

# 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 Kitheo TIST Cluster receiving their payments on 12<sup>th</sup> April, 2017.

**Inside:** The Rains Have Come – Time to Plant Many More Trees. Page 2

TIST: Sustainable Development. Page 4

Deforestation and forestland degradation are serious problems. What can we do? Page 5

Fast growing indigenous trees. Page 6



# The Rains Have Come – Time to Plant Many More Trees.

## Preparing seedlings for transplanting (Hardening Off)

Now that the rains have come, seedlings need to be planted out. It is important this month to make sure that seedlings will be ready to be moved from the nursery and planted in the field.

Seedlings first need to be prepared for the harsher conditions of the field. If seedlings have been properly looked after in a nursery, they may have received more water and shade than they will have once they have been planted. Gradually reduce the watering and expose the seedlings to full sunlight to make this transition successful.

## Characteristics of good seedlings

As a general guide (remember different species have different characteristics) good seedlings for planting out have the following characteristics:

- The shoot should be twice the length of the roots or the pot.
- The stem should be strong and woody.
- The seedlings should have many thin roots in addition to the main roots.
- Many seedlings will achieve these characteristics two months after germinating.

## Transplanting.

- Transport the seedlings in an upright position.
- Mark out a circle with a diameter of 30cm in the field.

- Remove the topsoil and place in a pile.
- Remove the next soil layer to a depth of 30cm and place in a separate pile.
- Put in a 5cm layer of grass (dry grass in rainy season, fresh grass in dry season, called mulching). Some groups add manure as well.
- Remove the seedling from the polythene bag. Do not break the earth-balls around the roots.
- Place the seedling in the hole
- Replace the topsoil first, then the second soil layer.
- Some groups do not fill the hole completely, but leave a gap of a few cm. This helps the rainwater enter the hole and infiltrate the soil.
- This can be especially helpful in dry areas.
- Any remaining soil can be placed in a mound on the downhill side of the seedling. This will help trap any rainwater and divert it into the hole.
- Water the seedling.

Also remember that to give your seedling the best chance of survival, you should plant them 3m - 4m apart. If you plant them closer together then the seedlings will not get all the water and soil nutrients they need because there is much competition. They will become weak and may die so follow the best practice of a spacing of 2.5 - 3m.

**The Importance of Trees.**

Trees are very important for environmental and material reasons:

**A. Environmental improvement:**

- Trees cover soil, which protects it from wind and water erosion.
- Leaves and twigs fall to the ground and provide the soil with extra nutrients.
- Trees increase soil moisture by covering the soil and hence reducing evaporation.
- Tree roots help bind the soil and therefore reduce erosion.
- Tree roots also help water to enter the soil and improve underground water circulation.
- Trees improve local weather conditions by increasing the amount of water vapor in the air (increased humidity).
- Trees improve air quality by absorbing carbon dioxide and releasing oxygen.
- Trees provide shade and shelter.

**B. Material and nutritional value:**

- Construction materials (furniture, posts, fences, rope etc.)
- Fuel wood
- Medicine.
- Food/fodder.

These benefits are really valuable for farmers and for the world. A recent survey of TIST farmers in Kenya showed that the value of fruits, nuts, fodder, and firewood from trees they have planted in TIST and improved yield from using Conservation Farming averaged almost 37,000 shillings per farmer. It's harder to put a value on the benefits of cooler, moister soil, cleaner air and some of the other benefits of the work we do in TIST, but we feel it on our farms every day.

Promoting tree planting is of great importance to the community. Imagine what we can do when we plant more together!

**Controlling Mosquitoes**

During wet seasons, malaria infections become common. Mosquitoes, which are responsible for the spread of malaria pathogens, breed fast. It is important to look after your homes to reduce the presence of mosquitoes.

These steps can help:

- Clear your compound of any unwanted bushes or grasses.
- Drain away any stagnant water near your compound. Stagnant water provides breeding ground for mosquitoes.
- Clear away any leftover food over-night.
- Keep rubbish outside the house in a covered container or rubbish pit.
- Sweep your house and compound daily.

Remember to use mosquito nets when possible.



# **TIST: Sustainable Development.**

## **Global Environmental Overview**

Kenya does not exist in isolation from the rest of the world and having knowledge about world environmental problems can help to identify future risks to Kenya. It is important to look at the world's environmental problems and understand the negative effects on our environs.

## **Climate change**

The burning of fossil fuels (coal, oil, natural gas) produces carbon dioxide. This traps heat in the atmosphere causing the earth's temperature to increase, polar ice caps start to melt and the sea level rises. This results in an increased risk of flooding and increasing temperatures which have negative effects for agriculture in parts of the Africa continent and the world.

## **Air pollution**

Poisonous fumes from industries and vehicles can cause respiratory problems to people. The fumes can dissolve in rainwater forming acid rain, which damages plants and buildings. Many cities have problems with smoke where the pollution hangs over the city like low-lying clouds or mist that reduces visibility and causes health problems.

## **Water pollution**

Industry waste, sewage and chemical fertilizer waste from farmers can enter streams, rivers and oceans polluting the world's water sources and causing harm to plants, animals and human health.

## **Decreasing biodiversity**

Biodiversity means the total variety of all different plants and animal species.

Pollution and deforestation decreases the number of living species with over 100 species become extinct each day. This reduces resources used for materials energy and medicine.

## **Desertification**

When land loses all vegetation and the soil becomes dry and blows or washes away, land becomes less productive. This is also known as the 'spread of deserts' turning fields and pastures into barren wastelands encompassing many hectares of land areas, which are potentially at risk.

## **Hazardous Waste**

Toxic and poisonous waste can come from factories

using chemical or radioactive materials. The waste harms all ecosystems through disasters such as when a Union Carbide pesticide factory leaked chemicals in Bhopal, India, causing the factory to explode.

## **Acid Rain**

Already mentioned under air pollution, acid rain destroys forests and lakes especially in Europe and North America. When pollution dissolves in water it makes the rain acidic. Trees, plants, fish and even buildings are all affected.

## **Ozone Depletion**

Certain chemicals like chlorofluorocarbons (CFC's) are used in products for refrigeration and other industrial processes, but are now found to destroy the ozone layer. The Ozone layer protects the earth from harmful sunrays known as ultra-violet rays (UV). When the chemicals destroy the ozone layer, increased levels of UV rays can reach the earth's surface and are harmful to human health causing skin cancer and other illnesses.

## **Urban Problems**

Many towns and cities suffer from litter, air pollution, noise pollution, congestion and decreasing areas of countryside.

## **Resource Depression**

Increased energy and material requirements throughout the world are causing natural resources like oil, coal, minerals and forests to become depleted. This encourages competition for resources causing increased international conflict. Finding more resources for energy requirements will soon become a big problem unless alternative sources of energy are used like water, wind or nuclear energy instead of using finite resources of oil, coal and gas.

## **Ask the Cluster participants these questions:**

Does Kenya suffer the bad effect of some of these problems?

Does Kenya contribute toward or cause any of these problems?

As Kenya develops, which global environmental problems do you think will become worse?

Encourage your TIST Clusters and other community members to plant more trees to minimize some of these climatically bad effects so our environment can be better!





# Deforestation and forestland 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 etc) worth billions of dollars and support millions 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 plant species is all harvested, or when forest is heavily grazed, so that trees can't grow to replace those that die).

Much of deforestation and forestland 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.

**Lack of other environmental 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 of diverse and indigenous trees and plant them yourself, or 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, and 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 re grow.

Encourage agro-forestry or the use of woodlots. Having trees on your land provides good access to forest products and helps protect nearby forest.



## Fast growing indigenous trees.

Indigenous trees provide many different benefits. This month, we focus on some indigenous trees that are especially useful because they are fast growing. In the wild, often these species are pioneer species, growing first and fast when space is opened by fire or cutting. Talk to trainers and other Small Groups in your cluster and discuss together which species are best in your area.

***Hagenia abyssinica***, African redwood, muhooru



With its beautiful red timber, and growing quickly up to 20 m, *Hagenia abyssinica* is a good tree to grow in high elevations that receive 1,000 to 1,500 mm of rainfall each year. It has many benefits: its leaves enrich soil, and make it a good tree for planting in farm fields for agroforestry. It is a medicinal tree, and can help preserve the soil. Its wood is valuable timber and also makes good firewood or charcoal.

The tree grows easily from seed. Pretreatment is not necessary and seeds germinate within 10-20 days of planting with a germination rate of 40-60%.

If planted in together with crops, plant at a low density. Prune branches to encourage straight growth of the trunk.

***Macaranga kilimandscharica***, mukuhakuha/mukura



*Macaranga* is a fast-growing tree that is a good choice for growing together with coffee or bananas.. It grows best with 1,500 to 2,500 mm of rainfall each year. It is a good barrier tree, and because of its fast growth, can protect soils from eroding. Its wood is good for firewood and is used in making boxes or fencing. An extract of its roots is useful medicine.

Grow macaranga from seed. The tree grows well and with minimal care once well established

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**Inside:** Mbura ikwija- Ni igita ria kuanda miti ingi imingi. Page 2

Witi na mbele bukumbika. Page 4

Ugiti miitu na kuthuka kwa miunda ya miitu ni thina inene. Niatia tuumba kuthithia? Page 5

Miti ya gintwire iria ikurangaga. Page 6





## **Mbura ikwija- Ni igita ria kuanda miti ingi imingi.**

***Kuthuranira miti iria iumithitue ithamua ita muundene (Kumithithia uria ikomba kuumiria muundene)***

Nandi niuntu mbura ikwija, miti iria iumithitue nigwiia kuandwa ome ya munanda. Burina bata mweri juju kumenyeera ati miti iu yaku iri tayari kuthamua kuuma munandene iandwa muundene. Miti iji iumithitue mbele nikwenda kuthuranirwa niuntu bwa mantu jamomu nkuruki naria muundene. Kethira miti nithiritwe ikimenygirwa bwega munandene, no ithirwe ikiiri ruuji na kirundu gikingi nkuruki ya kiria kiri muundene yarikia kuandwa. Mpari mpari nyiyia ruuji ruria ukumikiira na umirugurire riu rionthe nikenda yumba gukara bwega yathama.

### **Miti ya kuanda iria miega ithagirwa irina jaja.**

Ta njira ya kawaida (ukirikanaga mithemba mwanya irina mantu mwanya) miti imiega ya kuanda niithagirwa irina jaja:

- Gitina kiria kiumirite kithirwe kiri na uraja bwa miri kana mubuko jairi.
- Gitina kithirwe kirina inya na kiri gikiumu.
- Miti ithirwe irina miri imiceke imingi na imwe iminene.
- Miti iria mingi nikinyithagia mantu jaja na igita ria mieri iiri yarikia kuuma

**Kuthamiria miti muundene.**

- Kamata miti irungi.
- Maka kithiururi kiri na warie bwa 30cm muundene kana aria ukwenda kuanda.
- Rita muthetu jwa iguru na urikire amwe.
- Rita muthetu jou jungi mwanka 30cm kwinama na urikire muthetu juju angi.
- Ikira nyaki centimeter ithano ( nyaki imbumu riria gukuura, nyaki itiumi igitene ria uumu)
- Rita muti mubukone. Ukagwithia muthetu jou jugwatene na miri.
- Ikira muti kirinyene.
- Cokia muthetu jwa iguru mbele, riu jou jungi jwa iiri.
- Ikundi bimwe bitijuragia kirinya buru, indi nibatigaga kanya ga cm inkai. Bubu nibutethagia ruuji rwa mbuura gutonya kirinyene na kwou gutonya muthetune. Bubu nobutethie mono mono naria kuri gukumu.
- Muthetu jungi juria jumba kwithirwa jutigere nijwikagwa na kibango bwagaiti ya muti. Juju nijugwatagia ruuji rwa mbuura na jukarutongereria gutonya kirinyene.
- Ikira muti ruuji.



**Bata ya miti**

Miti iri bata mono niuntu bwa mantu jeienaria gututhiurukite na biria tutumagira:

**A. Kuthongomia naria gututhiurukite:**

- Miti nikunikagira muthetu, untu buria buebithagia gukamatwa kwa muthetu ni ruugo na ruuji.
- Mathangu na maang'i nijagujaga muthetune na jakongeera irio muthetune.
- Miti niingiagia ruuji muthetune gukurukira gukunikira muthetu na kwou kunyiyia gukamatwa kwa ruuji ni riuu.
- Miri ya miti nitethagia kugwata muthetu na kwou kunyiyia gukamatwa kwa muthetu.
- Miri ya miti nitethagia kinya ruuji gutonya muthetube na kwou kuthongomia kuthiuruka kwa ruuji nthiguru ya muthetu.
- Miti nitethagia kutongomia rera ya aria iandi gukurukira kwingiyia ruuji ruria ruri ruugone.
- Miti nithongomagia uthongi bwa ruugo gukurukira gukucia ruugo ruruthuku na kurita ruugo rurwega.
- Miti niejanaga kirundu na antu a gwikunikira.

**B. Into na irio biria miti iejanaga:**

- Into bia gwaka ( into bia nyomba, ikingi, ndwego, mikanda)
- Nkuu na makara
- Ndawa
- Irio bia antu na ndithia

Baita iji icithiritwa ciri inene mono kiri arimi na nthiguru yonthe. Uteri bwarua bwa arimi ba TIST ndene ya Kenya nibwonenie ati baita cia matunda, nkandi, iria ria ndithia na nkuu kuumania na miti iria baandite ndene ya TIST na maciara jamathongi nkuruki kuumania na urimi bubwega niikinyite baita ya ngiri mirongo ithatu na mugwanja kiri o murimi. Burina inya nkuruki kuthima baita ya muthetu juri na ruuji rurwingi nkuruki na ruugo rurutheru nkuruki na kinya imwe cia baita ingi cia ngugi iria turitaga ndene ya TIST, indi nitucigagua ndene ya miunda yetu ntuku cionthe.

Kwou gwitithia na mbele uandi bwa miti kurina bata mono kiri antu betu. Thugania jaria tuthithia tukeja kuanda miti ingi turi amwe!



## **Witi na mbele bukumbika.**

### **Gutegera mazingira ndene ya nthiguru yonthe.**

Nthiguru ya Kenya itithagirwa iri antu amwe yonka kuraja na nthiguru ingi na kwithira irina umenyo bwegie thina cia nthiguru yonthe ciegie naria kuthiurukite nogutethie kwonera thina iria cikwenda kwija Kenya kuraja. Burina bata gutega thina cia naria kuthiurukite na kwelewa mantu jamathuku kiri naria gututhiurukite jaria jejanagia na thina iji.

### **Kugaruka kwa rera.**

Kuithua kwa maguta ( maguta ja maiga, maguta jongwa na gasi ya gintwire) nikurita ruugo rwa kaboni. Ruru nirugwatagia kirutira ndene ya nthiguru na gutuma murutira jwingia, mitwe ya irima ya nkamia kwambiria gukeruka na ruuji ndene ya iria kwongereka. Jaja nijaongagira kuigara kwa ruuji rwa mbura na kwongera murutira, mantu jaria jaretaga thina kiri urimi ndene ya Afrika na nthiguru yonthe.

### **Kuthukua kwa ruugo.**

Toi cirina sumu kuuma kiri kambuni cia kuthithia into na ngari noirete thina cia gukucia miruki kiri antu. Toi iji nocitonye ruujine rwangai na kuthithia ngai ya acidi iria ithukagia imera na nyomba. Tauni inyingi cirina thina ya toi niuntu niitagia iguru igakara ta matu jamarito kana ta nduume iria itumaga antu baremwa kwona kuraja na iria iretaga thina cia mwili.

### **Kuthukua kwa ruuji.**

Ruuko kuumania na factory cia kambuni na ruuko na fertilizer kuuma kiri arimi norutonye nduujine na iriene na kwou rukathukia biumo bia ruuji bia nthiguru yonthe na kugitaria imera, antu na thiria ya antu.

### **Kunyyia mithemba ya imera na nyomoo iria igukaraniria.**

Biodiversity ni mithemba yonthe mwanya ya imera na nyomoo.

Kuthukia na kugiita miitu nikunyyiagia mithemba ya biumbe biria biri moyo na gutuma nkuruki ya mithemba igana mwanya ithira buru nthigurune o ntuku o ntuku. Bubu nibunyyiagia into biria bitumagirwa kuruga na ndawa.

### **Gutamba kwa uumo.**

Riria muunda jwathia imera na muthetu jwooma na jwakamatwa, muunda nijunyyiagia unoru. Gutamba guku kwa uumo nikugaruraga miunda na antu a kuriithia gukaa antu guticiara kinya mbi na nokujukie hectare inyingi cia munda, juria juri akui.

### **Ruuko ruria rugitaragia na njira inene.**

Ruuko rumba kwajithia kana rurina sumu kuuma kiri factory iria igutumira chemical kana into bingi biria bitibui kiri thiria ya mwiri. Ruuko ruru nirugitaragia into bionthe biria biri moyo gukurukira mantu jaria jatieteretwe, mung'unano, riria factory ya kiama ya kuthithia ndawa ya iria yeeturire chemical iji naria Bhopal ndene ya India, factory niyalipukire.

### **Ngai ya acidi.**

Nigwetetwe au iguru kiri kuthukia ruugo, ngai ya acidi nigitaragia miitu na nduui mono ndene ya Europe na North America. Riria ruuko ruru rwatonya ruujine na rwatuma ngai igia acidi, miti imera, makuyu na kinya miako nigitaragua.

### **Kuthiria nkuniki ya ozone.**

Chemical imwe ja CFC nitumagirwa kiri into biria bitumagirwa nikenda into biungwa gwika igita riraja bitirathuka na kiri kuthithia into bingi, indi nandi nimenyekene ati nicithukagia nkuniki iu ya Ozone. Nkuniki iji niithaga nthiguru kuumania na miale ya riuu iria igitaragia iria itagwa ultra-violet rays (UV). Riria chemical iji ciathukia nkuniki iji, riuu ririthuku riuu UV nirikinyagira nthiguru na rikagitaria thiria ya mwili ya antu na gutuma bajua ni cancer ya ngozi na mbajua ingi.

### **Thina cia tauni.**

Tauni inyingi ciri thina cia ruuko, kuthukua kwa ruugo, gituma, kwingia gwa antu na ngari na kunyyia kwa naria gutina nyomba cia biashara.

### **Kuthirua kwa into bia gutumira.**

Kwongereka gwa utumiri bwa maguta na nkuu na into bingi nthigurune yonthe ja maguta, maguta ja maiga, na miitu no gutume into bibi bithire. Untu bubu nibwongagira gushindanira into bibi na kwou ndua cia nthiguru ikaingia. Gucua into bibi bia gutumira akui mono gukareta thina mono tiga aki into bingi bigatumirwa antua bibi, into bibi ni ja ruuji, ruugo kana nuclear antu a gutumira biria biumba kuthira ta maguta, maguta ja maiga na ngasi.

### **Aritani, urieni amemba ba cluster biuria bibi:**

Kenya nionaga mantu jamathuku jaria jaumanagia na imwe cia thina iji?

Kenya nionagagira kana nitumaga kugia imwe cia thina iji?

O uria Kenya igwita na mbele, ni thina iriku cia nthiguru yonthe ukuthugania igeta ikiingiaga nkuruki?

Ikira inya cluster cia TIST na amemba bangi ba ntuura kuanda miti ingi imingi nikenda thina imwe cia rera cinyia nikenda naria gututhiurukite kuthongoma nkuruki!



# Ugiti miitu na kuthuka kwa miunda ya miitu ni thina inene. Niatia tuumba kuthithia?

## **Ugiti bwa miitu ni kugita miti na imera bingi bia mpao.**

Miitu na miunda imininene ya miti ya mpao nikunikirite gicunci kimwe kiri bithatu kia nthiguru yonthe. Niigaruraga rera, igakunikira na kumenyeera biumo bwa ruuji, igatua into bia mwitu ( ja mpao, ndawa, matunda) biria biretaga mbeca bilioni inyingi na biria biikaga moyo milioni kithumba cia mithemba ya imera na nyomoo. Indi o miti iji nikuthukangua nainya, miunda irina hectare milioni mirongo iri o mwaka. Nusu ya antu ndene ya nthiguru yonthe nibatumagira miti iji ta nkuu kana makara, indi akui antu milioni igana batina nkuu kana makara jang'ani kuumba kuruga biria bakwenda o ntuku o ntuku.

## **Mantu jaria jatumaga miitu igitwa:**

Miitu nigitagwa riria imera bikuritwa birugurira mantu jangi ja urimi kana uriithi na mootumiri ja; nkuu, kuthithia maiga ja gwaka, gutoyia makuyu, kumia mbaki, kumia majani, gwaka na mpao.

Kuthukua kwa miitu ni riria mwitu jwanya mithemba ya imera na nyomoo na jwaremwa kuthithia jaria jurathithagia niuntu bwa utumiri na urungamiri butibui (ja riria miti imikuru yagitwa yonthe, miti imikui aki yatigwa, kana riria muthemba jurina utumiri bubunene jwagitwa junthe, kana riria mwitu jwarithua nainya mwaka miti ikaremwa gukura irungama antua iu ikuite).

Ugiti bwa miitu na kuthukua kwa miunda ya miitu nikuretagwa ni kwaga umenyo bwegie bata yongwa ya miti.

Naamwe, bata ya miti no imenyekane indi thina na kuthugania guti njira ingi nigutumaga antu bakagita miti yonthe.

**Mantu jaria jaumanagia na kugita miti Gumatwa kwa muthetu:** Kuura gwa kirundu na gwa kugwatwa kwa muthetu ni miiri nigukunuraga muthetu jugakamatwa.

**Kuura kwa biria biumanagia na miitu:** Kugiita miti ni kuthukagia ikaro, gukanyiyia wingi bwa mithemba ya imera na nyomoo iria igukaranira, gukathiria antu a gwita irio na ndawa, na kuingiyia gushindanira into bia gwaka. Antu bagetia gwita kuraja nkuruki gucua nkuu na kethira into biria biumanagia na mwitu kabikugurwa, mbeca cia uguri cigaitia.

**Kwaga baita ingi kiri naria gututhiurukite iria ciumanagia na miti:** Miti ninyiagia ruugo, igeeka ruuji igita riraja nkuruki, ikongeera ruugo rurwega, na ikongera irio bia imera muthetune. Kwou miti itio, rera ikooma nkuruki na kuumbika kwa kuigara kwa ruuji rwa mbura, gukamatwa kwa muthetu ni ruugo, kunyia kwa unoru bwa muunda na kunyia kwa utheru bwa ruugo kwoombika.

## **Niatia tuumba kuthithia nikenda tunyiyia ugiti bwa miitu na kuthukua kwa miunda ya miitu?**

Thithia minanda ya miti irina mithemba imingi mwanya nay a gintwire na umiande wengwa, kana utambie kana wendie miti iu ndene ya ntuura yaku.

Tuumira mariko ja nkuu kana makara jamakai.

Tuumira into bingi antu a nkuu kana makara riria ukuumba ( ta kurutiria na riuu, sawdust, mati ja kauwa na ja muchele, nyaki, maria, matigari ja imera, ruuko rwa ndithia).

Andeni miti. Eni gikundi gikuumbana na gigwita ngugi gia TIST!

Ukarima mundane juri akui na ruuji. Tigana na miti na imera bikuure nikenda bikunikira nduui iji.

Menyeera utikarithie muundene nkuruki ya uria ubati. Nyiyia gukinyirwa kwa miti iminini ni ndithia nontu noigitarie miti iu, nikenda ua mwitu kanya ga gukura kairi.

Ikira inya kuanda miti amwe na imera kana kuanda miti na milaini. Kwithira urina miti muundene jwaku nigukuumbithagia gukinyira into biria biumanagia na miitu na nigugutethagia kumenyeera mwitu juria juri akui nagwe.





## Miti ya gintwire iria ikurangaga.

**M**iti ya gintwire nithagirwa iri na baita inyingi mwanya. Mweri juju, tugategera miti ya gintwire imwe mono iria itethagia nontu nikurangaga. Nau mwitune, jaria maingi mithemba iji ni mithemba ya kwambia, ikuraga mbele na ikurangaga riria kanya kathithua gukurukira kuithia kana kugiita. Uria aritani na ikundi bingi bibinini ndene ya cluster yaku mithemba iria iri imiega ntuurene yaku

**Hagenia abyssinica**, African redwood, muhooru



Na mbao ciaju intune inthongi, na jugikurangaga mwanka uraja bwa 20m, muhooru ni muti jumwega jwa kuanda guntu kuria kuri iguru kuria kwithagirwa kuri na ngai inyingi (1000 gwita 1500mm ya ngai o mwaka). Muti juju jurina baita inyingi: mathangu jaju nijanoragia muthetu, na bubu nibujuthithagia muti jumwega jwa kuanda miundene ya imera amwe na imera riria ukwenda kuungania. Ni muti jurina ndawa, na jumba gutethia gukaria muthetu. Mbao ciaju ni injega mono cia gwaka na

kinya niithithagia nkuu injega kana makara

Muti juju nijukuraga jutina thina kuuma kiri mbira. Ti lazima mbegu iji cithuranirwa nontu mbira niciumaga ndene ya ntuku ikumi gwita mirongo iiri na niikurangaga (na rate ya 40 gwita 60%).

Jukaandwa amwe na imera, ukaanda imingi. Gita mathangu nikenda muti jukuura jurungami bwega

**Macaranga kilimandscharica**, mukuhakuha/ mukura



Mukura ni muti jukurangaga na ni muti jumwega riria ukujuandaniria na kauwa kana marigu. Nijukuraga bwega buru guntu kuri kuri na mbura inyingi ya kuuma 1500 gwita 2500mm omwaka. Ni muti jumwega jwa kunyiyia ruugo na niuntu nijukurangaga, jwomba kumenyeera muthetu kuumania na gukamatwa. Miiri yaju nithithagia ndawa iria itethagia mono.

Anda mukura kuuma kiri mbira. Muti juju nijukuraga bwega na kumenyeerwa gukai riria jwagata.

# 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 Kitheo TIST Cluster makiamukira marihi mao mweri 12/04/2017.**

**Inside:** Mbura niyurite – kahindaga kuhanda miti makiria. Page 2

Mogaruruku mangihoteteka. Page 4

Utemi wa Miti na unini wa mititu ni mathina manene muno. Niatia tungika? Page 5

Miti ya ki-nduire iria ikuraga naihenya. Page 6



# **Mbura niyurite – kahindaga kuhanda miti makiria.**

**Kuhariria mimera niguu kuhanda mugundaini.**

Riu tondu mbura niyurite, mimera niyagiriirwo nikuhandwo migundaini kuuma nthari. Niwega mweri uyu gutigirira mimera iri ho ya kuhandwo.

Mimera yagiriirwo ni wambere kuharirio niundu wa riera iritu mugundaini. Angikorwo mimera nditoretwo wega iri nathariini, akorwo niirahetwo maai maingi na kiiruru gukira uria yagiriirwo kana gukira uria ikuheo yathii mugundaini. Kahora kahora nyihia muhere wa maai na wehutie kiiruru hari mimera niguu ihote guikara migundaini

## **Mimera miega ikoragwo na:**

Ta kioereria kiega, (ririkana mithemba ngurani ya miti ndihananaga) mimera miega ya kuhanda ikoragwo na;

- Mimera uraihe maita meeri gukira muri.
- Mumeru ukorwo na hinya.
- Mumeru ukorwo na miri miingi.
- Mimera miingi niikinyanagiria maundu maya thutha wa mieri 2.

## **Guthamia miti:**

- Thamia mimera irugamite na iguru.
- Cora tuthiururi twa warii wa 30cm mugundaini.
- Eheria tiiri wa iguru.
- Eheria tiiri ucio ungi urumiriire nginya uriku wa 30cm.
- Ikira mahuti urku wa 5cm( nyeki nyumu hingo ya mbura nanjigu hingo ya riuu) ikund ingi cihuthagira thumu.
- Ruta mimera kuuma maratathiini na ndugatinie gatiiri karia kari muthiaini wa muri.
- Ikira mimera irimaini.
- Ikira tiiri wa iguru na ucokerere na ucio ungi.
- Ikundi ingi citihuragia irima na tiiri biu. Njira ino niiteithagiriria maai ma mbura kuingira irimaini na gutonya tiiriini na njira ino ninjegamahinda ma riuu.





- Tiiri uria ungikorwo utigarite nougo nakianda ia irima nigo uhingiririe maai.
- Itiriria mimera maai.
- Miti niitheragia riera na njira ya kugucia carbon dioxide na kuruta oxygen.
- Miti niikoragwo na kiiruru.

## **Bata wa miti:**

Miti niiri bata wa maundu maria maturigiciirie.

### **A. Kwagirithia maria maturigiciirie:**

- Miti niihumbagira tiiri, njira iria iugitagira kumana na ruhuho na maai.
- Mahuti magwa thi nimatumaga iiri ugie na ugunyu.
- Mahuti magwaa thi nimongagirira thumu tiiriini.
- Miri ya miti niinyitagirira tiiri kumana na gukuuo ni maai.
- Miri ningi niiteithagia maai kuingira tiiriini.
- Miti niyagiragia riera na ikaingiria maai rieraini.

### **B. Indo cia micii na cia kuria:**

- Indo cia gwaka(mbau, rugiri, ndigi etc).
- Ngu.
- Dawa.
- Irio cia mahiu.

Maundu maya nimakoragwo na umithio kuri arimi othe thi yothe. Uthuthuria uria wikitwo ni TIST thiini wa Kenya wonanitie ati umithio wa matunda na iria cia mahiu na ngu kuma mitiitni iria ihanditwo ni arimi a TIST niikoretwo ikiongereka kumana na urmi wa Kilimo Hai na igateithia arimi na 37,000 hari o murimi. Niuritu kumenya umithio kumana na tiiri na riera riega na maundu mangi maingi no nituonete TIST igiteithia arimi o muthenya.

Kwa uguo kuhanda miti nikuo kumgiteithia arimi na matuura. Tawicirie maundu maria tungika riria twahanda miti ino turi hamwe!



## **Mogaruruku mangihoteteka.**

### **Murorere wa maria maturigiciirie thi yothe.**

Kenya ndikoragwo keheri-ini kuma kuri thi yothe na riria twagia na umenyo wa mathina ma maria maturigiciirie notuhote kumenya ugwati uria utung'etheire turi Kenya. Niundu wa bata kurora mathina ma maria maturigiciirie thi yothe na tutaukwo ni mathina maria mangirehwo kuri ithui.

### **Ugaruruku wa riera.**

Gucinwo kwa indo cia tene ta (coal, maguta na natural gas) nikuingihagia carbon dioxide. Njira ino nihitagiriria urugari riera-ini na kwa uguo gutuma thi kwongerereke urugari. Barafu cia riera-ini cikambiriria gutwekuka na maai ma iria makambatira. Maundu maya nimatumaga kugie na miiyuro ya maai na kwongerera riera njira iria ikoragwo na mathina ma kuhotomia urimi na makiria icigo cia Africa thiini wa thi..

### **Uthukia wa riera.**

Ndого njuru na iri na giko kuma iganda-ni o hamwe na ngari nocirehe thina wa mahuri kuri andu. Ndogo ino riria yathii riera-ini niithondekaga mbura iri na acid, iria ithukagia mimera na miako. Cities nyingi nicioetwo na thina wa ndogo kuria ndogo ino iinyitagirira na igacuha ta matu kana thatu na andu makaga gukorwo makiona wega ohamwe na gukorwo na ugima muuru wa miiri.

### **Uthukia wa maai.**

Giko kia iganda, giko kia cioro ohamwe na fertilizer kma kuri arimi nocingire njuui-ini na iria-ini na cithukie maai na mimera ohamwe na indo iria ckaraga maai-ini na ningi ugima wa miiri ya andu.

### **Kunyahia biodiversity.**

biodiversity nikuuga mithemba yothe ya miti na ya nyamu.

Uthukia na utemi wa miti niunyahigia muigana wa mithemba ya indo iria cikoragwo thi na igathira na muigana wa 100 o muthenya. Njira ino niunyahigia indo iria ithondekaga hinya na dawa.

### **Desertification.**

rira mugunda wanina miti na mimera yothe na tiiri waniara biu, mugunda ucio niunyahigia maciaro maguo. Njira ino ningi niitagwo "spread of desert" kugarura migunda ituike mihinju na gutuma migunda miingi muno igie na mogwati maingi.

### **Giko kiri na ugwati**

giko kiria gikoragwo na poison nokiume thiini wa factories iriri cihuthagira chemical na indo iria cikoragwo ciri radioactive. Giko giki nigithukagia ecosystems kuhitukira ugwati ta wa riria Union Carbade kiganda kiria githondekaga dawa cia tutambi kiaunithiirie chemicals thiini wa Bhopal, India na gutuma kigana kiu gituthuke.

### **Mbua iri na acid.**

Kuri maundu maria magwetagwo ma uthukia wa riera, mbura ya acid niithukagia mititu na iria na muno Europe na North America. Riria giko kiaingira maai-ini nigitumaga mbura igie na acid. Miti, mimera, thamaki na miako cigakorwo ugwati-ini.

### **Ozone Depletion.**

Chemicals ingi ta chlorofluorocarbons (CFC's) nicihuthagirwo hari kuhehia na njira ingi thiini wa iganda. No riu nicinekete nocitukie layer ya ozone. Layer ya ozne igitagira thi kumana na miruri ya riu iria itagwo Ultra Violet rays (UV). Riria chemical yathukia ozone, muigana wa UV niukinyafira thi na nourehe murimu wa cancer ya ngothi na mirimu ingi miingi.

### **Mathina ma town.**

matown maingi nimakoragwo na thina wa giko, guthuka kwa riera, inegene na muhinyano wa andu na kunyahia andu ichagi-ini.

### **Kunyahia kwa indo cia bata.**

Kuongoerereka kwa ma-hinya ma ai ma kinduire thiini wa thi nigutumite mahinya ma ki-nduire ta maguta, coal, minerals na mititu cinyihe. Njira ino niiratumama macindano ma indo ici cia bata makorwo iguru thi yothe. Kuhota kuona indo ici ci kinduire niugukorwo uri thina munene muno gutangikorwo na njira ingi ta maai, ruhuho na hinya wa nuclear handu ha kuhuthira maguta, coal kana gas.

### **Athomithania uriai ciuria ici kuri arimi a cluster.**

Kenya niikoragwo ni mogwati ma mathina maya? Kenya niichangagira kana igatuma kugie na mathina maya?

O kenya igithiaga na mnere, ni thina uriku munene urona ta ungineneha makiria?

Hinyiriria amemba a cluster yaku kuhanda miti miingi niguu kunyahia mathina ma ki-rirea niguu tuthondeke maria maturigiciirie.



# Utemi wa Miti na unini wa mititu ni mathina manene muno. Niatia tungika?

**Deforestation ni kwheria miti na mimera ingi.**

Mititu na ithaka cikoragwo na gicunji kia igiri hari ithatu gia thi. Nicitumaga kugie na riera riega, kugitira ihumo cia maai, kuhotithia kugia na indo cia mititu ta Mbau, daa, matunda na ingi nyingi iri ni muigawa wa mbecha wa billions na niciteithagia mamilioni ma mimera na andu. No nicirathukio na gichunji kinene gia 20 million hectares hari o mwaka. Makiria maNuthu ya thi ya aria maikaraga kuo mehokaga indo ici no makiria ma andu 100million matikoragwo na indo ici cia kuigana ta maguta.

**Itumi nene cia deforestation:**

Deforestation ihanikaga rira miti na indo cia mugunda cieherio na urimi na uriithi wa nyamu ukambiriia ohamwe na maundu mangi ta: gutema ngu, gucina maturubari, gucina thamaki, gucina mbaki kuumithia macani, miako na mbau.

Kunyahia mititu ni riria mititu yatuika mitaganu niundu wa kwaga kumenyererwo wega (kwa muhiano, riria miti mikuru yatemwo na gugatigara ithaka, kana riria miti miega yagetwo kana mititu yariithio.

Deforestation nene hamwe na kunyahia kwa mititu kumanaga na kwaga kwa umenyo wa mawega ma miti.

Maundu-ini mangi, mawega ma miti nimamenyekaga no ukia na meciiria ati gutiri njira ingi nicitumaga andu mateme miti.

**Mogwati ma Deforestation**

**Gukuuo kwa tiiri ni maai:** rira kwaga miti na miri ikaumira iguru.

**Kwaga indo ca bata cia mutitu:** kweheria miti niguthukagia ciikaro, kunyahia biodiversity, kunyahia irio na dawa na kwongrera ucindaniri wa indo cia gwaka. Andu nimathiaga kundu kunene magietha ngu, na riria indo cia mutitu cirendio, thogora ugathii iguru.

**Kwaga bata munene wa miti:** miti ikoragwo ihana kinyihia kia ruhuho, gwikira ugunyu tiiri-ini, kwongerera oxygen riera-ini na kunoria tiiri. Riria gutri na miti, riera niriumagaraga na gugakorwo na ugwati wa miiyuro ya maai, ruhuho runene na kunyihia kwa unoru tiiri-ini na guthuka riera.

**Niatia tungika niguo tugiriririe utemi wa miti na unyahia wa mititu**

Korwo na nathari ya miti ngurani ya ki-nduire na umihande, kana uhenae na wendie kuri andu angi.

Huthira riiko ritarahuthira ngu nyingi kana makara.

Huthira njira ingi cia mahinya riria kwahoteka(muhiano; huhia maai na riuu, mura, makoni ma kahua, nyeki, matigari ma irio cia mugunda na mai a ngombe.

Ikirira uhandi wa miti. Tuika murimi mwega w TIST na uhinyiririe aria angi maingire TIST.

Ndukarime mugunda hakuhi na ruui kana gitomboa. Reke iti na mimera ikure niguo igitire maai.

Menyerera ndukariithe makiria mugunda-ini. Nyihia uingiri wa nyamu mugunda-ini niguo citigathukie na ningi niguo miti ikure.

Hinyiririe uhandi wa miti mugunda-ini wa irio. Riria uri na miti mugunda-ini waku, rekereria miti na indo cia mutitu cingire kuo.





## Miti ya ki-nduire iria ikuraga naihenya.

**M**iti ya ki-nduire niikoragwo na mawega maingi. Mweri uyu tukurora miti ingi ya kinduire iria ihuthikaga tondu ikuraga na ihenya. Ithaka-ini , mahinda maingi miti ino ikoragwo iri ya kiambiriria na ikuraga naihenya riria yatemwo kana yacinwo ni mwaki. Ariria athomithania na ikundi ingi thiini wa cluster yanyu na mwariririe ni mithemba iriku miega.

**Hagenia abyssinica**, African redwood, muhooru



Uri na mbau thaka na ndune, na ugikura na-ihenya nginya uraihu wa 20m Hagenia abyssinica ni muti mwega ungikurio kundu kwamukagira githimi kia mbura kia 1.000-1,500mm o mwaka.niukoragwo namawega maingi, mahuti maguo nimega na tiiri na kwa uguo ugakorwo uri mwega kuhanda kundu kuri na irio. Niukoragwo na dawa na nouhuthike

kumenyerera tiiri. Niukoragwo na mbau njega muno na ngu njega ohamwe na makara.

Muti uyu ukuraga kuma mbegu-ini. Guthondeka mbegu mbere ya uhandite nikwagiriire na imeraga na thiku 10-29 na kumera na gicunji kia 40-60%.

Ungihandanirio hamwe na irio cia mugunda ceha mahuti niguo mimera ikure wega.

**Macaranga kilimandscharica**, mukuhakuha/ mukura



Macakanga ni muti ukuraga na-ihenya hamwe na kahua kana marigu. Ukuraga wega na githimi kia mbura kia 1,000-1,500mm hari mwaka. Niundu wa gukura na-ihenya, niugitagira tiiri kumana na kiguu. Nimwega na mbau na ngu hamwe na kuiriga na ugakorwo na dawa.

Kuria macakaranga kuma mbegu-ini. Muti uyu ukuraga wega na mubacirire munini.

# Mazingira Bora



# TIST

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**Kiswahili Version**

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**Wanachama wa Kitheo TIST Cluster wakipokea malipo yao tarehe 12/04/2017.**

**Inside:** Mvua imefika - Wakati wa kupanda miti mingine mingi. Page 2

Maendeleo Endelevu. Page 4

Ukataji wa misitu na uharibifu wa ardhi ya msitu ni matatizo makubwa sana.  
Twaweza kufanyeje? Page 5

Miti ya kienyenji inayokua haraka. Page 6



# Mvua imefika - Wakati wa kupanda miti mingine mingi.

## ***Kutayarisha miche ili kuihamisha (Kuitayarisha kuishi katika hali ngumu)***

Sasa kwa kuwa mvua imefika, miche inahitaji kupandwa. Ni muhimu mwezi huu kuhakikisha kuwa miche iko tayari kuhamishwa kutoka kitaluni na kupandwa shambani.

Miche kwanza inahitaji kutayarisawha kwa hali ngumu iliyo shambani. Kama miche imekuwa ikichungwa vyema kitaluni, inaweza kuwa ikipata maji zaidi ya ambayo itapata ikishapandwa shambani. Kidogo kidogo, ipunguzie maji unayoipa na uifungulie jua lote kuhakikisha itaweza kuhimili uhamisho huu inavyofaa.

## **Sifa za miche mizuri.**

Kama mwelekezo wa kijumla (ukikumbuka namna mbalimbali huwa na sifa mbalimbali) miche mizuri ya kupanda huwa na sifa zifuatazo:

- Shina linapotokeza lafaa liwe na urefu wa mizizi au mfuko mara mbili.
- Shina lafaa kuwa lenye nguvu na gumu.
- Miche inapaswa kuwa na mizizi myembamba mingi pamoja na mizizi mikubwa.
- Miche mingi itakuwa na sifa hizi baada ya miezi miwili ikishaota.

## **Kuhamisha.**

- Beba miche ikiwa imesimama inavyofaa.
- Pima duara lenye upana wa sentimeta thelathini shambani.
- Toa mchanga wa juu na huuweke kwa pango.
- Toa safu la pili la mchanga hadi sentimeta thelathini na uweke kwa pango lingine.
- Safu la nyasi sentimeta tano (nyasi kavu msimu wa mvua, nyasi mbichi msimu wa ukavu). Vikundi vingine huongeza mbolea pia.
- Toa mche mfukoni. Usivunje mchanga uliozunguka mizizi.
- Weka mche shimoni.
- Rudisha mchanga wa juu kwanza, halafu safu la pili la mchanga.
- Vikundi vingine havijazi shimo hadi pomoni, ilhali huacha pengo lasentimeta chache. Hili husaidia kuingiza maji ya mvua shimoni na mchangani. Hili sana sana husaidia maeneo makavu.



- Mchanga ambao hubaki unaweza kuwekwa kwa pango kwa upande wa chini wa mche. Tendo hili husaidiakushika maji yoyote ya mvua na kuyarudisha shimoni.
- Chotea mche maji.

### **Umuhimi wa miti.**

Miti ni muhimu sana kwa sababu za kimazingira na kibidhaa:

#### **A. Kuboresha mazingira:**

- Miti hufunika mchanga, tendo ambalo hulinda mchanga kutokana na mmomonyoko unaosababishwa na upepo na maji.
- Majani na matawi huanguka ardhini na kuoongeza madini mchangani.
- Miti huongeza unyevu mchangani kwa kuufunika mchanga na kupunguza evaporation.
- Mizizi ya miti husaidia kuushika mchanga na hivyo basi kupunguza mmomonyoko.
- Mizizi husaidia maji kuingia mchangani na hivyo basi kuboresha mzunguko wa maji yaliyo chini ya ardhi.
- Miti huboresha hali ya anga ya ilipopandwa

kwa kuongeza unyevu hewani (kuoneza ubaridi).

- Miti huboresha uzuri wa hewa kwa kunyonya hewa chafu na kupumua hewa safi.
- Miti hutupa kivuli na pa kujifunika.

#### **B. Thamani ya kibidhaa na kilishe:**

- Bidhaa za kujenga ( vyombo vya kutumia ndani ya nyuma, gogo, kamba na kadhalika).
- Kuni au makaa.
- Dawa.
- Lishe ya watu na ng'ombe.

Faida hizi ni zenye thamani sana kwa mkulima na kwa dunia yote. Utafiti wa hivi juzi wa wakulima wa TIST katika Kenya ulionyesha kuwa thamani ya matunda, lishe ya ng'ombe na kuni kutoka kwa miti waliyopanda wakiwa TIST na mavuno bora kutokana na Ukulima Bora ilifika elfu thelathini na saba kwa kila mkulima. Ni ngumu kupima thamani ya faida za mchanga baridi na wenye unyevu zaidi na faida zingine za kazi tunayofanya katika TIST, lakini tunaiona thamani hii mashambani mwetu kila siku.

Kupendakeza upandaji wa miti hivyo basi, ni muhimu sana kwa jamaa. Fikiria ambayo twaweza kufanya kukipanda zaidi tukiwa pamoja!





## Maendeleo Endelevu.

### **Kuangalia mazingira ya dunia kwa ufupi.**

Kenya haijatengwa kutokana na sehemu zingine za dunia na kuwa na ujuzi kuhusu matatatizo ya kimazingira ya dunia nzima kwaweza kusaidia kutambua hatari kwa Kenya kwa umbali. Ni muhimu kuchambua matatatizo ya dunia ya kimazingira na kuelewa madhara hasi yanayoweza kufikia mazingira yetu.

### **Madaliko ya hali ya anga ya muda mrefu.**

Kuchoma ngataa au mafuta ( makaa yam awe, mafuta, gesi asilia) hutoa hewa chafu ya kaboni. Hii hewa hutega joto katika anga na kusababisha joto duniani kuongezeka, kofia za barafu katika maeneo ya milima kuanza kuyeyuka na kiwango cha maji katika maziwa kupanda. Haya husababisha uwezekano wa mafuriko na joto kupanda jambo ambalo huwa na athari mbaya kwa kilimo katika sehemu za bara la Afrika na dunia nzima.

### **Uchafuzi wa hewa.**

Mafusho yenye sumu kutoka viwandani na kwa magari yaweza kusababisha shida za kupumua kwa watu. Mafusho haya yaweza kuingia katika maji ya mvua na kutengeneza mvua wenye asidi, ambao hudhuru mimea na mijengo. Miji mingi huwa na matatizo ya moshi ambapo machafuko hutanda juu ya miji kama mawingu ya chini na kupunguza uwezo wa kuona mbali na kusababisha shida za kiafya.

### **Uchafuzi wa maji.**

Maji na uchafu kutoka viwandani na kemikali kutoka kwa wakulima zaweza kuingia katika vijito, mito na maziwa na kuchafua vyanzo vya maji vya dunia nzima na kudhuru mimea, wanyama na afya ya binadamu.

### **Kupunguza bionuwai.**

Baonuwai ni wingi wa aina mbalimbali za mimea na wanyama. Uchafuzi na kukata miti hupunguza nambari ya viumbe hai na kumaliza zaidi ya aina mia moja kila siku. Jambo hili hupunguza rasilimali inayotumika kama vifaa, nishati na dawa.

### **Kuenea kwa jangwa.**

Ardhi inapopoteza mimea na udongo unapokauka na kubebwa, ardhi hukuwa na uzalishaji uliopungua. Hili pia linajulikana kama 'kuenea kwa jangwa' na hugeuza mashamba na mahali pa kulisha wanyama kuwa ardhi isiyona uzalishaji iliyo hectare nyingi, zilizona uwezekano wa kupotezwa.

### **Uchafu wenye madhara.**

Uchafu wenye sumu unaotoka kwa viwanda vinavyotumia kemikali na mionzi. Taka hii hudhuru mazingira yote kupitia majanga kama kiwanda cha chama cha kutengeneza dawa ya magugu kilipovuja kemikali huko Bhopal, India, kiwanda kililipuka.

### **Mvua ya acidi.**

Imetajwa hapo juu chini ya uchafuzi wa hewa, mvua ya acidi huharibu misitu na maziwa hasa katika Europa na Amerika Mashariki. Uchafuzi unapoingia majini na kufanya mvua kuwa yenye acidi, miti, mimea, samaki na hata mijengo huathirika.

### **Kupungua kwa safu ya ozoni.**

Baadhi ya kemikali kama chlorofluorocarbons (CFC's) hutumiwa katika vitu vinavyotumika katika majokofu na katika taratibu nyinginezo za viwandani lakini sasa zinaonekana kudhuru safu ya ozone. Safu ya ozone hulinda ardhi kutokana miale hatari ya jua inayoitwa ultra-violet rays (UV). Kemikali zinapoharibu safu ya ozone, kuongezeka kwa miale ya UV hufika ardhini na kudhuru afya ya binadamu huku ikileta kansa ya ngozi na magonjwa mengineyo.

### **Matatizo mijini.**

Miji mingi hukabiliwa na shida za taka, uchafuzi wa hewa, kelele, msongamano na kupungua kwa maeneo yakuishi.

### **Kupungua kwa rasilimali.**

Ongezeko la mahitaji ya nishati na rasilimali katika dunia nzima linasababisha rasilimali ya kiasilia kama mafuta, makaa ya mawe, madini na misitu kuisha. Jambo hili linaongeza ushindani wa rasilimali jambo ambali linaleta migogoro ya kimataifa. Kutafuta rasilimalizaidi ili kutimiza mahitaji kutakuwa shida kubwa hivi karibuni isipokuwa vyanzo vya nishati badala vvitumike kama maji, upepo au nishati ya nyuklia badala ya rasilimali inayopimika kama mafuta, makaa ya mawe au gesi ya kiasilia.

### **Wakufunzi, uliza wanacluster maswali haya:**

Je, nchi ya Kenya hufikiwa na athari za baadhi ya shida hizi?

Je, Kenya huchangia au kusababisha yoyote ya shida hizi?

Jinsi Kenya inavyokua, unafikiria ni shida zipi za kidunia zitakuwa mbaya zaidi?

Hamasisa cluster yako ya TIST na wanajamii wngine kupanda miti zaidi ili kupunguza baadhi ya athari hizi mbaya kwa hali ya anga ili mazingira yetu yawe bora zaidi!



# Ukataji wa misitu na uharibifu wa ardhi ya msitu ni matatizo makubwa sana. Twaweza kufanyeje?

**Ukataji misitu ni kung'olewa kwa miti na mimea mingine yenye mbao.**

Misitu na miti ya mbao hufunika theluthi moja ya uso wa dunia. Miti hii hudhibiti hali ya hewa, hulinda rasilimali za maji, hutupa mazao ya msitu (mfano, mbao, dawa, matunda na kadhalika) iliyo na thamana ya mamilioni pesa za America na yanayosaidia aina milioni za mimea na wanyama. Hata hivyo miti hii inaharibiwa kwa haraka sana, hectare milioni ishirini kila mwaka. Nusu ya watu wote katika dunia nzima hutegemea msitu kupata ngataa, hata hivyo watu takribani milioni mia moja hawana ngataa tosha kutimiza mahitaji yao ya kila siku.

## Sababu kubwa za ukataji wa misitu:

Ukataji wa miti hufanyika wakati mimea inakatwa kabisa ili kuruhusu shughuli zingine kama kilimo, malisho na matumizi kama: kuni, kutengeneza matofali, kukausha samaki, kuponya tumbaku, kukausha majani chai, kujenga na mbao.

Uharibifu wa msitu ni wakati msitu unakua na aina za mimea na wanyama chache na uwezo wake wa kuzalisha unapungua kwa sababu ya utumizi na usimamizi mbaya (mfano, miti yote mizee ikitatwa na miti mifupi tu kuachwa, ama mimea yote ya aina muhimu ikitatwa, ama msitu ukilishwa sana, hadi miti inashindwa kukua ili kuisimamia iliyokufa)

Ukataji miti na uharibifu wa misitu mwingi hutokana na kukosa ujuzi kuhusu thamani kamili ya miti.

Wakati mwingine, thamani ya miti inajulikana lakini umaskini na fikira ya kuwa hakuna njia badala huongoza watu kukata miti.

## Yanayotokana na ukataji wa misitu.

**Mmomonyoko wa udongo:** ukosefu wa kizuizi na mizizi ya kushika udongo hufungulia udongo mmomonyoko wa udongo.

## Ukosefu wa rasilimali za msitu: Kung'oa miti

huharibu makazi, hupunguza bionuwai, hutoa rasilimali za chakula na dawa, huongeza mashindano ya kupata vifaa vya kujenga. Watu watahitajika kutembea mbali zaidi kupata kuni na iwapo mazao ya misitu yanauzwa, bei zitapanda.

**Ukosefu wa faida zingine za kimazingira za miti:** Miti hupunguza upepo, huweka unyevu muda mrefu, huongeza oksijeni hewani, na huongeza virutubisho udongoni. Kwa hivyo bila miti hali ya hewa itakuwa kame zaidi na uwezekano wa mafuriko kuongezeka, mmomonyoko wa udongo, kupungua kwa rutuba ya udongo na kupungua kwa ubora wa hewa.

## Twaweza kufanya nini ili kuepuka ukataji wa miti na uharibifu wa misitu?

Anzisha minanda ya miti yenye miti mbalimbali na ya kiasili na huipande mwenyewe, au hutambaze au huuze miche kwa jamii.

Tumia meko ya kuokoa nishati kama yanayotumia kuni au makaa chache.

Tumia vyanzo badala vya nishati na ngataa inapowezekana (kwa mfano, pasha joto na jua, mavumbi ya mbao, maganda ya kahawa na mchele, Nyasi, magugu, mabaki ya mimea, kinyesi cha wanyama)

Fanya shughuli za kupanda miti. Kuweni kikundi cha TIST chenye mafanikio na kinachofanya kazi! Encourage your neighbors and friends to join TIST as well.

Usilime ardhi yanayokaribiana na mto au bwawa. Iache miti na mimea kukua ili kulinda maji.

Chunga usilishe zaidi ya inavyofaa. Punguza uwezo wa wanyama kufikia miche kwani wanaweza kuiharibu, ili kuupa msitu nafasi ya kukua tena.

Hamasisha kilimo-mseto ama kutumia miti inayokua kidogo. Kuwa na miti katika ardhi yako hukupa uwezo wa kufikia mazao ya misitu na husaidia kulinda msitu ulio karibu.



## Miti ya kienyenji inayokua haraka.

Miti ya kiasiri hutupatia faida tofauti. Mwezi huu tunaangalia baadhi ya miti ya kienyeji ambayo ni ya manufaa na kukua kwa haraka. Kwenye poli miti hii hukua haraka ikiwa imekatwa au kuchomwa na moto. Jadiliana na walimu au vikundi vya cluster kuhusiana ma miti hii na hasa ile inayomea huku kwetu.

***Hagenia abyssinica***, African redwood, muhooru



Mbao yake ya rangi nyekundu inapendeza sana na imamea haraka kwa kufikia meter 20, *Hagenia abyssinica* ni mtu mzuri na unakua ukienda juu na pia unafanya vizuri mahali kuna mvua ya kima cha 1,000 to 1,500 mm kwa mwaka. Ina manufaa mingi kama matawi yake inatoa rutuba. Inatumika kama dawa. Pia inatumika kwa kuzuia mmomonyoko wa udongo. Muti mwenyewe unatoa kuni na makaa mazuri sana na pio mbao.

Muti mwenywe unamea kutokana na mbegu yake. Haihitaji kunyunyizia dawa. Mbegu inamea kwa munda wa siku 10-20 na inamea kwa muda wa 40-60%.

Ikipandwa na mimea mingine hakikicha umekata matawi ili mtu mwenyewe ukuwe ukienda juu.

***Macaranga kilimandscharica***, mukuhakuha/mukura



Macaranga ni mtu unaokua haraka sana na unafanya vizuri sana na mimea mingine kama Kahawa ama madizi. Inafanya vizuri sana wakati kuna mvua ya kima cha 1,500 to 2,500 mm kwa mwaka. Kwa sababu ya ukuaji wa haraka wake, inazuia mmomonyoko wa udongo. Ni mzuri sana kwa kuni na kwa kujengea ukuta. Mbao yake ni nzuri sana kwa kujengea masanduku, meaza, viti na kadhalika. Mizizi yake inatumika kama dawa.

Macaranga inamea kutokanan na mbegu yake macaranga. Haihitaji kuchungwa sana ndio ikue.



# 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 Kithio TIST Cluster receiving their payments on 12<sup>th</sup> April, 2017.

**Inside:** Mbua niyukie - Ivinda yingi ya uvanda miti ingi mingi. Page 2

Maendeeo ma kwikala meanite. Page 4

Kwengwa kwa mititu na mititu kwanangwa ni nthina umwe munene muno.  
Na niata tutonya kwika? Page 5

Miti ya kithio ila imeaa mituki. Page 6





## **Mbua niyukie - Ivinda yingi ya uvanda miti ingi mingi.**

### ***Kusevya miti yikivuioni nikanya ithyamiw'e muundanikithekani (Kumiumiisya)***

Nundu yu mbua niyukie, miti ila yikivuioni niyaile uvndwa miundani. Ni useo kuikiithya miti ila yikivuioni yina ivinda yaile ya kuthamiw'a miundani.

Miti ino niyaile kuumiwa kwa kumyeteelya kuvanda kuithekani vala iteusuviwa muno ta kivuioni. Ngelekany'o ila yikivuioni nikwataa kiw'u kingi, muunyi kwi yathamiw'a kithhekani. Nikana iumiie niuseo kuola kiw'u kila uungithya na mavinda ala uungithya na kumiveta muunyi nikana wamithamya ndikew'e thina yithiwe itonya kumiisya.

### **Mbeu nzeo iilye yithiawa na mawonany'o mailye ata.**

Kwa mithemba yoonthe nikana mithemba kivathukany'o yithiawa na mawonany'o kivathukanyo. Miti ya mbeu nzeo iilye uu.

- Munguthe wayo ni muasa kundu kwili kwa mwii kana mbisu.
- Muthamba withiawa na vintya na wimunou.
- Ingi yaile ithiwa natumii tungi twingi vamwe na mwii ula munene.
- Mithemba mingi ya miti yaile ithiwa na mawonany'o aya itina wa kumea.

### **Kuthamya.**

- Mikue iungye ndukakulumanie.
- Thima kyelenge kina uthathau wa 30cm kithhekani vala uvanda.
- Umya muthanga wa iulu na uyumba kavumbu.
- Umya muthanga ula uatiie ta uliku wa 30cm na uyumba kavumbu kangi.
- Ikiya nyeki susue kisio kya 5cm ethiwa kwi mbua ongela vuu.
- umya ithanguni kana mbisuni na uyumya nesa ndukatilange mii.
- Vanda yiimani yiu.
- Ususya na ula muthanga wayiulu.
- Ikundi imwe iyusuasya muthanga vyu nimatiaa mwanya wa kiw'u. Kii kithiawa kiseo kya utwiikana kiw'u yila mbua yaua na kutetheesya kiw'u kunywa muthangani.
- Ngithya mbeu isu wavanda.

**Vata wa Miti**

Miti niyavata muno kwa mawithyululuko nundu wa itumi ii:-

**A. Kwailya mawithyululuko**

- Miti niwika muthanga, na kuusiana na kukuwa ni kiseve kana kiw'u.
- Matu na ngava ila syavaluka nisyooa na kutwika liu kwa muti.
- Miti niyongelaa wiu wa muthanga nundu nisiiia kiw'u kukuwa ni nzeve kuma muthangani.
- Mii ya miti nayo niyovaa na kukwatany'a muthanga na kuola muthanga kukuwa.
- Mii ya miti ingi nitetheesya kiw'u kunywa nthi na kwailya kiw'u kya ungu wa muthanga kuyaiikani.
- Miti niyailasya nzeve ya vandu kwa kuthithya nzeve
- Miti nitheesya nzeve kwa kuveta nzeve itavisaa nzeveni ila ingi.

- Miti ninenganae muunyi na wivitho / Mawikalo.

**B. Kutune unou ula waile na miti ya utumia**

- Miti ya kwaka, kwikia wiio, makanda etc.
- Ngu.
- Ndawa.
- Liu wa andu na uithyo wa indo.

Vaita ula miti itunengai niwavata muno kwitu aimi na nthi yonthe. Ukunikili ula uneekiwe o mituki kwa aimi ma tist niwoonanisye kana matuna, mbindi, liu wa indo syonthe kuma mitini ila ivanditwe ni aimi ma TIST kwa nzia ya nima ya kusuvia ninenganite ueti museo na vaita wa silingi 37,000 kwa kila muimi. Ve vinya kwikia thooa kwa vaita ula umanite na uthithu, kimeu kya muthanga na nzeve ntheu wivo vaita na useo ungi mwingi kumana na wia wa TIST, indi nitwiw'aa useo kila muthenya twi miundani yitu.

Kwoou ni useo munene kutavya angi vaita na vata wa kuvanda miti ala twi isioni imwe namo na mbaitu. Kweesilye undu tutonmya kwika tukavanda miti mingaingi mbee kwa vamwe!



## Maendeeo ma kwikala meanite.

### **Undu Nthi yonthe isiasya na kwona mawithyululuko.**

Kenya ndikalaa yiyoka itena ikonyo ingi sya nthi. Kwina umanyi iulu wa manthina ala methiitwe na mawithyululuko ni utetheesya Kenya kumanya iulu wa mathima ala makoka ivindani yukite. Ni useo kusisya mathina ala methiitwe mawithyululukoni nikana kuelewa mothuku ala methiawa kwa mawithyululuko.

### **Movinduku ma Nzeve.**

Kuvivv'a kwa mauta na makaa ma coal nikumasya nzeve itavisaa. Kii kietae uvyuvu mawithyululukoni na kwoou kwambatya uvyuvu wa nthi, Kula kwithiawa na ia yiyambiia uyaiika na utwika kiw'u na kyalika ukangani naw'o uyambiia kwambata na kuvwika nthi nyumu. Kii kitumaa kwithiwa na mavuliko na nzeve kuvyuva na kwoou nima iyanangika munamuno isioni sya ilembeta ya Africa na nthi yonthe.

### **Kuthokoanwa kwa nzeve**

Miuke kuma kwa maindasituli na ngali nimaetae mauwau ma mimeo na manthina kwa andu maveva nzeve isu. Miuke ino nitonya kulika kiw'uni kya mbua na kutuma kithiwa na asiti na kuete wanangiko kwa mimea na myako. Misyi mingi yithina wa nzeve kuthokoanw'a ni miuke vala yikalaa iniine ta matu kana muumbi na kuola metho kwona na ni itonya kuete mathina ma uima wa mwii.

### **Kiw'u kuthokoanwa.**

Kiko kuma kambunini sya useuvya syindu na siwengyi, vatalinza kuma miundani nutonya uluka mikaoni, mbusini na kula kiw'u kyumaa na kwananga mimea na kuete uwau kwa andu na nyamu.

### **Kuoleka kwa mithemba kivathukanyo.**

Mithemba ya yamu, miti, ikuthi ona mimea yothye niyiolekaa yila kweethiwa na nzeve ka kumiwa kwa nzeveni na miti kutemwa vakuvi mithemba 100 niyaa kila muthenya. Kii nikiolaa matilio na kundu kula kumaa vinya na kula ndawa ikwatikanaa.

### **Kutwika weu/Ing'alata.**

Yila nthi yaasya ngua syayo ila ni mimea muthanga niwumaa na nukuawa ni kiw'u kana nze na uyithiwa utena w'umi nesa. Ingi ii niyiawa ni nzia ya kunyaiikya mang'alata.

### **Kiko kina sumu.**

Kiko kuma kambunini kana vakitolini nikithiawa na kemikoo na matilio itonya uete na kuaa syindu kwa kulivuka kana kuivivya syonthe syi thau. Kwa ngelekany'a yila kambuni kuma India imwe (Bhopal) ya useuvya ndawa sya kuaa mitutu yeethiwe iyita kemikoo matesi niyalivukile.

### **Mbua ya Asiti.**

Kiw'u kii kina asiti ni kyanangaa mititu na masiwa munamuno ta ngaliko sya Europe na North America. Yila kiw'u kya mbua kyalikana na kuthokoanw'a ni asiti niw'o kiseuvasya mbua ya asiti.

Miti, Makuyu na myako niw'o kietae wanangiko.

### **Itu yila yivwikite wingi wa sua kuendee na kwanangika.**

Yila ndawa thuku (kemikoo) ta Chlorofluorocarbons (CFC's) syatumika syinduni kuete mbalavu na kwa indasituli kuseuvya syindu ukunikili weekwa nisyonekete kana nimwe kati ka syindu ila ikwananga itu yila yisiiaa sua kuatha (kuola uvyuvu wa sua) na kwananga (UV" ultra violet rays). Yila kemikoo syaananga itu yii niw'o UV syongelekaa kuvika nthi na kuete mauwau kwa andu ta uwau wa kenza ya kikonde na mauwau angi.

### **Mathina ma misyi minene ya mataoni**

Mataoni maingi mina nthina wa kiko kya mavuti, nzeve kumiiwa, kelele, kusuania na kunyiva kwa isio sya miundani.

### **Monou manthi kunyiva.**

Kwongeleka kwa wendi wa matilio sya kutumika ni andu nthi yonthe uthwii wa nthi ta mauta, mavia mavisaa (coal) na mititu niendee kuoleka. Kii kithuthasya na kuthingiisya masindano na kuete uvituukanu wa nthi kivathukany'o. Kumatha mothwii ma nthi ma kutunenge vinya na mwaki omituki nukwithiwa wi nthina munene ateo vethiwe na nzia ingi sya kukwata mwaki na vinya ila nisyindu sya vata muno ta kukwata syindu ithi kuma kiw'uni, nzeveni na neukilia vandu va utumia mothwii ala manini ta mauta ma nthi, mavia mavisaa (coal na Nzeve ya kuma nthi.

### **Amathisya ma TIST nimakulasya ala mekw'o kwoondu wa ngwatanio syoo makulyo aya:**

Kenya nikwatawaq ni mathina amwe ala maetetwe ni manthina aya twasisya vaa iulu?

Kenya ni imwe kati wa nthi ila ietae wongeleku wa mathina aya?

Oundu Kenya iendee na kwiana nimawiko meva ukwisilya maendee matonya kuendee na kwinthiwa me nthina munene oundu Kenya iendee na kwiana?

Thuthya ala mwi imwe nthini wa ngwatanio yenyu ya tist undu wa kuendee na uvanda miti kunyivya mathina ala maetetwe thini wa mawithyululuko na kuete uvinduku wa nzeve ni mawiko ma andu kwoondu wa mawithyululuko maitu methiwe manzeo!



# **Kwengwa kwa mititu na mititu kwanangwa ni nthina umwe munene muno. Na niata tutonya kwika?**

## **Kwenga ni kutemanga na kuveta miti na ikuthu ila imeete vandu.**

Kitheka/ ikuthu nikivwikite kilio kya imwe iulu wa itatu kya nthi yonthe. ikuthu na itheka niamuaa undu.

undu nzeve ikwikala na kusuvia mothwii ma mithi na kutuma syindu ila ikwatikanaa kithekani syithiwa vo ta ngu, ndawa/muiito, matunda na ingi mbingi, ila ni sya mbesa mbingi na nisyikalitwe miti na mithemba mingi ya nyamu. Na vailye uu ikuthu na itheka nisiendee na kwanangwa ta eka milioni 20 kila mwaka. Nyusu ya andu ala me ungu wa sua mekalaw'a ni mititu kwa mwaki na vailye uuu andu mbee wa million iana yimwe mayithiawa na mwaki wianite ona wautumia vanini.

## **Kila kitumaa ikuthu/miti na itheka syengwa:**

Kwengwa kukaa yila mundu waamua kuithya indo kana kutemanga miti na ikuthu akwate vandu vaKuima, Ingi nukwenda ngu, kuvivya matuvali, kuvivya makuyu, kuthia mbaki, kunyasya maiani, kwaka na miti.

Mititu ya nangikaa yila weethia mutitu usu ndutonya kumiisya na kwiana ingi nundu wa undu utumiitwe nai na kulea usuviwa vala kwa ngelekany'o miti ila mikuu ya temwa na kutia ikuthu syoka, ingi yila mithemba mina ya miti yatemwa na ilea uvandwa ingi muthemba usu wa miti nuthelaa vyu.

Kana yila vandu vaithw'a muno weethia ona vaimea kindu. Kaingi mititu ithelaa ni andu kulea umanya undu maile umisuvia na kumikalaya. Kungi nowithie nimesi vaita wa miti indi ungya ula wivo uituma matemanga na kwananga mititu nikana matonye kwitethya.

## **Mathina ma mititu kuthela.**

**Muthanga kukuwa:** Ethiwa vai miti ila itonga ukwatany'a muthanga muthanga nutonya ukuwa ni kiw'u kana nzeve.

**Kukosa kwa mititu:** Kuveta miti kwithiawa kwi kwananga mawikalo na nikuolaa tusamu tula twikalaa muthangani na ingi syindu ila ikwatikanaa mitini kukosa, na ethiwa ve miti imwe yatiwa uyithia yiendeka ni andu aingi kwi undu itonya kwianisya mavata moo. Kwa negelekany'o uyithia miti ya kwaka, ngu na syindu ingi kuma mitini iyiuwa kwa vei wi iulu.

## **Kukosa kwa moseo angi ma mawithyululuko.**

Miti niyithiaa isiia nzeve, kukwatiia kimeu, kuete nzeve nzeo na kwongela unou muthangani. Kwoou.

vate miti nzeve ya vanduu nikeukaa nakwithiwa yi mbumu, itonya ukwatwa ni mavuliko, kukuwa kwa muthanga ni nzeve, muthanga kumosa na nzeve kwithiwa itetheu ya uveva.

Nata tutonya kwika kusii itheka mititu na ikuthu kwengwa?

Kuseuvya ivuio sya miti ya kiene na kumivanda ithyi na kunenga ala mbaitu onamo mavande.

Kutumia maiko ma usuvia mwaki ta ala matumiaa ngu na makaa manini Kutumia muthemba ungi ta ngu ngelekanyo, kutumia sua kuvyuvya kiw'u, mutu wa musumeno, makavo ma kaawa, nyeki, yiia, matialyo ma makusa na kyaa kya indo.

Ika wia wa kuvanda miti, ithiwa wi umwe wa ikundi ila TIST ikutania kwa kwika kwoo nesa, thuthya anyanyau na atui maku malike nthini wa Tist. Ndukaime nguumoni sya mbusi kana vakuvi na maia kana syandani, eka miti ikuthu imee na kusuvia kiw'u lthya indo undu vaile utekueka syenge nyeki vyu na kutia ingalata. Ingi siii ikathi vala uvandite miti yi minini iikanange kana kumiya.

Thuthya angi mavande miti na liu vamwe. Kwithiwa na miti kithekani kwakunikutumaa ukwata syindu ila inenganawe ni miti vate kuthi kuasa mitituni.





## Miti ya kithio ila imeaa mituki.

**M**iti ya kithio nitunengae moseo maingi me kivathukanyo. Mwai uu twikunikila miti mina ya kithio ila yi vata muno nundu niyanaa mituki .Kithekani mbai sya miti ino nisyo mbai sya tene na nisyo imeaa mbee na mituki yila sya temwa kana kuvya ni mwaki.Ta amanyiwa na ikundi ingi nini nduani yaku ni miti yiva ila yikaa nesa nduani yenyu?.

**Hagenia abyssinica**, African red wood, muhooru.



Kwoondu wa mbwau syayo ndune, na kwiana kwa wo kwa mituki kuvia mita ta miongo ili Hagenia abyssinica ni muti museo uivandwa nthi ila mbukilu na ikwataa mbua ya mm katikati wa 1000 na 1500 kila mwaka. Wi mavata maingi, matu mawo ni manoasya muthanga, na ni muti museo uivandwa kula kwi mititu. Ni muti museo kwa uiiti na nusiiia muthanga kutwawa, ni muti museo wa mbwau na na ngu na makaa.

Muti uu numeaa mituki kuma mbeuni yawo.Tilasima ukunwe ndawa na mbeu yayo nimeaa katikati wa matuku 10 na 20 itina wa kuvandwa na niwianaa na mituki na uasa 40-60% itna wa mumea

Ethiwa miti uu nuuvandwa muundani vanda wimutaaniu. Sea mbonge nikana wiane win a muthamba mulungalu.

**Macaranga kilimandscharica**, mukuhakuha / mukura.



Makaranga ni muti umeaa mitiki na museo uivandaniwa vamwe na kaawa na maiu.

Umeea nesa kula kwi mbua ya katikati wa mm 1500 na 2500 kila mwaka. Ni muti museo kwa wiio na nundu wakumea mituki nusiiia kutwawa kwa muthanga. Muti uu ni museo kwa ngu, kuseuvya masanduku na kwa kwiiia wiio. Mii yawo nitumika kwa uiiti. Vanda ngii sya makaranga na muti uu ndwendaa usuvii mwinga wa mina kumea.

# 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 Kitheo TIST Cluster receiving their payments on 12<sup>th</sup> April, 2017.

## **Inside:**

Iwatgut inguni: Ongemin ketik. Eng kasari komiten Robta neo ogemin ketik. *Page 2*

Keri b bandabtai. *Page 4*

Ngemetab timwek ak olemiten timwek ko koik kewelnatet mising kiyoe nee? *Page 5*

Ketikab gaa cherutu kochogu. *Page 6*



# Iwatgut inguni: Ongemin ketik. Eng kasari komiten Robta neo ogemin ketik.

Chobchingei chitugul eng arawani ile  
kegol eng chonginto.

## ***Nebotai ko kechobchigei kesuwek:***

Chobchigei eng kabeti amun miten beek  
chechng. Eng kabeti iger ile keter beek  
komowech ak ingany uruwet asi mowechok  
ketik en kabeti.

kosibet ne karan nebo kesuwek: (en abogora  
kotiye ketik terchinet eng kabeti kotienge  
korikab ketik.) Tinye ortinuwek che uchu:

- Metitab kesuwot kotiye kebarta oeng  
kosir tigitiyot.
- Nyonu kogimit temet
- Nyonu kotiye tigitik chemengechen  
chechang.

- Nyonu en orowek oeng kotiye oteboni.

## **Minet:**

- Min ketit kotonon komie
- Bal keringet nebo 30cm kotuyo
- Itaban ngungunyek chebo barak
- Itaban chebo orit ak ichek
- Inte susuwek cheyomiyotin koit 5cm ak  
itesi keturek.
- Itutun ketit mat imin ak selele.
- ingoto nguggunye chetai
- Mat inyit nguggunyek kerimget asi  
kotoche beek.



- Ingo nyor koguwoiti 3m-4m asi komuchi koet ak kosich omituwogik.

## Komonut nebo ketit:

Bo komonut ketit eng ribetab Itondab Emet ak amuneisiek checheng:

### A - Ribetab Emet:

- Ketik kotere ngungunyek, koristo asi moib.
- Tesin sogek ngungunyek koyor omituwogik.
- Igochin ketik koyor beek ngungunyek ak koter beek komaiyeso koba barak.
- Igochin tigitik koyum asi moib beek
- Nyorunen Emet koristo ne karan.

- Kiyorunen uronok ak teretab koristo.

### B-Tuguk chegiboisien ak Omituwogik:

- Kimyorunen (bogoinikak kwenik)
- Kerichek
- Omituwogik eng biik ak Tuga

Tuguchuton tugul kobo komolut eng temik ak Nguwony komugul. Miten chi en tist ne koyai kosegei komwa kole bogomolut logoek, kuwelik ak ketik chegigemin ak imarenik chema kigol komuchi koyor Temintet age tugul Ksh 37,000. Kimoginigei tuguk chechang eng kaa ak eng imarenikiyok asi keitin mogutikiyok.

Ogetes ketik eng mbarenik kiyok asi keyorun mengotet ne kararan. Ogibwat kemin eng kibagenge keigu koborunet eng biik.





## **Keri b bandabtai.**

Geretab ole kimenye en nguong kenya komomiten inegen kotabatanat kition en nguong komugul miten kotinye kabwatet en koimutik che nyoru ak kogere agobo mengotodiek en agobo mengotosiek en agobo betusiek chebwone, bogomonut mising ye kiger koimutichuton ak kiguiyo ngemisiet ne konu waletab mengotosiek.

### **Waletab emet.**

Ye kibel ngetuna nikab tiongik (coal, oil, natwal gas) kogonu koristo ne ya (carbon dioxide) niton kogochin kotal burgeiyet ne miten soet kogochin ng'ontet koet burgeiyet, nyoru nyanchosiet chemiten murot nebo katam kotesak beak amun chotos koigab beak, bitunen maranet nebo oinosiek, rurutik komonyor kelchin amun etu burgeiyet en ne met (kement) en africa ak en ngu'wong komugul.

### **Air pollution.**

Koristo nebunu karisiek ak industries konyorunen bik kaimetab ge amun moitin konyor koristo ne kararan, ye imuka en soet nesechuton ko yerobon ekochote ak goik (acid rain) ne imuchi kowech menutik ak teksosiek, en mengotosiek cheech komiten kewelnatet nebo iyet neimuchi kosoginin en town koige bolik ne moimuchi biik kosoita ak kogonu miyonuek.

### **Beek chenobirotin.**

Beek chemongunen (industries) chemongunen kabngatat, kerichek che mongunen imbarenik kotetechin oinosiek ak nyanchosiek kongochin kotametusiekab beek, nyorunen tiongik ak minutik ak biik mionuwek.

### **Ichuchuchi minutik ak tiongik.**

Nyorunen ketik ak minutik kobosok amun en waletab emet, ak tiyongik nyabira niton ak tiletab ketik kobose inyotetab mengikab timuwek en kila belut bose kora tuguk chegiteksen ak kerichek.

### **Kaumanikab beek cheyachen**

Chuton ko beek cheyachen mising chebunu factorisk che imuchi kobutok anan kongemak ko weche emet.

### **Robta netinye acid.**

Kagemwai entai agobo niton kiristo ne nyabirat, chetinye acid weche niton timwek ak oinosiek cheech en europe ak murot nebo katam en america, yon korobon kobitu beek chetinye acid ko ketik, minutik, nchirenik ak teksosiek ko ngeme.

### **Istoetab burang'etitab nguong.**

Miten anyun kerichek cheu (chlorocarbons) chekiboisien kogotiten mongutik chebo factory chuton anyun kongeme burangetitab nguong, burongetini kotuche nguondet asi monyor burgeiyet neo mising, ye bii miyonuek kou; lubaniatab magatet ak miwonuek cheter ak chetes.

### **Nyoru koimutik mengotosiekab barak.**

En toonisek ak cilies konyor murindo neo, koristo, bolotosiek, chiletabgei ak kobosok ole kemenye.

### **Rorunetab kelunoikab emet.**

En amun kimogingei tuguk chechang chegiboisien en nguong komugul kobitu rorunetab tuguk kou, oil, coal, mineral ak timwek kobenti kobetos, en rorunetab tuguchu kogonu boriosiek, komalo kobitu kewelnatosiek amun en rorunetab kimnotetab mat ne kimogingei baten kecheng oretagei kou beek ak koristo ne kata oil, coal.

### **Konetikab cluster oteben biik tebutichu.**

tos nyoru kenya youtichu yachen, tos toreti kenya anan tesini koimutichuton, oketeben kenya agobo tetet, ainon koimutiet nebo mengotet ne gibuoti kele nyone koyoitu missing oginet biik en tuiyopsiekab kilasta ak biik alak komin ketik en chonginto asi komuch kotes tuguk alak che wole emet, asi kenyorun mengotet ne kaigai



# **Ngemetab timwek ak olemiten timwek ko koik kewelnatet mising kiyoe nee?**

***Ngemetab timwek ketik ak tuguk tugul che nyolilen che tuche emet.***

Timwek ak olemiten ketik koibe agenge en somok en nguong tugul, igochin ana wole burgetab nguong, ribe kondametusiekkab beek, toreti koet timwek kou (bogoinik, kerichék, ak logoek), toreti kora katagetugul ak tionyagetugul ne en kila kenyit kengeme 20 million hectares biik chechang kotiyengei timwek koboisien kwenik, kora chechang komotinye yamet en boisionikwak

***Nee ne konu asi kengem timwek.***

Ye kingem timwek en koluletab ketik asi kobit konyor biik kogolso anan koyagen kiyagik anan ko kwenik, matubaruk, yamsetab chaik, tegsosiek ak bogoinik, chang mising mogutik che mogingei bii en sobenyuan ye kingem timwek komegonyoru boroindo ketik kota kobitiyo, ye kiyagem tuga ak ngorek en chongindo komegorutu anyun agot suswek ngemetab timwek ko wolutienyin komagotinye ketik komonut, bananda kogochin biik kongem osnosiek ak timwek amun mata konoik bii kole tinye ketik komonut en ichek terchinet nebitu ye kingem timwek kobetatab ngungunyek; agot komomiten ketik cheimuchi korat ngungunyek kobenti tugul koba oinosiek en kasarta robta yon motinye timwek kelunoik; ngemetab ketik komobitu mengotosiek che kororon, mogonyoru omitwogik, kerichék ak

tegsosiek chengoti kwenik en banda ne koi, tesoseni mogutik en biik ak kotesak.

***Oliye tab tuguk cheyobu timwek.***

Betos anyun kanutoik chebo ketik ketik kotoreti koter koristo, toreti kogatit emet komayam, tese koristo ne kararan (oxygen) ak kotesin ngungunyek okwoindo, en yemomiten ketik koetu borgeiyet koyam emet ko bitu maranosiek, koristo ngungunyek ak kobi nyabiretab koristo ne kibusen

***nee negeyoe asi keter ngemetab timwek ak osnosiek?***

Nget angun akinam kabeti nengung ak ibit ketikab kipkaa ak imin koinye anan igochi biik kesuwek komin, boisien mostiluek cheboisien kuwenik che ngerin anan ko nesek, coffee and husks, grass, weeds ak animal waste, ogeib koguoutik en minetab ketik kou ye yoe kurubisiekkab tist oginet biik alak kanam koba tist, ogerib mat ketem ole negit oinet anan ko nyanyawet amun rutu timto ago rib beek ogeba tuga anan ko nego che ngerin asi maimuch emet ak kogochi ketik korut en timwek, ogemin ketik che kigole ak rurutik asi komuchi ko wale emet, ye igole ketik en kaa ko toreti komagus osnet anan ko timwek en ole imenye



## Ketikab gaa cherutu kochogu.

**K**etikab gaa kotinye boishonik chechang che ter. En arawani, kegere alak en ketikab kaa chebo komonut ak kochogu.

En timwek mising' ko ketichuton ko che tai, che rutu kochokyin ak kochogu mising' ko ole momi ketik. Ng'ololchin konetik ak groupiskek alak en cluster ing'ung' akobo ketikab kaa en kebebertang'uong'.

Hagenia abyssinica, African redwood, muhooru



Tinye bogoinik chebiriren ak korutu en chokyinet agoi mitaishek tibtem. Hagenia abyssinica ko ketit ne kararan negimuche kemin en ole tulwet ole siche milimitaishek 1000 agoi 1500 nebo ropta kila kenyin tinye boishonik che chang': sogek chik kotoldole ng'ng'unyek ak koyai ketit ne kararan ne kimine en imbarenik en minsetab minutik ak ketik. Keti kobo kerichkek ak komuche kotoret koter ng'ngu'unyek. Bogoinik kyik kobo olyet nemi barak ak en kwenik ak makaa keti kemine koyop

tenderek. Robsetab tenderek ko mobokomonut ak rutunet koen egosyek 10 agoi 20 ak rutunetab 40-60%.

Ngemin koboto minutik kotinye nyigisindo nebo ng'wony til ketik si kotoret koteta.

Macaranga kilimandscharica , mukuhakuha/mukura



Macaranga ko ketit nerutu kochogu nemie kemin koboto ndisinik ana ko kahaawek. Rutu komie yon kosich roptab milimitaishek 1500 agoi 2500 en kenyt. Kararan en teretab koristo ak amun en rutunetab chokyinet komuche koter ngu' ngunyek en ibet. Bogoinik kyig ko kororon ago tinye kwenik che kororon ak kimuche keboishen en ng'otishet. Tiftyondonyin ko kerichkek. Kimine Macaranga keboishen tenderek.

Keti ko chogu mising' ko yon kagimin komye ko momoche robet ne o.