu iendee kwiana na iendee kutune ukwati.
- Kuveta ila myumu, miwau, iendee kwoa na ila itemiseo.
- Suvia miti kumana na kiw’u kuema uthi
- Tumia nzia ila itatuumanasya kiw’u
- Kwata mbau uvandi wa miti mithemba kivathukany’o
- Syaiisya mutitu waku kumana na tusamu tula twanangaa na uwau
- Ngwatana na athukumi kuma ngwatanioni sya selikalini kusii mowau na tusamu tula twanangaa mititu.
- Siia mwaki wa kitheka.

## NDUKEKE UU



Clear cutting

## IKA UU



Single tree selection



# **Nzia ila itumiawa ni tukundi tunini: Ta kulikangana na kukwatangana.**

**a) Ni nzia yiva nzeo ya kuvanga andu tukundi yila mwi mbumbanoni?**

Kilinge kinini nikiseo muno. vaikethiwe na mesa kati nundu noithukume ta ukuta kati wa andu vaikethiwe uvanthukanu wa kila kikwikalilwa ethiwa ni kivila ateo kwa mundu munengete ndaia mbee. Ingi nthini wa TIST ithyoo the twikalaa nthi undumwe ethiwa ni muthangani kana ivilani kwa kila umwe.

**b. Nata mutonye kwika ethiwa andu mbee wa 12 nimekwenda kulika kakundini kenyu?**

Ethiwa ve andu aingi mekwenda ulikana nenyu nikavaa kusevya kakundi kangi kana tungi twili vena mainyiva ene ana kana atatu kuma kakundini kala kambee (amemba ala akuu). Uu ni useo mbee kwi mundu umwe kwenda kwambiia kakundi eweka. Lilikanai kwambiia utonoi na kusumia nzia ya utongoi wa kithyululu.

**c. Ni nzia myau utonya utumnia ethiwa vinya wa kakundi winthi?**

Aanai withie ni andu eli eli na kila umwe ayosa undu uu ta muio wake. Ingi mathau ma malimano na nthekany'a ni matetheeasya kwongela ngwatanio vinya na uthangaau. Ingi kunee niea wia wenyu museo kwakwiyonany'a mwi mbee nikutumaa angi makwata vinya na thambuu. Lilikanai yila mwoombana kulea kuselewa na kumina mbumbano tene. Kwithiwa na munini wa muungamii imusyaisya wa masaa nokutume kila umwe ekia vitii na kuthangaa kwona wia ula walanitw'e niwathela masaani ala maile.

## **Walany'o wa kukomana**

Nikana musuvie ivinda tukundi tunini nitwaile kwia walany'o museo wa mbumbano. uu ni useo nundu nukumwia mwina mwolooto wa kila angyendani ya muthenya usu na mawia ala maile kwianiw'a muthenya usu. Ingi ni useo nundu nthini wa TIST nitweeyumisye kuthukuma vamwe kwa ivinda yiasa kuvanda na kuea miti yiane kuvikia soko wa nzave itavisaa. Nitukwenda kumanya tukundu tunini twitu na ena mwatw'o na kwona ni itambya yiva tutonya kwosa kuikiithya ithyotho na TIST nitweethiwa na kivathukany'o.

Ni undu wavata kumanya kakundi kaku kanini nikaile kumbana kaingi ona ethiwa ni keli kwa mwai. Kii nokiete kwosa vinya kwa kikundi kyenyu kwa kuthuthany'a na kila umwe kunenga ula ungi utao na undu wikite kwake omithenya ila mutela onana na kila kinakivathukany'o na kitonya uete ualyuku museo kwa kila umwe vamwe na uu mawoni meu.

Yila mwoombana niuseo kwia mbee maundu ala mavata. Tukundi tunini twingi nitwoonie kuatiia nzia ithi syi vaa nthi kwi kwavata nthini wa mbumbano, na matambya asu ni:

**Itambya 1. Ngethi na kwimanyithany'a kwondu wa andu ala eu kikundini (Ndatika 5-15):**

Ikiithyayi kila umwe niweew'a e muthokye, kila umwe etavany'a kwa mituki.

**Itambya 2. Mboya sya kwambiia (ndatika ili (2))**

Mboya nini nguvi noitethye kwa kwongela ngwatanio.

**Itambya 3. Wathi (ndatika itano 5)**

Uyu no withiwe wi wathi usevitw'e ni kikundi kyenyu kana wathi wa Ngai wina uthuthio kwa kila umwe

**Itambya 4. Kwiw'ana undu mukwika na mwitumia ivinda yiana ata (Ndatika itano(5))**

Mutongoesya akaeleany'a kila kikwikwa wumbanoni na ene kikundi mayitikila kwika. Masaa ala meutumika kwa kila undu nonginya mambe uneenewa na munini wa mutongoesya no ethiwe emusyaisya wa masaa.

**Itambya 5. Wia wa kikundi (Isaa yimwe I)**

Nonginya muimina kila wumbano nimwithiawa muneene wia ula mukoka uthukuma wumbanoni ula ungi. Ngelekany'o ethiwa no kila umwe kutunga livooti ya undu wikite kutetheesya TIST na mawalany'o na uthukumi wayo museo. Kumanyiany'a nzia nzau na maundu angi mavata ala matonya utuma kakundi kenyu keana na kwaila.

**Itambya 6. Kwakana (ndatika itano (5))**

Kila mumemba kunengane ondeto imwe ya kwakana onaethiwa ni yiulu wa utongoi. ingi kinengo kila kikivathukany'o kyonekete kwa mutongoi nikyaile uwetwa ethiwa kivo.

**Itambya 7. Mboya ya kumina/ kvinga wumbano (ndatika ili (2))**



## Undu nima ya kusuvia yikawa.

**I**tina wa ngetha ndukavivya matialyo ma mimea. Vandu va kuvivya ekana namo nundu nimeunenge

muthanga unou yila me kwoa ona ingi nimavwikite muthanga ethiwa kuna mbua. ukavwika mimea vaa wungu na matilyo asu niwasiia kiw'u kuny'aa na uyithia kimeu nikyekala kwa ivinda iasa na uyikala uteungithya miti / mimea isu kwa kavinda nundu kimeu kivo. Ingi lilaka matialyo asu no umatumie kuseuvya vuu wa yiima.

- Tata usiie indo iikalike muundani na kuya vo, nundu mimea na mavuti ala mavwikite muthanga nitonya uya ikamina kyothe kila kiwwikite muthanga.
- Ingi maima ma nima ya kusuvia maile kwiswa mbee wa mbua itanambiia. Kwoou ni useo kumesa tene.
- Ikiya uvano vala ukwenda kwisa maima, osa ikanda iasa kana ulii na uyiveea tuvululu twina utaaniu wa 70cm. Tambuukya ikanda /ulii usani wa muunda waku. Kila kavululu ni vala ukwisa yiima na katetheeasya kwikia utaaniu wianene. Vana utaaniu wa misitali uitumia iembe. Misitali yaile utaaniu wa 90cm. Ikiya uvano wa maima na misitali ila ukwona utonya umina muthenya usu.
- Muthenya ula weekia uvano now'o waile inza maima asu. Maima aya maile ithiwa mena uthathau wa 15cm na uasa wa 35cm na uliku wa 15cm.

- Wamina kwiyumbania uvanda ni useo utumie muthanga ula munou kuvika mbeu nikana imee yina vinya. Osa vuu na muthanga wa yiulu uvulanie vrika naw'o yiima utie uliku wa 5cm wa kutetheesya kutwiikania / kutuumania kiw'u kwaua.
- Ethiwa wivanda mbemba inda vandu va masaa 6-7 mbee wa kuivanda. kii kitetheeasya mbemba kumea na mituki na mbingi kwikala. wamina vanda mbeke inya uasani wa yiima. Vrika na muthanga wina vuu ta uliku wa 2.5cm. Itina wa uu mwanya ula uutiala wiithia nita 2.5cm. uliku ula uutiala ndwaile ithiwa muliku kwi uu, maveli indi yothe nimaile uawa mbee nikana muthanga uvikie mbeu nesa.
- Etiwa wivanda muvya ngii / mbindi 5-6 nisyaille uvandwa yiimani yimwe itina wa mbua kua nesa. vrika na muthanga uvulene na vuu uliku wa 2.5cm.
- Mwanya ula watiwa maimani aa utetheeasya kutuumania / ukwatya kiw'u kiikanthi kitananya nthi. Vande mwanda uu wa nyiima kiw'u ni ukita uyululuka na kuthi kikuite muthanga na unou waw'o.
- Ima uthyululukile maima aya kaingi nikana kuveta yiia na withie niyaoleka muno.
- Ndukakw'e ngoo! Inza maima maku oyu wetelee mbua yukite na ndukenza ingi mwaka wukite.



## Kusevya vuu wa yiima - Vuu ute na kemikoo.

**V**uu wa yiima ni vuu usevitw'e vate ndawa na mimea kuma muundani na nutumaa mimea yiana nesa. Ni museo kwi vuu wa kuuu ula wina kemikoo nundu niwakuma mniemani na niwamana ti wakuu na nwanangaa liu kana mawithyululuko ta vuu /vatalisa wa kuuu. Ve nzia mbingi sya usevya vuu uyu, lakini ve nzia imwe nzeango kwi syothe isioni imwe. Kulya mutui waku wa ngwatanio yenyu kila kithukumite nesa kwoo.

### usevya vuu wa yiima.

- 1) Kusakua kisio kya matambya 4 x 4m na kwisa yiima.
- 2) Enga kisio.
- 3) Inza yiima uthathau wa 3 - 4m na 1.5uliku.
- 4) Kolany'a matialyo ma mavemba, muvya, mavoso na uutilanga tulungu tuniini.
- 5) Ikia yiimani itumie uliku wa 0.5m.
- 6) Ikia muu wa lita itano.
- 7) Ongela kyaa kya indo ethiwa kivo kya uliku wa 30cm ethiwa vaii oundu kiana (uyu ni vuu wa nguluwe, ng'ombe, mbui kana nguku).
- 8) Ongela matu na makusa uliku ungi wa 0.5m.
- 9) Ikia muu ungi wa lita itano.
- 10) Ongela matu na makusa withie yiima notayausua.
- 11) Ususya yiima na muthanga.
- 12) Uyususya yiima ikia muti muasa kati withie utinite yiimani ungu.
- 13) Eka yiima yiu yiyiue vandu va myai itatu kana mithenya miongo kenda.
- 14) Ivindani yii yonthe osaa kiw'u kila kina kiko uketa vo ngelekany'o kila wavua nakyo kana kuthambya miio. Ethiwa wina maumao ma indo no wite vo.
- 15) Kii nikyongelaanzeve ya Nitrogen nthini wa vuu.
- 16) Tata navinya ungithye yima yii kila muthenya kwa nzia ila utonya.
- 17) Itina wa mithenya miongo keenda vuu wiithiwa wi tayali.

Tumia muti uyu wikati ta kithimi kya uvyuvu. Vuu wasuva ukeethiwa wimuvyu na nowone muti uuyu waumya uitoa.

### Utumii wa Vuu wa yiima.

wenza maima ma uvanda mbemba, muvya kana o mimea ingi ikia ngundi imwe ya vuu kila yiimani. Syaiisya wone kila ukwata kuma vo!



# **Kwanangwa kwa mititu na kwanangika kwa itheka sya mititu ni withiitwe wi thina munene. Nata tutonya kwika?**

**Mititu yanangawa yila miti yatemwa na ikuthu ila ivwikite kisio kiu kuvetwa.**

Mititu niwkwite kisio kya ta imwe iulu wa itatu kya nthi yothe. Mititu niyietae uvinduku wa nzeve, ikasuvia w'umo wa kiw'u, ikatune mosyao mayo ta ngu, mbwau, matunda, ndawa na angi maingi maundu aya ni malato munene na nitetheeasya mithemba ya miti na nyamu kwithiwa/kwikala. Indi niendee na ngwanangwa kwa kilungu kinene kya milioni miongo ili kwa kila eka umwe kila mwaka. Nyusu ya ekali manthi metethasya kwisila mitituni ino ta kwa mwaki/ngu, navaili oou andu ta milioni iana yimwe mena uvungulu wa mwaki/ngu wa kutuma meka maundu manini ala maile ika.

**Ni itumi syiva ietae Thina wa Mititu munamuno:**

- Mititu yanangawa yila andu meenga mayenda kuima, kuithya, na kutumia ngu, kuvivya mavali/matuvai, kutoesya makuyu, kuthia mbaki, kumya maiani, kwaka na mbwau.
- Kwanangika kwa mititu kwithiawa yila mutitu wavutha na weethia ndutonya kwikala nundu wa kutumiwa nai na vate muvango. Ngelekany'o yila miti mikuu yatemwa na vaitiwa ikuthu syoka, kana yila muthemba muna wa muti niw'o ukutemwa na kuvetwa, kana yila mutitu usu waithw'a muno uteunewa nzeve ukeyaka, na yila mutitu uteuekwa miti ikeana kuvwika kilio kya ila mikw'u.
- Kwanangika kwa mititu na itheka syayo kuetawe ni unyivu wa umanyi iulu wa vata na vaita wa mititu/miti.
- Kundu kungi vata wa mititu nowithiwe wisikie indi nundu wa thina andu mayona titave nzia ingi ya kwikala andu maitema miti na kwananga mititu.

**Mathina ala maumanaa na kwanangwa kwa mititu.**

- **Kukuwa kwa muthanga:-** Yila vate kindu kiwkwite muthanga muthanga niwithiawa ute mulumu na kwoou kukuwa ni mituki.

- **Kwaa kwa maueti ma mititu:-** Yila miti/mititu yeethiwa itevo vethiawa vate wikalo wa syindu ila syaile ithiwa vo nundu vayithiawa liu, ndawa, naindi kulimana kuyingiva na thoowa wa syindu ta ngu nakila kingi kikwatikanaa mitituni uyithiwa wi iulu muno.
- **Kwaa kwa vaita ingi sya miti thini wa mawithyululuko:-** Miti nisuviaa kiseve kikanange, nitumaa kimeu kikala, niseuvasya seve ya andu kutumia, niyongelaa unou muthangani. Indi vate miti withiaa nzeve ya kisio niyavinduka na kweethiwa na munyao ingi kukethiwa na muthanga kukuwa ni nzeve kana kiw'u, unou wa muthanga kuoleka na nzeve ntheu ya kuveva.

**Tutonya kwika ata indi kusiiia kwanangika kwa mititu na itheka syayo?**

- Kuseuvya ivuio na kunengane ka kuteea atui na mbaitu miti ino ya kuvanda.
- Kutumia maiko ma usuvia mwaki/ngu ala mendaa makaa kana ngu nini.
- Kutumia nzia ingi sya mwaki (ta kutumia sua, makavo, nyeki, yia, kyaa kya indo, makoloso)
- Kuvanda miti na kutwika umwe wa nduika sya TIST. kuthuthya atui na anyanya malike ngwatanioni na ikundini sya TIST.
- Ndukaima nguumoni sya mbusi kana vala ve ndia. Eka miti na ikuthu imee isuvie kiw'u kiu.
- Ithiwa wi metho ndukaithye kitheka kikauke vvu. Siia indo kuthi vala ve miti minini iendee kwiana (nundu indo niisaa mithya na kutuma ieka kwiana) nikana yithiwe itonya kuseuvya mutitu.
- Thuthya andu kuvanda miti ona miundani kana kuvanda miti mithei kisioni kinini kithekani kwoo/kwaku. Kwithiwa na miti kithekani kyaku kwiutetheesya we kwithiwa utonya ukwata syindu syothe utonya kwithiwa uyenda kuma mutituni na kwoou usuvia ula mutitu wivakuvi naku.

# Mazingira Bora



# TIST

The International Small Group & Tree Planting Program  
www.tist.org

**Kipsigis Version**

An Environmental, Sustainable  
Development and Community Forestry  
Program.



Members of Giaki TIST Cluster during their monthly meeting last month.

## **Inside:**

**Kechoror ketiguk sigogorogitu ak ibagach kolulet.** Page 2

**Mitindoishek chepo groupishek che meng'echen: Kotuyet tap ke en Groupishek.** Page 3

**Ole kisibto.** Page 4

**Ketoo keturrek chebo minutik.** Page 5

**Tiletab ketik ak wechetab imbarenikab osnet ko uinwek che echen. Nee ne kimuche ke yai?** Page 6



# Kechoror ketiguk sigogororogitu ak ibagach kolulet.

**K**iboboi mising amun kingen kele membakab TIST kosibi tolochikab TIST ak kotebie en koyochinet ne kioyan. Ngerin temikab TIST che kibus koyochinoton, miten che kilit ketik ak kuwalta koboisien, kebeberiat 1% en imbarenik 40,000 che kigimich ketikab TIST en kenya ko kogonam kotit ketik en kastab kenysisiek sisit kongeten igeto TIST en kenya.

Amune asi kechochor ketik kosigobwa kome ak konget kotonontos kinyoru kuwetik, postisiek ak chegitesen en eche temikab TIST niton anyun komitenngatutiek neribe osnet anan asi konget ketik muwoe kole keges kebertain 5% en ketik cheitinen en kasartab kenysisiek taman kongeten igemin nyon kabit imbaret ne kogitinen ketik tugul, kogonu asenet neo mising en kurubit, en kilasta ak en emet tugul. Biik chengerin cheimuchi kogochi biik alak asenet neo. Kimongu biikab kurubisiet chemengech ak kilasta kogasit komtil ketik en kasarta nemonyolu.

Kondoikab oli kotonyi boroindo koboisii biik che kogikochi lelutiet kou tiletab ketik amun kimogin biik konyor melegto en ketik asi kotestai tetetab TIST.

Kin kogagiochin en koyosienyon (ghg) kogimitech niton kerib ketik chegigemin ago moetenech keges koit kenysisiek sosom, niton kogobwotutiet ne kararan missing kibwat kele ketik ochon chegimuchi kegol en imbrenikyok kechoror ketik ko kararan amun kinyorune kelut ak kobwa kochok ketik.

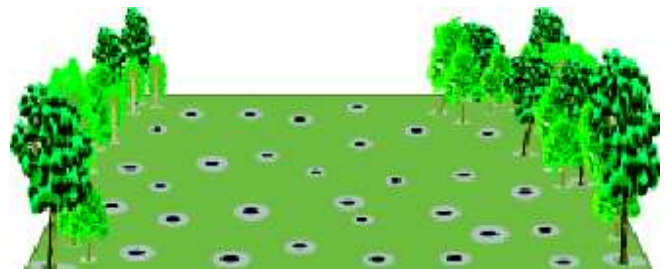
Ye kiyoe kouniton kogochin ketit konyor itondo ne kararan ak kobit osnet ne kararan niton koribetab ketik ak kemin alak miten alage kou kipkaa, sebesebe, chepkogutgei ak cheborus ko ketik chegitu agomotinye temenik chechang, ketik agetugul kotinye mogutik kiik, anage kobo kwenik, tere alage koristo alage kemine ak rurutik. Alage kowole itondab emet.

Nyolunet anyun kemin ketik kokwontik oeng anan kosomok, asi konyor kimlotet ketik niton ko koyochinetab TIST. Ketik alak (kou maembe ak avocado) komoche kokwoutik chechang chesire mut, enyor ketit kokwoutik cheyome konyoru beek ak omitwogik cheyome go etu kitit komie. Monyolu kemin ketik kochilgei amun moegitu ago norchin omitwogik alage koechen.

## Koborunet ne karan ak minet.

- Chomchin ketik korut kot koit kogong .
- En TIST kochamtaat inges ketik kebebertain 5% en ketik cheitinye chebo kenysisiek taman asi inyoru melegto.
- Isten ne meat, ne mioni ak nemotinye kenut.
- Boisien tugul cheitinin chimiten kwony en oliyet.
- Min ketik chegororon.
- Ruten iger ketikuk igomiten ne mioni anak kogonam isirek.
- Oyomegei ak biikab sirigali asi komuch koter miyonuwokik anan ko isirek che ome ketik
- Ogeter anan ogerib mat.

## DO NOT do this



Clear cutting

## DO THIS



Single tree selection





# Mitindoishek chepo groupishek che meng'echen: Kotuyet tap ke en Groupishek.

## a) **Ne oret ne kimuche kepanganen pik en tuyoshek chepo groupit?**

Oret ne kararan ko kechop circle. Matonde mezoshek amun iku koimutyet. Matochop ngecherok che echen anan ko ngecherok alak tugul chebo pik che bo maana. En TIST, ketibotosi tukul kokerkeit. Kimuche ke toboten tugul en ng'echerok anan ketobote en ng'weny.

## b) **Nen ne iyoe yon moche kochut pik che ite taman ak oeng' grouit?**

Angot komi pik che sire taman ak oeng' che moche kochut groupit kokararan inda kichope groupit ake. Imuch kebchei groupit koyop oengu, anan konget membaek somok anan ko angwan chebo groupit neta kochop core nebo groupit ne kitou. Inoni ko kaikai kosir koto membayat ageng'e. Obwat oboishen zungganet ab kandoinatet kobore konam.

## c) **NE oret ne omuche oboishe yon kiten inguvut nebo groupit,?**

Bchei groupit korop pairishek. Toret kora drama. Saaishek alak ketononi, ak kekaskomwa chi tugul ki ne ibwate agobo groupit. Obwat kora orib saaishek asimakoit tuyet. Yomeke kecheng' netoreti kondoindet en ripet 'ab saaishek, Imuche igeshi nguvushek chepo groupit iger ile kakai kasit nekokitokchinke.

### **Ole kiyuito tuyet.**

Asi kerip sait komye, Groupit ne kiten koyoche kotinye schedule nebo tuyet. Inoniton koba maana angamun kere kole kotar agendas chebo maana koron. Kora koba maan en TIST angamun, kikekonu ke en boishet nebo minet 'ab ketik, kemin ak kerip ketik chebo carbon markets. Yoche kora kenai membaekchok en groupishek che meng'echen komye, angamun chitukul kotinye jukumu en groupit ak en TIST kotugul.

Bo maana kora koyai groupishek tuyoshek kila mara, sana sana en kila wikipit anan ko oeng' en wikishek oeng'. Inoniton kokochin membaek koneteke

en groupit ak kotech groupit ko mugul ak konai tuguj che imbya.

En tuyoshek chuton, kobo maana keker tuguk che bo maana. Groupishek che chang' en TIST kokoker kole boishe mtindo ne isubu en tuyoshek.

### **Stepit neta; Kokotiet ak Tachet'ab membaek che imbya(5 - 15 minutes):**

Hakikishan ile kokas chitugul komi komye. Ingonwakit lakini bokokchin chitugul komwa ge.

### **Stepit nebo oeng;. Saet ne kiyoten tuyet (2 minutes):**

Saet yon kinome tuyet kotoreti groupit koik kibageng'e.

### **Stepit nebo aomok; Tyenwokik (5 minutes):**

Imuche koik tyenwokik che kisire membaek, anan ko tyenwokik che ituitos pik kou chepo kanisa.

### **Stepit nebo angwan; kiyonchindos sait ak boishonik(5 minutes):**

Ororu kondoindet boishonik che kiyoe en groupit ak koyon chin membaek koyai kasishek choton. Kasarta neki boishen en kasit ake tugul koyoche kiyonchin asi kong'et co-leader kotoret korip saishhek en tuyet.

### **Stepit nebo mut. Kasishek ab groupit (1 hour):**

Yoche kokidiscussen boishonik en tuyet ne kikobata. Boishonik komuch koik tuguk che kikoret chitugul groupit groupit anan ko TIST, training en tuguk che bo maana, ak ki ake tugul ne imuch kotoret groupit kota kwo taa kosir ole mi.

### **Stepit nebo lo. Tachet'ab ke (5 minutes):**

Kila membayat koyoi teset en TIST. En teset komuche kobor chei kit ne talenta en kondoindet.

### **Stepit nebo tisab. Saet ne kikeran tuyet (2 minutes):**



## Ole kisibto.

**Y**e kaiges kesutik komat ibel  
ngetunanik ingotebi imbar asi  
kogochorotiyo asi konyor

okwoindo ngungunyek, nebo oeng ko kochin  
imbar kotitindo. Agot ketik kosiche beek agichek.

Kimuchi ke tounen keturek.

- Amat ichomchi tuga kwam mobek amun  
mongetu ngetunanik ago menyoru rurutik  
chechang tun.

- Keringonik kesib kebole en kasartab  
kemeut.

- Lewen oleimoche ibal icheng borowet ne  
goi asi imuch koteta keringonik en  
kokwoutik ak en tebesindo ko (90 cm).

- Kokwoutikab keringet kouni:15cm wide,  
35cm long and 15cm deep.

- Ye negit igolse ituch ak ngungunyek  
chebusbusen asi tun kogimit rurutik.Tesin  
keturek ak iburuchen tugul ingonget 5cm  
en barutab keringet.

- Agot ko bandek koibie kesuwek 4  
keringet,tesin ngungunyek kogeny got  
konget 2.5cm nito ko si kotoche beek

- En mosonyik ko 5-6 ak iyai kou bandek.

- Semberet kitutin keringet orit en kobogora  
asi kogochi kesiwot koet ak kokimit. En  
kwenutab tebesinto kesuwoche ak ketugen  
lainit asi kotoret en beek anan ngot ko  
susuwek ibaen tuga.

- Keringonik imuchi iboisien en kenysisiek  
chema ngerin yeirib kome.



## **Ketoo keturrek chebo minutik.**

**K**eturek ko toreti mising minutik kochok en ngungunyek. Ago kororonon amun motinye ngemet en rurutik ago nyumnyum kenyor ago motiye oliyet neo mising, motiye ngemet en agobo Itondab emet.

Miten anyun orinuwek chechang che kimuchi ketounen keturek en koborunet ne isibu ko kigoyomnda biik chechang temik. Otebenge en Kilasta ole kiboisio to biik alak.

### **Tounet ketoo kechob keturek.**

1. Lewen ole imuchi ichoben keturek (4m by 4m).
2. Itilil yoton.
3. Bal keringet netinye kokwoutik 3m - 4m - 1.5m kochut orit.
4. Iyum anyun ngetunanikab imbar tugul ak itonaton komengegitun ak itorchik keringet chon ko kou (sogegab ketik mobekkab bandek, ngendek) ak alakau.
5. Torchi keringt koit 0.5m.
6. Tesin beekab 5ls chebo orek.
7. Tesin sorowekab tuga, neng, lgogenik kot koit 30cm.

8. Tesin ngetunanaik kot koit 0.5m.
9. Tesin beek 5ls chebo orek.
10. Testai itesi ngetunanik got konyi keringet.
11. Tesin baragut ngungunyek.
12. Ye itestai icheng bitoiyot ne koi ak ilumchi kwenutab keringet kot kotiny kwony.
13. Igomuny keringet kotar betusiek 90(orowek somok).
14. En kasariton tugul itestai itumchi beek chon kiunen tuguk en kaa. Ingot itinye tuga imuchi iyum sogororek asi itesi keringet.
15. Niton kotesin nitrogen.
16. Yai kouniton en betusiek tugul.
17. Ye kagobata orowek 3 ko koruriyo keturek.

Togunen burgeyet ne mi keringet.

### **Boisietab keturek:**

Ye kagoit ichob imbaret inam ibal keringonik kosibgei ak minutik cheimoche igol. Keringet angenge koibe keturekab rubeito, rib anyun wolutik che bitunen imbarengu.



# **Tiletab ketik ak wechetab imbarenikab osnet ko uinwek che echen. Nee ne kimuche ke yai?**

## ***Niton kotiletab ketik eng osnet ak bukonok si ketemis.***

Osnosiek ak bukonok koityin agenge eng somok nebo ngwonydet.terei walutikab barakak,ribei ainosiek ak ko konu (pakoinik,kerichek,logoek ak alak) che konu bilionishek ak kotoreti milionishekab ketik ak tiong'ik. ako any weketab chutan komi barak nebo milionisyek tiptem eng kila kenyit.Nusu chebo bik eng ngwony kotiengei eng kwenik,ako bik che negit millionisiek 100 ko ma tinyei ot kwenik tuten che boisen.

## **Taunetab tiletab ketik:**

- Tiletab ketik koname yon kagiisto ketik asi keyai boisionik che bo temisiet anan ko ribsetab kiyagik ak en boisionik che u kwenik, chopetab matubaruk, koyoetab nchirenik, kayamsetb tomotet,kayamsetab majanik, tekset ak bakoinik.
- We getab osnosiek ko yon kainaam osnet ko metinyei ketik ak boisiet ne mie koyob boisiet ne ya ak ribset (ko u yon kakitil ketik tugul che bo keny ak kebakach osnosiek che mengechen anan yon kagitil ketik che echen keboisien anan yon kaagiboisien osnet en kayagisiet, ago ma imuche kobwa ketik che lelach ne kata che kibek.
- Che chang en tiletab ketik wechetab osnet ko itu yon mamiten naet agobo miendaab osnet.
- En olda age, miendaab ketik ko naat ngandan bananda ak ngalek kele momiten bik che ribe koyaei bik kotil ketik.

## **Kareunetab tiletab ketik**

- **Ibetab ng'ung'unyek:**yon mamitei ketik che terai ak korat ng'ung'yek kokonu ibetab ng'ung'unyek

- **Rarunetab borotetab osnet:**Istoetab ketik koweche oleu osnet ak korar karorindap osnet,Istoi amitwokik ak kerichek ak kotes magetab tuguk che kiteksen.Bik kobendi olelo ko cheng kwenik,ak ngot kialdoi tugukab osnet ,kobendi barak beit
- **Rarunetab baratetab ketik:** ketik koterei koristo ak koititietab osnet ak kotes koristo ak kotes toldolindap ng'ung'unyek ako yan mamitenketik koyame oleu emet ak komuche kotesak maranet,ibetab ng'ung'unyek koyop koristo,bosetab toltolindap ng'ung'unyek ak wechetab koristo.

## **Nee ne kimuche keyai kebos tiletab ketik ak wechetab ketik:**

### **Kinam kabetishekab ketik ak kepcheite ketichoton anan kialdechi biikab kokwet.**

### **Boisien jikosiekap ribetap kwenik anan ko makaa.**

- Boisien oratinwek che imuche korib mat anan ko kwenik( kou iyoo bek ibaisien asista ,murek,kawek,ak suswek,katukanikap minutik)
- Kinam minsetab ketik,keik chito ne borot en kurupitabTIST, igimit choronok ak bikab kokwet ak choronokuk kochut TIST akichek.
- Matitem olerupegei ak ainet,pakach ketik si korip beek.
- Keer ile machanga kiyagik en olndo agenge.Rib kiyagik komawech kabetisiek che katarutu kogeny sikomawech ketik che katarutu en osnet
- Kigimi minsetab ketik ak amitwogik en imbarenik:Yan itinyei ketik eng imbarenikngu. Imuche inyoru tuguk che katebeichengei en osnet ne negitchin ak kerib osnet.