

Mazingira Bora



TIST

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

English Version

An Environmental, Sustainable
Development and Community Forestry
Program.



Muforocchah TIST Small Group Tree Nursery

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It's 6th TIST Kenya Birthday.

In February 2005, the first TIST Seminar was held at Christ the King, Nanyuki. The vision of starting TIST was shared and born during this seminar. The first action plans were developed. TIST Values were agreed. They became pillars of TIST Program.

Like a small spring, that struggled first to find its course and later became a big river, TIST started small, with only a few farmers. The enthusiastic pioneers spread the TIST gospel like bushfire. Many more farmers joined in. Small Groups were formed. Quantifiers and

Trainers were established. Quantification and Training began in earnest.

Today, 6,975 Small Groups have been established with more than 50,000 farmers joining. More than 5.1m trees have been planted, cared for to keep them alive and have been quantified. TIST has spread to Mbeere/Embu, Kirinyaga, Tharaka, Meru, Laikipia, Nyeri, Bomet and Narok counties.

We are growing. We continue to serve our country and environment. We are TIST!



Conservation Farming Field Preparation

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

Try to stop animals from grazing on the area. If they graze there will be less crop remainders left covering the ground.

Conservation farming holes have to be dug before the rains come. It is therefore vital to start digging them early.

Mark out where you are going to dig your holes. Get a long piece of rope or string and squeeze bottle tops on to it 70cm apart. Stretch the rope across the width of your field. Each bottle top marks the centre of a hole and it makes sure that the holes are correctly spaced out. Mark out the rows of holes using a hoe. Each row should be 90cm apart. Just mark out the rows and holes you think can be completed that day.

On the same day as you mark a block of holes, dig the holes. The holes need to be oblong. They should be between 15cm wide, 35cm long and 15cm deep.

When you are ready to plant the grain it is important to put some very fertile soil into the holes to help the crop to be stronger. Take some manure and good topsoil and mix it together, or use compost manure. Fill the hole with the mixture up to 5cm from the surface. That space will help capture more rain.

If you are planting maize, soak the seeds in some water for 6-7 hours before planting them. This speeds up germination and means that more will survive. When you plant the seeds, plant 4 seeds in the soil across the hole. Cover them with 2.5cm of the rich soil and manure mixture. After this the soil in the hole should be about 2.5cm below the surface of the field. It should never be more than this. Clods (big lumps of soil) should always be broken up so that the soil makes good contact with the seed.

If you are planting sorghum, plant 5-6 seeds at each end of the planting hole after a good shower of rain. Cover the seeds with 2.5 cm of the rich soil and manure mixture.

The space at the top of the hole enables water to get to the plants when the rains come. Without this space the rain will just run off the land, taking a lot of the soil nutrients with it.

Weed around the holes regularly. Each year there will be few and fewer weeds.

Don't be discouraged! Digging the holes now will mean they are ready for this year and you will not have to dig them next year.

How to Make Compost Manure

This compost manure is a natural fertilizer to help your crops grow. It is better than chemical fertilizer because it is natural and has no damaging effects for the crops and environment. There are lots of different methods, of which the following is just one that has been useful in some areas.

Preparation of compost

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

Use of compost

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



Ten Clusters Paid in TSE Clusters Last Month

Last month, Small Groups in 10 TSE Clusters received payments. These Clusters included;

Laikipia West TSE:

- Mithuri Cluster
- Karaba Cluster
- Tandare Cluster
- Njorua Cluster.

Imenti North TSE

- Mituntu Cluster
- Limoro Cluster
- Muruta Cluster

Kithurine TSE:

- Kithurine Cluster
- Tharu Cluster

Wiyumiririe TSE:

- Wiyumiririe Cluster

We are encouraging other Clusters leaders to organize for the quantification of Small Groups so that they can be paid too. It is important to ensure that the quantification work is accurate, and honest. Each of the Clusters TIST servants should hold one another mutually accountable so that the Clusters and Small Groups can be in good standing.

Further, it is important to note the quantification data will be audited. The Clusters that will pass the audit will be paid in the next Small Group payments.

Kithurine Cluster: Forward Ever in Environment.

By Jane Makena.

When Elizabeth Kiogora introduced TIST in our Kithurine Cluster, it took little time for farmers to appreciate TIST is a good program for them and the environment.

Elizabeth, a TIST Social Entrepreneurship (TSE), with her partners Mercy Nkonge and Waston Majau as well as coordinator Patrick Murithi worked very hard to build Cluster structures within a short time. Farmers were happy and the Small Groups were formed, seven Trainers and four Quantifiers were recruited and trained.

As more groups continued to join TIST, trainings were intensified. Small Group members were taught new best practices in planting trees, planting of indigenous trees, best tree spacing for healthy trees and optimum benefits, conservation farming (CF), making compost manure, tree nurseries establishment.

Farmers took the trainings positively. They had a lot energy and enthusiasm that they began taking immediate actions. Many started planting indigenous trees while others planted fruit trees such as avocados. Their household incomes have increased as surplus fruits are sold in the market.

Our motto in Kithurine cluster is: FORWARD EVER FOR ENVIRONMENT, and our

environment has improved greatly due to the indigenous trees that TIST farmers have planted. We reduced the number of eucalyptus which was common in our region. Our rivers now have increased in water volume. We are working hard to protect and conserve our riparian areas.

A number of TIST farmers have practiced C.F. They have experienced high yields and lower cost. Use of compost manure has been beneficial to farmers as they do not have to rely on chemical fertilizers. This has enabled farmers save money.

Currently we have 52 Small Groups in Kithurine cluster. We have multiplied this cluster to form a child cluster, Tharu, with 45 groups.

In Kithurine cluster, 35 groups have been trained and quantified. They passed an audit and 11 groups have over 500 trees and so have qualified for payments. They recently received payments. A sum total of Ksh 23,600 was paid in Kithurine while Ksh 2,200 was paid in Tharu cluster.

Our vision is to have all groups plant many more trees, get quantified accurately and get paid. We target to have all our groups paid in the next payments and receive more than Ksh 200,000 for each cluster. We know we can, because in TIST, we are!



TIST: Understanding Global Warming and Climate Change.

TIST farmers are working hard to tackle two major world challenges today - climate change and poverty.

Climate change has accelerated poverty as many world farmers, especially in developing countries, continue to experience reduced and erratic rainfall. Today, parts of Kenya are experiencing severe drought.

Global warming contributes to climatic phenomena such as the El Niño floods of 1998 that ravaged the country and the subsequent long drought. It contributes to hurricanes and other severe weather. Global warming is also causing the glaciers at the peak of Mt. Kenya to shrink. Climate change from global warming can cause unpredictable weather patterns that lead to crop failures in many areas, and drying of water springs and water catchments.

TIST farmers through planting of trees are playing a significant role in mitigating the effects of global warming.

What are Global Warming and Climate Change?

Global warming refers to an increase in Earth's average temperature, which in turn causes changes in climate. The Earth has warmed by about 1°F over the past 100 years.

A warmer Earth may lead to changes in rainfall patterns, 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. Many of the world's leading climate scientists think that things people do are helping to make the Earth warmer e.g. burning of fossil fuels, trash, coal and natural gases, and cutting of forests.

Deforestation is the second largest contributor to global carbon dioxide emissions and accounts for over 20% of all emissions caused by man. Deforestation destroys habitat for multiple species, reduces biodiversity, degrades soil fertility

and water quality, and forces conversion to fossil fuels due to scarce supplies of wood and charcoal.

What is the greenhouse effect?

The greenhouse effect is the rise in temperature that the Earth experiences because certain gases in the atmosphere like carbon dioxide, nitrous oxide, sulphur dioxide, and methane trap energy from the sun. These gases act like a greenhouse or a blanket, making the world hotter and hotter.

What are dangers of Global Warming?

- ❖ Severe water stress in arid and semiarid land areas with more areas becoming desert.
- ❖ Increased spread of diseases like malaria. As areas become warmer, dangerous mosquitoes can survive and spread diseases in new areas.
- ❖ Decreased agricultural production in many tropical and subtropical countries, especially in East Africa. Due to decreased rainfall and increased breeding of pests due to warming, production of food crops may decrease. This would result in poverty and hunger among many families and communities.
- ❖ Higher worldwide food prices as crop yields decrease and food becomes scarce.
- ❖ Major changes in the productivity and composition of critical ecological systems. Water catchment areas in mountains and forests will dry up. This will affect the ability to irrigate crops and reduce stream flows necessary to keep dams and reservoirs replenished. This will affect generation of hydro- electric power. Industries, hospitals and others that rely on electric power will be severely affected. The supply of piped water to urban areas and 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.

What Can We Do About Global Warming?

Plant trees!

Carbon dioxide is one of the gases that cause global warming. Trees absorb carbon from the air during photosynthesis and store it in the wood, roots and soil as cellulose carbon as they grow. When trees are cut and burned, they release the carbon they had stored back to the air. Less carbon dioxide in the air means less greenhouse gas effect, and a cooler, safer planet with lessened effects of climate change. TIST farmers in Kenya have already planted more than 5 million trees, but we need millions more.

Did you know each tree can create a micro climate?

Trees and their cover cool the surface of the earth. When the ground stays cooler, the ground holds more moisture longer. This means that trees on your land can help hold water in your soil for a longer time. This will

help your crops and also even help the water users in your area a bit.

Do all trees absorb the same amount of carbon?

No. Tree that have wider circumference (more biomass) store more carbon than trees that are thin. Taller trees also have absorbed more carbon than short trees. Therefore, trees that are big and thick will bring more benefits. Trees planted with good spacing have a better chance of growing big and tall. They do not compete for soil nutrients and water as much as trees that are closely spaced.

Quantifiers measure trees we've planted on our farms to know how much carbon has been stored in these trees. This carbon can then be sold, providing the tree incentive payment we receive in our cluster meetings. Next month, we'll learn more about the carbon markets, and how we sell this carbon while the trees and their many benefits stay on our shambas.

To fight climate change, improve our farms and our planet, let's plant more trees today, and plant them with good spacing!

NO Change, NO Growth.

By David Mawira.

The world is fast evolving. We need to adapt to the ever changing technologies, new ways of doing thing, even our behaviors. If we refuse these changes, we risk being left behind!

For instance, the traditional ways of doing things are being replaced fast. New energy saving jikos has come to replace the traditional three stones stoves. Many people who have adopted new stoves are saving a lot of trees. They are keeping smoke away from the kitchen through chimneys, hence keep diseases at bay.

Conservation Farming, thought not a new innovation, is fast replacing the traditional

tilling farming practices. With Conservation farming, many farmers are getting better yields besides saving on the production costs such as use of fertilizers, chemicals and ploughing costs.

Planting high value fruits e.g grafted mangos is fast replacing the traditional mango trees. Today, farmers who have adapted this new technology (grafting) are getting more money, their mango yielding at an early age.

TIST has embraced these changes and more to help farmers grow. Join TIST today and experience changes that you can trust!



Kihato Bee Keepers: We have a bigger mission in TIST

By Joseph Thitai.

When Kihato bee keepers started in 1995, we, the members, had a vision of empowering ourselves through, income generating projects and finding ways of improving our lives.

Our first projects were bee keeping and flower farming. However, in our efforts to keep bees, we realized that bees cannot do without trees. We began tree planting, but due to drought common in our area ? Lamuria, Laikipia County, we experienced high death rate of our transplants. Hardly any tree survived.

We almost abandoned the project until TIST came in. TIST taught us new tree planting best practices. The survival rate of our trees improved tremendously.

We were very much encouraged.

All the members decided to join TIST. We multiplied the giant Kihato bee keepers to form three groups - Kihato Kiburi TIST Number 2006KE261, Kihato bee keepers TIST Number 2006ke1214 and Kihato livestock TIST Number 2006KE487. Each of these groups work independently in TIST program.

Today, we have a bigger mission - to encourage more of our neighbours to join TIST and plant many more trees. Besides receiving tree incentives, we have benefited a lot from TIST. We have been taught Conservation Farming, construction of energy saving jikos, rotational leadership among many others.

It's Dry Season. Avoid Fires.

By Peter Mithiru

Many farmers have struggled hard to keep the trees they have planted survive. It is important that we avoid any risk that would reverse our gains.

During this period of dry spell, the risk of fire burning our fields and tree groves become high. It is important to avoid charcoal burning or burning litter in the field. These have the potential of spreading the fire to uncontrollable

situation where it can cause untold damages.

Remember to begin preparing your farms for this year CF planting now. Keep irrigating trees seedlings in the farm and nurseries. You can treat your domestic soapy water with ashes to make it suitable for your trees.

Again, avoid fire this dry season. Encourage others too.

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Ni Birthday 6 ya TIST guku Kenya.

Mweri-ini wa keeri mwaka wa 2005, seminar yambere ya TIST niyekirwo Christ the King, Nanyuki. Kioneki gia kwambiriria TIST nigithugundirwo na gigiciarwo thiini wa seminar ino. Mibango yambere na ya kwambiriria niyathondekirwo. TIST values cikiiguithanirio na igituika itugi cia mutaratara wa TIST.

Ota karui kanini karia keyethagira njira na muico-ini gagatuika ruui runene, TIST yambiriirie iri nini, iri na arimi anini. Aria mambiriirie TIST nimatheremirie uhoro wayo na njira nene muno na ugitherema ta mwaki wa githaka na arimi angi

aingi makiingira mutaratara-ini uyu. Ikndi nini cikiambiririo na atari a miti na athomithania makimenyeka. Uteri na uthomithania ukiambiriria wega.

Umuthi, ikundi nini 6,975 nicithondektwo iri na makiria ma arimi 50,000. Miti makiria ma 5.1 milion niitaritwo. TIST niitheremete nginya Mbeere/Embu Kirinyaga, Tharaka, Meru, Laikipia, Nyeri, Bomet na Narok counties.

Niturakura. Tugathii na mbere gutungatira bururi witu na maria maturigiciirie.



Urimi mwega - Uhariria wa Mugunda waku

Thutha wa kugetha ndugachine matigari no umaige kuu mugunda. Oro uria kuri na matigari maingi mugundaini waku, niguo tiri waku ukunora makiria. Ririkana no uhuthire matigari maya ma mumera guthondeka thumu.

Ndukari-ithie mahiu maku mugundaini waku, ungiriithia mahiu mugunda waku niukwaga matigari ma kunuria tiri.

Marima ka kuhanda mendaga kwenjwo mbere ya mbura yurite.

Wamenya haria urenda kwenja marima maku, oya rurigi na woherere tukuniko twa chuba utigani wa 70cm na uguchie rurigi ruu kuringana na uraya wa mugunda waku. Haria tukuniko turi niho gatagati ka irima riaku. Huthira thechi kwenja marima maku. Warie wa raini imwe nginya iria ingi yagiriire gukorwo iri 90cm.

Enja marima maku muthetha oroucio wa thima. Marima maya magiriire gukorwo mari ma kona inya. Makorwo mari gatagati ka warie wa 15cm, uraihu wa 35cm na uriku wa 15cm.

Ukihanda mbegu ciaku niwega kuhanda na tiri munuru nigetha ikure iri na hinya. Niwega guikira thumu na uthike na utigie handu ha uriku wa 5cm.

Angikorwo urahanda mbembe niwega gucirikiamai-ini mathaa 6-7 mbere ya kuhanda. Uu nigutumaga cimere naihenya na igatuma cikure nyingi itekura muno. Ukihanda mbegu ciaku, handa mbegu inya ukiranite irimaini. Thika na tiri utukanitio na thumu nginya uraya wa 2.5cm. thutha waguikira tiri uyu, hagiri-ire gukorwo na utiganu wa 2.5cm kuma haria tiri ukinyite nginya iguru. Mumuthura mathui nigetha tiri unyitane wega na mbegu ciaku.

Angikorwo urahanda muhia, handa kuma mbegu 5-6 konaini cia irima riaku. Humbira tiri waku na tiri muigana wa 2.5cm utukanitio na thumu.

Karima kau uratigia hau iguru gateithagia mai maingire tirini wega riria mbura yoiri. Ungiaga gurigia karima gaka mbura ikoira na ikururie tiri uria munuru.

Rimagira mumera waku maita maingi. Oro mwaka kurikoragwo na ria rinini.

Ndukage hinya, kwenja marima riu nikuga ati niukamahuthira mwaka uria ungi.

Uria ungithondeka thumu waku.

Thumu uyu nimwega na gutuma mumera waku ukure wega. Nimwega gukira bataraita ya ndukaini tondu nduthukagia mumera kana maria matuthiuruki-irie. Nikuri njira nyingi cia guthondeka thumu uyu, no ino no njira imwe ya guthondeka; -

Guthondeka Thumu waku.

1. Hariria handu ha guthondekera. Hagiri-ire gukorwo hari ha 4m by 4m.
2. Theria handu hau.
3. Enja irima ria githiururi kia 3 - 4m na uriku wa 1.5m .
4. Ungania matigari ma mimera yaku (Mabebe na makoni) na umatinangie tuchunji tunini.
5. Ikia tuchunji tutu nginya tukinyie uriku wa 0.5m
6. Ikira lita ithano cia muhu.
7. Ikira kioro kia mahiu (Kana Gichoro) maku, no akorwo mari makuma kuri ngurwe, Mburi, Ngombe kana Nguku.
8. Ikira tuchinji tungi twa matigari macio ma mimera yaku handu ha 0.5m.
9. Ongerera lita 5 cia muhu.
10. Ongerera machunji macio utinangitie nginya hakuhi kuihuria irima.
11. Muthia ongerera tiri nginya irina riaku ri-ihure
12. Thutha wa kuihuria tiri, Ikira muti muraya gatagati nginya ukinye thi.
13. Reke Thumu waku uikare hau mieri itatu.
14. Gwakahinda gaka huthagira mai maku ma giko guitiriria thumu uyu. Kwa ngerekano thutha wa guthambia nyumba kana nguo. Angikorwo ni uri mahiu, no wiritiririe mathugumo macio thumuini uru.
15. Itagiriria thumu waku mai oromuthenya kana kuringana na uria wonamai.
16. Thutha wa matuku 90. Huthira muti ucio uri wa guthima. Riria thumu waku waharirika muti waku ukoragwo uri muhiu na no wone ugitoga.

Mahuthiro ma Thumu uyu.

Thutha wa kwenja marima ma kuhandira ikira ngundi imwe ya thumu uyu.



Cluster ikumi kurihwo thiini wa TSE mweri muhituku.

Mweri muhituku, ikundi nini thiini wa Cluster cia TSE 10 niamukirire marihi. Cluster ici ni;

Laikipia West TSE:

- Mithuri Cluster
- Karaba Cluster
- Tandare Cluster
- Njorua Cluster.

Kithurine TSE

- Kithurine Cluster
- Tharu Cluster

Imenti North TSE

- Mituntu Cluster
- Limoro Cluster
- Muruta Cluster

Wiyumiririe TSE

- Wiyumiririe Cluster

Niturahinyiriria atongoria a cluster ingi mathondeke kuhitukio kwa ikundi nini niguo mamukire marihi onao. Niwega gutigirira wira wa gukinyanira kwa ikundi ni wa ma na utheri na mukinyaniru. Servant o wothe wa TIST niagiriirwo kurora ucio ungi nigetha cluster na ikundi nini cirugame wega.

Makiria, niwega kumenya ati gukinyanira kwa ikundi nigugathuthurio. Cluster iria ikuhituka uthuthuria nicikarihwo hindi ya marihi ma ikundi nini.

Kithurine cluster: Tukoragwo mbere gwoka ni maria maturigiciirie.

Mwandiki; Jane Makena

Kahinda karia Elizabeth Kiogora atumenyithanirie na TIST thiini wa cluster iitu, ndahuthirire kahinda kanene kuiguithia arimi ati TIST ni njega kuri o na maria maturigiciirie.

Elizabeth uria ni mumemba wa TIST Social Entrepreneurship(TSE), ari na muruna wake niwe Mercy Nkonge na Waston Majau hamwe na Patrick Muriithi nimarutire wira munene guthondeka mitaratara ya cluster gwa kahinda kanini. Arimi nimakenire na ikundi nini igithondekwo, trainers 7 na quantifiers 4 makiheo wira na magithomithio.

O uria ikundi nyingi ciathire na mbere kuingira TIST, githomo nikiarikiire. Amemba a ikundi nini nimathomithirio mitaratara mieru ya kuhanda miti, kuhanda miti ya ki-nduire na gutagania miti niguo ikure wega na igie na magetha maingi, Kilimo Hai guthondeka thumu na tuta.

Arimi nimamukirire githomo na njira njega. Nimari na hinya na wendi munene na makioya makinya ma naihenya. Aingi nimahandire miti ya ki-nduire na aria angi makihanda miti ya matunda ta American Ashes na makorobia. Riu nimakoretwo makiamukira mbeba nyingi micii-ini yao na matunda makaingiha thoko.

Motto iitu thiini wa Kithurine cluster iri **EVER FOR ENVIRONMENT;** maria

maturigiciirie nimagiriire na njira nene niundu wa miti ya ki-nduire iria ihanditwo ni arimi a TIST. Nituthomithitio kunyihia miti ya eucalyptus iria irari miingi guku gwitu. Njui niongereire maai na niturathii na mbere kugitira matura maria riparian.

Arimi aingi nimarimite Kilimo Hai. Nimagite magetha mega, na magakorwo mahuthirite mbeba nini. Uhuthiri wa thumu wa gwithondekera niuteithitie arimi muno tondu matirabatara kugura fertilizers na kwa uguo kunyihia mahuthiro.

Gwa kahinda gaka turi na ikundi nini 52 thiini wa Kithurine cluster. Nitugayanitie cluster ino na tukagia na cluster ingi ya Tharu iria iri na ikundi 45.

Thiini wa Kathurine ikundi 35 nicithomithitio na igatarirwo miti, nimathuthuritio na makahituka na ikundi 11 cira na miti makiria ma 500 nakwauguo niamukire marihi. Ica ikuhi nimamukirire marihi. Muigana wa 23,000 niciarahirwo thiini wa Kithurine na 2,200 ikirihwo Tharu.

Kioneki giitu nigutigirira ati arimi aingi nimahanda miti miingi, nimatearirwo miti na nimatearirwo. Niturongoreirie kuriha ikundi ciothe hari marihi maria mokite na mamukire makiria ma 200,000.00 hri o cluster. Nitui no tuhote, tondu turi a TIST.



Kumenya iguru ria wongerereku wa urugari thi hamwe na uchenjia wa riera.

Aingi a arimi a TIST - Kuhitukira mitaratara mithemba na mithemba nginya hamwe na themina cia TIST, Urutani wa maturaini na michemano ya ikundi - nimakoretwo mari na wendi na wetereri munene guthoma iguru ria wongerereku wa urugari hamwe na uria mangiagiria. Ngathiti ino ni ikirite na kinyi nigetha guteithia andu aria mangienda kumenya iguru ria wongerereku wa riera hamwe na uchenjia wa riera. Nigetha kuheana ngerekano, hari maundu mahanikite makonainie na wongerereku wa riera bururini, maya nita; mbura ya Elnino ya mwaka wa 1998 iria yachungiri-ire ng'aragu nene muno, ingi nita ruhuho runene -tsunami - rwa mwaka ya 2004 na mbarabu iria yonekanire mwana wa Nyahururu. Maundu mangi monekanite nita guthira kwa mbarabu kirimaini gia Kirinyaga, riera ritaramenyeka uria ritarii na kuniara kwa icigo iria ikoragwo ciarahite mai guku buruini.

Tukwanjiriria na kumutariria maritwa. Niuguthoma uria miti iteithagia kuhurana na kuingiha kwa urugari guku thi.

Wongerereku wa urugari ni kii?

Ni wongerereku wa urugari thin na ugachungirira uchenjia wa riera. Thi irina urugari muingi no itume uria mbura yuraga guchenjie, mimera yage gukura, mimera ichenje makiria, nyamu cia githaka nacio icenje orohamwe na andu na muikarire wao. Riria ataaramu mararia iguru ria uchenjia wa riera, makoragwo makiria makirora mawira maria andu marutaga.

Urugari thi niwongererekete?

Ii! Gwa kahinda ka miaka 100 thi niyongerekete urugari na gichunji gia 1°F. Ataaramu aingi marageria gwiciria ati maundu

maria ithui ta andu twikaga nimo machungiri-ire wongerereku wa urugari uyu. Maundu maya nita; takataka hamwe na indo ingi iria tuhuthagira nigetha gutwarithi na mbere iganda citu.

Machungirira ma Greenhouse nikii?

Machungirira ni wongerereku wa urugari niundu riera riria rithiaga rieraini ta; carbon dioxide, nitrous oxide, sulphur dioxide, na methane ni rigiragia hinya wa riuu ukinye thi uria kwagiri-ire. Riera riri ria Carbon riumananga na; Gutema miti, riera riria riumaga igandaini citu hamwe na mitokaa itu na guchina miti, makira kana mititu.

Ugwati wa wongereku wa urugari thi nikii?

- ❖ Ichigo nyingi cia mai hamwe na iria ciarahaga mai no ciume.
- ❖ Wongerereku wa mirumi ta malaria niundu wa ichigo nyingi kugia na urugari, na nogwo citumaga rwagi rwongerereke na machungirira malaria makongerereka. Andu aingi hamwe na mathibitari makagomerwo ni mariria na machungirira muturire wa andu ugakuhiha na ciana nyingi igakua.
- ❖ Magetha makanyiha muno makiria mabururini maingi na makiria mabururi maria mari gichigoini gia irathiro ria Africa. Niundu wa unyihu wa mbura hamwe na wongerereku wa tutambi kumana na wongerereku wa urugari, magetha nimanyihaga na gukugia na ngaragu nene muno ichigoini citu.
- ❖ Thogora wa irio ukongerereka muno. Magetha ni manini na ubatari wamo ni muingi na kogwo thogora ukambatira muno.



❖ Maundu maingi maria matuthiururuki-irie na makiria mititu ni ichenjetie muno. Ichigo nyingi iria ikoragwo na mai ikaniara na kogwo urimi wa irio ukihuthira mai ukarituha makiria niundu wa kwaga mai hamwe na kuniara kwa njui nini. Uu no gutumaga ichigo iria irutagwo hinya wa thitima itharare. Iganda citu, mathibitari hamwe mathukuru maria mahuthagira hinya wa thitima magatharara. Mai ma miberethi ichigoini citu hamwe na maturaini magatharara aro namo.

❖ Makiria ma andu million 10 mari ugwatini wa kugumirwo ni kiguo na kumomoka gwa iharuruka na irima nene. Niundu wa wongerereku wa hinya wa mbura na uchenjia wa githimi gia gichuaini.

Ben, tukigweta machungirira maya me haha iguru, niturahota kwonia murimi uria wongerereku wa urugari uri ugwati munene. Wakeri, machungirira maya marihaha iguri nimonekete. Wagatatu, murimi nionete bata munene wa kuhanda muti. Orona kuri ouguo, mwandiki ndarenda gukumkia no arenda

gukumenyithia.

Uria tungigiririria wongerereku wa urugari thi

Kuhanda miti

Tauguo twa gweta hau iguru, riera ria Carbon ni rimwe riria riongagirira urugari thi. Miti ni ihotaga kunyua carbon iria ikoragwo rieraini na ikamiiga mirini, ndumbi-ini na tirini waguo. No riria miti yatemwo na ya chinwo ni ihotaga kurekereria carbon iria yeigiire na igathii rieraini ororingi.

Niui ati oro muti no uhote guthondeka kariera kanini kega?

Miti hamwe na machangi maguo ni ihotaga kuhehia thi. Hindi iria tiri utari na urugari muingi, noguo uhotaga kuiga mai maingi. Uu nitakuga ati muti uria uri mugundaini gwaku niugutuma mai maria mari tirini maikare makiria. Mimera yaku ni iguteithika na mai nimakwongerereka gichigoini giaku kana kianyu.

Gutari na maugaruruku, gutiri na gukura.

Mwandiki: David Mawira

Thi niiracenjia na-ihanya muno. Nitwagiriirwo kuingirana na mogaruruku ma technology maria mari kuo, na njira njeru cia gwika maundu ona miikarire iitu. Tungiregana na maundu maya no tutigwo na thutha!

Kwa muhiano, njira cia ki-nduire cia gwika maundu niciracenjia na ihanya muno. Riiko rieru ritarahuthira mwaki muingi niriukite kuoya handu ha mariiko ma ki-nduire. Andu aiingi aria mahuthirite riiko riri nimahonoketie miti miingi. Nimanyihitie ndogo mariko-ini mao na kwa uguo kunyihia mirimu.

Conservation, iria iciragirio ti njeru, ni iroya handu ha urimi wa ki-nduire, kuhitukira Kilimo Hai, arimi nimagite na magetha maingi.

Thengia ya kuhonokia mahuthiro ta ma uhuthiri wa fertilizers, ndawa na kurima.

Kuhanda matunda ma gikiro kia iguru ta maembe ma guciarithanio ni iroya handu ha maembe ma ki-nduire. arimi aria maiyukitie technology ino njeru (guciarithania) nimaragia na mbeca nyingi na maembe magakura naihenya.

TIST ni iyukitie mogaruruku maya na mangi maingi niguo guteithiriria arimi gukura. Ingira TIST umuthi na ugie na ugaruruku unghoka!



Kihato Bee Keepers: Turi na wira munene thiini wa TIST

Mwandiki; Joseph Thitai.

Kahinda karia Kihato Bee Keepers yambiriirio mwaka-ini wa 1995, ithui, amemba nitwari na kioneki gia kwiikira hinya kuhitukira maundu makurehe mbecha na gucaria njira cia kwagirithia miturire iitu.

Mitaratara iitu ya mbere yari kuriithia njuki na kurima mahua. Ona kuri o uguo mubango-ini witu wa kuriithia njuki, nitwamenyire ati njuki itingiikara kundu gutari na miti. Nitwambiriirie kuhanda miti na niundu wa riuu riria riaraga guku gwitu-Lamuria, Laikipia County- mimera miingi niyomire yathamio tuta-ini.

Twari hakuhi gutiganiria mubango ucio nginyagia riria TIST yokire. TIST niyatwonirie njira njeru cia kuhanda miti. Miti iitu ikiambiriria gukura na njira nene na

tukigia na umiriru wa guthii na mbere.

A memba othe makiiguithaniria kuingira TIST. Nitwagayanirie gikundi kinene gia Kihato Bee Keepers na tukigia na ikundi nini na nicio; Kihato Kiburi TIST Number 2006KE261, Kihato bee keepers TIST Number 2006ke1214 na Kihato livestock TIST Number 2006KE487 iria irutaga wira ciirugamitie thiini wa TIST.

Umuthi turi na wira munene gwikira andu hinya niguo maingire thiini wa TIST na mahande miti ingi miingi. Ona tukiamukagira mawega ma miti, nituteithikite muno na TIST. Nituthomithitio Kilimo Hai na guthondeka riiko ritarahuthira mwaki muingi na utongoria wa guthiururukana na mangi maiingi.

Ni kimera kia riuua-Wihuge miaki

Mwandiki; Peter Mithiru.

Arimi aingi nimarutaga wira munene muno kuiga miti iria mahandite muoyo, niundu mwega kugitira maundu macio matigatuike ma tuhu.

Kahinda-ini gaka ka riuu, mogwati ma migunda iitu gucinwo ni mwaki nimaingihaga. Niwega kwaga gucina kana gucinira makara migunda-ini iitu tondu nimo maundu maria mangirehe

miaki iria itangihoreka migunda-ini iitu.

Ririkana kuhariria mugunda waku niundu wa Kilimo Hai mwaka uyu. Thii na mbere guitiriria mimera iria iri tuta-ini na migunda-ini maai. Nowikire maai mari na thabuni muhu niguo kumatheria na matuikie maguitiriria mimera. O ringi, menyerera miaki kimera giki na umenyithie aria angi.

Mazingira Bora



TIST

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

Kimereu Version

An Environmental, Sustainable
Development and Community Forestry
Program.



Muforocchah TIST Small Group Tree Nursery

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Ni igita ria uumo kairi- ebeera mianki. Pg. 6

Ni mwaka jwa itantatu kuuma TIST iguciarwa ndene ya Kenya.

Ndene ya mweri jwa iiri mwaka jwa 2005, semina yambele ya TIST niyathithirue antu gugwitwa Christ the King, Nanyuki. Kioneki kia kwambiria TIST nikiaganirwe na giaciarwa ndene ya mucemano jou. Mibango ya mbele ya uriti ngugi yathithua. Mantu jwa gwikirwa mantune jonthe ja TIST jetikanirua. Mantu jaja jaagitugi giatIST.

Ja kamuuro ka ruuji gakanini, ngugi iu ya mbele ya kugiita njira na muthia kunenea rua ruuji rurunene, TIST yambiririe inyii, iri na arimi

babakai. Mwambia TIST aatambia nkuuma ya TIST ja mwanki jwa kithaka. Amemba bangi babaingi batonya. Ikundi bibinini bambirua. Atari miti na aritani bataarwa. Utari miti na uritani bwambiria orio

Narua, ikundi bibinini 6,975 nibithithitue biri na nkuruki ya arimi nkuruki ya ngiri Magana jatano batonyete. Nkuruki ya miti million 5.1 nitari. TIST nitambite Mbeere/Embu.

Nitugukura. Nitugwita na mbele kuritira nthiguru yetu nan aria gututhiurukite ngugi.

**KUTHURANIRA ARIA UKAANDA NA URIMI BUBWEGA (C.F)**

Wona waketha, ukaithia mati jaria jatigaraga tigana najo jakare nthi. Oo uria mati jagutigwa nthi nou muthetu junoraga. Mati jari gitina kia muti kana mbeune yaku ijatumaga ruuji rugakara nthi jakarigagiria gutikoome. Rikana ati mati jaria jatigaraga joraga jakaa mboreo.

Aria ukarima ukareka kurithua o tuntu kwarithua guti mati jagutigwa nthi.

Marinya ja kwanda jenjagwa mbere ngai itiraura. Jukia murigi jumuraaja utonyithi tubiira twa tukuniki twa cuuba tutugeene na 70 cm. kucia murigi jugitenie mundene jwaku. Oo aria kabira ka nkuniki kari nio gatigati ka irinya na nitumaga marinya jethirwa jataraniritie bwega. Ikira arama ya misitari gwita kiri jungi ni 90 cm. Ikira arama ya misitari iria ukuminya ukenja na uthirie ntuku iu.

Inja mariinya jaria ugekira arama ntuku iu. Marinya jethirwe jari na warie bwa 15cm, uraaja bwa 35cm na kworokera kwa 15cm.

Waa tayari ya kwaanda mbeu yaku, no mwanka wikire muthetu juria munoru irinyene kenda imera bikura biri na inya. Jukia mboreo na muthetu jwa iguru ujuganie bwega kana utumire mboreo ya mati jaria joraga. Ikira irinyene riaku utigarie 5cm iguru. Kaanya kau otigaria gagatetheria kugwata ruuji rwa ngai.

Kethira urianda mpempe mirinde mathaa 6-7 mbere utiraanda. Guku igutethagia ciuma na ikwonania iria nyingi ikauma. Aanda mbeu 4 muthetune ugitenie irinyene. Ikunikiri 2.5cm na muthetu jumunoru jungenu na mboreo. Kwou ikwonania mbeu yaku ikethirwa iri 2.5cm kuuma iguru. Ikethirwa iri nkuruki ya uu. Matheng'eng'e ijabwirite kurwa buru kenda mbeu yumba kwithirwa iringithie muthetu.

Wethirwa urianda muyaa aanda mbeu 5-6 oo irinyene ngai yanyunyua. kunikira irinya 2.5cm muthetu jumunoru.

Kaanya kau gatigarite iguru ni ka kugwata ngai yeja. Kaanya gaka gakethirwa gatio ngai yaura ruuji rutigwatia ka rukaura na rujukie mboreo iria iri muthetune.

Rimagira gatigati ka marinya. Oo uria ukurimira nou iria rigeta na mbere rikinyiaga.

Ugaku mwoyo. Wona wenja marinya mwaka juju utiyeenja mwaka juu jungi.

URIA UMBA KUTHITHIA MBOREO

Mboreo ni fertilizer yaku ya kwithithiria ya

gukuria imera biaku. Iji niyo njega nkuruki ya iria ithithagua, yaku ni ya kawaida na iti na bia kuthukia imera biaku kana aria gututhiurukirite (environment) kuri na njira inyingi mono cia kumithithia indi iji ni njira imwe iria itumagira guntu kumwe.

NJIRA YA KUTHITHIA MBOREO

- ❖ Thurania aria ukenja irinya. Rikethirwa riri ria 4mx4m.
- ❖ Theria au
- ❖ Inja irinya 3-4m na kworokera kwa 1.5m.
- ❖ Ooja mati jaria jatigaraga waketha (e.g. mabua ja mpempe, mwere kana mati ja mung'au) jagitange tucunci tuniini.
- ❖ Wajagitanga jekire irinyene mwanda 0.5m.
- ❖ Ongera 5ltrs cia ruuji rwa muju.
- ❖ Ongeera mati jangi 30cm (kana uria jakwonekana) na ntaka ya nyomoo (e.g. ntaka ya ng'ombe, ngurwe, mburi kana nguku).
- ❖ Cooka wikire mati jangi 0.5cm.
- ❖ Ongeera ruuji rungi rwa muju 5ltrs.
- ❖ Ongeera mati jangi mwanka jatigarite aniini irinya riujura.
- ❖ Muthiene, ongeera muthetu mwanka ujurie irinya.
- ❖ Riria ukujuria muthetu tonyithia muti jumuraja gatigati ka irinya mwanka jukinye nthi.
- ❖ Tigana na irinya ria mboreo ntuku 90 (mieri 3)
- ❖ Igitene riri geraga ruuji rwa ruko irinyene riri. Kwa mung'uanano, ruuji ruria ukuthambia naru nyomba, into kana waura naru nguu urugerage kirinyene giki indi ti ruria ruri na chemical inthuku.
- ❖ Geragia gwikagira irinya riri ruuji na njira iji ntuku cionthe kana riria ruuji rukwonora.
- ❖ Nyuma ya ntuku 90, mboreo ikethirwa ikubua. Tumira muti ta thermometer mboreo yabwa muti jukethirwa juri na mwanki na no wone kinya toogi ikiuma wajukuura.

UTUMIRI BWA MBOREO IJI.

Wenja marinya ja kwaanda mpempe, mwere kana imera bingi, ongeera nkundi imwe ya mboreo iji irinyene

**CLUSTER IKUMI CIA TSE NICARIIRWE MBECA MWERI MUTHIRU**

Mwari muthiru, ikundi bibinini ndene ya cluster cia TSE nibajukirie mbeca ciao cia miti. Cluster iji ni amwe na:

Laikipia West TSE:

- Mithuri Cluster
- Karaba Cluster
- Tandare Cluster
- Njorua Cluster.

Imenti North TSE

- Mituntu Cluster
- Limoro Cluster
- Muruta Cluster

Kithurine TSE

- Kithurine Cluster
- Tharu Cluster

Wiyumiririe TSE

- Wiyumirie Cluster

Nitugwikira atongerira ba cluster ingi wiru bwa kubanga cluster ciao nontu bwa utari miti bwa miti ya ikundi bibinini nikenda kinyabo bomba kuriwa. Buri na bata ariti ngugi ba TIST bekana werune mantune jonthe gatigati kabo bongwa nikenda cluster na ikundi bibinini birungama bwega.

Kwongera, burin a gitumi kumenya ati utari miti bugategwa ni ategi ngugi. Cluster iria igakuruka utegi ngugi bubu nicio ikariwa igita riu ringi ikundi bibinini bikethirwa bikiriagwa.

Cluster ya Kithurine: witi nambele rionthe kiri mantu ja naria gututhiurukite.

Ni Jane Makena

Riria Elizabeth Kiogora aretere muradi jwa TIST ndene ya ntuura ya Kithurine, niyamujukirie igita ririkai arimi kwona na kumenya ati TIST ni mubango jumwega kiribo na kiri naria kubathiuurukite.

Elizabeth, muriti ngugi umwe wa TIST ja TSE, na baria baritanagiria ngugi nawe Mercy Nkonge na Waston Majau kinya amwe na uria umenyagira uthuraniri bwa mantu Patrick Muriithi nibaritire ngugi nainya mono gwaka cluster ndene ya kagiita gagakai. Arimi nibagwirirue na ikundi bibinini biathithua, aritani mugwanja na Atari miti bana batonyithua na baritanwa.

O uria ikundi bibinini biendeleela gutonya ndene ya TIST nou uritani bwaingiir, amemba ba ikundi bibinini baritanwa miitire iria miega buru kiri uandi miti, uandi miti ya gintwire, gutarania miti nikenda ikuura iri nainya na baita inene, urimi bubwega (CF), kuthithia mboleo, kuthithia na umenyeeri bwa minanda ya miti.

Arimi nibajukirie mooritani jaja na urito buria bubati. Baratumira inya yao inyingi na wiru bou bari nabu oriu kujukia matagaria. Babaingi baambiria kuanda miti ya gintwire na bangi baanda mitunda ja American Ash na mibukando. Mbeca iria boonaga ciaingia nontu bwa matunda jaria jambirie gutigaraga jakendua thokone.

Untu buria turitaga ngugi bututongeretie ni: WITI NA MBELE RIONTHE, WITINA NYUMA GUTI BU; naria gututhiurukite nikuthongomete na njira inene

mono niuntu bwa kuanda miti ya gintirwe iria arimi ba TIST baandite. Nitumenyete kunyiyia mibao iria yari miti iria mingi buuru ntuurene yetu. Miuro yetu kairi niongereketete ruuji. Nitukurita ngugi nainya kumenyeera nteere cia miuro ya nduuji.

Arimi ba TIST babaingi mma nibagutumiira njira ya urimi bubwega. Niboonete maketha jamanene, kinyethira batumirite mbeca inkai kumenyeera miunda na imeera biao. Utumiri bwa mboleo nibwithiritwe burina baita kiri arimi nontu batitumagiira fertilizer. Bububutethetie arimi kunyiyia utumiri bwa mbeca.

Nandi turina ikundi mirongo itano na bithatu ndene ya cluster ya Kithurine. Nitugaenie cluster iu twathithia cluster ingi inini igwitwa Tharu iri na ikundi mirongo inna na bitano.

Ndene ya cluste ya Kithurine, ikundi mirongo ithatu na bitano nibiritenwe na biatarirwa miti, nibitegegeri ngugi na biakuruka na ikundi ikumi na kimwe nibitariri na biri tayari kuriwa. Nibarirwe ruua mono. Ngiri mirongo iiri na Magana jantatatu nicariirwe ndene ya cluster ya Kithurine na ngiri ijiri na Magana jairi ndene ya cluster ya Tharu.

Kioneki gietu ni ikundi bietu bionthe kuanda miti ingi imingi, bitarirwe miti bwega na biriwe. Nitutegerete kuriwa igitene riu ringi ria kuriwa nkuruki ya ngiri Magana jairi ndene ya o cluster. Itwije twomba, nontu ndene ya TIST, I tuuri!

**TIST: Kumenya Kugwata murugutira Nthigurune na Kugaruka Kwa Riera.**

Arimi babaingi ba TIST kumania na semina, moritani nja ciao na biuthuranone bingi ibendaga kuthoma mantu jaria jegie kugwata murugutira nthigurune na uria juthukagia ruugo .Gaseti ya mweri juju niciejene na ikatharira arimi baba nab aria bangfi bakwenda kumenya bwega kugaruka kea ruugo na kugwata murugutira nthiguru Kugweta mung'uanano jumwe ni;Ngai ya Elnino ya 1998 iria yaurire guntu gukwingi mono nthigurune na nyumene kwaara igiita riraaja na Tsunami ya 2004 na oorua nkamia iria yagwiire naria Nyahururu yakunika nkuruki ya Ika igaana cia munda.Untu bungi buuria bukwoneka ni kuthira kwa nkamia kirimene kia Mt.Kenya na kwithirwa kuri na ngai utumba kumimenyera mwanka yatuma imera biathuka guntu gukwini,nduuji ciongwa amwe na ithima ni binyarite.

Tukambiria na kuthoma ngugi na kweresa uria miti yaku yiumba kurita kenda irigiria kurugutira kwa nthiguru.

Kurugutira kwa nthiguru nimbi?

Kurugutira kwa nthiguru ni kwongereka kwa murugutira juria jwithagirwa jurio nthigurune juria jutumaga kwithirwa gukireta ugaruruku kiri riera..Nthiguru yarugutira nitumaga mubangi jwa ngai iria iuraga jugaruruka..gwitia kwa migombe ya iria, imeera bikarega kubua na imera bikaringika mono amwe na nyomoo cia kithaka na antu.Riria ataaramu baragiria mantu ja kugaruka kwa nthiguru beethegirwa bategeerete mono kurugutira kwa nthiguru kureti ni mathithio ja antu..

Nthiguru ni itite na Mbere ikigijaga murugutira?

Nthiguru niirugute mono na 1% F ndene ya miaka 100 iria ithiri.Ataaramu barithugania mathithio ja antu nijo jatethagiria kurutira kwa nthiguru,Mung'uanano ni kuuthia into biria bithithagia maguta na miruki iria yiumaga nthiguru.

"Greenhouse Effect" nimbi?

Iji ni thina iria yiumaga riria murugutira jwa ingia ndene ya nthiguru niuntu bwa miruki imithuku ta Carbon Dioxide, Nitrous Oxide, Sulphur dioxide na Methane igwata inya ya riuu.Miriku iji yiumanagia na kurika miti kwa wingi, toogi iria yiumaga kiri macini cia kampuni, toogi ya ngari, toogi ya makara na kwiithua kwa maitu.

Nthiina Iria ciumanagia na kurugutira kwa Nthiguru Ni iriku?

Kunyia kwa ruuji Rwanda kuria gutumaga guntu gukuingi kua Rwanda.

Gutambaa kwa mirimo ta malaria .Oo uria nthiguru ikugwata mwanki niu rwagi rwitaga mbere kuingia na antu bakagwatwa ni murimo.Nja inyingi ni iringikaga na cibitari cietu na miturire ya antu ikanyia na twana tukanyia miturire.

Maketha jakanyia mono nthiguru cai Africa niuntu bwa ngai kunyia na kwingia kwa tunyamu twa nthiguru niuntu bwa kwongereka kwa murugutira.Imeera bigeeta na mbeere kunyia mwanka ukia bukaingia amwe na mpara ndene ya njaa cietu.

Maguri ja irio ja gaitia mono.Oo uria



arimi bakwaga maketha nou uguri bwa into bugwitia niunti wendia bwa into buri iguru ria uria bikuonekana.

Kuri na ugaruruku kiri onoru bwa miunda na na kuthirua kwa miitu. Ithima bigeeta na mbere kunyia na kugwa mwanka ruujii rwa kurima na ru rukaura amwe na ruuji rwa kurita sitima. Guntui gwetu kuria kwendaga sitima ta cibitaari gukaringika mono. Kinya nduujii cietu cia miberethi ikanyia.

Mamillioni ja antu bakeethirwa bari na ugwati ta bwa gukondorua ni miguuo ta gutobokerwa ni irima kuria kuretagwa ni wingi bwa ngai iria ijaga tutimirigirite na gwitia kwa iria.

Njira iria tumba gutumira kurigiria kwongereka kwa murugutira ndene ya nthiguru.

Uuandi bwa Miti.

Tauria tugwetere ruugo ruthuuku niru rutumaga nthiguru igia murugutira. Miti irijaga ruugo ruru ruthuku na ikarwika mitine jungwa ns mirine. Na riria miti ikarikwa ruugo ruria ruthuuku ruri muti jugwikite rugacoka ruugone.

Ni wiji Oo muti nijuthithagia riera?

Muti na kirundu kiaju ibikunikagira nthiguru. Riria nthiguru ikagia mugunye, nthiguru niumbaga kugwatiira ruuji igita riraaja. Kwou ikwonania miti iria iri mundane jwaku nitethagiriria kugwatira ruuji muthetune kagiita gakaraja. Ikwonania miti igatetheria imera amwe na baria batumagira ruuji aniini.

Guti jo jakugaruka, gutigukura.

Ni David Mawira

Nthiguru nikugaruka na mpwi mono. Nitugwitia kugaruka ou uria mantu jakugaruka, njira injeru cia kuthithia mantu, na kinya mitire yetu. Twarega kugaruka, twomba gutigwa nyuma!

Mung'uano, njira inkuru cia kuthithia mantu nicikurungamirwa aria ciari ni njira injeru na mpwi. Mariko jameru ja gutumira nkuu inkai niciejire kurungama antu a mariko jamakuru ja maari jathatu. Antu babaingi baria baambirie gutuumira mariko jameru nibagutuma miti inyingi ithira irio. Nibagwika toi kuraja na riiko riao gukurukira chimney, kwou mirimo igekwa kuraja.

Urimi bubwega, buria butikwonwa buri untu bubweru, n bukurungama antu a urimi bwa gutumira njira cia karaja. Na urimi bubwega, arimi babaingi nibakwona maketha jamega amwe na gwika mbecha iria ciringi gutumirwa kiri urimi bagitumagra fertilizer, ndawa na kurimithia. kuanda mitunda ya mbegu cia iguru ta miembe mbegu cia miembe mwanya ciunganagua nikenda maciara jathongoma niuntu miembe yao niguciara igita riti ririraja. TIST nitikiritia kugaruka guku na mono nkuruki gutethia murimi akuura. Tonya TIST narua na woone kugaruka kuria umbagwitikia!



Gikundi kia Kihato Bee Keepers: turi na kioneki gikinene nkuruki ndene ya TIST

Ni Joseph Thitai

Riria Kihato Bee Keepers kiambirirue ndene ya mwaka jwa 1995, batwi, amemba, nitwari na kioneki kia guciikira inya, mibango ya gucionera mbeca na gucua njira cia kuthongomia miturire yetu.

Mubango jwetu jwa mbele jwari gwika njuki na kulima maua. Indi ri, ngugi cietu ciari kuriithia njuki, nitwonere njuki itikara guti na miti. Itwmbirie kuanda miti, indi niuntu bwa uumo buria bwithagirewa burio mono ndene ya ntuura yetu- Lamuria, Laikipia County- miti yetu iria mingi niyakuire ikurikia kuthamirua muundene. Ni miti imikai yombire gukuura.

Nitwari akui gutigana namuradi jou jwetu mwanka riria TIST yejiire. TIST niyaturitanire njira iria njega buuru cia kuanda miti. Miti iria yakuraga kuumania na

iria twaandaga yaingia bubunene. Nitwekirwe inya mono.

Amemba bonthe bagiita igamba gutonya kiri TIST. Twagaania gikundi gietu gikinene kia Kihato Bee Keepers bia bithatu- Kihato Kiburi TIST namba 2006KE261, Kihato Bee Keepers TIST namba 2006KE1214 na Kihato livestock TIST namba 2006KE487. Ikundi bibi bionthe biritaga ngugi ndene ya TIST bicirungamirite bionka.

Narua, turi na kioneki gikinene- gwikira inya atuuri gutonya ndene ya TIST na kuanda miti ingi imingi. Amwe na mbeca cia kwendia ruugo iria twonaga kuumania na miti, nitwonete baita inyingi kuuma kiri TIST. Nituritani urimi bubwega, kuthithia mariko ja gutuumira nkuu inkai, kuthiurukia utongeria amwe na jangi jamaingi.

Ni igita ria uumo kairi- ebeera mianki.

Ni Peter Mithiru

Arimi babaingi nibaritite ngugi injumu mono nikenda miti iria baandite itirakue. Burina bata mono kwebera mantu jamathuku jaria jagatugarurira baita cietu.

Igitene riri guti na mbura, mwanki nijugwatangaga ntuti mono miundene yetu. Burina bata kwebere gwakia makara kana kuithia ruuko rwa munda muundene. Jaja nojatume mwanki jugatambanga nkuruki ya uria juumba kworuana kwou jungekira hasara inene.

Rikana kwambiria kuthuranira miunda yaku mwaka juju niuntu bwa urimi bubwega. Ita nambele gwikira ruuji miti yakuiria iri muundene na munandene ruuji. No uthanbie ruuji ruria rutumagirwa njaa rwa sabuni na muju nikenda rubua rwa gwikira miti yaku. Kairi ebeera mwanki igitene riri ria uumo. Ikira antu bangi inya iu kinya bo.

Mazingira Bora



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Ni isyawa ya thatathu ya TIST.

Mwai wa keli 2005 umbano wa mbee wa TIST wai Christ the King, Nanyuki. Woni wa TIST waneeneiwe vau ta TIST yasyawa kikaloni kiu. Nzia ya kwambii TIST yavangwa. Useo wa TIST wetikilika na watuika itui sya mvango wa TIST.

Ta mwanda munini uimantha nzia ya kutwika usi, TIST yambiie yi nini na aimi anini. Woni wa TIST wakwatie ta mwaki wa kithekani na aimi aingi malika kikundini. Ikundi nini nisyambiie. Andu ma kuthima na mavundisya ni mamanthiwe na

momanyisyo mambii kwa vitii.

Umunthi ikundi nini 6,975 nimambiie ila niundu umwe na aimi 50,000. Mbee wa miti 5,000,000 nimaliku na TIST ikanyaiika mbeere/Embu, Kirinyaga, Tharaka, Meru, Laikipia, Nyeri, Bomet na Narok Counties.

Nituendee na kwiana, na nituendee na kuthukuma nthi yitu na kuseuvya itheka situ.



Kusuvia miunda ivinda ya kuvutha.

Itina wa ngetha, tuikavivye mavuti, ve vata wa kuekana na mavuti nundu wa kutungia mbolea muthangani, wingi wa mavuti matinani ma liu kana miti masiiaa kimeu kila ki muthangani na iituma miti ndikome. Lilikana kana mavuti ma liu nimatumiawa kuseuvya mbolea.

- Siia indo kuya vakuvi na vala uvandite miti. Nundu syaithiwa vakeethiwa na unyivu wa mavuti.
- Uvandi wa miti, maima menzawa mbua itanamba kua. Kwa uu ve vata maima makenzawa tene.
- Vaniia vala ukwinza maima, osa ikanda kana ulii wovee tuvuuu uasa wa 70cm, kila kavuululu na katikati ka iima, na miti iyithiwa na myanya yianene na myailu. Kila laini niwithiwe utaanisye na ula ungi kwa 90cm, seuvya laini sya maima ala winza kila muthenya.
- Inza maima muthenya ula wathima. Maima methiwe na uthauthau 15cm na uasa wa 35cm na uliku 15cm.
- Ivinda ya kuvanda, ikia mbolea muti umee wina vinya, osa muthana wa yiulu na vuu uvulanye. Iki muthana na mbolea uliku wa 15cm nikana tutethesye kutava kuwu kya mbua.
- Ethiwa wivanda mbemba inda mbeu kiwuni masaa 6-7 mbee wa kuvanda. Kii kitetheesya kumea kwa mbeu nundu mbeu ndyoaa. Kuvanda mbeu ni inya kikelanyo iimani na uivyika muthanga wa 2.5cm ula munou. Muthanga maimani ndwaile kwithiwa wi mbee wa 2.5cm uliku muunda woothe mavali maile ni kuawa nikana mbeu ikwatane na muthanga.
- Ethiwa wivanda muvya, vanda ngii 5-6. Kila muthya wa iima itina wa mbua, vwika mbeu na muthanga munou wa mbolea 2.5cm.
- Myanya maimani nitumaa kiwu kya mbua kilika maimani na kuvikia mbeu ovamwe na unou wa muthanga.
- Imia iiya maimani na kila mwaka ukoona iia yikioleka.
- Ndukewe utulu kwinda maima oyuu, nundu wenza oyuu ndukenza maima mbua isu ingi.

Undu utonya kuseuvya mbolea.

Mbolea ni nzia ya kunenga mbeu yaku unou ute wa ndawa. Ni unou museo mbee wa wa ndawa. Nimuseo nundu ndwavangaa muthanga na liu. Ve nzia mbingi ateo ii ni imwe ya syo yathiitwe yinzeo isioni.

Kusenvya mbole.

1. Mantha valu winze iina ya 4m x 4m.
2. Vutha vala ukwinza.
3. Inza iima kithyululu 3-4m na aliku 1.5m.
4. Umbanya mavuti ma liu oothe ala winamo (ta, mavya, mwee, ndengu na thooko, matu, miti ya muvya, mwee, ndengu, na uthooko) tilanga mavuti tulungu tunini.
5. Iki mavitii aa iimani na uivwika utialye 0.5m na uivwika.
6. Koloka muu wa lita itano (5L).
7. Ongela vuu 30cm kana omwingi (vuu wa mbui, ngombe, ngulue kana nguku)
8. Iki mavitii angii 0.5m.
9. Ongela muu ungi wa 5 litres.
10. Ongela mavuti angii muvaka iima yusue.
11. Vywika iima na muthanga.
12. Endee na kuvwika iima ikia miti kati kati ka iima uivike itina. (nthi vuu).
13. Ekana na iima yu ya mbolea vandu va 90 days.
14. Ivindani yii ithiwa unyita kiwu kyaku kila kiiko vau iimani, ateo ndukete kiwa kya ndawa. Ona maumao ma ng'ombe na indo ila ingi ni maseo kuseuvya mbolea.
15. Ngithasya iima yii mavinda onthe yila ve kiwu.
16. Itina wa matuku miongo kenda (90days) mbolea yaku noitumike, tumia muti kuthima uvyuvu wa mbolea yavya nowone syuki yiyuma vau wakua muti.

Tumia mbolea ii.

Tumia mbolea ili kuvanda miti mbemba na mbeu yoonthe ya muundani. Uta ngundi imwe kwa kila iima ya kuvanda.



Cluster ikumi ila syaiviwe na TSE Cluster mwai muthelu.

Laikipia West TSE:

- Mithuri Cluster
- Karaba Cluster
- Tandare Cluster
- Njorua Cluster.

Imenti North TSE

- Mituntu Cluster
- Limoro Cluster
- Muruta Cluster

Kithurine TSE

- Kithurine Cluster
- Tharu Cluster

Wiyumiririe TSE

Wiyumiririe Cluster

Twindeesya ndongoi sya ikundi nini kutalilwa miti ni kana maivwe. Ve vata wa kwika masavu kwa nzia mbitikiliku. Kila muthukumi wa ikundi ya TIST niwaile kwithiwa emuikiiku ni kana Clusters na makundi manini methiwa mailye nesa.

O muno ve vata wa kumanya kana masavu nimakasyawa nundu wa kumina ukengani na kila masavu/utalo woo museo, kuivwa ivinda ya ndivi ya makundi manini

Cluster ya Kithurine: Kuendee mbee mavinda onthe nundu wa mawikalo.

Ila Elizabeth Kiogora waetie TIST utuini wa Kithurine, yakuie ivinda ivuthu kwa aimi kwitikila TIST ta muvango mwailu kwoo na kwa mawikalo.

Elizabeth e muvandi wa miti na mwalimu wa uvandi wa miti ena anyanyae, Mercy Nkonge na Watson Majau na "coordinator" Patrick Muriithi mathukumie kwa vitii kuseuvya "cluster" ivindani ivuthu. Aimi mai na wendi na ikundi nini syambiia, alimu muonza na atali ma miti ana mooswa na mamanyiwa.

Yila ikundi nyingi syaendeeie na kulika TIST, momanyisyo maendee na amemba aingi mamanyiwa nzia nzeo sya kuvanda miti ovamwe na kuvanda miti ya kithio, uvandi wa miti yina mwanya nundu wa miti kwiana nesa ovamwe na kukwata vaita. Usuvii wa muthanga ovamwe na kuseuvya mbolea na ivuio sya miti.

Aimi ni moosie momanyisyo nesa. Mambiia uvandi wa miti kwa uthangaau. Amwe nimavandie miti ya kitheo na angi mavanda matunda ta "American ash" na avocado. Mosyao maailya misyi yoo na mata matunda ala angi ndunyu.

Mwolooto (motto) witu "cluster" ya Kithurine ni **kuendee mbee mavinda oonthe nundu wa mawikalo maitu, mawikalo maitu.** Mawikalo maitu

nimavindikite vanene kuma TIST yatuetee miti ya kitheo. Nitumanyiitwe kuola misanduku ila niyo yai miti ila yavandawa kwa wingi kisioni kitu. Mbusi situ yu nisyongelekete kiw'u na nituendee na kutata kusiia mbusi na nguumo syasyo.

Aimi aingi ma TIST nimaendee kwimanyisya kusuvia muthanga, na kiu kikongela ngetha yoo matumiite ngalama nini. Kutumia vuu na mbolea nikuetete vaita munene nundu maikutumia ndawa na kwa kitumi kiu kuola ngalama.

Umunthi twina ikundi nini 52 "cluster ya Kithurine" na kiu kikasyaa "child cluster" Tharu kina ikundi 45.

"Cluster ya Kithurine", ikundi 35 niamanyisye na makatalilwa miti, na ikundi 11 ikavita mutiani na mena miti ivitukite 500 na nimanaiviwe.

Isavu ya Kshs. 23,600 niyaviwe kithurine, Kshs. 2,200 syaivwa Tharu "cluster"

Woni witu ni ikundi syonthe ivande miti mingi nundu vatonyeka, tutalilwe ni kana tuivwe. Twienda ikundi syoonthe iivwe ndivi ino yukite na kila "cluster" ikwate mbee wa KShs. 200,000. Nitwisi nitutonya nundu twinthini wa TIST.



TIST kuelewa kuvyuva kwa nthi na kuvinduka kwa mavinda/nzeve.

Aimi ma TIST maendee na kuthukuma vatekunoa nundu wa kusindana na kuvinduka kwa nzeve na ukya. Kuvinduka kwa nzeve nikwangelete ukya na aimi aingi ma nthi yonthe muno muno ma nthi ila itanamba kuendee ni mekuumiwa muno ni unini wa mbua. Umunthi isio mbingi Kenya iina mbua.

Kuvyuva kwa nthi kula kuetae kuvinduka kwa nzeve nikwo kuetae nzeve muthemba wa El-nino ta ila yai 1998 na ila yaetie mbanga mbingi na wanangiko na mayua ala monekete kuma ivinda yiu kiseve kya Tsunami, kya 2004 na maundu ta kwitika kwa ia Nyahururu yila yavwikie eka 100. Maundu angi moneku nivamwe na kuoleka kwa mbalavu ila yonekaa muthya wa kiima kya Mt. Kenya. Kwithiwa na uvinduku wa nzeve (mbua na mathano matema kawainda) ii syonthe ietete wanangiko utena kithimo kwa aimi, kundu kwingi, kungala kwa maia, silanga na kundu kwingi kula kweethiawa na kiwu tene.

Nitukuelesya kila kyo kwa kukineenea kithini. Nimukumanyiwa undu aimi ma TIST kwa kuvanda miti maendee na kutethya wia wa vata muno kwa kutethesya kuola kuvyuvya kwa nthi.

Kuvyuva kwa nthi ni kyau?

Kuvyuva kwa nthi ni kwongeleka kwa uvyuvu kula nikwo kuetae kuvinduka kwa nzeve.

Nthi mbyu ietae mauvinduku ma mbua, kwambata kwa kiwu kya ukanga na kuthuka kwa ngeetha, ovamwe na mavinduku angi maingi kwa andu na nyamu sya kithekani.

Yila **ataalamu** makuea ngewa ya movinduku ma nzeve, methiawa maiweta iulu wa maundu ala mekewa ni andu mekwananga mawikolo maitu.

Nthi iendee na kuvyuva?

Ii, nthi iendee na kuvyuva kwa 1°F kwa 100yrs mivitu. Ataalamu aingi measya maundu ala andu maendee na kwika ala ni ovamwe na, kutumia mauta ala menzawa nthi, kuvivya mavuti, kutumia makaa na mwaki na ngesi.

"Green House" syikaa ata?

"Green House" sietae uvyuvu ula tuendee na kwona nundu wa "gases" ila syumanaa na kutumia "green house" syavulanila yayani na kyeni kya sua, nzeve ta "Carbon Dioxide, Nitrous Oxide, Salpha Dioxide na Mathene".

Nzeve ya "Carbon" yumanaa na kutemwa kwa miti, syuki yila yumanaa na kutumia ngu, ovamwe na kuvivya itheka.

Muisyo wa kuvyuva kwa nthi ni mwau?

- Kwa kwa kiwu isio ila itethiawa na mbua kwa wingi ona kutwika mang'alata.
- Kwongeleka kwa mowau ta ndetema kumana na kuongeleka kwa uvyuvu kula kwongelaa kusyaana kwa umuu na kii kiyiete thina misyini nundu wa mowau na kusua kwa masivitali, ikwu sya tene (andu makethiwa matekwikala myaka mingi ta tene) na wingi wa ikwu sya syana nundu wa mowau.
- Kunyiva/kuoleka kwa ngetha nthi mbingi



sya wumiloni wa sya na ila ingi ithengeanie, kii nundu unyivu wa mbua, na kwongeleka kwa "pests" (wadudu waharibifu) nundu wa uvyuvu, nima yathuka na kii kyaete ukya, nzaa nduani situ.

- Kwambata kwa mathooa ma liu nthi yonthe, nundu wa unyivu wa ngetha, liu uinyiva na mthooa mayambata nundu wa wingi wa andu.
- Movinduku maingi kundu ta kula tusyaithiasya, ta itheka situ, mbusi, iima niendee kuma natuyaiwa ni kiwu kya kunyithia miunda, kiwu kya kususya masilanga maitu, ovamwe na kusyaithya sitima. Makambuni, masivitali na masukulu maitu ala matumiaa sitima meithiwa makwatwa ni mathina. Kiwu kya miveleki mataoni (towns) ona misyi yitu kikethiwa na thina.
- Andu milioni nyingi muno me muisyoni wa kukuwa ni kiwu, kuombokewa nundu wa

mbua kua muno kuvita kiasi na kwa andu ala mevakuvi na ukanga-kwambata kwa kiwu kya ukanga.

Kusiia kuvyuva kwa nthi.

Kuvandi miti

Kumana na uelesyo vau mbeeni, nzeve ya "Carbon" niyo ietae uvyuvu. Miti niyo inyusaa "Carbon" iiseuvya liu na iyikala vau muthambani wa muti, miini na muthangani.

Kwa kitumi kiu miti yatemwa nayavivwa itungaa "Carbon" nzeveni.

Niwisi kana kila muti nouvindue nzeve?

Miti yavandwa ithekani ni ithithasya muthanga. Muthanga niwikalaa wina kimeu. Kwondu wa uu, kimeu kii kitetheesya liu na andu ala mevakuvi naku nundu wa wingi wa kiwu.

Tuvinduwe mikalile yitu twiane.

Muandiki David Mawira

Nthi iendee na kuvinduka, ni nitwailitwe na kuvinduka mavinda na nzia sya kwika maundu ki-umunthi ona mikalile yitu nundu twaema kusenzya nitukutiwa itina.

Kwangelekanyo, maundu titaundu tweekaa tene mavindikite kwa mituki vya. Maiko ma kuua ala mokite nimaminite maiko ala ma tene ma mavia atatu. Andu aingi nimathooete maiko asu na miti ya ngu ikasuviika. Ni maiko maminite syuki iuioni na mowau ma ithui na makua makathela.

Kusuvia muthanga kwisila nzia nzau sya uimi, nikuminite nima ila yaimawa tene. Kusuvia

muthanga aimi aingi nimekukwata ngeta nzeo ovamwe na kusiia ngalama ya kuima, ila ni vamwe na kutumia mbolea, ndawa na kusimba.

Kuvanda miti ya vaita ta maembe ma kusingania, ni kumite maembe ala ma kikamba. Umunthi aimi mevanda miti ya kusingania (grafting) na mekwata vaita munene na miti kwambiia kusyaa tene.

TIST niyitikilite movinduku aa na angi maingi nundu wa kutetheesya muimi kwiana. Lika ikundini ya TIST umuthi wone kivathukanyo kya mwanya.



Kihato Bee Keepers: Twina muvango munene nthini wa TIST.

Muandiki Joseph Thitai

Yila aniki ma myatu ma Kihato mambiie mwaka wa 1995 mai woni wa kunenga aniki ma myatu vinya kwisila, uthoosya wa uku wa nzuki na kwailya mikalile.

Twambiie na mwanika myatu na kuvanda malaa. Ouu wivo nitweethiie nzuki iyikala vate miti, na twambiia kuvanda miti. Nundu wa mbua kisioni kitu cha Kihato miti mingi niyoomie vatiwa miti ya kutala.

Tukiliilye kukua ngoo niwo TIST yookie. TIST yatuvundisya nzia sya mwanya sya kuvanda miti. Na kuma vau miti yitu ni yeethiwe yina

kivathukanyo kinene muno na kiu kyatunenga vinya.

Amemba oothe meetikila kulika TIST. Nitwakwatanisye ikundi inene ya Kihato Bee Keepers na twayiaanya yatwika ikundi itatu.

Umunthi twina muvango munene wa kuthingiisya atui maitu oothe malike ikundi ya TIST ni kana tuvande miti mingi kisioni. Ovamwe na kunewa mithinzio, nitwithiitwe na vaita kuma TIST. Nitumanyiitwe kusuvia muthanga, kuseuvya maiko matatumiaa ngu mbingi ma momanyisyo angi maingi.

Ni thano - Twisuviane na myaki.

Muandiki - Peter Muthiru

Aimi aingi nimatataa muno kusuvia miti ila mavandite ndikome. Ve vata wa kusuvia miisyo ila itonyo kututunga itina.

Ivandinani yii ya thano, kuvya kwa ithaka na miti yitu kwithiawa kwi yiulu mono. Ve vata wa kusiiia kuvivya makaa ma mavuti utheini, nundu kii nikitonya kutuma mwaki wakana kwa nzia ya iulu muno na kuete wanangiko munene.

Lilikana kwambiia kuseuvya miunda mwaka uu muvango CF nundu wa kuvanda. Endeea na kunyithya miti miundani na ivuioni. Ona kiwu kya savuni no utumie kunyithya kwa kukikia muu.

Oingi isuvie mwaki thano uu na uimanyithya andu angi.

Mazingira Bora



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Kenyit ab lo kongeten kesich TIST eng Kenya.

Eng arawet ab oeng, 2005, ko kikiyaiy tuiyiet ne tai ne bo TIST eng Christ the King, Nanyuki. Takyinet ab kanamet ab TIST ko kipchei ak kesich eng tuiyonoton. Banganet ab kasit ne tai ko kikisir. Tolochik ab TIST ko kikionjin. Kiik tolochik ab banganet ab TIST.

Kou oinet ne mingin ne yome koheg ole bune ak yeibata koig oinet neo, TIST ko ki inam ko mingin, ak temik tuten. Konomik che kitinye maat ko kibcheitalokoiywek ab TIST ko u maat ne lale. Temig chechang ko ki chut. Kurubisiek

che mengech ko kikitoo. Koitik ak konetik ko kikinam. koitisiet ak konetisiet ko kiginam en chokinet.

Raini, kurubisig 6,975 kokikesich kotinye temik che sire 50,000. Ketik che sire 5.1m kokikiit. TIST kokikinam en Counties che bo Mbeere Embu, Kirinyang, Tharaka, Meru, Laikipia, Nyeri, Bomet ak Narok. Kitesetai ke echekitu. Kitesetai keribe emenyon ak timwek.



Temisiet ab ribet ab ngungunyek chobet ab mbar.

Yon karigesisie ko mat Ibel katukanik ab minutik. Ne kataibele ibakach eng ngwony. Ingochanga katukanik eng ngwony, kotoreti ngungunyek kokimit ak konyor rotuba neo. Panganet ab katukanik eng ketik ngwony ak ketik che mengechen ko wendi kotoretikotes baroindab koristo eng ngungunyek ak kotoret ketik komo yamio. Ibwat ile katukanik ab minutik keboisien koraeng keturik.

yom I rib kiyakik komat koageten. Ngot koageten ko tutikinitu mobek che ngetu che tuche ngwony.

Keringoik chebo temisiet ab ribet ab ngungunyekko nyolu kebal komo robon. Nyolu anyun kinam kebal en tai.

Imar oleiwendi ibalchini keringoik. Cheng rokoet neo ak I birchi kiratek barak eng 70 cm kongeten age agoi age. Ichut rokoet komurok eng mbar. Kiratiat age tukul koigu kwenet ab keringet ak kobor komie ine kole iwendi ibole keringonik che choton. Imar lainisiek iboisien mokombet. Lainit age tukul konyolu ko 90cm kongeten age agoi age. Imar lainisiek ak keringoik che imuche itar eng betut.

Eng betut noton yon kaimar keringoik, ibal keringoik. Keringoik konyolu ko gerkeitun tukul. Nyolu ko 15cm tebesindo, 35cm koindo ak 15cm loindo.

Yon karichobo ke imin bandek k obo kamanut iwekyi ngungunyek ab barak che toltol koba keringetasi kotoret minutik kokimegitun. Ingol soroek ak ngungunyek ab barak anan iboisien keturik. Inyit keringet konget loindab 5cm. Ioini kotoretin kotaach beek ye robon.

Ngot imine bandeek, inur keswek eng beek en saisiek 6-7 kotomo minet. Ni kochokin eng kabistaet ak kosobcho che chang. Yon imine keswek, inde bandeek angwan konait ab keringet agetukul. Tuchen 2.5cm keswechuton ak ngungunyek che toltol anan ko soroek. Yeibataita konyolu konget loindab 2.5cm. ma nyolu kosir ni. Mugugik ko nyalu ketui komegekitun asikonyor ge ngungunyek ak keswek.

Angot imine mosongik, imin tenterek 5-6 eng keringet agetukul yeibata robta ne kayam ngwony. Tuch tenterek ak 2.5cm chebo ngungunyek che toltol ana ko keturek.

Boroindo ne kebakaach eng keringonik kotoreti kotaach beek yan korobon. Komomiten baraini, korwoe beek kityok eng barak, ak kolaa ngungunyek che toltol che bo barak. Semberchin olebo keringonik abakorai. Kila kenyit ko tutikinitu chemasai. Mat ko mein mugule! Balet ab keringoik

inguni kotun tun iboisien eng kenyit ne nyone. Ole Kichoptoi Keturek.

Keturekchu ko agenge eng mbolea che toreti minutik korut komie. Kororon

kosir mbolea chebo kerichiek, amun matinye ngemutik alak tukul eng minutik ak

emeet ne rube. Chang ortinwek che kechoben, eng choton ko niton agenge ne kibunchi kamanut eng kamaswek alak.

Chobet ab Keringet.

1. Cheng oleibolchini keringet. Nyalu ko 4m eng 4m.
2. Itilil yoton.
3. Bal keringet ne kwenet ko 3-4cm ak 1.5cm kwo ngwony.
4. Iyum katukanik tukul chebo minutik (kou sokek ak mobeek ab bandeek, beek, ngendeek). Murmur komegekitun .
5. Nde katuganichuton eng keringet konget 0.5m.
6. Tesyin litaisiek 5 che bo orek.
7. Nerube I tesyi akoi 30cm (anan chechang kotienge bitunet) chebo soroek ab kiakik (kou chebo tuga, nguronik, nego, anan inkogenik).
8. Nerube inde panganet age nebo sogek ak ketiik ab minutik (0.5m).
9. Tesyin litaisiek 5 alak chebo orek.
10. Tesyin sokek ak ketiik kora kotko rikyi konyi keringet.
11. Neletunen, itesyi panganet nebo ngungunyek kot konyi keringet.
12. Yon itesetai inyite keringet ak ngungunyek, inde kirokto kwenutab keringoni iger ile kait ngondet ab keringet.
13. Bakaach keringoni eng betusiek 90 (arawek somok).
14. Eng kasari iboisien beek che kageboisien itumchi keringoni. Kou yan ketar iune tukuuk anan ko ingoroik, itumchi keringoni taa komeboisien kerichiek che yaach eng beechu. Ngot itinye kiakiik imuche itumchi sokororeg chwak keringoni.
15. Yom itumchi beek keringoni beetut age Tugul, anan yon kabit beek.
16. Ye kaibata betusiek 90 ko ka go chobok keturik. Boisien kirokto ibimanen- yon kagochobok konyalu kobel biik ak imuche ko oywon yon kecheru ketit.

Boisiet Ab Keturek

Yon karibal keringoik chebo bandeek, beek anan minutik alak, itesyi eut agenge chebo keturek eng keringet age tukul.



Karurukutik (clusters) Taman che kikiliba eng TSE arawani konye

Arawani konye, kurupisiek che mengech eng kaurukutik che echen taman(TSE) kokikiliban. Choton ko

Laikipia west TSE:
Mithiru cluster
Karaba cluster
Tandare cluster
Njorua cluster.

Imenti North TSE:
Mituntu cluster
Limoro cluster
Muruta cluster

Kithurine TSE:
Kithurine cluster
Tharu cluster

Wiyumiririe TSE:
Wiyumiririe cluster

Ki kimate kandoik ab klusta alak kobangan ge eng koitisiet ab ketikeng kurupisiek che mengechasi keliban ak ichek. Ba kamanut kobunchi kaitisietchoton ak iman.kandoik ab Klusta agetukul konyolu koik che tie ge asi klusta ak kurupisiek che mengech kosich tiet ne mie. Kosir, kobo kamanut kenai kele isabuk che bo kaitisiet kenyogechikili.

Klusta ne kosir eng chigilet konyoru libanet eng libanet ab kurupisiek che mengech.

Kithurine Cluster: Taa Kila Eng Ribet Ab Emeet

Kosire Jane Makena

Kingomwoweche akobo TIST Elizabeth Kiogora eng klusta nenyon kithurine klusta, ki ib kasarta nenwach kabotik koguyo kole TIST kotinye panganet ne mie eng icheek ak emenywan.

Elizabeth, ko agenge eng (TSE), ak choronokchik Mercy Nkoge ak Waston Majau ak kandoindetnywan Patrick Mureithi ko kiigilge kotech panganet ab klusta eng kasarta ne nwach. Ki boiboi temik ak kikinam kurupisiek chemengechen, konetik tisap ak koitik angwan kokisir ak kikinnet.

Kingochanga kurupisiek che kichut TIST, kokichanga kanetisosiek. Kikinnet kurupisiek chemengech akobo ortinwek che miach chebo minet ab ketik, minset ab ketik ab kippaa, boroinwek che koron chebo minet ab ketik ab borotet ab temisiet ab ribet ab ngungunyek(CF), chobet ab keturik ak kanamet ab kab betisiek ab ketik.

Kiib kanetisiet kabotik eng boiboiyet. Kitindo kimnated neo ak nyikanatet ak konam koyaiy en boisionik. Kichanga biik che kimin ketik ab kippaa ak ketik ab logoek cheu American Ash and Avacados. Borotet ab rabinik ko kiwa barak ak kochanga lokoek che kioldo eng ndonyo.

Toloitanyon eng Kithurine Klusta ko;TAA KILA

ENG RIBET AB EMEET.: emenyon kokiwalak amun eng ketik ab kippaa che kimin temik ab TIST. Kiginetge kebos Eucalyptus (blue gum) ne ki agenge eng ketik che kichang eng olinyon.Oinosiek chok ko kowek kogeny ak kochanga beek. Kigile ge kerib tabondoisiek ab ainosiek.

Temik ab TIST chechang ko kikonetge kolset ab ribet ab ngungunyek(CF). kikonetge kesisiet ne o ngandan kiboisien rabisiek che mi ngweny. Boisiet ab keturik ko ki kotoret temik nekata ole mbolea chebo kerichek. Kitoret niton temik kogonor rabinik.

Eng inguni ketinye kurupisiek che mengech 52 eng klusta nebo kithurine. Kikenyilen klusta ini koi lakwenyini klusta Tharu netinye kurupisiek 45. Eng klusta nebo Kithurine, kokikinnet ak kiit kurupisiek 35, kigechigil ak kosir ak kurupisiek 11 kotinye ketik chesire 500 ako kokoyam keliban. Eng oin, kokitaach rabinik. Eng tukul kokisich Kshs 23,600 kokikiliban eng kithurine ak 2,200 keliban eng Tharu.

Tokyinenyon bo kee ko komuch kurupisiek Tugul komin ketik che chang, keit komie ak keliban. Kiborchinigei keliban kurupisiek Tugul eng libanet nenyonen ak kesich rabisiek chesire Ksh 200,000 eng klusta agetugul. Kingen kele kimuche, amun eng TIST, kimuchel!



TIST: Burgeindab Ngwony Ak Walet Ab Koristo

Temik ab TIST kigilei kogirindai uinwek aeng che mi ngwong nguni-walet ab koristo ak bananda. Wallet ab koristo ko kogoib bananda kou ele temiik che chang chebo ngwony missing eng emotinwek che ilangu ge kotese tai konyoru kasarwek ab robwek che mi ngweny. Raini, komoswek alak eng Kenya konyoru kemeut ne ya.

Burgeindab ngwony neibu wallet ab koristo ko kikiityi kele naton neibu wallutik chu yaach bo koristo, kou maranet ab El-nino nebo 1998 neki ib asenet neo eng kamaswek che chang. Ak yeibata kosib kemeut ne o, Koristab Tsunami (hurricane) nebo 2004 ak nebo oin raragunet ab koitab beek (snow) ne kirarok eng Nyahururu ak komaluch ole sire ekarisiek bokol(100). Koborunoik al ko chotet ab koitab beek eng mt. Kenya, walutik ab ateptab robwek che kogoib asenet ab minutik eng kamaswek che chang, yamet ab keringoik ab beek ak ainosiek eng alak che chang.

Kiname eng arorunet ab ngoliot agetugul ak kiaroru eng koindo. Iwendi inete gei ole temik ab TIST ngandan mine ketik ko toreti eng istoet ab asenet ne konu burgeindab ngwony.

Ne Burgeindab Ngwong? Burgeindab ngwony ko langet ab barak nebo burgeiyiet ab ngwony, ne wekyinet koibu walutik eng wallet ab koristo. Burgeiyiet ab ngwony koibu wallet ab robwek, langet ab beek eng barit, asenet ab minutik ak weget neo eng ketiik, tiongik ak biik. Ngongalaleng kipngomotisiek agobo wallet ab koristo, tokyinet nywan kobo burkeiyiet ak ngwony ne ibu yautik ab chito.

Tos Yetu Maat Eng Ngwony I?

Eiy!kigoburgeit ngwondet eng 1°F eng

kasartab kennyisiek bokol (100) che kisirto. Che chang eng ngomotik ab walutik ab koristo che bo ngwony kobwote kole tukuk che yae biik ko tareti ngwandet ko burgeit kou beelet ab mwanik ab peterol (petroleum products), saratik, makaa, ag koriswek che mongunen ngwony.

Ne asenet ab barakut ab koristo (greenhouse effects)

Asenet ab barakut ab koristo ko langet ab barak eng koristo ne nyoru ngwonyndet amun eng koriswek che mi barakut che u (crabon dioxide, nitrous oxide, sulphur dioxide and methane)kosiche kimnatet eng asista. Olebiitunen koristo ne ya (carbon) ko; yebet ab ketiik, iyosiek chemangunen industries, iyosiek chemangunen karisiek, iyosiek che mangunen kwenik, makaa anan beelet ab osnosiek.

Ne ngwoyondit ab burkeiyet ab ngwony?

- Rarunet ab beek eng emotinwek ab melewet. Ni koibu emotinwek alak koik melewosiek.
- Letaet ab mianwokik cheu malaria. Ngo burkeitu emetinwek alak, kotese tai koreu umbu ak konyokoib mianwokik che chang che bo malaria. Kapchi che chang ak sipitalisiek kotinyoksek, kenyisiek ab chito kobosokse ak meet ab lagok che mengech kolonye barak.
- Kachuchuknatet ab kesutik ab kabatisiet en emotinwek che siche ropta missing eng East Africa. Amun eng rarunet ab ropta ak changindab kutiik che ngeme minutik amun eng maat ne mi barak, keset ab amitwokik konyone ngwony ak niton koreu bananda ak rubeet eng kapchi ak bororosiek che chang.
- Aliet ab barak nebo amitwokik eng



ngwony. Ye tese tai temik kosiche kesutik che mi ngwony ak kareitaet ab omitwokik koigu tuten, alioshiek koba barak amun maaget komi baraaq ag kareitoet komi ngwony.

- Walutik che nin eng chabutik ak kayamet ab kayomet ab timwek. Oleinomen ainosiek eng tulonok ak osnosiek kotese tai koyomtosak inyo koib wallet eng tumchinet ab beek eng minutik ak kotutikinitun beek che mi ainosiek ak koyomnyo silangosiek. Inoni kora koibu wallet eng mangunet ab maat nedo hydro-electric power. Factorishiek, sipitalisiek ak ketisiosiek che tiegen missssing sitimet kosiche asenet missing. Kareunet ab beek ab paibusiek koba townisiek anan korik alak eng resop kobuone ngwony.
- Biik millionisiek che chang ko mi ole yai amun eng maranosiek ak turiecheet ab ngwony cheibu robwek che mi barak ak

eng tabanosiek ab baarishek kolanye barak beek.

Ole kitertoi burkiyet ab ngwony Minet ab ketik Kou olekagemwaita eng barak, iyet ne yai nebo carbon ko neibu burkeiyiet ab ngwony. Ketik kwome korisi yai ne kanyoi soet eng kasartab omisietnywan beet ak kokonor eng ketit kwen, tikitik ak eng ngungunyek che mi ngwomy eng ketit. Ngandan, yekitil ak kebel ketik, kochundo korisi kaya inoni Koran kokonor kwo soet. ingen ile ketit age Tugul komuche koundo koristo i? Ketik ak urwenywan komuche ko kaitit ngwonyndet. Yon kagaititit ngwonyndet, kosiche kokonor koristo kogagei. Ni koboru kole ketik che mi mbarengung kotoretu eng konoret ab beek eng kasarta ne koi. Niton kowendi kotoretu minuutik kug ak kotoret kora biik che boisien beek en bororietngung kiten.

Momi wallet mo mi bandab tai

Kosire David Mawira

Waloksei ngwony eng chakinet. Nyolu kewalagen kosipge ak walutik ab mosongnotet ab kasari, ortinwek che lelach chekiyoen tukuk okot ateptanyon. Ngot keyeshie walutik chu kebokoktech ke mi ole ya!

Ko u ole kikiyaitai tukuk ko kowalak eng chakinet. Koitab ma che ribe maat kokobwa asikoisto koitab ma nebo koiywek somok. Biik che chang che kikoboisen koitab ma ini kokiko sor ketik che chang. Bokokto iyet en jigat komandaen konda ne kikichop kounoton kogirindo mianwogik.

Ribet ab ngungunyek, ngandan mo kit ne ton

ko eng changindo kowale ole kitam ketemtoi mbarenik chok. Eng temisioni, ko temik che chang onyuru keljin ne mi barak kotabala konorwet ne siche eng alutik ab mbar che u boisiet ab mbolea kerichek ak temisiet.

Temisiet ab logoek che bo oliet ab barak che u maembe che kigirok ko eng chakinet ko wale maembe nebo kipгаа. Raini, temik chekikoboisien ortinwek ab kasari (robot) ko siche rabinik che chang, maembe che chwak ko isip koiyie eng chakinet.

TIST ko ki ko cham waluti chu ak ne sire ko kotoret temik ko bor. Ikun agenge eng kotab TIST ak inetge walutichu che imuche iyan.



Boik ab sekemik che bo kihato: kitinye tokyinet neo en TIST.

Kosire Joseph Thitai

Kin konam boik ab sekemik che bo kihato en 1995, ichek temik ko kitinye keret nebo kotoret ge koyob kasisiek che konu kelchin ak kocheng oratinwek che tesen sobenywan.

Kasitnyon ne tai ko ki baet ab sekemik ak temisiet ab mauk. Kobaten koyob kokilenyon bo baet ab sekemik, ko ki kinai kele ma kimuche keyai ko ma mi ketik. Ki kinam minet ab ketik, ngandan kotienke kemeusiek en oli nyon-Lamuria, Laikipia county- ko kikinyoru asenet ne o koyob kosiptoet ab ketik ko ba mbar ko koyomnyo tukul.

Ki gel komakibakagtei kasini nda mo TIST ne kinyo oli. TIST ko kinyo konetech oratinwek che kororon che kiminen ketik. Ketik che ki sobcho ko kiba barak

missing. Ki ki cherage missing.

Ki iyan biik ab kurubit kochut TIST. Kii kurubit ne o ne bo kihato koik kurubisiek alak somok- Kihato Kiburi TIST Number 2006KE261, Kihato bee keepers TIST Number 2006KE1214 ak Kihato Livestock TIST Number 2006KE487. Agetukul en kurubisiek chu ko icheken en banganet ab TIST.

Eng raini ketinye tokyinet ne o-ke cher biik ab kokwenyo che chang kochut TIST ak komin ketik che chang. Kotabala, siget ab rabinik ko kige nyoru borotet ne o eng TIST. Kiginetech temisiet ab ribet ab ngungunyek, tekset ab koitab ma che bo kasari, kandoinatet ab sungukanet eng alak che chang.

Nguni ko kasartab kemeut- ongerib mastinwek.

Kosire Peter Mithiru

Temik che chang ko kikogilge ko rib ketik che ki komin asi ko sobcho. Bo komonut ke ger kele koki istoen ge tukuk che imuche ko kon asenet ak kowal borotenyon.

Eng kasari bo kemeusiek, ngoyodit ab belet ab mbarenik ak osnosiek ko mi barak. Bo kamonut keistoen ge belet ab makaa ak siratik en tirikwek. Chuton ko tinye kamuget koreito mastinwek che

makimuche kimis ak kokon asenet ne o.

Obwat onam obal mbarenik kwog eng minet ab ribet ab ngungunyek. Otestai onage beek ketik eng betit ak mbar. Omuche owal beek che bo sabunisiek onde orek sikowal konyolchi ketikwok.

Kora orib maat eng kasari bo kemeut. Omwochin alak ak iche.