

Mazingira Bora



TIST

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

English Version

TIST is an innovative, time - tested,
afforestation program led by the
participants.

TIST Answer Desk Number 0795 - 011 130. Call in Today!



Munyaka cluster members, in Trans Nzoia, happily receiving their 70% carbon profit share vouchers.

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TIST: Greenhouse Gas Business.

Growing trees absorb carbon dioxide through photosynthesis. Carbon dioxide is one of the 'greenhouse gases', which captures the sun's radiant heat inside the Earth's atmosphere helping to maintain the temperature of the Earth's surface. Some scientists think the Earth is getting hotter and hotter which can be very damaging. This is called the Greenhouse Effect, which causes some areas of the world to experience more flooding, more drought or desertification.

The burning of fossil fuels like oil, coal and natural gas produces carbon dioxide. Because trees absorb carbon dioxide, they help reduce the Greenhouse Effect. Governments and large Industries in many countries want to reduce their emission of carbon dioxide so that the Earth does not heat up as much.

TIST Quantifiers count and measure the

trees we plant so that TIST can work out how much carbon dioxide the trees absorb. The unit of measurement is called a carbon credit, and is equal to one tonne of carbon dioxide absorbed. Companies and Governments can then buy 'carbon credits' meaning they can pay for trees to reduce their carbon dioxide emissions.

We must have honest and accurate data on trees to sell these credits to a buyer. The carbon credit money can help groups to be even more productive, effective and start new projects. TIST groups get paid \$20 for each 1000 trees each year (roughly 2.00 kshs per live tree per year). The greenhouse gas payments are not the only benefits a Small Group receives because the trees are worth 10-40 times as much as money received from the greenhouse gas business.

**TIST Farmers - let's plant more trees!
Together we achieve greater benefits.**

Environment and Conservation.

Sound Environmental Management is not only the maintenance and enhancement of wildlife and habitats, but also the management of soil, air, and water. The positive management of these factors leads to better use of resources with a reduction in waste and lessens the risk of pollution. All reasonable pro-active efforts should be made to conserve the environment.

Biological diversity is fundamental to agriculture and food production.

Members should understand and assess the impact their growing activity has on the environment, and consider how they can enhance the environment for the benefit of the local community, flora and fauna.

It is strongly recommended that each member have a plan for the management of wildlife and conservation of environment on their own property compatible with sustainable agricultural production and minimize environmental impact. A key aim should be the enhancement of environmental biodiversity on the farm through positive conservation management.

Key elements:

- ~ Conduct a baseline audit to understand existing animal and plant diversity on the farm.
- ~ Take action to avoid damage and deterioration of habitats
- ~ Create an action plan to enhance habitats and increase biodiversity on the farm.



TIST Farmers Combat Global Warming and Climate Change.

TIST farmers have responded to a global call to combat global warming and climate change. Many farmers have sought understanding through TIST seminars/trainings and at cluster meetings to learn and understand more about global warming, its effect on the climate, and mitigation approaches. We see many impacts of climate change today. Just to illustrate a few instances of impacts, the El Nino floods of 1998 that ravaged most of the country and the long drought that followed, and the strong hurricane of 2004 were likely intensified by global warming. Other notable illustrations are the gradual wearing off the glaciers at the peak of Mt. Kenya, unpredictable weather patterns that have resulted in crop failures in many areas, drying of water springs and water catchments areas, among many others.

This month's newsletter will share training notes from seminars so that we all can understand global warming and climate change better. We will begin by defining each term and explaining it further and then learn how your trees play a significant role in mitigating the effects of global warming.

What is Global Warming?

Global warming refers to an average increase in the Earth's temperature, which in turn causes changes in climate. A warmer Earth may lead to changes in rainfall patterns, stronger storms, a rise in sea level, crop failures, and a wide range of impacts on plants, wildlife, and humans. When scientists talk about the issue of climate change, their concern is about global warming caused by human activities and the extremes of climate and weather variability this brings about.

Is the Earth getting warmer?

Yes! The Earth has warmed by about 1°C over the past 100 years. Many of the world's leading climate scientists think that things people do are helping to make the Earth warmer, such as burning of fossil fuels including coal, petrol, and natural gas, and cutting forest and managing land poorly.

What is the Greenhouse Effect?

The greenhouse effect is the rise in temperature that the Earth experiences because certain gases in the atmosphere, called greenhouse gases, like carbon dioxide, nitrous oxide, sulphur dioxide, and methane trap energy from the sun. Major sources of carbon are deforestation, gases emitted from industries, gases emitted from motor vehicles, gases

emitted from burn of wood fuel or charcoal and burning of forests.

What are the dangers of Global Warming?

- Severe water stress in the arid and semiarid land areas would result in more areas becoming desert.
- Increased spread of diseases like malaria. As areas become warmer, they become suitable breeding grounds for mosquitoes, and increasing risks of malaria infection. Many families and health institutions can be impacted, average life spans decline, and infant mortality rates rise.
- Decreased agricultural production in many tropical and subtropical countries, especially countries in East Africa. Due to decreased rainfall and increased breeding of pests due to increased warming, the production of food crops may decrease and this results in poverty and hunger among many families and communities.
- Higher worldwide food prices. As more farmers get less yields and food supplies become scarce, the prices increase because the demand is high and supply is low.
- Major changes in the productivity and composition of critical ecological systems particularly forests. Water catchment areas in the mountains and forests continue to dry up. This will affect the ability to irrigate crops and will reduce stream flows necessary to keep dams and reservoirs replenished. This will reduce generation of hydroelectric power. Our industries, hospitals and other institutions that heavily rely on electricity will be severely affected. The supply of piped water to urban areas as well as rural homes will also be affected.
- Tens of millions of people at risk from flooding and landslides, driven by projected increases in rainfall intensity and in coastal areas, rising sea levels.

How can I prevent Global Warming?

Plant and care for trees!

As mentioned above, carbon dioxide is one of the gases that cause global warming. Trees absorb carbon dioxide from the air during photosynthesis and store it in the wood, roots and soil as cellulose carbon. However, when trees are cut and burned, they release the carbon they had stored back to the air.

**Did you know each tree could create a microclimate?**

Trees and their cover cool the surface of the earth. Feel the comfort of the shade of a tree. Notice that the soil below is moister than where the sun bakes it with no shade. When the ground stays cooler, the ground holds more moisture longer. This means that trees on your land will help improve the amount of water in your soil, and help retain it for a longer time. This will help your crops and also even help the water users in your area.

What are carbon credits?

To make a TIST carbon credit requires 3 things:

- 1) A real and additional reduction in the carbon dioxide (CO₂) being emitted to the air;
- 2) A promise to keep the carbon out of the air for many years;
- 3) A Verification by an independent third party that certifies that the actions have taken place according to all the rules.

Trees absorb carbon dioxide from the air during photosynthesis and store it in the wood, roots and soil. The amount of carbon taken from the air and stored can be measured and calculated, and then, when verified as accurate, this absorption of carbon dioxide can be sold on the world market as carbon credits. Buyers can purchase these credits to offset their carbon dioxide emissions.

TIST is able to sell the carbon absorbed in trees just like producers sell sugar and milk. With carbon, however, you don't ship the tree to the market. Instead, the value is from the carbon taken out of the air, kept in the tree on your farm or forest, measured and reported. The trading of carbon credits can be done in New York, Chicago, London, and other cities globally, or it can be arranged between people or companies directly. We have to meet the market rules and requirements. We cannot clear forest or cut trees to plant trees since this is bad for the environment. We have to commit to keep trees in a grove growing for the long-term, 30 years or more. We have to report data accurately. Once trees are planted, some measurements and calculations are made to measure the amount of carbon TIST farmers trees have absorbed. Note again, trees are never actually taken to the markets. They remain in the shambas and the longer they stay alive, the longer the period of receiving payments. So, the farmer keeps the trees, the fodder, the firewood, and the fruits and the nuts. The money that TIST makes selling carbon offsets creates a new source of income and is then shared with TIST Small Groups and used to support the costs of TIST, including training, quantification, and management.

Do all trees absorb the same amount of carbon?

No, trees with wider circumference (more biomass) store more carbon than trees that are thin. Taller trees also absorb more carbon than short trees. Therefore, trees that are thick will bring more income from carbon credits. This means trees planted with good spacing have a chance of growing big and tall and earn more carbon income. They do not compete for soil nutrients and water as much as trees that are closely spaced.

Therefore, in order to receive good payments out of our trees, it is important to plant them in a good enough spacing that will allow them to grow healthy, tall and big. Thinning some of the trees to harvest firewood and keep the other trees growing well is usually the best way to manage your trees.

Where/who are the buyers of carbon credits?

Currently, carbon credits are sold on voluntary markets and in compliance markets. They may be certified in different ways, just as there are different brands and certifications for other products you buy and sell (like coffee, and organic coffee under different labels). TIST could market its carbon credits on the compliance or the voluntary market because they are of high quality.

There are many different standards in these markets with different and ever-changing rules about tree planting, monitoring, and reporting that we must meet to sell carbon offsets. We use the highest quality standards for the Validation and Verification — the Verified Carbon Standard (VCS) and the Climate, Community, and Biodiversity Alliance Standards (CCBA).

TIST has two basic types of buyers:

The first is made up of people willing to give money to encourage people to plant trees. Examples include paying for tree planting projects to make a wedding or a conference carbon neutral. The second type is made up of companies in the US, Europe, Canada and other industrial countries that are making voluntary commitments to reduce their GhG emissions either because they are good stewards of the environment or they are preparing for future regulatory requirements.

TIST is very happy to have good quality carbon credits, and to be able to supply many different customers.



Seed Storage & Pre-treatment.

When storing seeds

- Make sure that if you are transporting fruit from the site of seed collection that you keep them dry, shaded and well ventilated so that the seeds inside the fruit do not spoil.
- Transport your fruit and seeds in woven sacks or baskets. Do not transport them in plastic bags or tins, which have no ventilation, and can cause the moisture to collect and spoil the items.
- Make sure you have sorted the good quality seed first (see unit 2) and that the seed is clean and dry before being stored. Dry seed rustles and cracks when you shake it. Most seeds need to have been dried in the sun for 2-3 days before they are ready.
- Store your seeds in a dry, shaded place. Use storage material such as cloth sacks or clay pots to reduce the chances of mold. Use airtight containers or jars for high-value seeds, filling your containers completely to reduce air space.
- If you do not have enough seed to fill your containers, fill the gaps with material such as charcoal, rice husks, or crumpled newspaper. These will absorb air moisture.
- Use wooden pallets or poles to make sure the seed containers do not touch the ground (this can make them more susceptible to changes in temperature, damp, pests etc.). If you are using sacks or bags, you can hang them.
- Obtain advice from your nearby Small Groups and local extension workers to ask if you need to use a pesticide or fungicide to protect your particular seeds from pests. For example, neem oil or leaves, gliricidia leaves and soap may offer some protection.
- Remember to check your seeds regularly to ensure they are not being damaged.
- Obtain local information on how long your seeds can be stored for. This is dependent on the species. Many species, if stored properly, can be kept for a year or more.
- You can experiment at different time periods to check the germination rate of your seeds. Pick a small sample of seeds (for example, 100), record the number of seeds chosen, sow them and count how many germinate. If you do this every month, for example, you will be able to see when the seed quality is starting to deteriorate. Share your findings with your Cluster.
- The cooler the storage environment, the longer your seeds can be stored. Ensure the seeds are not exposed to light. If the storage area is too humid, the seeds will spoil more quickly.
- Note there is one category of seed called 'recalcitrant seed'. These seeds ideally need to be sown straight away after collection and extraction because they require high moisture content. If they are wrapped in damp cloths they can be stored for a few days up to a week. A recalcitrant seed dies once it is dry. Tree species that are examples of recalcitrant seeds include: *Artocarpus heterophyllus* (jackfruit), *Azadirachta indica* (neem), *Calamus* species (rattans), *Durio zibethinus* (durian), *Eusideroxylon zwageri* (ulin), *Theobroma cacao* (cacao) and many dipterocarps (*Shorea*, *Hopea*, *Palaquium*, etc).



- Finally, when you are transporting your seeds to the nursery, remember to keep them dry and covered.

What kind of pre-treatment might be needed?

- Sow some seeds and see how long they take to germinate. If they take longer than one week, consider pre-treatment. If you are not sure which of the following advice is best, do an experiment and try different pre-treatment techniques and share your findings with your Cluster leader to share the best practices.
- If the seeds have a very small or thin coat, often no treatment will be needed; e.g. *Croton megalocarpus*, *Neem*, *Cassia* species and *Kei apple* can be sown directly into a pot.
- If you have collected fruit, you can soak the fruit for 1-2 days, then get a wire mesh and squeeze the fruit against it to release the seed, using water to wash away the fruit pulp; e.g. for *Syzium cuminii*, *Dovyalis caffra*, *Trichilia emetica*, *Vitellaria paradoxa*, *Prunus Africana*, *Gmelina arborea* (*gmelina*), *Azadirachta indica* (*neem*) and *Tamarindus indica* (*tamarind*).
- Some fruit just needs the outer layer removed by rubbing together; e.g. *Tectona grandis* (*teak*) and *Calamus* species (*rattans*). Some fruits have seeds that need to be pounded. After soaking the fruit for 1-2 days, pound the fruit with a mortar and pestle; e.g. for *Melia volkensii*, *Melia azedarach*, *Sclerocarya birrea* and *Cordia Africana*.
- Some pods need to dry for 3-5 days (in the semi-shade) and then be threshed to extract the seed; e.g. *Leucana* species, *Calliandra*

calothyrsus, *Acacia* species, *Sesbania sesban*, *Grevillea robusta*, *Casuarina* species and *Eucalyptus* species.

- Seeds that have thick coats will need some form of pre-treatment. Some need to have their seed coat cracked with a hammer, or a stone, after drying for 3-5 days to allow water to enter the seed for germination. Seeds should be planted immediately after cracking. Species that may need cracking include *Melia* (*mukau*), *Podo* species, *Croton megalocarpus*, *Adansonia digitata*, *Swietenia macrophylla*, and *Delonix regia*. For small, hard seeds place them in a jar lined with sand paper and shake hard, enough to scratch the surface.
- Some seeds just require a small cut in the seed coat to help water infiltrate (*nicking*). Do not cut the part that was attached to the pod or capsule as this part contains the baby plant.
- Some seeds respond well to soaking in hot water; e.g. *Calliandra*, most *Acacias*, *Tamarind*, *Leucaena* and *Albizia*. Put the seeds in a container, boil the water and pour it over the seeds. Allow the water to cool and remove the seeds from the water after they look swollen.
- Some seeds can be soaked in cold water for 12-24 hours; e.g. *Sesbania*, *Tephrosia*, *Dalbergia* species, and *Gmelina*, *Gliricidia* and *Acacia augustissima*. Put the seeds in a container and add the cold water (roughly double the volume of the seeds). Remove any seeds that are floating.
- All seeds, once pre-treated, need to be planted straight away.

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Kimereu Version

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Washiriki wa nguzo ya Munyaka, huko Trans Nzoia, wakipokea kwa furaha vocha zao za asilimia 70 za faida ya kaboni.

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TIST: Biashara ya ruugo ruruthuku.

Kuanda miti nikujukagia ruugo rwa ruruthuku rwa Carbon dioxide gukurukira kuthithia irio. Carbon dioxide ni rumwe rwa ruugo ruria rwitagwa rwa ‘greenhouse’ (antu gukunikenue), ruria rugwatagia mwanki jwa riu ndene ya nthiguru na gutetherie gwika mwanki jwa nthiguru. Athomi bamwe nibathuganagia ati nthiguru nikugia mwanki nkuruki na nkuruki untu buria bumba kwithirwa buri bwa kugitaria. Bubu nibu bwitagwa ‘greenhouse eefect’, untu buria butumaga guntu kumwe ndene ya nthiguru kuur mbuura iria igutuma kuigara, na namwe gukaaga mbura na gukooma

Kuithia kwa into bimwe ta beteroi, makara na bingi nigwitaga ruugo rwa carbon dioxide. Niuntu miti nijukagia carbon dioxide, niitethagia kunyiyia untu bubu bugwitwa “greenhouse effect”. Thirikari na kambuni inene ndene ya nthiguru inyingi nicikwenda kunyiyia kuthithua kwa carbon dioxide nikenda nthiguru itagie mwanki jumwingi. Atarimiti ba cluster nibataraga na kuthima miti iria

tuandaga nikenda TIST yumba gutara ni ruugo rung’ana rwa Carbon miti iu ikujukia. Carbon iu ithimagwa na gintu gigitwa “carbon credits”, nan i umwe na kilo ngiri imwe cia ruugo rwa carbon ruria rujukitue. Kambuni na thirikari riu nocigure carbon credits iji kuuga no iririire miti nikenda inyie uriti bwa ruugo rwa carbon.

No mwanka twithirwe tujukitie mantu jamma na jario jegie miti nikenda tuumba kwendie credit iji cia carbon kiri muguri. Mbeka kuumania na kwendia guku no itethie ikundi kuumba kuthithia mantu jamaingi nkuruki, kurita ngugi uria bibati na kwambiria miradi imieru. Ikundi bia TIST nibiriagwa mirongo iiri kiri o miti igana o mwaka (ni akui umwe na shilingi 1.8 kiri o muti juria juri mwoyo o mwaka). Mbeka iji cia ruugo ti baita yonka iria ikundi bibinini bionaga nontu miti iri na baita maita ikumi gwita mirongo inna nkuruki ya mbeka iria ciumanagia na biashara iji ya kwendia ruugo.

Arimi ba TIST – tuandeni miti ingi! Amwe tukinyire baita inene nkuruki.

Naria gututhiurukite na gukumenyeera.

Urungamiri bwa naria kuthiurukite bubwega ti aki gwika bwega na kwingiyia nyomoo cia kithaka na ikaro, indi ni amwe na urungamiri bwa muthetu, ruugo na ruuji. Kurungamira gukwegwa kwa into bibi nikuretaga utumiri bubwega nkuruki bwa into biria birio na kunyiyia ruuko. Ngugi iria cibatiri cia kumenyeera na gwika naria gututhiurukite bweganibati kuthithua.

Gukaraniria kwa mithemba imingi mwanya ya imera na nyomoo kurina bata mono kiri urimi na kuthithia irio. Amemba nibabati kumenya na kuthima mantu jaria jaumanagia na kuongereka kwa mantu jaria bathithagia kiri naria kubathiurukite na bathuganirie uria bomba kuthongomia naria kubathiurukite niknda baita iija kiri ntuura, kiri imera na kiri nyomoo.

Ni bwega mono riria o mumemba arina

mubango jwa kurungamira nyomoo cia kithaka na kumenyeera naria kumuthiurukite ndene ya miunda yawe, mubango juria jugwitania na urimi bwa gwita na mbele na kunyiyia magitaria kiri naria kuthiurukite. Untu bwa bata nkuruki bubati kwithirwa buri kwongera gukaranira kwa nyomoo na imera bia mithemba mwanya ndene ya munda jou gukurukira urungamiri bubwega bwa umenyeeri.

Mantu jaria jarina urito nkuruki:

- ~ Thithia utari na utegi bwa biria birio mwambirio; wingi bwa mithemba ya nyomoo na imera muundene.
- ~ Jukia itagaria kwebera kugitaria na kuthuka kwa ikaro bia nyomoo iji
- ~ Thithia mubango jwa matagaria ja kuthongomia ikaro na kwongera wingi bwa mithemba ya imera na nyomoo iria igukaraniria.



Arimi ba TIST nibakurua na Kwongeraka kwa murutira jwa nthi na kugaruka kwa rera.

Arim ba TIST nibaigitue na bacokia kiriro kia nthiguru gia kurua na murutira jwa nthi na kugaruka kwa rera. Arimi babaingi nibacuite kuelewa gukurukira semina na moritani ja TIST nan dene ya micemano ya cluster nikenda bathoma na belewa kwegie murutira juju, jaria jwijanagia najo, na jaria tuumba kuthithia nikenda tujwebera. Nitwonaga mantu jamaingi jaria jaumanitie na kugaruka kwa rera narua. Kwonania ming'uanano imikai, ngai ya Elnino ya mwaka jwa 1998 iria yathukiria akui nthiguru yonthe na mpara iria yathingatire, na kiurutani kia mwaka jwa 2004 kiria kiongerere murutira juju nainya. Ming'uanano ingi iria ubati kumenya ni kunyia kwa nkamia iria iri mulima Kenya kuria kwonekete, rera itikuumba kubangirwa iria itumite imera bithuuka ndene ya ntuura inyingi, kunyara kwa ithima nan aria kugwatagia ruuji, amwe na mantu jangi jamaingi.

Gatheti ya mweri juju nikugaana moritani kuumania na semina nikenda tuumba kuelewa murutira jwa nthiguru na kugaruka kwa rera bwega nkuruki. Tukaambiria na kumenya o riiwa ririuga atia na kueleza nkuruki na riu tuthome uria miti yaku iritaga ngugi ikwoneka kiri kunyiyia magitari jaria jaumanagia na kurutira kwa nthiguru.

Kurutira kwa nthiguru nimbi?

Kututira kwa nthiguru ni kwongereka kwa mwanki ndene ya nthiguru, kuria kuretaga kugaruka kwa rera. Nthiguru irina murutira nkuruki no irete kugaruka kwa mbura, biurutani birina inya nkuruki, kwongereka kwa ruuji iriene, kuthuka kwa imera, na magitaria jamaingi kiri imera, nyomoo cia kithaka na kinya kiri antu. Riria athomi barairia kugaruka kwa rera, wasiwasi yao ni mono kwegie kurutira kwa nthi kuria kuumanagia na mantu jaria jathithagua ni antu na kugaruka gukunene kwa rera kuria kuumanagia na bubu.

Ka Nthiguru igwita na mbele kurutira nkuruki?

Ii! Nthiguru niongerokete kimwanki nauu 1°C ndene ya miaka igana iu ikurukite. Babaingi ba Athomi ba science baria batongeretie ndene ya nthiguru nibathuganagia ati mantu jaria antu bathithagia nijatethagia kurutira nthiguru, ja kuithia into ja makara ja maguta, beteroli, ngasi na kugiita miitu na kumenyeera muunda bubuthuku.

Greenhouse effect nimbi?

Iji ni kwongereka kwa mwanki juria nthiguru igagua niuntu ruugo rumwe, ruria rwitagwa ruugo rwa greenhouse, ja carbon dioxide, nitrous oxide,

sulphur dioxide, na methane nirugwatagia mwanki jumwe kuumania na riuu. Biumo biria binene bia carboni ni ugiti miitu, ruugo ruria rurekagua kuuma viwandene, ruugo kuumania na ngari, ruugo kuumania na kuithua gwa nkuu kana makara na kuumania na kuithia miitu.

Kurutira kwa nthi kuretaga magitari jariku?

- ♦ Kwaga ruuji ndene ya ntuura injumu (ndwanda) kuria kuumba gutuma ntuura inyingi nkuruki ikaa rwanda.
- ♦ Kwongereka kwa gutamba kwa mirimo ja rwagi. O uria ntuura cirutagira, nou ciejaga injega cia guciarana kwa rwagi na kwongereka kwa kuumbika gwa kuajua ni rwagi. Nja na cibitari inyingi no citongwe ni jaja, miaka ya gutuura ninyiaga na gukua kwa aana babanini gukongereka.
- ♦ Kunyia kwa maketha kuumania na kulima ndene ya nthiguru iria ciri guntu kurina riuu riringi, mono nthiguru iria ciri East Africa. Niuntu bwa kunyia kwa ngai na kwongereka kwa tunyomoo turia tuthukagia imera niuntu bwa kurutira, maketha kuumania na imera bia irio no janyie na bubu bukareta ukia na mpara ndene ya nja na ntuura inyingi.
- ♦ Irio kwongerra goro ndene ya nthiguru yonthe. O uria armi babaingi baguketha maketha jamanini na irio bekanyia, nou ngarama ya irio ikongereka na irio ndene ya thoko bikaa bibikai.
- ♦ Nikugijaga kugaruka gukunene kiri maketha na gukarania kwa imera na nyomoo mono ndene ya miitu. Naria kugwatagia ruuji ndene ya irima na miitu nigwitaga na mbele kunyara. Bubu bukareta thina ya kurima na ruuji na bukanyia ruuji ndene ya miuro ruria rwendekanaga nikenda naria gwaki gwa kugwatia ruuji kuumba kung'ania ruuji. Untu bubu bukanyia kuthithua kwa sitima. Kambuni, cibitari iria citumagira stima na wingi ikagitarua. Ruuji rwa paipu rwa tauni na rwa risabu kinyaru rukagitara.
- ♦ Antu makumi ja mamilioni bakarugurirwa thina cia kuigara kwa ruuji na kugua kwa nthi, kuria gucukumagwa ni kwongereka kwa mbura na nterene cia iria, kwongereka kwa ruuji iriene.

Natia mpumba kueberia kurutira kwa nthi? Anda na umenyeere miti!

Ja ou tuugite au iguru, ruugo rwa carbon dioxide ni rumwe rwa iria iretaga kurutira kwa nthi. Miti nijukagia carbon dioxide kuuma ruugone riria



ikuthithia iria na ikamiika ndene ya rubau, miri na muthetune ja kaboni ya cellulose. Indi-ri, riria miti yagitwa na yaithua, kaboni iu ireki nirekagua ruugone kairi.

Nwiji o muti nojuthithie rera ya antu au gukuiritie?

Miti na kithiiki kiayo niioragia nthi. Nwiji kuganirwa kuria kuri kithiikine kia muti. Ona ati muthetu juria juri rungu jurina ruuji nkuruki ya juria juri aria kurina riu na gutina kithiiki. Riria nthi ikaraga na gapio, nthiguru niikaga ruuji igita riraja nkuruki. Guku nita kuugamiti iria iri muundene jwaku nitethagia kwongera ruuji ruria ruri muthetune jwaku, na igatethia kuruika ku igita riraja nkuruki. Bubu bugatethia imera biaku na kinya butethie baria batumagira ruuji ndene ya ntuura yaku.

Krediti cia kaboni nibicio?

Kenda uthithia krediti ya kaboni ya TIST nigwitagia into bithatu:

- 1) Gutaurwa kwa mma na kwongerekete gwa carbon dioxide iria igutonyithua ruugone;
- 2) Ahadi ya gwika kaboni iu kuraja na ruugo ndene ya igita ria miaka imingi;
- 3) Gutegerwa ngugi na gukurukithiua ni kياما gitina uthoni na TIST kiria kibati kwona ati mantu nijathithikite kuringana na mawatho jonthe.

Miti nijukagia ruugo rwa kaboni riria ikuthithia irio na kumiika ndene ya rubau, miiri na muthetune. Kaboni iria ijukagua kuuma ruugone na gwikwa noithimwe na igatarwa, na riu, yarikia gukurukithua ati ni yam ma, kujukua guku kwa ruugo rwa kaboni no kwendue ndene ya thoko ya nthiguru yonthe ja krediti cia kaboni. Aguri nobagure krediti iji nikenda bathiria ruugo rwa kaboni ruria bagutonyithia ruugone.

Tist niumbaga kwendia kaboni iria iri kiri miti iji o uria antu bendagia sukari na iria. Indi-ri kiri kaboni, utikagia muti thokone. Antu au, uguri ni kuumania na kaboni iria irititwe ruugone, na yekwa mitine ndene ya munda kana mwitu jwaku, ithimwi na ripoti yaikua. Kwendia na kugurwa kwa krediti iji nikuthithikaga, New York, Chicago, London na tauni ingi ndene ya nthiguru kana gukabangwa gatigati ka antu kana kambuni. No mwanka tukinyire mawatho na jaria jakwendeka ndeme ya thoko. tutiumba kugiita mwitu junthe kana tugiita miti tuanda ingi nontu bobu butibui kiri mazingira. no mwanka tucititwe gwika miti ndene ya miunda moyo ndene ya igita riraja, miaka mirongo ithatu kana nkuruki. No mwanka tuuge mantu jongwa jaria jario. Riria miti yaandwa, ithimi na mathabu jamwe nijathithagua kuthima ni kaboni ing'ana miti ya arimi ba TIST ijukitie. Rikana kairi,

miti itikagua thokone. Ikaraga miundene na ouria ikaraga igita ririraja iri moyo, nou igita ria kuriwa riongerekaga. Kwou, murimi neekaga muti, irio bia nithia, nkuu na matunda na nkandi. Mbeka iria TIST ithithagia kuumania na kwendia kaboni ni kiumo gikieru kia mbeka na riu ikagaanwa na ikundi bibinini bia TIST na igatumirwa kutirima ngarama cia TIST, iria ciri amwe na moritani, utari miti na urungamiri.

Miti yonthe nijukagia ruugo rung'anene?

Aari, miti iria iri imiarie nkuruki niikaga kaboni inyingi nkuruki ya miti imiceke. Miti imiraja kinyayo nijukagia kaboni inyingi kiri miti imikui. Kwou, miti iria imati niretaga mbeka inyingi kuuma kiri krediti cia kaboni. Guku ni kuuga miti iandi itarenie bwega irina kanya ga kunenea na kurea na kwona mbeka inyingi nkuruki kuumania na kaboni. Iticindanagira irio na ruuji ja miti iria iandi ikuianiritie.

Kwou, nikenda twona mbeka injega kuumania miti yetu, burina bata kumianda itarenie bwega nikenda yumba gukura irina thiria, ia imiraja na imiarie. Gutaura miti imwe nikenda twona nku riu tugeeke iu ingi igikuraga bwega jaria maingi niyo njira iria njega buru ya kumenyeera miti yaku.

Ninaa/Ni bau baguraga krediti cia kaboni?

Nandi, kaboni yendagua thoko cia kwiritira nandene ya thoko cia lazima. Thoko iji citikurukanagia umwe, ojauria kurina mianya na gukurukua kwa into bingi biria uguraga na kwendia. TIST noyendie krediti cia kaboni kiri thoko imwe ya iji nontu krediti iji ni injega mono.

Kurina ithimi mwanya ndene ya thoko iji birina mawatho mwanya na jakaraga jakigarukaga kwegie uandi miti, kumenyeera na kureta ripoti jaria tubati kuujuria nikenda tuumba kwendia ruugo rwa kaboni ruria twitite. Nitutumagira ithimi biria biega buru kiri gutegerwa ngugi na gukurukithua — the Verified Carbon Standard (VCS) na Climate, Community, and Biodiversity Alliance Standards (CCBA).

TIST irina mithemba iiri ya aguri:

Muthemba jwa mbele ni jwa antu baria bakwenda kunenkanira mbeka nikenda bekira antu motisha ya kuanda miti. Ming'uananona ni amwe na kuririra miradi ya uandi miti nikenda batuma muranu kana mucemano jutikongere kaboni ruugone. Muthemba jwa iiri jurina kambuni ndene ya US, Europe, Canada na nthiguru ingi iria ciri mbele mantune ja ibanda baria bakwiritira bongwa kunyiyia kuongerwa kwa ruugo ruruthuku (ruugo ruria ruretaga murutira) nontu bari akaria babega ba mazingira kana niuntu nibakwithuranira niuntu bwa gutirimana na mahitaji manna jaria jakwendeka. TIST nigwiritue mono kwithirua irina krediti cia kaboni cia iguru, na kuumba kuenderia aguri babaingi mwanya.



Gwika mbeu na kwithuranira niuntu bwa kuanda.

Gwika Mbeu.

- Menyeera ati kethira nugukamata matunda kuuma antu aria ukuuthurania mbeu, jeke janyaari na antu kurina kirundu na kuwi na ruugo nikenda mpindi iria iri ndene ya ntunda itithuka.
 - Kamata itunda riaaku na mpindi iri nkuniene kana gikabune. Ugaikamatira kiratasine kia nailoni gitina antu a gukurukia ruugo na aria gugatuma ruuji ruuthurane amwe na kuthukia ntunda na mbeu iu.
 - Menyeera ati ukuathurana mbeu injaga mbele na ati mbeu nitheri na niumi mbele ya gwika. Mpindi injumu niciritaga sauti na kuunika wainania. Mpindi iria nyingi niciendaga kuumua riuene ntuku ijiri gwita ithatu mbele ya cibua cia gwika.
 - Ika mbeu yaku antu gukuumo na kurina kirundu. Ikira nkuniene kana nyongune ya muthetu nikenda uniyiia kanya ga kuthuuka. Tuumira mikebe itigutonyithia ruugo riria ugwika mbeu ya goro na ujurie mikebe iu buru nikenda uniyiia kanya ka ruugo.
 - Kethira utina mbeu ing'ani kuujiuria mikebe yaku, ujuriria na gintu ja makara, mati ja mucere kana maratasi ja ngazeti. Bibi bikajukia ruuji ruria ruri ruugone.
 - Tuumira mpau kana mbito kumenyeera ati mikebe iu irina mbeu itigutonga nthiguru (guku nigutumaga mbeu ikathukua ni kugaruka kwa murutira, ruuji, na tunyomoo). Kethira uritumira nkunia kana mibuko, curia.
 - Uria kirira kuumania na ikundi bingi biria bigukuiritie na ariti ba ngugi ya gutetheria arimi nikenda umenya uria ugutumira dawa cia tunyomoo na cia iria nikenda umenyeera mbeu yaku kuumania na tunyomoo.
- Mung'uanano, maguta kuumania na muarubaine kana mathangu, mathangu ja muti jugwitwa gliricidia na sabuni imwe nocikue utethio.
- Rikana gutega mbeu yaku o nyuma ya igita ririkai nikenda umenyeera ati itirathuka.
 - Cuaa umenyo kwegie ni igita ring'ana mbeu yaku iumba wikwa. Bubu bukaringana na muthemba jwacio. Mithemba imingi, igekwa bwega, noikare mwaka kana nkuruki.
 - No ugerie gwika igita ria uraja mwanya nikenda utegera ni ririku ritumaga mbeu ikaumanga na mpwi. Jukia mpindi inkai (mung'uanano igana), andika ni ing'ana wathuura, ciumithie na utare ni ing'ana ikauma. Ukaththia uju o mweri, mung'uanani, ukomba kwona riria uthongi bwa mbeu bukambiria kuthira. Gaana jaria ukoona na cluster yaku.
 - O uria antu aria wikite mbeu yaku kurina mpio nou igakara igita riraja nkuruki. Menyeera ati mpindi iu itiki werune. Kethira antu aria ugwika kurina ruugo rurina ruuji rurwingi, mbeu ikathukanga na mpwi nkuruki.
 - Rikana ati kurina mithemba imwe ya mbeu ciitagwa 'recalcitrant' mbeu iji niciendaga kuandwa orio ciothuranua kuuma mitine na ciaritwa ntundene niuntu niciendaga ruuji rurwingi. Cikaogwa na nguo irina ruuji no cikare ntuku inkai mwanka kiumia kimwe. Mpindi iji nicikujaga ciaga cioma. Mithemba ya miti iria iri muthemba juju jwa mbeu ni amwe na *Artocarpus heterophyllus* (jackfruit), *Azadirachta indica* (muarubaine), *Calamus species* (rattans), *Durio zibethinus* (durian), *Eusideroxylon zwageri* (ulin), *Theobroma cacao* (cacao) na mithemba inyingi ya dipterocarps (*Shorea*, *Hopea*, *Palaquium*, na nkuruki).



- Muthia, ukithamia mbeu yaku wikia munandene rikana guciika itina ruuji na cikunikiri.

Ni uthuraniri bwiku buumba kwendeka?

- Umithia mbeu imwe na woone ni igita ring'ana ikujukia kuuma. Ciajukia nkuruki ya kiumia, tugania kwithuranira.
- Kethira utikumenya bwega ni uthuraniri buriku kiri njira iji ubati gutumira, geria na njira mwanya na ugaana jaria ukoona na mutongerira wa cluster yaku nikenda ugaana nawe njira iria njega buru.
- Kethira mpindi niinini mono kana irina gikonde gigiceke jaria maingi guti uthuraniri bwendekaga ja mithemba ya *Croton megalocarpus*, muarubaini, *Cassia* na Kei apple no iandwe mikebene o rimwe.
- Kethira nuuthuranitie matunda, no urinde matunda jau ruujini ntuku imwe gwita ijiri, riu ujukie nkunju uinye matunda nacio nikenda urita mbeu ugitumagira ruuji kurita itunda mung'uanano kiri *Syziium cuminii*, *Dovyalis caffra*, *Trichilia emetica*, *Vitellaria paradoxa*, *Prunus Africana*, *Gmelina arborea* (gmelina), *Azadirachta indica* (neem) na *Tamarindus indica* (tamarind).
- Matunda jamwe nijendaga gikonde kia iguru kiriti na njira ya gukirithania matunda jairi mung'uanano mithemba ya *Tectona grandis* (teak) na *Calamus* (rattans).
- Mithemba imwe ya matunda iri mpindi iria ciendaga gukaburwa nainya. Warikia kurinda ntuku imwe kana ijiri, kabura na muti na ntiri mung'uanano *Melia volkensii*, *Melia azedarach*, *Sclerocarya birrea*, *Cordia Africana* .

- Mithemba ingi niendaga kuumua ntuku ithatu gwita ithano (kirundune kirina riu ririkai) riu ikaurwa nikenda mbeu iitwa mung'uanano *Leucana*, *Calliandra calothyrsus*, *Acacia*, *Sesbania sesban*, *Grevillea robusta*, *Casuarina* na mithemba ya mibau.
- Mpindi iria ciri makonde jamanene niciendaga muthemba jwa uthuraniri. Imwe niciendaga gikonde gikaringwa na nondo kana iiga nikenda kiunika ciarikia kuumua ntuku ithatu gwita ithani nikenda ruuji rumba gutonya mbeune nikenda iuma. Mbeu nibati kuandwa orio warikia kuuma gikonde. Mithemba iria yendaga kuunwa ni ta *Melia* (mukau), *Podo* , *Croton megalocarpus*, *Adansonia digitata*, *Swietenia macrophylla*, *Delonix regia*. Mpindi inini cirina gikonde gikiumu niibati gwikwa mukebene juthiuruki na sand paper ndene na jukainainua nainya, mkanka mbeu ikang'arangwa.
- Mbeu imwe niciendaga kugitwa antu anini gikondene nikenda ruuji rumba gutonya. Ukagita aria mpindi iu iragwatene na gicau niuntu aja niu gukaumira.
- Mpindi imwe niciendaga kurindwa ruujine rwa mwanki ja *Calliandra*, *Acacia* iria nyingi, *Tamarind*, *Leucaena* na *Albizia*. Ikira mbeu mukebene na ucamukie ruuji riu witurire mpindi iu. Eteera ruuji rwore riu wite mpindi ruujine ciakara jaka ciimbi.
- Mpindi imwe no cirindwe ruujine rwa mpio mathaa ikumi na jairi gwita mirongo iiri na janna mung'uanano *Sesbania*, *Tephrosia*, *Dalbergia*, *Gmelina*, *Gliricidia* na *Acacia augustissima*. Ikira mpindi iu mukebene na wongeere ruuji rwa mpio mwanka rukinye maita jairi aria mpindi ikinyi. Rita mpindi iria cikwerera.
- Mpindi cionthe, ciarikia kuthuranirwa, niciendaga kuandwa orio

Mazingira Bora



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Amemba a Munyaka cluster, kuma Trans Nzoia, mari na gikeno makiamukira marihi gichunji kiao faida ya 70% ya carbon.

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TIST: Biashara ya Greenhouse Gas.

Gukuria miti nikugucagia carbon dioxide kuhitukira photosynthesis. Carbon dioxide ni imwe ya 'Greenhouse gases', iria ihotaga kunyita urugari wa riuwa thiini wa thi igateithia kuiga urugari wa thi. Atalamu amwe maugaga thi ithiaga na-mbere na kuhiuha na uhoro ucio nouthukie maundu. Mathina maya nimo metagwo ma Greenhouse, maria matumaga miena imwe ya thi igie na mihuro ya maai, kwaga mbura na gukagia na ngaragu.

Gucina indo ta maguta, coal na gas ingi niguthondekaga carbon dioxide. Na tondu miti niigucagia carbon dioxide niguu thi ndikahiue muno.

Atari a miti a TIST mataraga na magathima miti iria wahanda niguu TIST ihote guteithiriria kugucia carbon dioxide.. githimi kia carbon iria igucitio

gitagwo carbon credits, na kiiganaine na tonne imwe ya carbon dioxide iria igucitio. Kambuni na thirikari nocigure carbon credits na uu nikuga nocirihe miti iria irahuthika kugucia.

Nomuhaka tukorwo na wihokeku na ukinyaniru hari mathabu ma miti kuri aria turenderia carbon credits. Mbeca cia carbon credits niciteithagia ikundi gukorwo na maciaro maingi na kwambiriria itaratara ingi. Ikundi cia TIST nicirihagwo \$20 kuri mit 1000 iria iri muoyo(kindu 1.8ksh hari o muti). Marihi ma greenhouse gas to mo marihi moiki ikundi ciamukagira tondu miti iri na mbeca maita 10-40 makiria ma mbeca ici.

Arimi a TIST - reke tuhande miti miingi! Turi hamwe nitwigiagira maciaro maingi

Amemba a cluster ya Karaba kuma County ya Laikipia mari mecemanio mweri ucio urathirire.

Kumenyerera maria maturigiciirie.

Kumenyerera maria maturigiciirie kwega to kumenyerera na kugitira nyamu na cikaro ciacio, ni hamwe na kugitira tiiri, riera na maai. Umenyereri mwega wa maundu maya niutumaga kugie na unyihu wa giko na guthuka kwa riera. Maundu mothe maria magiriire no marutithio wira niguu tuagirithie maria maturigiciirie.

Biological diversity ni kindu kia bata kuri urimi na ukuria wa irio. Amemba nimagiriirwo guthuthuria na kumenya maundu maria mangiukakuri maria maturigiciirie na ningi kuona uria mangiagirithia maria maturigiciirie niguu andu mateithike o hamwe na flora and fauna.

Nikwiritwo ati o mumemba akorwo na

mubango wa kumenyerera nyamu cia githaka na cikoro ciacio na amenyerere maria maturigiciirie igundaini yao iria iraingirana na urimi ningi kunyihia ugwati wa maundu macio.kindu kia bata kurorereria ni kwagirithia maria maturigiciiri na migunda-ini kuitukira umenyereri mwega wa riera.

Maundu ma bata:

- ~ korwo na uthuthuria murikiru wa gutaukwo ni nyamu na mimera mugunda-ini.
- ~ Oya ikinya niguu kugiririria guthuka kwa cikoro cia nyamu na andu.
- ~ Thindeca Action Plan niguu kwagirithia biodiversity migunda-ini.



Arimi a TIST kuhurana na ugaruruku wa riera.

Amemba a TIST nimakoretwo makihurana na ugaruruku wa riera uria ukoretwo kuo thi yothe na arimi aingi nimoritie mataaririo wega thiini wa semina na micemanio niguu mataukwo wega uhoro uyu wigii ugaruruku uyu wa riera, maundu maria ungirehe na uria mangihota kuhurana naguo.

Nitwonaga maundu maria ugaruruku wa riera urehete umuthi. Na kuheana mamwe ma maundu maria marehetwo niguu, mbura iria yari nene muno ya Elnino ya mwaka wa 1998 iria yathukirie bururi na gukigia na ng'aragu nene muno hamwe na muiyuro wa maai iriaini wa mwaka wa 2004 muno ciarehetwo ni ugaruruku uyu wa riera. Maundu mangi ni ta guthira kwa barafu iria ikoragwo kirima-ini kia Mt. Kenya na imera citarathimika na cigatwarana wega iria citumite magetha mathuke na manyihe, kuhua kwa njuui na ihumo cia maai na mangi maingi.

Mwari uyu ngathiti niikwonania maundu maria maririirio thiini wa semina maria mangituthia gutaukwo wega ugaruruku wa riera nikii. Tukwambiriria na kumenya wega ciugo icio naningi tuthii na mbere na guthoma uria miti yaku inyitaga itemi kunyihia ugwati uria umanaga na ugaruruku wa riera.

Ugaruruku wa riera ni kii?

Ugaruruku wa riera ni kwongerereka kwa urugari uria uri thi uria ucokaga ugatuma riera ricenje. Thi riria yagia na urugari muingi niitumaga imera cia mbura cijenje na gukagia na ihuhakanio nene na maai ma iria makambatira, mimera igathuka na miti ikaninwo ohamwe na nyamu cia githaka. Riria ataalamu makwaria maundu megii ugaruruku wa riera, nimaroraga muno global warming iria irahagwo ni maundu mariu mundu ekaga na mogwati maria marehagwo ni maundu maya.

Thi niirahuha makiria?

Ii! Thii niyongereire urugari na muigana wa 1°C kwa makiria ma miaka 100. Aingi a ataalamu a uhoro wa riera monaga ati andu nio matumite thi yongerereke urugari na njira ya gutema miti na gucina indo cia tiiri, coal petrol na riera itheru na kwaga gutungata migunda yao.

Maundu maria marehagwo ni Greenhouse.

Maundu maria marehagwo ni greenhouse nit a kwongerereka kwa urugari wa thi nitondu riera guku iguru riria ritagwo greenhouse ta carbon dioxide, nitrous oxide, sulphur dioxide na methane nichotaga kunyita hinya wa riuu. Carbon nyingi yumanaga na gutema miti, ndogo ya iganda, ndogo ya ngari na ndogo ya makara na miti.

Mogwati ma Global Warming ni mariku?

- Kwaga kwa maai na kuuma kwa migunda.
- Gutherema kwa mirimu ta malaria. Kugia na urugari muingi na kuhotithia rwagi guciarana na kwongerera ugwati wa malaria. Micii miingi na mathibitari nomakorwo ni ugwati uyu na mituurire ya andu ikanyiha na ikuu cikongerereka.
- Kunyihia kwa magetha ma urimi na makiria mabururi-ini maria mari East Africa. Na niundu wa kunyihia kwa mbura na kwongerereka kwa guciarana kwa tutambi niundu wa ungi wa urugari, magetha nimanyihaga na uthoni ugathii nambere na kuongerereka miciini iitu.
- Kwongerereka kwa mathogora ma irio nitondu arimi aingi nimanyihitie magetha na irio cikanyiha, mathogora nimathiaga iguru nitondu andu nimarabatara irio na ni nini.
- Mogaruruku manene ma magetha na riera na muno mititu. Ihumo cia maai cikahua. Maundu maya nimagutuma uhei wa maai wa irio unyihie. Maundu maya ningi nimakunyihia uthondeki wa thitima ya maai. Iganda ciitu, mathibitari na kundu kungi kuria gutumagirwo thitima nigukuhutio na njira nene ma. Utambia wa maai mataown-ini na miciini nigukuhutio ona kuo.
- Mamilioni ma andu mari ugwati-ini wa muiyuro wa maai uria urehagwo ni mbura nene na maai ma iria kwambatira.

Niatia tungigitira Global Warming?

Handa na utungate miti!

Ta urui twona haha iguru, carbon dioxide ni imwe ya riera riria rihaga global warming. Miti niigucagia carbon dioxide kuma riera-ini riria ireka photosynthesis na ikamiiga thiini wayo mutiini na miriirni hamwe na tiiri ta cellulose carbon. Na ningi, riria miti yatemwo na yacinwo niirekagiriria carbon iria ikoretwo iigite rieraini.

Niui ati o muti nouthondeke riera riaguo?

Miti na mahuti maguo niuhumbagira tgi. Niitumaga kugie na riera riega na kiiruru gikaagira.



Niukuona ati tiiri uria uri miti-ini iria iri na kiiruru niukoragwo uri mugunyu gukira uria uri riua-ini. Riria thi yaikara iri hehu, tiiri niuhotaga gkuiga ugungu gwa kahinda karaihu. Uu nikuga ati miti iria iri mugunda-ini gwaku niiteithagia tiiri kugia na maai na igateithia kuiga maai macio gwa kahinda karaihu. Njira ino niiguteithiriria mimera yaku hamwe na aria mahuthagira maai.

Carbo Credits ni kii?

Niguo uthondeke carbon credits cia TIST urabatara indo 3;

- 1) Kwongerereka kwa kunyiha kwa carbon riera-ini
- 2) Kwiranira kunina carbon riera-ini gwa kahinda karaihu.
- 3) Kuhitukio ni honge ciirugamiriire ati makinya nimoetwo kuringana na watho.

Miti niigucagia carbon dioxide kuuma riera-ini riria ireka photosynthesis na ikamiiga thiini wayo , miri-ini ohamwe na tiiri-ini. Muigana wa carbon uria woyagwo kuuma riera-ini na ukaigwo nouthimike na uthuthurio na uhitukio na njira nginyaniru na kugucio kuu kwa carbon rieraini nokwendio kuri thoko ya carbon credits. Aguri nomagure carbon credits ici niguo kunyihia carbon dioxide.

TIST iri na uhoti wa kwendia carbon iriaigucitio miti-ini ota uria arimi mendagia igwa kana iria. No riria urendia carbon ndurabatara kuneana muti. No urabatara kugucia carbon dioxide kuma riera-ini mugunda-ini waku kana mutitu-ini na utarirwo. Wendi wa carbon nouhanikire New York, Chicago kana London ona kana micii mingi bururi-ini wothe, kana uiguithanirio ni andu kiumbe na makambuni imwe kwa imwe. Nonginya tukinyirie ikiro na mawatho ma thoko. Tutingitema mititu kana miti iria iri migunda-ini gwitu tondu undu uyu niuthukagia maria maturigiciirie. Nonginya twitikire kuiga miti iri muoyo gwa kahinda ka miaka 30 na makiria. Nonginya tuheane ugoro mukinyaniru. Riria miti yahandwo, ithimi na uteri nichithikaga guthima muigana wa carbon iria igucitio ni miti ya arimi a TIST. Ririkana o ringi, miti nditwaragwo thoko. likaraga migunda-ini na o uria iraikara kuo noguo marihi maguthii nambere na kuingiha. Kwa uguo murimi athiaga nambere na kuiga miti iri muoyo na ikamuhe irio cia mahiu ohamwe na ngu na matunda. Mbeca iria TIST

ithondekaga kumana na wendia wa carbon cithondekaga kihumo kia marihi maria magayanagwo ni arimi a TIST na igatumika gutheremia TIST, hamwe na githomo, uteri wa miti na utungati wa TIST

Miti yothe igucagi carbon iiganaine ?

Aca, miti iria ikoragwo na utungu munene niuhotaga kuiga carbon nyingi gukira iria miceke. Miti miraihu noayo niigugagia carbon nyingi gukira iria mikuhi. Kwa uguo, miti mitungu niirehage marihi maingi kumana na carbon credits. Uu nikuga ati miti iria ihanditwo na utaganu mwega iri na mweke wa gukura iri minene na irehe marihi maingi. Ndigayanaga unoru wa tiiri na maai ta miti iria ikuhaniriirie.

Kwa uguo, niguo kwamukira marihi maingi kumana na miti, ni hari na bata kuhanda miti na utaganu muiganu uria ukumiteithia gukura iri mitungu na miraihu. Kuhurura miti niguo wone ngu na niguo ikure wega ni njira njega ya gutungata miti.

Aguri a carbon credits mari ku na ni ariku?

Gwa kahinda gaka carbon credits yendagio na njira ya kwirutira kuhitukira gukinyiria mawatho ma thoko. Mawatho maya nomakorwo mari ngurani ota uria gukoragwo na mithemba ngurani ya indo thoko-ini ingi iria wendagia na ukagura(ta kahuwa). TIST noyendie carbon credits kuhitukira mawatho maya kana kuhitukira thoko ya kwiyendera tondu ikoragwo iri na ukinyaniru mwega.

Kuri na ikiro ngurani cia thoko na mawatho ngurani maria macenjagia ma uhandi wa miti, urori na uramati na nomuhaka tukinyanirie maundu maya niguo tuhote kwendia carbon. Tuhuthagira uthuthuria uria niwa kirathi kia iguru muno –Verified Carbon Standard (VCS) na Climate, Community and Biodiversity Alliance Standards (CCBA).

TIST ikoragwo na aguri mithemba iiri.

Wa mbere ni andu aria merutiire kuheana mbeca ciao niguo kuhinyiriria andu kuhanda mit. Muhiano nit a kuriha mitaratara ya uhandi wa miti niguo gutua uhiki na micemanio iri na riera itheru. Wa keeri ni kambuni thiini wa US, Europe, Canada na mabururi maria mangi makoragwo na iganda maria marihaga na kwiyendera uhnyihia wa carbon nitondu nomakorwo mari na wendi mwega kana makihariria niundu wa ,awatho maria mangiuka thutha-ini.

TIST niikenetio nigukorwo na carbon credits ya kirathi kia iguru na ikahota kuhe aguri aao.



Uigi mwega wa mbegu na guthondeka.

Uigi wa mbegu.

- Tigirira ati angikorwo niurathamia matunda kuma kuria uronganiria niwagiriirwo ni kwamba kumomithia na kumaiga kiiruruini na makorwo na riera ria kuigana na ndukamathukie.
- Kuua matunda maku na makonia ma gutumwo kana ikabu. Ndumamakuue na makonia ma plastic kana mikebe iria itari na kundu gwa kuingiriria riera na gutuma magie na ugunyu muingi na mathuke.
- Tigiriira niwacagura matunda maria mega mbere na makorwo mari matheru na makomithio mbere ya gukuuo. Umithia matunda na miatuka riria ukuinainia. Mbegu nyingi citibataraga kumithio riuaini gwa kahinda ka 2-days mbere ya gukorwo cirri njega..
- Iga mbegu cirri nyumu na cirri hehu. Huthira indo njega cia kuiga ta itambaya kana nyungu cia ndoro niguu unyihie kuguma. Huthira indo citangiingiria riera kana mikebe ya kuiga mbegu, na uihurie mikebe biu niguu gutikagie na mwanya wa riera.
- Angikorwo nduri na mbegu njiganu cia kuihuria mukebe, huthira indo ingi ta makara, mahuti ma mucere kanamaratathi ma ngathiti niguu cihote kunina ugunyu.
- Huthira turubau kuigirira niguu gutigirira mikebe ndiikarite thi niguu citikanyitwo ni tutambi kana mirimu na ugaruruku wa riera. Angikorwo urahuthira makonia noumacurie iguru.
- Geria gwetha utaari kuma kuri ikundi iria cirri kwanyu niguu umenye kana niukuhuthira dawa cia kuingata tutambi niguu ugitire mbegu ciaku. Kwa muhiano, maguta kana mahuti ma neem, mahuti ma gliricidia na thabuni nocihuthikekugitira
- Ririkana kurora mbegu ciaku maita maingi niguu gutigirira citirathukio.
- Geria gwetha ugoro wa kuria uri wigii kahinda karia mbegu cingiigwo. Uu nikuringana na mthemba wa mbegu. Mithemba miingi ingiigwo wega niikaraga miaka miingi.
- Nougerie kurora mahinda maingi niguu umenye cimera na njira iriku. Cagura mbegu cia kugeria ta 100, andika muigana uria woya, handa na ucitare na wone nicigana cikumera na ungika uu o mweri kwa muhiano niukwona riria na uria mbegu ciaku cingimera na uheane ugoro uyu thiini wa cluster yanyu.
- O uria haria uigite mbegu hari hahehu noguo mbegu ciaku ciguikara na utigirire mbegu ciaku citinanyitwo ni riuu. Angikorwo kuria uigite nikugunyu niciguthuka naihenya.
- Ririkana kuri na mithemba iiri ya mbegu, “recalcitrant seed”. Mbegu ici ciagiriirwo ni kuhandwo marimaini thutha wa kunganio tondu cibataraga ugunyu muingi. Cingikunjwo na gikuo kigunyu nocikare ta wiki kana mieri.
- Recalcitrant cikuaga riria cioma. Mithemba ya miti iria ni ya recalcitrant ni *Artocarpus heterophyllus* (jackfruit), *Azadirachta indica* (neem), *Calamus species* (rattans), *Durio*



zibethinus (durian), *Eusideroxylon zwageri* (ulin), *Theobroma cacao* (cacao) and many dipterocarps (*Shorea*, *Hopea*, *Palaquium*, etc).

- Muthia, riria urakuua mbegu nginya nathariini ririkana guciiga cirri ngunike wega.

Ni njira iriku cia guthondeka mbegu ciagiriire?

- Amba uhande mbegu imwe niguu wone kahinda karia cikwoya kumera. Angikorwo nicikwoya kahinda kanene niwagiriirwo ni gucithondeka. Angikorwo nduri na uuma ni njira iriku njega geria njira ngurani na wone niiriku njega ya guthondeka na uheane uhoru ucio kuri cluster yanyu.
- Angikorwo mbegu cirri nangothi huthu nikuuga ndurabatara guthondeka kwa muhiano *Croton megalocarpus*, neem *Cassia* na Kei apple nocihandwo imwe kwa imwe marimaini.
- Angikorwo niunganitie mbegu, nourinde maaiini gwa kahinda ka 1-2 days thutha ucoke wethe waya ya gicungina wanike mbegu ho na uhihinye niguu ciume wega ucoke uhuthire maai gucithambia ta *Syzium cuminii*, *Dovyalis caffra*, *Trichilia emetica*, *Vitellaria paradoxa*, *Prunus Africana*, *Gmelina arborea* (gmelina), *Azadirachta indica* (neem) and *Tamarindus indica* (tamarind).
- Matunda mangi mabataraga o gukumuthwo niguu mambegu ciume ta *Tectona grandis* (teak) and *Calamus species* (rattans).
- Mangi nimakoragwo na ngothi ibataraga kunurwo thutha wa kurinda maai-ini gwa kahinda ka 1-2 days, uraga makoni na ndiri ta *Melia volkensii*, *Melia azedarach*, *Sclerocarya birrea*, *Cordia Africana*.

- Makoni mamwe nimagiriirwo ni kumithio 3-5 days kiiruruini na ningi marutanio niguu mbegu ciume ta *Leucana species*, *Calliandra calothyrsus*, *Acacia species*, *Sesbania sesban*, *Grevillea robusta*, *Casuarina species* and *Eucalyptus species*.
- Mbegu iria cirri namakoni momu niciagiriirwo guthondekwo. Imwe ciagiriirwo kuragwo na nyundo kana ihiga thutha wa kurindwo maai-ini thiku 3-5 niguu maai maingire wega na cihote kumera wega. Mbegu ciagiriirwo nikuhandwo imwe kwa imwe irimaini thutha wa kuragwo na mithemba iria yagiriirwo ni gwikwo uguo ni (mukau), *Podo species*, *Croton megalocarpus*, *Adansonia digitata*, *Swietenia macrophylla*, *Delonix regia*. Niundu wa mbegu iria nyumu na ni nini, ciikire mukebeini na uthuke nginya cikue.
- Mbegu ingi cibataraga o gutinio hanini. Ndugatinie mwena uria uri na kamera tondu hau niho mbegu imeragira.
- Mbegu ingi nicikoragwo cirri njega riria warinda maaiini mahiu ta *Calliandra*, most *Acacias*, *Tamarind*, *Leucaena* and *Albizia*. Ikira mbegu mukebeini, therukia maai na uitiririe mbeguini. Eterera maai mahore na urute mbegu thutha wa kuimba.
- Mbegu ingi nociikirwo maaiini mahehu mathaa 12-24 ta *Sesbania*, *Tephrosia*, *Dalbergia species*, *Gmelina*, *Gliricidia* and *Acacia augustissima*. Ikira mbegu mukebeini na wikire maai mahehu na wongerere mangi tamo ucoke wehuti mbegu iria cikureera.
- Mbegu ciothe, riria ciathondekwo ciagiriirwo ni kuhandwo orio.

Mazingira Bora



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Washiriki wa nguzo ya Munyaka, huko Trans Nzoia, wakipokea kwa furaha vocha zao za asilimia 70 za faida ya kaboni.

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TIST: Biashara ya hewa chafu.

Miti inayokua hunyonya gesi ya kaboni kwa njia ya kutengeneza chakula. Kaboni dioksidi ni mojawapo ya 'gesi chafu' (greenhouse gases) ambazo huteka joto la jua lililopo katika anga ya dunia na kusaidi kudumisha hali ya joto katika uso wa dunia. Wanasayansi wengine wanafikiri kuwa dunia inazidi kuwa na joto zaidi na zaidi, joto ambalo lweza kuwa lenye kudhuru sana. Jambo hili huitwa athari ya hewa chafu (greenhouse effect), ambayo hufanya maeneo mengine kupanda mafuriko zaidi, ukame zaidi au kuenea kwa janga.

Kuchomwa kwa ngataa kama mafuta, makaa yam awe na gesi ya kiasili hutoa kaboni dioksidi. Kwa sababu miti huchukua kaboni dioksidi kutoka hewani, inasaidia kupunguza athari za gesi chafu. Serikali na viwanda vikubwa katika nchi nyingi wanataka kupunguza utoaji wa kaboni dioksidi ili dunia isizidishe joto sana.

Maqwantifaya wa TIST huhesabu na kupima miti tunayopanda ili TIST ifanye kazi ya kuhesabu ni kiasi kipi cha kaboni dioksidi kinachonyonywa na miti. Kipimo chake huitwa 'carbon credit' (kadi za kaboni) na ni sawa na kunyonya kilo elfu moja za kaboni dioksidi. Makampuni na serikali zaweza kununua kadi hizi kumaanisha wanaweza kulipia miti ili ipunguze utoaji wa kaboni dioksidi.

Lazima tuwe na data yenye kuaminika na sahihi kuhusu miti ili kuuza kadi hizi za kaboni kwa mnunuaaji. Pesa kutokana na kuuza kaboni hii zaweza kusaidia vikundi kuzalisha zaidi, kufanya kazi zaidi na kuanza miradi mipya. Vikundi vya TIST hulipwa dolla ishirini kwa kila miti elfu moja iliyo hai kila mwaka (takriban shilingi 1.8 kwa kila mti hulio hai kila mwaka). Malipo ya gesi chafu si faida ya kipekee kikundi kidogo hupata kwa sababu miti ina thamani mara kumi hadi arobaini kuliko pesa inayopata kutokana na biashara ya kaboni.

**Wakulima wa TIST – tupandeni miti zaidi!
Pamoja tufikie faida kubwa zaidi.**

Mazingira na Uhifadhi.

Usimamizi mwafaka wa mazingira hauhusu tu kuchunga na kuimarisha wanyamapori na makao yao, bali pia usimamizi wa udongo, hewa na maji. Usimamizi mzuri wa chanya hizi hufuatwa na utumizi mzuri zaidi wa rasilimali na upunguzaji wa taka na uwezekano wa uchafuzi pia kupungua. Juhudi zote zenye busara zafaa kufanywa zikilenga kuhifadhi mazingira.

Bionuwai ya kibaolojia ni muhimu sana kwa kilimo na uzalishaji wa chakula.

Memba wanafaa kuelewa na kutathmini athari za shughuli wanazokuza kwa mazingira na kufikiria wanavyoweza kuboresha mazingira ili kufaidi jamii, mimea na wanyama.

Pendekezo kali ni kila memba kuwa na mpango wa kusimamia wanyama pori na kuhifadhi mazingira katika mashamba yao na uzalishaji wa kilimo ulio endelevu na kupunguza athari za kimazingira. Lengo muhimu ni kukuza bionuwai ya kimazingira katika shamba kupitia usimamizi wa kuhifadhi.

Mambo muhimu:

- ~ Fanya hesabu ya kimsingi ili kuelewa wingi wa wanyama na mimea uliopo katika shamba hilo.
- ~ Chukua hatua ili kuepuka uharibifu na uchakaji wa makazi.
- ~ Tengeneza mpango wa utekelezaji wa kukuza makazi na kuongeza bionuwai katika shamba.



Wakulima katika TIST wapambana na ongezeko la joto ulimwenguni na mabadiliko ya tabia nchi.

Wakulima katika TIST wameitikia mwito wa ulimwengu wa kupambana na ongezeko la joto na mabadiliko ya tabia nchi. Wakulima wengi wametafuta kuelewa kupitia semina/mafunzo ya TIST na katika mikutano ya cluster ili kusoma na kuelewa mengi zaidi kuhusu kuongezeka kwa joto, athari zake kwa tabianchi na mbinu za kukabiliana nalo. Tunaona athari za mabadiliko ya tabianchi leo. Ili kuonyesha matukio kadhaa ya athari hizi, mafuriko ya Elnino ya mwaka 1998 yaliyovuruga karibu nchi yote na ukame mrefu uliofuatilia, na upepo mkali wa mwaka 2004 sana sana uliongezewa na ongezeko la joto duniani. Viashiria vingine mashuhuri ni kupunguzika kwa barafu katika kilele cha mlima Kenya, hali ya anga isiyo na utaratibu na ambayo imesababisha kuharibika kwa mazao katika maeneo mengi, kukauka kwa chemichemi na vyanzo vya maji, pamoja na mengine mengi.

Jarida la mwezi huu linaangazia mafunzo kutoka semina ili sote tuelewe ongezeko la joto duniani na mabadiliko ya tabianchi. Tutaanza kwa kuelezea kila neon na kulieleza zaidi na pia tujue jinsi miti yako ina jukumu kubwa katika kukabiliana na athari za ongezeko la joto duniani.

Ongezeko la joto duniani ni nini?

Ongezeko la joto duniani ni ongezeko wastani la joto duniani, ambalo huleta mabadiliko katika tabianchi. Dunia yenye joto zaidi yaweza kusababisha mabadiliko katika mvua, dhoruba kali zaidi, kuongezeka kwa maji baharini, kuharibika kwa mimea, na athari kadhaa kwa mimea, wanyama pori na wanadamu. Wanasayansi wanapoongea kuhusu suara la mabadiliko ya tabianchi na katika hali ya anga, wasi wasi yao huelekezwa kwa ongezeko la joto linalotokana na kazi za binadamu na utofauti katika tabianchi na hali ya anga unaoletwa na jambo hili.

Je, joto katika dunia linaongezeka?

Ndio! Dunia imeongezeka joto zaidi ya digrii moja katika miaka mia moja iliyopita. Wengi wa wanasayansi wanaoongoza katika dunia hufikiri kuwa shughuli za binadamu hufanyanya dunia kuongezeka joto, kama kuchoma makaa yam awe, petrol na gesi ya kiasilia na kukata misitu na usimamizi mbaya wa ardhi.

Greenhouse Effect ni nini?

Athari hii ni kuongezeka kwa joto duniani kutakotokana na uwepo wa gesi Fulani katika hewa,

zinazoitwa gesi chafu, kama, carbon dioxide, nitrous oxide, sulphur dioxide, na methane ambazo hutega nishati kutokana na jua. Vyanzo vikuu vya kaboni ni ukataji wa misitu, gesi kutokana na viwanda, gesi kutokana na magari, gesi kutokana na kuchoma miti au makaa na kuchoma misitu.

Hatari za ongezeko la joto duniani ni zipi?

- Uhaba wa maji mkali katika maeneo kame au yanayopakana na maeneo kame waweza kusababisha maeneo zaidi kuwa na jangwa.
- Ongezeko la kuenea kwa magonjwa kama malaria. Jinsi maeneo yanavokuwa yenye joto zaidi, yanakuwa mwafaka zaidi kama maeneo ya kuzalisha ya mbu, na kuongeza uwezekano wa kupata malaria. Familia na hospitali nyingi zaweza kuathirika, wastani ya miaka ya kuishi kupungua, na ongezeko la vifo vya watoto wadogo.
- Kupunguka kwa uzalishaji katika nchi za kitropiki na kisub-tropiki, hasa nchi katika Afrika Mashariki. Kwa sababu ya mvua iliyopunguka na ongezeko la uzalishaji wa wadudu kwa sababu ya joto, uzalishaji wa chakula waweza kupungua na ili husababisha umaskini na njaa katika familia na jamii nyingi.
- Gharama zilizoongezeka za chakula katika ulimwengu mzima. Jinsi wakulima wengi watakavyopata mazao chache na chakula kuwa adimu, ndivyo bei ya chakula itakavyoongezeka kwa sababu mahitaji ni mengi na usambazaji ni kidogo.
- Mabadiliko makubwa katika uzalishaji na muundo wa mifumo muhimu ya mazingira hasa misitu. Maeneo ya vyanzo vya maji katika milima na misitu huendelea kukauka. Hili litaathiri uwezo wa kumwagilia mazao maji na kupunguza maji katika mikondo ya maji yanayohitajika kujaza mabwawa na hifadhi za maji. Hili litapunguza kutengenezwa kwa umeme. Viwanda, mahospitali na taasisi zinginezo zetu ambazo kwa kiwango kikubwa hutegemea umeme zitaathirika sana. Usambazaji wa maji ya paipu katika maeneo ya mijini na ale ya vijijini pia utaathirika.
- Makumi ya mamilioni ya watu watawekwa katika hatari ya mafuriko na maporomoko ya ardhi, yanayoletwa na makadirio ya ongezeko la uzito wa mvua na katika maeneo ya bahari, ongezeko la viwango vya maji.

**Naweza je kuzuia ongezeko la joto ulimwenguni?****Panda na uichunge miti!**

Kama ilivyotajwa hapo juu, carbon dioxide ni moja ya gesi zinazoleta ongezeko la joto ulimwenguni. Miti hunyonya gesi hii kutoka kwa hewa inapotengeneza chakula na kuiweka katika mbao, mizizi na udongo kama kaboni selulosi. Hata hivyo, miti inapokatwa na kuchomwa, huachilia kaboni iliyokuwa imeweka.

Unajua kuwa ila mti waweza kutengeneza tabianchi ndogo mahali ulipo?

Miti na bima yake hupunguza joto lililo katika uso wa dunia. Hisi faraja ya kivuli cha mti. Tambua kwamba udongo ulio chini yake huwa na maji zaidi kulika ya udongo ulio palipo na jua pasipo na kivuli. Udongo unapokaa ukiwa baridi, huwa unaweka maji muda mrefu zaidi. Ili lamaanisha kuwa miti katika ardhi yako itasaidia kuongeza kiasi cha maji katika udongo wako na pia itasaidia kuweka maji udongoni kwa muda mrefu zaidi. Hili litasaidia mimea yako na pia kusaidia watu wanaotumia maji katika eneo lako.

Kadi za kaboni ni nini?

Ili kutengeneza kadi ya kaboni wahitaji vitu vitatu:

- 1) Punguzo la kweli na la kuongeza la kaboni dioksidi iliyo katika hewa;
- 2) Ahadi ya kuweka kaboni hiyo mbali na hewa kwa muda mrefu;
- 3) Ukaguzi unaofanywa na chama tofauti kinachothibitisha kwamba shughuli zimefanyika kulingana na mujibu wa sheria.

Miti hunyonya kaboni dioksidi kutoka kwa hewa wakati inapotengeneza chakula na kuiweka katika mbao, mizizi na udongo. Kiasi cha kaboni kilichochukuliwa kutoka kwa hewa hupimwa na kuhesabiwa, halafu, kinapothibitishwa kuwa sahihi, kaboni hii iliyonyonywa yaweza kuuzwa katika soko la ulimwengu kama kadi za kaboni. Wanunuzi waweza kununua kadi hizi kukabiliana na kaboni wanayoachilia kwa hewa.

TIST huweza kuuza kaboni iliyonyonywa na miti kama wazalishaji wanavyouza sukari na maziwa. Hata hivyo, katika kaboni, hauhitaji kutuma mti sokoni. Badalake, thamani ya kaboni iliyotolewa katika hewa na kuwekwa katika miti iliyo shambani au katika msitu wako, hupimwa na kuripotiwa. Biashara ya kadi za kaboni zaweza kufanyika New York, Chicago, London na mijiji mingineyo ulimwenguni, ama pia kupangwa kati ya watu au kampuni mbili moja kwa moja. Lazima tutimize sheria na mahitaji ya soko. Hatuwezi kukata msitu wote au kukata miti ili kupanda miti kwani hili ni baya kwa mazingira. Lazima tujitoe kuweka miti hii katika shamba kwa muda mrefu, thelathini au zaidi. Lazima turipoti data sahihi. Miti inapopandwa, vipimo na hesabu hufanyika ili kupima kiasi cha

kaboni iliyonyonywa na miti ya mkulima katika TIST. Kumbuka tena, miti haipelekwi sokoni. Hukaa shambani na jinsi inavyokaa hai, ndivyo malipo yanavyoongezeka. Kwa hivyo, mkulima hukaa na miti, lishe ya mifugo, kuni, matunda na pia karanga. Pesa zinazotengenezwa na TIST katika kuuza kadi za kaboni hujenga chanzo kipya cha mapato na hugawanywa kati ya vikundi vidogo katika TIST na hutumika kusaidia kukidhi gharama za TIST, ambazo ni pamoja na mafunzo, uhesabu miti na usimamizi.

Je, Miti yote hunyonya kiasi saw ach kaboni?

La, miti iliyo na mzingo mpana huweka kaboni zaidi ya miti iliyo myembamba. Miti mirefu pia hunyonya kaboni zaidi ya miti mifupi. Hivyo basi, miti iliyo mipana huleta mapato zaidi kutokana na kadi za kaboni. Haishindani kupata virutubisho katika udongo na maji kama miti iliyokaribiana.

Hivyo basi, ili kupata mapato mazuri kutokana na miti yetu, ni muhimu kuipanda kwa nafasi tosha itakayo iruhusu kukua kiafya, kwa urefu na upana. Kupunguza miti ili kupata kuni na kuiacha miti mingine ikue vizuri huwa njia nzuri zaidi ya kusimamia miti yako.

Ni wapi/nani hununua kadi za kaboni?

Hivi sasa, kadi za kaboni huuzwa katika masoko ya hiari na katika masoko ya kuhitimu mahitaji. Zaweza kuthibitishwa kwa njia tofauti, kama kulivyo na bidhaa mbalimbali na kuthibitishwa kwa bidhaa zingine unazonunua na kuuza (kama kahawa, kahawa aina mbalimbali). TIST yaweza kuuza kadi zake za kaboni katika masoko ya hiari au katika masoko ya kuhitimu mahitaji kwa sababu kadi zake ni za hali ya juu.

Kuna viwango mbali mbali katika masoko haya vilivyo na sheria mbali mbali na zinazobadilika kila baada ya muda zinazohusu upandaji wa miti, ufuatiliaji, na kuripoti ambazo tunahitajika kuhitimu ili kuuza kadi hizi za kaboni. Tunatumia viwango vya hali ya juu zaidi katika ukaguzi na kuthibitishwa — the Verified Carbon Standard (VCS) na the Climate, Community, and Biodiversity Alliance Standards (CCBA).

TIST ina wanunuzi wa aina mbili msingi:

Aina ya kwanza ni ya watu wanaojitolea kupeana pesa ili kuwapa watu motisha ya kupanda miti. Kwa mfano kulipia miradi ya upandaji wa miti kufanya harusi au semina kuwa kuwa isiyoongeza kaboni katika hewa. Aina ya pili ni ya makampuni yaliyo Amerika, Uropa, Canada na katika nchi zingine zilizokua viwanda zinazojitolea kupunguza gesi chafu zinazotoa kwa sababu mawakala wema wa mazingira au wanajitayarisha kuhitimu mahitaji Fulani ya baadaye.

TIST ina furaha sana kuwa na kadi za kaboni za hali ya juu, na kuweza kusambaza kwa wateja mbalimbali.



Kuhifadhi na kutibu mbegu kabla ya kupanda.

Kuhifadhi mbegu.

- Hakikisha ikiwa unahamisha matunda kutoka pahali pa kukusanya mbegu uyaweke yakiwa pakavu, yamefunikwa na kufikiwa na hewa vilivyo ili mbegu zilizo ndani ya matunda ziziharibike.
- Beba matunda na mbegu zako zikiwa katika magunia au vikapu. Usizibebe katika makaratasi ya plastiki au mikebe isiyo na hewa na ambayo inaweza kufanya unyevu kukusanya na kuharibu mbegu hizi.
- Hakikisha umechagua mbegu nzuri zaidi kwanza na kuwa mbegu hiyo ni safi na kavu unapohifadhi. Mbegu kavu hupiga kelele na kuvunjika unapotikiza. Mbegu nyingi huhitaji kukaushwa juani kwa muda wa siku mbili kufika tatu kabla ya kuwa tayari.
- Hifadhi mbegu yako pahali pakavu na penye kivuli. Tumia kifaa cha kuhifadhi kama gunia au chungu cha udongo ili kupunguza uwezekano wa mbegu kuharibika. Tumia mikebe isiyoruhusu hewa kuingia au kutoka unapohifadhi mbegu zenye thamani ya juu, na ujaze mikebe yako kabisa ili kupunguza pahali pa hewa.
- Ikiwa hauna mbegu tosha kujaza mikebe yako, jaza ukitumia kitu kama makaa, maganda ya mchele au magazeti yaliyokunjana. Haya yatanyonya unyevu ulio katika hewa.
- Tumia mbao au fito kuhakikisha mikebe haiguzi chini (jambo hili laweza kuzifanya mbegu kushambuliwa na mabadiliko ya hewa, unyevu, wadudu na kadhalika kwa urahisi. Iwapo unatumia magunia au mifuko, waweza kuining'iniza.
- Uliza mawaidha kutoka kwa vikundi jirani au wafanyikazi wa kilimo kujua ikiwa unahitaji matumizi ya dawa za wadudu kulinda mbegu zako kutokana na wadudu. Kwa mfano. Mafuta au majani ya muarubaini, majani ya gliricidia na sabuni zaweza kukupa ulinzi.
- Kumbuka kuangalia mbegu zako kila baada ya siku chache kuhakikisha hazijaharibika.
- Tafuta ujuzi kuhusu muda mbegu yako yaweza hifadhika. Muda huu hulingana na aina. Aina nyingi, zikihifadhiwa vizuri zaweza kukaa mwaka au zaidi.
- Waweza jaribu muda wenye upana mbali mbali kujua ni mbegu ngapi zinaota. Chukua mbegu chache (kwa mfano, mia moja), andika nambari uliochagua, zioneshe halafu uhesabu nambari iliyoota. Ukifanya jambo hili kila mwezi, kwa mfano, utaweza kujua ni lini thamani ya mbegu yako inaanza kudhoofika. Gawana matokeo yako na cluster yako.
- Jinsi pahali pa kuhifadhi kupo baridi ndivyo muda ambao mbegu yako yaweza kuhifadhiwa huongezeka. Hakikisha mbegu yako haijawekwa palipo na mwangaza. Ikiwa pahali pa kuhifadhi pana unyevu mwingi mbegu itaharibika kwa haraka zaidi.
- Jua kuwa kuna kikundi kimoja cha mbegu kinachoitwa “mbegu kaidi”. Mbegu hizi kwa kawaida huhitaji kuoteshwa mara moja baada ya kukusanywa na kutolewa kwa tunda kwani huwa zinahitaji unyevu mwingi sana. Zikifungwa kwa nguo zenye unyevu, zaweza kuhifadhiwa siku chache ata kufika wiki moja. Mbegu hizi hufa zinapokauka. Aina za miti zilizo mfano wenye mbegu hizi ni pamoja na: *Artocarpus heterophyllus* (jackfruit), *Azadirachta indica* (neem), *Calamus* (rattans), *Durio zibethinus* (durian), *Eusideroxylon zwageri* (ulin), *Theobroma cacao* (cacao) na aina nyingi za aina zinazoitwa ‘dipterocarps’ (*Shorea*, *Hopea*, *Palaquium*, na kadhalika).



- Hatimaye, unapohamisha mbegu kuzipeleka kitaluni, kumbuka kuziweka zikiwa kavu na zimefunikwa.

Ni matibabu gani yaweza kuhitajika kabla ya kupanda mbegu?

- Otesha baadhi ya mbegu ili huoneni muda gani zinachukua kuota. Iwapo zitachukua saidi ya wiki fikiria kuzitibu.
- Ikiwa hauna uhakika ni mawaidha gani hapa ni bora zaidi, jaribu njia mbali mbali za kutibu na ugawane matokeo yako na kiongozi wa cluster yako kuhusu njia bora zaidi.
- Ikiwa mbegu ni ndogo sana au ina ganda nyembamba mara nyingi haihitaji matibabu yoyote kwa mfano aina za *Croton megalocarpus*, *Neem*, *Cassia* na *Kei apple* zaweza kuoteshwa moja kwa moja mkebeni.
- Ikiwa umekusanya matunda, unaweza kuyalowesha majini kwa muda wa siku moja au mbili, halafu uchukue waya na kuitumia kufinya tunda na kutoa sehemu majimaji ili kutoa mbegu ukitumia maji kuosha hayo mabaki ya tunda kwa mfano katika mbegu za *Syzium cuminii*, *Dovyalis caffra*, *Trichilia emetica*, *Vitellaria paradoxa*, *Prunus Africana*, *Gmelina arborea* (gmelina), *Azadirachta indica* (neem) na *Tamarindus indica* (tamarind).
- Baadhi ya matunda huhitaji tu maganda ya juu kabisa kutolewa kwa kuyagwaruzana kwa mfano matunda ya *Tectona grandis* (teak) na *Calamus species* (rattans).
- Baadhi ya matunda huwa na mbegu inayoitaji kugonwa kwa nguvu. Baada ya kulowesha tunda katika maji kwa muda wa siku moja au mbili, bonda tunda kwa mchi na chokaa kwa mfano matunda ya *Melia volkensii*, *Melia azedarach*, *Sclerocarya birrea*, *Cordia Africana*.

- Maganda mengine huhitaji kukaushwa kwa siku tatu kufika tano (chini ya jua lenye kivuli) halafu kufinya kwa kutumia waya ili kutoa mbegu kwa mfano maganda ya *Leucana*, *Calliandra calothyrsus*, *Acacia*, *Sesbania sesban*, *Grevillea robusta*, *Casuarina* na mikaratusi.
- Mbegu zilizo na maganda manono huhitaji matibabu ya aina maalum. Baadhi huhitaji maganda yake kuvunjwa kwa kutumia nyundo au jiwe baada ya kukaushwa ka siku tatu kufika tano ili kuruhusu maji kuingia ili mbegu iweze kuota. Mbegu zafaa kupanda mara moja baada ya kuvunja maganda. Aina ambazo huhitaji kuvunjwa ni kama *Melia* (mukau), *Podo*, *Croton megalocarpus*, *Adansonia digitata*, *Swietenia macrophylla*, *Delonix regia*. Mbegu zilizo ndogo na ngumu ziwekwe katika mkebe uliowekwa karatasi ya mchanga ndani na mkebe utikizwe kwa nguvu hadi ganda likwaruzwe.
- Baadhi ya mbegu huhitaji kukatwa kidogo tu ili kusaidia maji kuingia. Usikate ambapo mbegu ilishikana na ganda kwani sehemu hii ndio iliyo na mmea utakaokua.
- Baadhi ya mbegu hutibika vizuri zinapoloweshwa kwa maji moto kwa mfano *Calliandra*, most *Acacias*, *Tamarind*, *Leucaena* na *Albizia*. Weka mbegu katika mkebe, chemsha maji na uzimwagilie mbegu. Ruhusu maji yapoe halafu utoe mbegu kutoka kwa maji baada yakuona kuwa zimefura.
- Baadhi ya mbegu zaweza kuloweshwa kwa maji baridi kwa masaa kumi na mawili kufika ishirini na manne kwa mfano *Sesbania*, *Tephrosia*, *Dalbergia*, *Gmelina*, *Gliricidia* na *Acacia augustissima*. Weka mbegu katika mkebe na uongeze maji baridi (mara mbili mbegu zilipofika kwa mkebe). Toa mbegu zinazoelea.
- Mbegu zote, baada ya kutibiwa, zahitaji kupandwa mara moja.

Mazingira Bora



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Washiriki wa nguzo ya Munyaka, huko Trans Nzoia, wakipokea kwa furaha vocha zao za asilimia 70 za faida ya kaboni.

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TIST: Viasala wa Greenhouse Gas.

Kuvanda miti nikumasya nzeve itavisaa mawithyululukoni. Carbon Dioxide ni nzeve imwe kati wa ila syithiawa nthini wa Greenhouse Gases. Ila syosaa uvyuvu wa sua na kuutunga kwithiwa na uvyuvu wa nthi. Asomi amwe ma saianzi mesilasya kana nthi niyiendee na uvyuva muthenya kuthi ula ungi undu ula utonya kuete wanangiko. Uyu niw’o witawa usyao Greenhouse kila kitumaa kundu kumwe kwithiwa na mavuliko kana yua na maweu/mang’alata kunyaiika.

Kuvivya kwa syindu ta mavia ma mwaki (Coal), mauta na nzeve kumasya nzeve itavisaa (Carbon dioxide, Nimatethee easya kuola uthuku ula uetetwe ni Greenhouse. silikali na indasituli nthini wa nthi yingi nikwenda kuola undu ikumya nzeve itavisaa nikana nthi ieke uvyuva muno. Avitukithya/ Athiani ma TIST nimatalaa nakuthima miti ila twavanda nikana TIST makeka masavu ma undu miti yosete nzeve itavisaa kuma mawithyululukoni.

Kithimi kila kitumiawa kuthima kitawa

Carbon Credit kila kithiawa kianenen na tani imwe ya Carbonk withiwa yumitw’e mawithyululukoni. Kwoou kambuni na silikali nitonya kuaa “Carbon Credits” kwasya nomaivie miti kuola nzeve itavisaa ile methiitwe mayumya na kumilekya mawithyululukoni.

Nitwaile ithiwa na uw’o na kunengane uvoo wa uw’o nikana tukwate athooi ma Credits. Mbesa sya Carbon Credit nitonya utetheesya ikundi kwithiwa syina projects na kwithiwa na ukethi munene na maendeeo. Ikundi sya TIST nikwataa ndivi ya \$20 kwa kila miti ngili imwe (1000) kila mwaka. Ndivi ya Greenhouse gas tiw’o vaita w’oka ikundi na aimi makwataa nundu miti yoo yina vaita kundu 10-40 kwi undu ndivi ya Greenhouse gas yiana.

Aimi ma TIST tuvande miti kwa wingi! Kwa vamwe no tuvikie vaita munene.

Mawithyululuko na Usuvio wamo.

Kusuvia na kuungamia usuvio wa mawithyululuko tiw’o w’oka utonya uete uvandiliku indi kusuvia

nyamu na mawikalo masyo, kusuvia muthanga, kiw’u na nzeve. Usuvio mwailu wa syindu ithi nutumaa utumuku wasyo waila na kuthokoanwa kwasyo kuyioleka. Kwa nzia syoonthe nitwaile utata usuvia mawithyululuko.

Uyaiiku wa mathayu kivathukany’o nuseuvasya nthi kwoondu wa nima na usyao mwingi wa liu.

Andu nimaile kuelewa kana oundu maundu maika maingivite iulu wanthi niw’o maile kumanya undu wa umisuvia vamwe na mawithyululuko mayo kwoondu wa mauseo kwa mbai na nyamu sya kithekani na kiw’uni.

Nikwithiawa na wito wa kala kila memba niaile kwia walany’o undu wa kusuvia nyamu sya kitheka na mawithyululuko na kutuma methiwa maseo kwa nima na kuola uthuku wa meko kwa mawithyululuko kwa nzia sya nima ya kusuvia na kumanya nzia na kuungamia mawithyululuko kusuviika.

Maundu mavata makuatiia.

- ~ Kwika ukunikili na kuelewa mivai ya nyamu na miti ila yi kithekani kwaku
- ~ Kwosa itambya ya undu utonya kusuvia mawikalo masyo na kulea kumananga
- ~ Kuseuvia matambya ma undu utonya kwika kwailya mawikalo asu me kithekani kwaku.



Aimi ma TIST kuola uvyuvu wa nthi na uvinduku wa nzeve.

Aimi ma TIST nimeetike wito wa kumatha undu tukuola uvyuvu wa nthi na uvinduku wa nzeve. Aimi

angi nimamathie unduu matonya kuelewa nzia ii kwisila kwa momanyisyo na semina sya TIST na ingi kwa mbumbano sya ngwatanio sya kila mwai nimaendeeie na kuelew'a undu wa uvyuvu wa nthi na uvinduku wa nzeve na niata matonya kwika kuola mothuku ala maetawe ni uvyuvu na uvinduku. Kwa ngelekany'o ta El-Nino ya 1998 ila yaetie wasyo munene na itina yaatiwa ni yua inene nthini wa nthi yitu Kenya, Ingi kiseve kinenen kya hurricane mwakani wa 2003 ila tukwo nitasyaetiwe ni uvyuvu na uvinduku wa nzeve. Ngelekany'o ingi ni kuthela kwa ia kiimani kya Mt. Kenya, mbua kwithiwa iteumanyika yia indii na kusesya ivinda yila yauaa na kwoou kundu kwingi ithima, nthongo kungala vamwe na mbusi na mikao ila itany'aa.

Ithangu ya mwai uyu ni kukwony'a momanyisyo amwe ma semina ala meutuma ueeangwa mbee undu wa uvyuvu wa nth na uvinduku wa nzeve mbeange. Mbee twianmbiia kwa kumanya kila ndeto na tuyona undu miti ithukumaa kuete ualyuku nthini wa uvyuvu wa nthi.

Uvyuvu wa nthi nikiyau?

Uu ni wongeleku muutia kuma muthangani ula uetae uvinduku wa nzeve. Uvyuvu/muutia mwingi kuma nthi utumaa undu mbua yuaa isesya, kukethiwa na iutani, kiw'u kya ukanga kwambata, mimea kulea usyaa, nyamu sya kithekani kukosa liu, miti vamwe na andu. Yila asomi ma saensi mekwasya uvyuvu wa nthi niwongelekete nundu wa mawiko ma mundu na kuete mauvinduku manene ma nzeve na uvyuvu wa nthi.

Ikonyo inya sya nthi niendee na uvyuva?

Ili, nthi yilu tui niyongelete uvyuvu kwa ndikilii imwe 10C ivindani ya myaka iana (100years). Asomi aingi meisilya kana mawiko ma mundu ala uendee na kwika nimo matumaa muiitia wa nthi uendee na kwongeleka amwe nita:- kuvivya syindu ila sumasya syuki ithuku muno ta mavia ma coal, mauta ma petrol na nzeve ila syi ungu wa muthanga vamwe na kutema miti na kulea usuvua itheka.

Nyumba ya Ngilini yithiawa na uthuku mwau?

Nyumba ino ya ngilini niyongelaa uvyuvu wa nthi nundu nzeve ila yumasya na kulekya nthini wa mawithyululuko nzeve nthuku ta Carbon Dioxide, Nitrous Dioxide, Sulphur Dioxide na Methane Trap kuma suani.

Nzeve ithi nthuku sumaa ona kambunini na industries syosawa ni miti na kwoou yila miti itevo iyiete uvyuvu kwa kwosa na kusiiia vinya kuma suani. nzeve ithi nisumaa nthini wa mitokaa, ngu syavivya na mititu yakana.

Mothuku ma uvyuvu wa nthi mni mau?

- Kiw'u kwaa isioni ila sya weu na kutuma iso ingi itwika weu kana mangalata.
- Kwongeleka kwa mowau ta malaria. nundu undu kundu kwavyuva niw'o kwithiawa kwaseuvya isio nzeo sya umuu kusiyaia na niw'o ukuaa tulinyu twa uwau wa malaria. Kwoou yila uu weeethiwa uwau wa malaria uyiika na kwongela ikw'u sya tuukenge na kutuma masivitali mausua.
- Kuoleka kwa ngetha ta undu kwithiitwe nthini wa nthi sya umiloni wa sua. Yila mbua yuaa nini na tusamu tula twanangaa liu twongeleka nundu wa uvyuvu liu kuma miundani naw'o nunyivaa nundu wa ukosa mbua na kulika ni tusamu tuu nakii kiyiete wongeleku wa ukya misiyini kuthi mbaini na nthi kwa vamwe.
- Nthooa wa maliu niwongelekaa nundu yila liu munini na ayi ini aingi na vai liu ungi nonginya vei wambate nikana uiwe nala mena mbesa sya kuuthooa.
- Ingi usyai na mititu iivinduka nundu ethiwa kuna kiw'u na liu nyamu nikuoleka kwa kukw'a na kukosa liu na mititu iyuma nundu miti ndikala vate kiw'u. kii nakyo ingi kiituma liu ulea ukethwa nesa nundu vai kiw'u kya kungithya miunda. Ingi sitima uioleka kwa ndustries, sivitali na kunduni kungi kwa vata kwa mundu. Ingi kiw'u kya miveleki kwa andu ma mataoni na kula kungi kiyioleka onakyo.
- Mamilioni ma andu nimekwithiwa na ivuso ithuku nundu wa muthanga kutuuka, nundu mbua yuaa nakw'o kula kwi ukanga na maia kiw'u kiyongeleka na uyithia mawikalo nimeethiwa matevo.

Nata tutonya ysiia Uvyuvu wa Nthi?

Vanda an Kusuvia miti!

Oundu tuwetete vaa iulu nzeve itavisaa (Carbon dioxide) ni imwe ya nzeve ila ietae uvyuvu nthini wa nthi yonthe. Miti niyosaa nzeve ino kuma kwa mawithyululuko yila ikusevya liu na kwia nthini wa mithamba, mii, matu na muthanga. Onakau yila twatema miti na twavivya isyokaa ikaumya nzeve isu itavisaa na kumilekya ingi mawithyululukoni.

**Ni wisi kana kila muti nusevasya kauvinduku ka nzeve?**

Miti na matu mayo nimavwika muthaka wa nthi. Nutaniaa muunyi wa muti. Sisy ungu wa muti nukwona muthanga ula wivo ni mwiu na ti undu umwe na ula uathitwe ni sua. yila ungu wa muti vena muunyi nivathithu na vena kimeu kwa ivinda iasa kwi vala vaathitwe ni sua. kii kionany'a kana miti ila yi muundani kwaku nitetheeasya muthanga kwia kimeu na kiw'u kwa ivinda iasa kwi vala vate miti. Kiw'u kii kikatethya mimea yaku ni kikatumika maundu ni angi kisioni yaku.

Carbon Credits nimyau?

Kusevya Carbon Credit sya TIST wienda syindu itatu

1. Nzeve itavisaa kwithiwa iyioleka na kwingeleka nzeveni (mawithyululukoni)
2. Kwiyiava kuola nzeve itavisaa kuma mawithyululukoni
3. Muthiani / muvitukithya kuikiithya kana mawiko othe mekitwe undu vaile.

Miti niyosaa nzeve itavisaa kuma mawithyululukoni na kutumia kusevya liu wayo vala iwiaa ta ngu mithambani, miini na muthangani. Nzeve itavisaa ila yumitw'e mawithyululukoni ithimawa na undu muti utonya kwia yiana naindi niw'o yikawa isavu na kuvitukithw'a kana ni yawo na indi nzeve ino yumitw'e mawithyululukoni na kwiwa mutini niyo itesawa sokoni ta Carbon Credits. Athooi ala mauaa mauaa ta nzia imwe ya kuola nzeve ino nthuku methiitwe mailekya mawithyululukoni.

TIST nitonya uta nzeve ino itavisaa ondu mundu utesaa sukali kana yia. Onakau kuta nzeve ino mundu ndalisasya muti melini/isiwani. Indi vaita ni kuma nzeve ila muti uyu wuwity'e mawithyululukoni na kwithiwa muti wivo uendee na unyw'a nzeve itavisaa. Nzeve ino itavisaa itesawa sokoni sya New York, Chicago, London na misyi ingi minene nthi yothe nitesawa kwa mivango kati wa andu kana kambuni. Nonginya tuvikie miao ya soko nikana tute nthini wa isoko. Mwiao umwe nikana miti ndyaile utemwe ngulutu kana mititu kwengwa nundu uu ni uthuku kwa mawithyululuko. Nitwaile kwiyumya kuvanda miti yikale kwa ivinda iasa ta myaka miongo itatu. Na ingi nitwaile unengane uvoo waw'o. Miti yamina uvandwa masavu amwe nimaile kwikwa ta undu nzeve itavisaa ikwoswa ni miti ivanditwe ni aimi ma TIST. Manya ingi kana miti nditwaawa sokoni itiawa o muundani kwaku vala yaile ikala kwa ivinda iasa

nikana ukaendee ukwata ndivi na kuunenge liu wa indo, ngu, matunda na mbindi/ngii. Mbesa ila TIST ikwataa kuma kutani kwa nzeve itavisaa nikuaaniaw'a tukundi tunini twa TIST na ingi utumika kukwathiia ndivi sya kumanyisya, kuvitukithya na kuungamia.

Miti yoothe inyusaa nzeve itavisaa yianene?

Anye'ee, Miti ila mithathau noyo yiaa nzeve mbiki kwi miti mitheke. Miti miasa niyosaa nzeve mbingi kwi miti mikuvi. Kwoou uthathau wa muti nuetae mbesa mbingi nthini wa soko wa carbon credits. Kii nikwasya utaaniu wa miti niwaile nikana unenge miti nzeve na kwithiwa itonya uthathaa na kuasava nikana yithiwe na ueti museo. Ingi yimitaaniu nesa ndiithiwa iyuaania unou wa muthanga, kiw'u kana sua. Kwoou nikana ukwate ndivi nzeve kuma mitini manya kana utaaniu wa miti niwaile nikana yiane nesa yimithathau na miasa. Ingi kuola miti ni kuseo ni kutumaa ukwata ngu na kutuma miti ila yatiwa yiana nesa.

Niva kana ni aau mauaa nzeve itavisaa (Carbon Credits)?

Kwayu nzeve ino itesawa sokoni sya kwiyumy'a. Nitonya kwithiwa ivitukithitw'e kivathukany'o kwa ivinda na mivai kivathukany'o otondu soko syithiawa kivathukany'o sya kaawa na kaawa ka kwiseuvisya ungu wa masyitwa kivathukany'o. TIST nitonya uta carbon credits syayo nundu niatiie mawalany'o na nisy kilasi kiyulu. Ve kilasi kivathukany'o na miao iulu wa uvandi wa miti yikalaa isesya na kusyaiiwa na livoti ila taile uvikia nikana tute nzeve yitu sokoni ithi yiya kilasi kya yiulu. Nitutumiaa nzia sya yiulu muno kuvitukithya, kukunikila, kuthiana n akwona nisyale - verified carbo standard (VCS) kwa nzeve, mawithyululuko, mbai na uvathukanu wa syithio situ (Climate, Community na Biodiversity Alliance Standards).

TIST yithiawa na aui mithemba ili:

Mbee ni andu ma ngoo sya wendi museo ala mauaa kwa kwenda matuthuthe kuendee na kuvanda miti. Ngelekany'o Kuiva andu mande miti kwa alusi kana conference ya kwikala tuoete nzeve itavisa.

Keli ni kambuni ila syi US, Europe, Canada na nthi ingi ila syina industries nimeyumasya kuola GhG ilasumite nikwithiwa mena wendi museo kwa mawithyululuko kana meenda wambiia kuete walany'o wa kuola nzeve itavisaa.

TIST yina utanu kwithiwa nzeve yayo yi imwe ya kilasi kya iulu na itonya uteea athooi aingi kivathukany'o.



Kwia Mbeu na undu wa kuiita mbee wa uvanda.

Kwia Mbeu

- Ikiithya ethiwa wiumya matunda kuma kisioni kii kuthi kingi niwamekalya me many'au, memuunyini na vandu vena nzeve nesa nikana ngii ila syi nthini iikanangike.
- Kua matunda maku na kyondo kya ikanga kana ikunia. ndukakue na mathangu ma nailoni maikanyale na ukosa nzeve na mayanangika.
- Ikiithya niwanzakua matunda ala maseo (unit 2) na ni manyau na matheu mbee wa kumaia. Mbindi na ngii mbingi syendaa kwanikwa suani vandu va mithenya ili kana itatu iny'ae nesa.
- Ila mbeu yaku vandu vany'au , ve muunyi na ve nzeve nesa. Tumia makunia ma ikonge, mbisu nikana uole ivuso ya mbeu kuunda. Kunika na nguniko nesa wusuity'e mbeu nesa kuola nzeve nthini wa kikuu, mbisu kana ikunia yila wiite mbeu.
- Ethiwa ndwithiawa na mbeu ya kususya vala ukwenda kwikia ususya na makaa kana makanzeti nikana makanyusaa nzeve ila yina kiw'u.
- Tumia miti kuseuvya makumbi kana utaa wi yiulu kwa kwia mbeu nundu waia nthi mbeu nitonya kuunda kana kwanangwa ni uvyuvu na tusamu kuma muthangani. Ethiwa witumia makunia kana syondu no ususye mitini nyumba.
- Kulya mawoni kivathukany'o kuma kakundini kaku kala ke vakuvi naku kana kwa athukumi ma ndilikasa iulu wa utumia ndawa sya kuaa mitutu na mauwau kusuvia mbeu yaku. Ngelekany'o Matu ma Neem kana mauta, matu ma Gliricidia, savuni nisuvia mbeu.
- Lilikana Kusisya mbeu yaku kaingi kuikiithya ti mbanangiku.
- Umbany'a uvoo iulu wa mbeu ino na undu wa kumia kuma kisioni kyaku kulingana na ni muvai wiva nundu kwi imwe itaiawa kwa ivinda iasa.
- No utatithye kusianisya ivinda ya kumea kwa kwosa ngii ta 100 na kwia lekoti ya ivinda yilaiutumia kumea kwa kutala nisiana imeete kwa ivinda yiana ata. Weeka uu kila mwai ukeethiwa utonya umanya kwa ngelekany'o undu siekete kwithiwa na vinya wa kumea na wamanya tavya ala ma ngwatatio yenyu undu usomete iulu wa mbeu isu na kumanya.
- Oundu vala wiite mbeu yaku vathithite now'o itonya kwikala kwa ivinda iasa. Ikiithya mbeu ndinalika kyenini muno na ethiwa vala wiite vena uthithu muvituku nilaisi mbeu kwanangwa ni mbuka.
- Manaya kana vena mbeu syitawa recalcitrant (ila syi vinya kuvinduwa). Mbeu sya muthemba uyu nila itendaa kwiwa syendaa ukethwa ivanditwe nundu syendaa wiu mwingi. Kwa kwia kwa ivinda inini ta kyumwa waile ulinga na makula meu. Mbeu muthemba uu utavinduwa nikusaa yany'aa. Mithemba ya miti ila mbeu yasyo iilye uu nita:- Artocarpus Heterophyllus (Jackfruit), Azadirachta Indica (Neem), Calamus Species (Rattans), Durio zibethinus (Durian), Eusideroxylon zwageri (Ulin), Theobrona caci (Cacao) na ingi ta Dipterocarps (Shorea, Hopea, paolaquiquium etc)
- Na muthya, yia uukua mbeu kuma kivuioni lilikana kumya na kuvwika.

**Ni Uiiti wau utonya kwendeka mbee wa mbeu kuvandwa?**

- Vand mbeu imwe na uisisya syikua ivinda yiana ata kumea. Ethiwa syikua ivinda iasa kwi kyumwa kimwe nuseo kwamba kuiita mbee wa kuvanda.
- Ethiwa ndwina muikiio na mawoni ala unengetwe iulu wa mbeeu ino ni useo kwamba kutatithya kwa nzia kivathukanyoo na uitavya amemba ma ngwatanio yenyu undu wonete itina wa kutumia nzia isu ethiwa ni nzeo.
- Ethiwa mbeu ii ni tungili tuniini kana twiona ikonde yumu ni useo kwamba kuiita ngelekany'o ya mivai ya ngii ila yithiawa na ikonde yumu nita Croton Megalocarpus, Neem, Cassia Species na kei appel ila syaile amaba uvandwa mikeveni.
- Ethiwa ukolanitye matunda amba uinde vandu va mithenya ili kana umwe, osa kisungi kya waya uvinyianisye na kusunga utiwe na iongii na kiw'u na nyama sya itunda iisungwa sume. Mithemba ya miti ila yikawa uu nita Syzium cuminii, Dovyalis Cffra, Trichilia Emitica, Vitellaria Paradoxa, Prunus Africana, Gmelina Arborea (gmelina), Azadirachta indica (neem) na Tamarindus Indica (Tamarind).
- Matunda amwe nimendaa kwamba kumwa kikonde kya nza na kutitianwa vamwe ngelekany'o Tectona grandis (Teak) na Calmus species (Rattans).
- Matunda angi methiawa na ngii ila syendaa uthiwa. Itina wa kuinda itunda vandu va muthenya kana mithenya ili, kima itunda na ndii na mwithi mithemba ino nita Melia volkensii, Melia Azedarach, Sclerocarya birrea, Cordia Africana.
- Mikea imwe niyendaa kwanikwa suani kwa mithenya 3kana 5(vandu vatena sua nyingi) na itina kutuangwa kumya mbindi/ngii. negelekany'o ni Laucana Species, Calliandra calothyrsus, Acacia species, Sesbania Sesban, Grevillea robusta, Casuarina Species na Eucalyptus species.
- Mbeu imwe syithiawa na ikonde yumu na syendaa kwamba kuiitwa. Imwe nisyendaa ona ikonde yasyo kwamba kwatuwa na yundo kana ivia itina wa kwanikwa vandu va mithenya 3 - 5 nikana kiw'u kilike na kutuma imea. Mbindi ii nisyendaa uvandwa mituki undu vatonyeka itina wa kwatuwa ila nita Melia(mukau), podo species, Croton megalocarpus, Adansia digitata, Swietenia macrophylla,, Delonix regia. kwa ngii iola ninin na syendaa kwatuwa ikia mukeveni wina nguniko na uyikia kithangathi na uikusakusya kwa vinya nikana syatuke.
- Mbindi imwe nisyendaa utilwa o vanini kutitheesya kiw'u kulika. Ndukatile muno ndukatile munguthe.
- Mbeu imwe nisyikaa nesa kwa kuindwa kiw'uni kimuutia kana kivyu ila nita:- Calliandwa, most acacias, Tamarind, Leucaena na Albizia. ikia mbeu mukeveni, na uyitiia kiw'u kitheukite. Eteela kiw'u kivoe na uyumya mbey ila ukwithia syaimba.
- Mbeu imwe syendaa kuindwa kiw'uni o kithithy kwa masaa ta 12-24 ila nita Sesbania, Tephrosia, Dalbergia Species, Gmelina, Gliricidia na Acacia augustissima. Ikia mbeu mukeveni ongela kiw'u kithithu kila kyaile ithiwa kundu kwili kwa imbindi, umya ila itonya kwithiwa ithambalalite.
- Mbeu yoothe yamina uiiitwa niyaile utwawa muundani kana kivuioni na kuvandwa.

Mazingira Bora



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Washiriki wa nguzo ya Munyaka, huko Trans Nzoia, wakipokea kwa furaha vocha zao za asilimia 70 za faida ya kaboni.

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TIST koristab mugaret.

Yenkimin ketik konyoru koboisien koristo noton yaa (CO2) korisiton ko agenge en chekiguren (greenhouse gases), en niton kotere burgeyetaf nguwofut en soet asi konyor burgeyetaf neo ng'uwofut, mwoe ng'omufik kole kigoet burgeyetaf en emet ako magararan weche emet en niton koweche emet, eniton koweche emet amun emotinwek alak komuche koet robta mising, bitu kameusiek anan ko melewet, bitu koristo neyaa yon koboisien karisiek mwanik, kou makaa (nesek) amun ketik koboisien koristo kobose chongitab korisuwef kemi soet, moche anyun seregali ak emotinuwef cheboisein (industries) kobos koristo neyaa asi nguwofut borgeiyetaf neyomegei.

En koitikab ketik chebo tist koiti ak kobimoni toltolitaf ketik asi komuch konai kole tiana koristo negobosien ketit, kobunisief ak seregali kwole koristo neya ak koliban ketik ak kobos korisoton.

Nyolche ko kibo imanit ak chelitif en koitetab ketik asi kimuch kiyanten, ye ka konyoru rabisief komuche kurubit koboisien komnye ak konam koyai tuguk alak che komagotinye, kurubisief kelibochin \$20 chebo ketik 1000 en kenyit (kogerfe ak 1.80ksh.) En ketit ne sobe, nyorunen kelchil temik kosir olik amun chechuak ketik.

Membraekab karaba kilasta en laikipia county komiten tuiyetaf en arawanik konye.

Ole kimenye ak ribet.

Ngoliot ole kimenye ko mogetononchin kitiyo ak keribchi tionfik ak mengotosiek kora ko kerib ngungunyek, koristos ak beek, niton kobose nyabireta, tuguk chechang, kou kelunoik chebo emet, nyolche keboisien kimnotosiek asi kimuch kerib mengotenyon niton ko kanametaf anan toloitab minufik ak omituwokik, nyolchin chitugul koguiyot mising agobo niton ak kocheng koimufik chemongunen mengotenyon ak nee negimuchi kenyorunen mengik, katagetugul nebo timin tionyagetugu nebo ng'uong kimogini kabuatetaf

en chitugul kotet agobo teretaf tionfik k ribetaf mengotenyon en mengotenyon en mogornotosiekwak asi kotononchin minufik ak kobos koimufik chebo mengotet, momi oretage kobaten kiyen kerib mengotosiekyok.

Kanamet.

Yai koitet en imbarengung asi iguye tionfik ak minufik chemiten.

Ibkokuontiet asi iisoengei ngemetaf mengotet chob koguontie ne mengotet asi ites minufik en imbar.



Temikab TIST kotinye naet agobo burgeiyetab nguony ak waletab itondab emet.

Ngen che chang en temikab TIST agobo niton. Kigechil niton temik en konetisiosiek ak seminars ak en tuiyosiekab kilasta koguiyo agobo burgeiyetab emet, ak nee nebitu agobo niton ne oret negimuche keposen. Kitinye ak kenyoru koimutik en betusiek tugul. Koborunet netai ko kirobon robta El Nino en 1998 ne kibun emet ak let konyo kemeut, kibitz kora koristo neo missing en 2004 nito ko koborunetab waletab emet. Kibit en emet; kosib kochotio koikab beek en Mt. Kenya amun en burgeiyetab ne kibitz en emet; kosib ko kobetio anan rorunetab amitwogik ene emet, kotenyo beek en kondametusiasiekab beek ak anagei chechang chegitok.

En arawani ketinye asi komuch koguiyo biik agobo burgeiyetab emet ak waletab emet komie. Kitinye ororunetab chuton tugul asi iguiye ile tos imuch kotoret.

Ne anyun burgeiyetab emet?

Burgeiyab emet kogochin nguwendet koet missing burgeiyetab, niton kogochin emet konyor wallet. Ye eet mat en emet komuch kowal orowekab robta, koriswek che gimen, kotesak beek en nyanchosiek, lo mabit omitwogik, koseretio ketik, tiongik ak biik. Ye ngalal ngomotik agopo niton bo waletab emet kotinyegei ak burgeiyetab emet; niton kotinyegei ak boisionikab biik missing ko agobo itondab emet ko bitumen niton.

Tos tesosei mat en emet?

Ee amun en kenysisiek 100 chegogopata kogitesak 1^oc. Tinye ngomotik kole eng bosionikab biik che

yoe kogochin ngwoindut koet mat. Niton kounetab mwanik chegitom kepoishen, petro, koristo nemiten ak koluletab keti, ribetab emet ne mayamat.

Tos tinye koriswek alak?

Niton keguren kotab kurwek amun miten en nguony koriswek che terotin kou carbon dioxide nitrous oxide, sulphur dioxide, mitane trap energy koyob asista. Olepitunen korisi ya (carbon) kotiletab timwek, koristo ne yopu factorisiek karisiek, nesek ak beletab osnosiek.

Ne ngoiyondit ne konu burgeiyetab emet?

- ◆ Konu kotesak ongatet en ye mamiten beek.
- ◆ Konu kotesak mionwek kuo eset.
- ◆ Amun igochin kalyangik che ibu eset kochanga, komuchi kebek biik che chang.
- ◆ Konu koet bananda en biik amun ye kaet mat, komuchi komabiit omitwogik missing ko korotinwek chemiten oretab asista.
- ◆ Konu kobit oliet ab omitwogik. Kwo barak missing amun rorunet.
- ◆ Ye tiny timwek ak osnosiek kobitu kobetio beek en tulonok, komagenyoru beek che kimuchi keboisien en imbarenik, kobetio omituokik, komagenyoru stimet ak beek en korik ak en townisiek.
- ◆ Biik che chang komosiche mengotosiek en maranetab neek.

**Omuche oter burgeiyetab emeti?****Min ketik ak irib!**

Kou en mwaetab koristo noton ya (Carbon) ko konu burgeiyetab emet. Ketik anyun koboishen koristo (carbon dioxide) en yaetab omitwogik, konori en temenik, tigitik ak ngunyek, yegitil ketik any ko kagichunda korisoton kwo soet, kotes burgeiyetab emet.

Tos imuch inai ile ketit kotinye waletab emet?

Ketit ak orwet gotuche emet. kaitit urwet kosir olemiten asista.ole kaitit kogochin yoto kokoitit en abogora niton koboru kole ye imin ketik konyoru ngungunyek chemiten imbarengung kotityet en kila ak kila ,agotrurutik tugul.

Mungaretab koristo konee?

Mungaret kotinye tuguk somok:

1. Komiten keretab bosetab koristo noto yaa (CO₂) en koristo.
2. Kebos carbon en kenysisiek chechang.
3. Miten biik che tononchingei asi korib agoib kokwout kole kogisib mogutik tugul che tinye.

Ketik koboisien carbon ak kogonor en ketik, tigitik ak en ngungunyek. Kimuch kenai koristo ne yaa nemiten barak ak nekogiboisien ak keyai esabu. Ko bit anyun chemungarainik che ole ak kwoldoi. Itin anyun TIST koalda koristo ne kogiboisien en ketik kou temik che tinye sugaruk ak chego. Mogimuchi keib ketit kwo ndonyo kobaten kibimoni toltolindab ketit ak kiyokto. Mungarani kotesetai en New York , Chigaco, London ak emotinwek alak. Miten ngotutik che bo mungaret

ak tononywan. Biik alak komuche kotil ketik en osnet asi kogol alak, maiyanat niton amun ketesi carbon kotes burgeiyet. Kimokinigei kemin ketik chebo kasarta ne goi choton ko kipkaa. Ye testai temik koribe ketik konyorunen kelunoik chetoretegei en kaa kou- rabisiek, kwenik ak logoek.

Tos ketik tugul koboisien koristo ne kergei?

Acha, ketik chetebesen ak chegoen kotinye koristo neo kosir ketik chemengechen. Ketik chetebesen kotinye raninik che chang amun konori koristo neo. Noton anyun ye kigole ketik kigochi kokwoutik che yome asi koet ak konyor beek. Rib ketingung ak kechororchi asi koegitun ak inyorunen kwenik ak omitwogikab tuga.

Ano/ng'o che ole koristo?

En nguni kochang olig ago miten boroindo en ole imoche. Amun tinye boroindo olik ak oldoik (kou kawek kotinye keruti).

Miten kobesosiek en indonyo amun tinye agetugul ngotutikyik kou ole kimindo ketik, ole kiribto ak ole kiyumdo report. Kiboisien biik che miten barak (validation and verification, V.C.S) ak Climate Community and Biodiversity Alliance Standard (CCBA).

TIST kotinye olik oeng

Netai miten biik che tinye kapuatet ne mie ko kon rabisiek, kogochi che kimin ketik. Nipo oeng komiten kombunisie en US, Europe, Canadaa ak emotinwek alak chegitestai kotinye maget kepos koristo ne yaa.

TIST kotinye boiboiyet en amun tinye koristo ne kararan netinye mungaret, en olik che chang.



Konoretab keswek ak ribet.

Konoretab kesuek

- Ibuat ine yon imoche iib logoek kongeten olekebuten komising iyamsi
 - Koyomio. ko kararan iur ak kosich koristo ne ome asi mowech kesuot en orit.kararan ingeboisien kuniok chemotinye kongik chebo asi konyor logoek ak keswek koristo
 - Maiyanat keboisien tukuk kou sebebeisiek anan plastikisiek amun motinye konyik chebo koristo komuche kowechob tuguk.
 - Ibwat ile cheta ko chekororonen ko choton chesib kekonori,amun tililen kiyamsi ak kekonor.
 - Amun keswek che yomnyotin ko ngebor koboroksei keswek chechang kemoe en betusiek 2-3 en asistab . kotomo kochobok .
 - konor anyun keswek en ole tinye urwet ago yamat. Boisien tuguk kou kuniet ne tinye ole chute koristo ak teretab kipkaa asi momunyok. Konoren tuguk che kororonen asi mowechok keswek ak irib komochut koristo.
 - Ago kend lolet keswek ago yemanyi imuchi itesi tuguk kou nesek metetekab muchelek
- ak alak Cheyomyotin niiton kotoreti koyamsi kititindab koristo ne mi orit.
- Ingoteben anyun bogoyot asi mutiny ng'wony keswek amun imuche kowalak konamak anan kochut susurik ak alak tugul che imuch koiti.
 - Chang kabwatet en bik alak en kurubit anan ng'omotik asi iteben ngo kimuchi keboisien Kerichek keteren susurik, korokut kou neemol gliricidia leave ak sobunit komuche kotoret.
 - Ibwat igergere keswek en abogora asi mowechok, tiny kora ile toss tore betusiek chetian Keswek asi mowechok . niiton kotiyenge koimbot keswek anan korikab keswek amun miiten Chetebie kasarta negoi kou kenyit agenge .
 - Imuche iyai korokut en kosorwek che terotin asi iguiye ile ibe keswot agetugul kasarta
 - Netyan en rutunet . Inemun keswek 100 ak inde kabeti asi inai ile ata chekorut ak chemorut
 - Niiton koboru kimnotet nebo keswek. Obchei ak biik alak en kurubisiekab kilasta.
 - Ingotebi keswek ole kaitit asi kokochi kotebi kogagei. Mokimoe keswek en asista agot



Konyor ole kaitit missing koweckoksei keswek. Naiy ile miten keswek che kemine kou

- Noton che mokiomsie anan kekonor amun moche beek chechang asi korut. Korikab keswechuiton
- Koyomtos en chokinet kou Artocapus, heterophillus (jack fruit) Azadirachuta indica (neem) calamus Rattaus Durio zibethinus (duria) Theobrome (cacao) ak alak che chang .
- Nebo let anyun ibwat ile yon iibe keswek koba kabeti konyolu koyomiotin .

Nee ne kimokinigei asi kateren.

- Miin keswek che ng'eriny asi iker kasarta neibe . Angot koib kasarta nebo wikit keib kasarta Kinya angot ko metinye kayanet ko onchu kosibutik ne tai ko iyai koborunet ak obchei ak Kondoikab kilasta asi onyuru walutik .
- Angot ko keswek che tinye makatet ne nyikis anan ko mengechen ko motinye kinde kerichek kou keleluet neem cassia ak kei apple kimuchi kemin kou noton

- Miten alake che kinuri en beek betusiek (1-2) asi komuch konur magatete asi
- Komong keswot kou kipkarkaryat chepkomon ak saunet.
- Keswek alak kebore asi komong tenderek . alak kindo koteben beek betusiek (1-2)
- Alak ketue ak kenut kou melia volkensis, melia azadarach ak che chang
- Keswek alak kimuchi kiyamsi betusiek (3-5) asi komuch komong tenderek kou sebesebe. Chepitet ak alak che chang
- Logoek che tinye magatete ne nyigis kimuchi kema en asista asi koter magatet anan ketui. Alk en logoek kimuchi ketil asi kobit ole bune beek asi korut keswot ak irb kometil ole rutunen
- Alage koboisien beek che loltos kou calliandra chebitet ak chepkomon ketorchin beek
- Ak kebakach kotgokoititegitun beek kelol. En saisiek 12-24 ko en keswek che kabwa barak ilolu Amun yachen choton
- Keswek tugul che kagetolet konyolu kemin en sait noton.