

Mazingira Bora



TIST

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

English Version

An Environmental, Sustainable
Development and Community Forestry
Program.



TIST leaders in their All Clusters Meeting (ACM) held in Nanyuki on October 21, 2016.

Inside:

TIST Seminar: **“Creating Strong Clusters”** Page 2

Ndalani TIST Cluster: Progress made by Small Groups. Page 2

TIST Receives Visitors from Taylors, Natural Capital Partners and KTDA Foundation.
Page 3

Sustainable Agriculture: Agroforestry. Page 4



TIST Seminar: “Creating Strong Clusters”

Thirty (30) Clusters sent their Cluster Leaders as representatives to the seminar held on 16-20th October 2016 at Gitoro Conference Centre.

The seminar’s **Conditions of satisfaction (COSs)** were; sharing each individual Cluster achievements, learning about developing Best Practices, learning how to establish raised seedbeds, preparing land for Conservation farming, learning more about carbon business, understanding better about their roles and responsibilities as Cluster leaders, learning about doing forest plans, learning about Kujengana, making friends and having fun. The seminar participants further helped in planning for All Clusters Meeting (ACM).

The seminar also discussed about the new payment voucher. The new voucher now shows the amount of carbon sequestered by the Small Group as well as Verified carbon. Sequestered carbon is the amount of carbon obtained after the quantification while verified carbon is the ‘saleable’ carbon obtained after the validation and verification. Its only verified carbon that can be sold and earn carbon revenue. Therefore, Small Groups are advised to study their voucher when they receive it.

Seminar participants were concerned why all Small Groups carbon is not Verified carbon and therefore not saleable carbon. In response, the seminar realized that in some cases, quantification has been done poorly and therefore some of the groves not qualifying for validation and verification. In other cases, some of the groves are new and are

yet to be included for Validation and verification.

Poor quantification has not only affected the qualification of groves for validation and verification but also in generating of payments vouchers. In the past several months, TIST management has been trying to run vouchers, but every time, some errors crop up. Such errors include over-payments or under-payments of Small Groups. In this case, payments are not accurate and honest. As such, it was agreed that the Small Group receives payments in a easy to understand and transparent manner. This entails, paying Small Groups for one calendar year, using data from recent quantification (last 18 months).

TIST Farmers understand the tree payment money they receive today is an advance / pre-payment for carbon. These pre-payments amounts will eventually be deducted to their profit share of carbon revenue. Therefore, the more advance they receive , the more deductions will done. If for instance, they haven’t received any pre-payment, nothing will be deducted.

Seminar participants were encouraged to discuss various ideas to help strengthen their own Clusters and Small Groups. The seminar involved participants working together in *small groups*, discussing various ideas and coming up with best ideas that they can implement when they go back to their Clusters. Moreover, there were practical demonstrations of raised seedbed and Conservation Farming. Participants also received training materials which they discussed and understood better so that they can train farmers in their Clusters .

Ndalani TIST Cluster: Progress made by Small Groups.

We, Ndalani TIST Cluster, in Machakos County, are happy to share with other TIST Clusters, our progress so far. Today, we have 49 Small Groups, 22 out of those have been baselined and quantified with 12,916 trees.

Through support of our new trained Cluster Servant, Naomi Kamau, our Cluster has held elections. We are impressed with Cluster Best Practices of rotational and servant leadership which we have embraced fully both in our Small Groups and Cluster meetings.

We are glad to have received training on raised seedbeds. Today, such Small Groups as Ngwatanio (2016KE44) have already started their

own raised seedbed. Many other Small Groups are learning from Ngwatanio group and preparing to start their own.

Through cluster meetings , we have able to share important ideas that are helping us to cope up with challenges faced due to the experienced dry spells such as burning of residue under mango trees to smoke off beetles and other insect that invade the fruit tree during flowering.

We have also started taking care of naturally growing trees mostly acacia instead of clearing for new planting. This help Small Group members grow more trees, most newly planted trees dries up due to harsh climatic conditions. We are also planting fruit trees such as mango trees.



TIST Receives Visitors from Taylors, Natural Capital Partners and KTDA Foundation.

TIST Kenya received visitors from Taylors, Natural Capital Partners and KTDA Foundation. They included, Simon Hotchkin, Head of Sustainable Development Taylors; Ian Brabbin, Head of Tea Taylors; Kevin Sinfield, Head of Brand Marketing Taylors; Simon Brown, Natural Capital Partners and Mr. Ndiga from KTDA Foundation. Their trip involved visits to TIST farms, talking to participants in a Cluster Leaders seminar, meeting management in selected Tea Factories.

During the Cluster Leaders Seminar, they were introduced to seminar participants by Ben Henneke, TIST Trainer and CAAC President together with Vannesa Henneke

Simon Brown and Inder (not in the seminar) visited Ndalani Cluster, and meet TIST farmers in Makomboki, Imenti and Kionyo area. Simon says, "Everywhere we went yesterday, we found farmers who are passionate about the work they are doing. In Ndalani Cluster particularly, we meet farmers in a Cluster meeting, where they shared with us their plan of planting thousands of trees, and what the trees means to them in terms of improving their livelihoods, income, health and income." They also visited Makomboki, where they met farmer doing grafted avocados, planting trees in riparian areas, doing raised seed beds.

In Imenti, they visited Imenti Tea Factory, and later visited Joshua Farm, a TIST farmer. Joshua and his family have done very dedicated tree grove and has put close to 50 beehives, therefore earning additional income from honey.

Kevin, who was on his first trip in Africa, was particularly impressed with fantastic work TIST farmers are doing to plant trees and thereby providing better environment for tea and coffee. "I will definitely talk to other people about your great work in TIST when I go back to my country," Kevin concludes.

Mr. Ndiga of KTDA welcomed TIST leaders to work with the foundation in learning about tree nursery preparation, tree grafting skills, and in helping other farmers plant many more trees.

Simon Hotchkin told the seminar how he was first

impressed by TIST when he made a visit in February 2014. He says, "That visit inspired Taylors to partner and work with TIST to bring trees to tea communities so that they can improve their livelihood, income, soil fertility, water retention among other benefits". "I am impressed by your very good work and I look forward to a long working relationship with TIST," he adds.

Ian, who is a Tea Taster for Talyor Tea also said he is impressed with fantastic job done by TIST farmers.

Seminar participants got an opportunity to ask the visitors some questions. Among the questions asked is request for seedlings or seeds, knowledge about grafting, and extension to buy tea from more factories. On the question of seedlings and seeds support, Simon Brown told the participants that the most successful tree farms he has visited is where the farmer does his tree nursery by himself, deciding on local tree species to plant, and give such a farmer a sense of ownership. He added, "tree grafting requires some specialised skills. Its important such skills be shared to Small Groups, perhaps through the collaboration with KTDA foundation." He concludes with encouraging farmers that getting free seeds or seedlings is an option by not always the best. "Easiest things are not always the best."

Later on, after greeting the seminar, they visited Kionyo area. Accompanied by TIST servants; Jeniffer, Kimani and Patricia, they visited TIST farms and Kionyo Tea Factory. Among the farms they saw include George Nkonge and Patrick Murethi farms. Mr Nkonge welcomed them and showed two(2)raised seedbeds comprised different species of trees. Also, Nkonge showed them his Conservation Farming plot. At Patrick farm, they saw a raised seedbed with mixed species.

TIST Kenya holds All Clusters Meeting (ACM) at Nanyuki Social Hall.



Sustainable Agriculture: Agroforestry.



An important topic for sustainable agriculture is agroforestry.

Definition: Growing trees and shrubs together with agricultural crops or livestock.

The overall aim of agroforestry is to increase the productivity of the land through the use of trees. Trees have many benefits for the farmer:

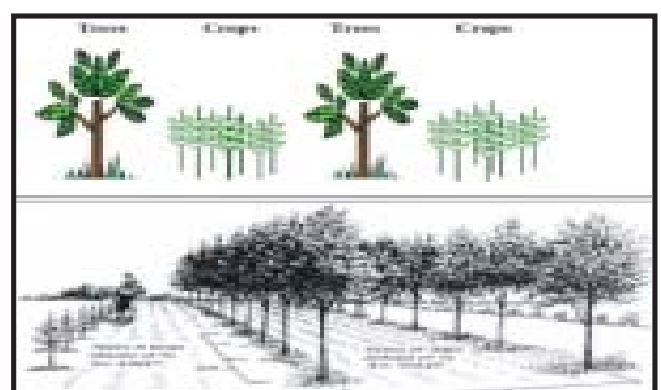
- Building material
- Fuel wood
- Fruits and other food
- Fodder
- Soil stabilization
- Soil fertility
- Moisture retention
- Wind shelter
- Marking of boundaries
- Medicine
- Cash income
- Reduced erosion (if a layer of litter/mulch is kept)

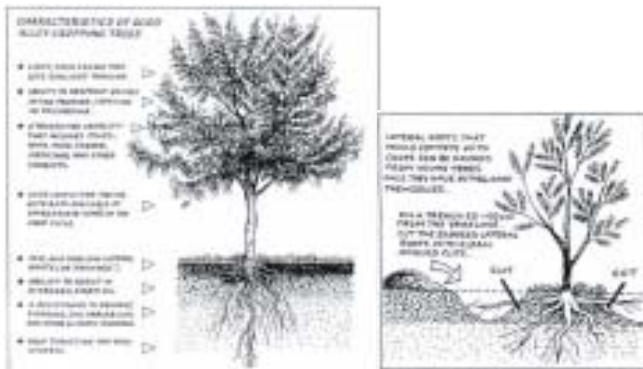
Agroforestry practices: There are many different techniques and new methods are being discovered all the time. Some techniques are successful in one place and a disaster in others. People need to try different techniques and share the best practices in the training meetings. The following are some common methods of agroforestry:

1. Hedges: This involves selecting a tree species which can be placed in a line and which have benefits for the land. Hedges require little space, control erosion, and can produce leaves for fodder or mulch. An example of hedging is to plant a row of trees around the field boundary. Recommended spacing is around 1.5 - 2m. The best design includes a mixture of tall and short trees. e.g. *Croton megalocarpus* planted with *Euphorbia tirucalli* and/or *Lantana camara*.



2. Alley cropping: This involves establishing trees at very narrow spacing (0.5-2m) in rows along fields. There may be a tree row, then two or three rows of crops, then another tree row, then crops etc. An example of this is planting alternating rows of maize with leucaena, or coffee and bananas. The most suitable trees are leguminous ones (ones that fix nitrogen for the soil). Spacing between rows of trees should not be more than 5-8m. The tree rows need to be weeded and pruned regularly. The trees cannot grow too tall otherwise they will compete with the crops for soil nutrients and light. The pruned leaves can be added to the soil to improve the soil fertility. So these trees will not be suitable for TIST payments, as they have to be kept short, but they will improve the agricultural land and provide many other benefits to the farmer. Some good alley cropping trees have the ability to re-grow after they have been cut. This means they can be cut every crop season so that they do not grow too big and compete too much with the crops. This practice is called coppicing, and only works with some species. Some commonly coppiced species are *Calliandra calothyrsus*, *Cassia siamea*, *Cassia spectabilis*, *Eucalyptus spp.*, *Leucaena leucocephala*, *Markhamia lutea*. Some species coppice well when they are young but may not coppice when they are mature e.g. *Casuarina spp.*, *Grevillea robusta*, *Sesbania sesban* and some *Albizia spp.*

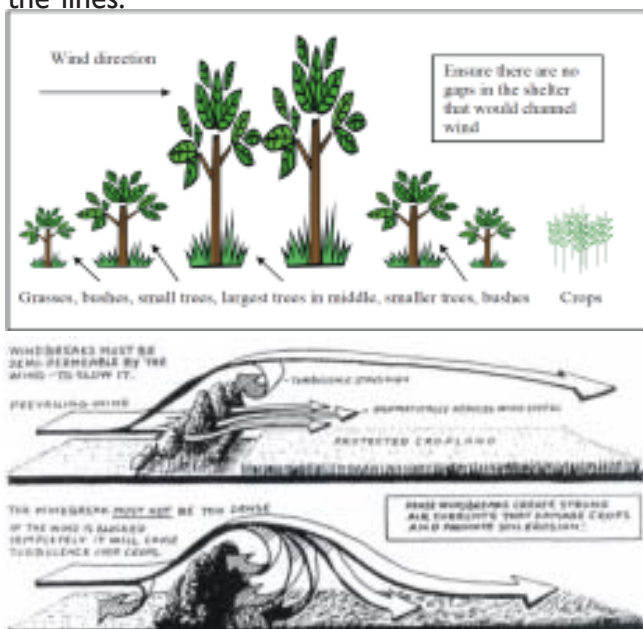




Have any farmers used this method of planting trees and crops together? If so, what were suitable combinations? Ask them to share their experiences and bring the information to the next training session.

Maybe farmers could try just a few rows of trees in their fields. Then they can see the results. If the results are good the number of tree rows can be increased next season.

3. Windbreak: Planting wide strips of trees to provide a windbreak. This then protects crops from the oncoming wind. Plant large trees in the center, smaller trees for the next two rows and low shrubs, bushes and grasses on the outside. Plant at right angles to the prevailing wind. Spacing within the lines of trees can be 4-5 m with 2-4 m between the lines.



The advantage of windbreaks is that the farmer does not have to sacrifice an entire plot of land for trees. It only takes a strip of land, and the benefits can improve yields by 30% in some areas. Note that poorly planned windbreaks can damage crops more because it can channel the wind through gaps. Find someone experienced in this to help you design your windbreak.

4. Fallow cropping: This is where farmers stop growing crops on a piece of land and let trees take over to help restore soil fertility. Mostly nitrogen-fixing shrubs are chosen e.g. *Sesbania* spp. and *Gliricidia sepium*.

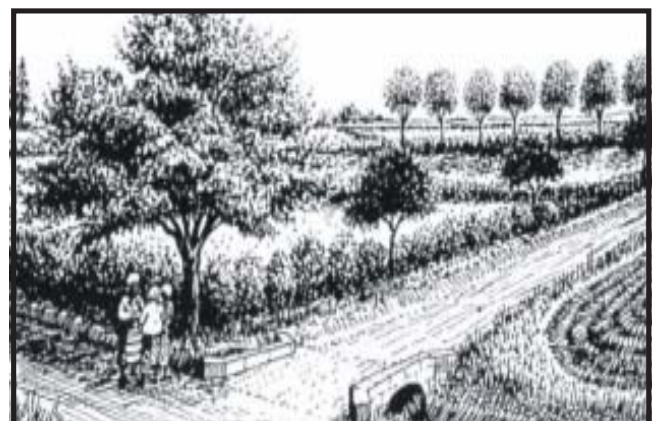
5. Inter-cropping: This involves wide and even spacing of trees among food crops. Good trees are those that have light canopies and fix nitrogen. More on this in the next unit.

6. Grazing area improvement: Managing trees on grazing land to provide wood and fodder. For example, in arid and semi-arid lands, consider *Acacia tortilis* or some of the following: *Salvadora persica*, *Cordia sinensis*, *Acacia eliator*, *Ziziphus mauritiana*, *Acacia albida*, *Acacia nubica*, *Acacia Senegal*, *Hyphaene compressa*.

In higher potential areas, depending on the altitude, consider *Leucaena leucocephala*, *Sesbania sesban*, *Calliandra calothyrsus* and *Leucaena diversifolia*. Consider supplementary feeding using leaves (15-20% of the feed) during the dry season for your animals.

7. Woodlots: Small woodlots can be grown on unused or unproductive land, e.g. woodlots planted on stony outcrops or in gullies. Woodlots can also be planted on cropland to serve as a windbreak, or they can be planted on fallow land.

8. Marking boundaries e.g. *Croton megalocarpus* and *Commiphora zimmermannii* subsp.



Trainers, note that TIST trees have to be correctly spaced in order to grow fully and remain in the ground long-term. Some of the above agro-forestry methods are best practices for agriculture, but may not qualify for TIST tree payments.



Other ideas to consider for certain ecological zones in Kenya.

Higher altitude slopes with acidic soils (e.g. areas where tea grows well)

Consider *Calliandra calothyrsus* and *Morus alba* for fodder production.

Consider boundary planting and windbreaks with *Croton megalocarpus*, *Grevillea robusta*, *Casuarina cunninghamiana*, *Millettia dura*, *Hakea saligna*.

Consider orchards for temperate fruits (e.g. plums, peaches, pears).

Lower altitude slopes (e.g. where coffee grows well)
Consider *Jacaranda mimosifolia* for boundary planting.

Consider *Syzygium spp.* for windbreaks and planting along water courses.

Consider fruit trees such as *Cyphomandra betacea* (tree tomato), *Persea americana* (avocado), *Macadamia tetraphylla* (macadamia), *Passiflora edulis* (passion fruit), *Casimiroa*.

Edulis (white sapota), *Annona senegalensis* (custard apple), *Psidium guajava* (guava), *Eriobotrya japonica* (loquat).

Calliandra, *Morus alba*, *Grevillea* and *Markhamia lutea* are good options for planting on areas you want to control for soil erosion (soil conservation structures).

Grevillea is a good shade tree for coffee.

High altitude plains, with gentle sloping land and scarce numbers of trees:

Consider windbreaks to protect crops, boundary planting and live fences e.g. *Acacia mearnsii*, *Grevillea robusta*, *Hakea saligna*, *Croton macrostachyus*, *Dombeya spp.*, *Dodonaea angustifolia*, *Casuarina cunninghamiana*, and *Dovyalis caffra*. Some temperate fruit trees may do well.

Rift valley maize and dairy system.

Since maize does not do well in shade, consider small woodlots or windbreaks, or trees planted on soil conservation structures e.g. *Grevillea*

robusta, *Sesbania spp.*, *Croton macrostachyus*, *Croton megalocarpus*, *Acacia abyssinica*, *Eucalyptus spp.*, *Acacia mearnsii*, *Casuarina cunninghamiana*, *Dovyalis caffra*, *Markhamia lutea*, *Cordia abyssinica*.

Reminder

Do remember that whilst planting trees brings many benefits you need to research the best types for your specific land type. Remember that trees compete with crops for water, and some crops do not like a lot of shade, for example. Get information from your nearby small groups and your extension workers.

- Particularly get advice on suitable trees with deep roots and fewer surface roots (these trees are beneficial in agroforestry since surface roots compete with crops). *Casuarina spp.*, *Leucaena leucocephala*, *Cupressus lusitanica*, and *Sesbania sesban* have shallow root systems and may be better for stabilising soil on conservation areas. *Eucalyptus spp.* and *Gmelina arborea* can produce compounds which inhibit crop growth.
- Intercropping may not work very well in areas receiving less than 800mm rainfall annually.

Resources:

There is a very useful website giving details on suitable trees for agroforestry in Kenya. You can search for details on specific trees. Available here: <http://agroforesttrees.cisat.jmu.edu/>

Videos

'**Grevillea agroforestry**' (6:26) introduces the many benefits of *Grevillea* within farming systems. It explains some of the management procedures such as pollarding and coppicing. <http://www.accessagriculture.org/node/895/en>

8. References

CARE-International (1989) *Agroforestry Extension Training Sourcebook*. Module 6: *Agroforestry Design*. Educational Resources Development Unit, Nairobi.

NEMA (1998) *Caring for our environment: A handbook for local leaders*. National Environment Management Authority, Kampala.

Tengnäs B (1994) *Agroforestry Extension Manual for Kenya*. International Centre for Research in Agroforestry: Nairobi.

Mazingira Bora



TIST

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

Kimereu Version

An Environmental, Sustainable
Development and Community Forestry
Program.



TIST leaders in their All Clusters Meeting (ACM) held in Nanyuki on October 21, 2016.

Inside:

Uritani Bwa TIST: Kuthithia Cluster iri na Inya". Page 2

Cluster ya Ndalani ya TIST: witi na mbere bwa tukundi tuniini. Page 2

TIST kugwata ugeni ageni kuma Taylors Natural Capital Partners na Foundation ya KTDA. Page 3

Urimi bwa Kungania miiti na Imera Bingi. Page 4



Uritani Bwa TIST: “Kuthithia Cluster iri na Inya”.

Cluster mirongo ithatu (30) batumite anene bao ba Cluster kiri uritani buria bwathithitue kuma ntariki 16 mwanka ntariki 20 mweri jwa Ikumi naria Gitoro Conference Centre.

Mantu jaria jaragirua ja njira ya kunganirwa ni: kugaana na o muntu wa Cluster mantu jaria bombite kuthithia, kwiritana mantu ja gukurianjira injega, kuritanwa kuthithia minanda yukiritue, kuthuranira miunda niuntu bwa urimi bwa kinandi bwa kumenyera, kumenyithua nkuruki iguru ria biashara ya riera ria Carbon, kumenya nkuruki iguru ria ngugi ciao ja anene ba Cluster, kumenya uria bakathithia mibango ya mwitu, kumenya mantu ja gwakana na kuthithia acore na kugwiranirua. Baria betire uritanine buu bagatetheria kiri kubangania micemanio yonthe ya Cluster (ACM)

Uritani bubu nibwaririe kinya marii jameru ja vucha. Vucha injeru nandi irionania carbon yonthe iria yathurani ni tukundi tuniini amwe na carbon iria ikurukitue iria yumba kwendua nyuma ya gutarwa na gukurukua. Carbon iria ikurukitue aki niyo yumba kwendua na kwona mbeca. Niuntu buu, tukuundi tuniini nituritue tuthome vucha bwega riria ikabakinyira.

Baria bari uritanine buu baari na biuria iguru ria niki carbon yonthe ya tukundi tuniini ititari na niunti buu itiumba kwendua. Kiri gucokerua, uritani ni bwamenyere ati kiri kesi imwe utari bitithithaga

bwega na niuntu buuutari buu bukarega gwitaniria. Kiri kesi ingi, miunda imwe ni imieru na iri na ikajukia kagita mbere ya utari bwambiria.

Utari bwa nthi butithukitie gukurukua aki kwa miunda no kinya uria vucha iritagwa. Kiri mieri imikai iria ikurukite, urungamiri bwa TIST nibugeretie kurita vucha indi oigita maitia jakejira au. Maitia jaa ni ja: marii ja iguru nkuruki ya uria kubati kana maguri ja nthi nkuruki kiri tukundi tuniini.

Kiri kesi iji marii jakethirua jatinganene na ja tina witikikua. Na nandi, nigwititikitue tukundi tuniini tujukie marii na njira inboro ikwereweka na itina witho. Ni amwe na kuria tukuundi tuniini mwaka jumwe jwa karenda gugitumagirwa ntento iria citari na ciakurukua kuuma kiri utari obwa rua (Mieri ikumi na inana ithiri)

Arimi ba TIST nibakwerewa ati mbeca cia marii ja miti iria bakuriwa narua ni marii ja mbere ja carbon. Marii jaja ja mbere nyumene jakaritwa kuuma kiri baita yao ya rugai rwao rwa marii ja carbon. Niuntu buu, ouria bakariwa jamaingi nou mbeca ciao igatauka. Kwa muguanano, kethira guti marii baranenkerwa, guti mbeca igatauka.

Baria bari uritanine nibekirwe moyo kwariria mantu mwanya mwanya gutetheria gwikira inya cluster ciao na tukuundi tuniini. Baria bari uritanine nibekirwe na tukundi tuniini bariria njira mwanya mwanya iria ikabatethia bacoka kiri Cluster ciao.

Cluster ya Ndalani ya TIST: witi na mbere bwa tukundi tuniini.

Batwi, Cluster ya Ndalani ya TIST ndene ya Machakos County, turi na kugwirua tukira Cluster ingi cia TIST witi na mbere bwetu mwanka nandi. Narua turi na tukundi tuniini mirongo iri na kenda (49) mirongo iri na biiri nibirikitie gutarirwa miti 12,916

Gukurukira kugwatwa mbaru ni muriti wetu uria uritani rua Naomi Kamau, Cluster yetu nithithitie kithurano. Nitugwiritue ni njira injega cia utongerira bwa kuthiurukana mantu jaria tujukitie buru kiri ikundi bietu biniini na micemanio ya Cluster.

Nitugwiritue kwamukira uritani iguru ria Minanda yukiritue. Narua ikundi bibi biniini ja Ngwatanio (2106KE44) nibiambiritie minanda yao

yukiritue. Ikundi bingi bibingi biniini nibikuthoma kuuma kiri gikundi gia Ngwatanio na kuthithia minanda yao.

Gukurukira micemanio yetu ya Cluster, nitumbite kugaa mantu jaria jagutethethia kuumbana na igita riria gutina mbura ja kwithia matigari rungu rwa miti ya maembe kenda twinge tunyomoo turia turijaga miti iji igita ria maciara.

Nitwambiritie kumenyera miti iria ikurute yongwa mono mono acacia antu a gutema twaanda ingi. Njira iji nitethetie amemba ba tukundi tuniini bakuria miti imingi, mono iria yaandi igita ria mbeere kayumaga niuntu bwa riera kuthuka. Nitukwaanda miti ja ya maembe.



TIST kugwata ugeni ageni kuma Taylors Natural Capital Partners na Foundation ya KTDA.

TIST Kenya niamukirite ageni kuuma Taylors, Natural Capital Partners na KTDA Foundation. Ni amwe na Simon Hotchkin, Munene wa witi na Mbere wa Taylors, Ian Brabbin, Munene wa Majani Taylors, Kevin Sinfield, Munene wa Thoko Taylors, Simon Brown, Natural Capital Partners na Mr.Ndiga wa Foundation ya KTDA. Kuriunga kwao ni amwe na miunda ya TIST bakiaragia na baria bari mubangone jwa Tist kiri mucemano jwa uritani jwa atongeria ba TIST kiri factory itaari cia majani.

Kiri micemano ya atongeria ba Cluster nibagwatirwe ugeni ni Ken Henneke, muritani wa TIST na Mutongeria wa CAAC bari na Vannesa Henneke.

Simon Brown na Inder (Batari uritanine) bariungire Cluster ya Ndalani bacemania na arimi ba TIST ba Makomboki, Imenti, na Kionyo. Simon augire “okuria kunthe turethire igoro, turethire arimi bari na wiru bwa ngugi iria bagwita” Kiri Cluster ya Ndalani niturethire arimi bari na mucemano jwa Cluster naria baratwirire mubango jwao jwa kwaanda mangiri ja mitina uria miti iji iri na gitumi kiri kiri bo na njira ya gutetheria muturire jwao, kubaretera mbeba na inya ya kimwiri” Ni bariungire Cluster ya Makomboki naria bethire arimi bakirima miti ya Mibokando iria ya kugita na naangi bathithitie minanda yukiritue.

Ndene ya Imenti, nibariungire factory ya Imenti ya Majani na nyumene bariungira murimi wa TIST, Joshua nanja yawe bathithitie muunda jumunene naria bekite maugu nkuruki ya mirongo itano (50) kwongonera mbeba ingi iria bonaga kuuma kiri wendia bwa naincu.

Kevin, uria urariungite Afrika igita ria mbere nagwirirue mono ni ngugi injega iria arimi ba TIST bagwita kwaanda miti na gutetheria riera ririega ria kwaanda kauwa na majani. :Nkeera antu bangi iguri ria ngugi injega iria bugwita ndene ya TIST ndacoka nthiguru ekwa” Kevin athiria kuuga

Mr.Ndiga wa KTDA agwatire ugeni arimi ba TIST gwitaniria ngugi na gikundi kiu kiri kumenya miti nkuruki iguru ria kuthuranira Minanda ya miti, uume bwa miti ya kugita ba gutetheria arimi bangi kwaanda miti ingi imingi.

Simon Hotchkin erire baria bari uritanine nagwirirue ni TIST riria abariungirite mweri jwa iiri (February) 2014. Augire “Kuriunga kuu nigwatumire Taylors bagwatanira na TIST kiri kureta miti kiri ntuura kenda bokiria miturire yao, boona mbeba nkuruki, bongera mboreo muthetune, kwongera ruuji muthetune amwe na maotethio jangi,” “Ndina kugwirua ni ngugi injega iria bugwita na ingwitikia ati tugaitaniria ngugi igita ririraja na TIST” arongera kuuga

Ian ni mucemi wa majani wa majani ja Taylor, kinya we ni augire niagwirirue ni ngugi injega iria iriti ni arimi ba TIST.

Baria baari Uritanine ni baari na kaanya ga kuria ageni buria . Amwe na biuria biria biorirue ni kuromba mbegu, uume bwa kwaanda miti ya gutema, na kwongerwa kwa kugurwa kwa majani kuuma kiri factory inyingi nkuruki. Kiuria kia mbegu ni kwagwatwa mbaru, Simon nierire baria bari uritanine ati miunda ya miti iria miega buru iria ariungirite ni iria murimi athithitie munanda jwa miti wengwa, kumenya kethira ii miti ya gintuire akaanda, njira iji nituma murimi emenya ati miti iu ni yawe wengwa. Arongera kuuga “miti ya kugita niendaga utalamu bwa mwanya. Ni bwega kugaa uume buu kiri tukundi tuniini gukurikira mubango jwa KTDA” Arikirie na gwikira arimi moyo ati kwewa mbegu ni njira imwe indi ti injega igita rionthe. “Into bia ntuti ti bibiega igita rionthe”

Nyuma ya gukethia baaria bari uritanine bubu, nibariungire Kionyo. Bari amwe na ariti ngugi ba TIST: Jennifer, Kimani na Patricia, nibariungire miunda ya TIST AND Factory ya Kionya ya Majani. Amwe na miunda iria bariungire ni ya George Nkonge na Partick Mureithi. Mr.Nkonge abagwatire ugeni na abonia minanda yawe iiri(2) iria yukiritue iri na miti mithemba imingi. Nkonge nabonerie muunda jwawe jwa gucokaniria. Muundene jwa Patrick bonere minanda yukiritue iri na miti mithema imingi.

TIST Kenya kuthuranira mucemano jwa Cluster cionthe (ACM) Nanyuki Socia Hall



Urimi bwa Kungania miiti na Imera Bingi.



Nteto cia gitumi iguru ria urimi bwa gitegemea bwa kungania miti na imera.

Maana: Gukuria miti amwe na imera bingi bia muunda.

Mworoto jwa kwaanda miti amwe na imera bingi ni gutetheria maciaro ja miunda jongerekete niuntu bwa gutumira miiti. Miiti iji iri na gitumi gikinene kiri murimi. Itumi bimwe ni:

- Mbao cia gwaka nyomba
- Nku
- Matunda na biakuria bingi
- Iria ria ndithia
- Kurigiria muthetu jutigetithue ni ruuji
- Kwongera unoru bwa muthetu
- Kwongera ruuji muthetune
- Kurigiria ruuo rurwingi
- Gwita mianka ya miunda
- Ndawa cia mithemba imingi
- Kureta Mbeca
- Kirugiria muthetu gwita na ruuji

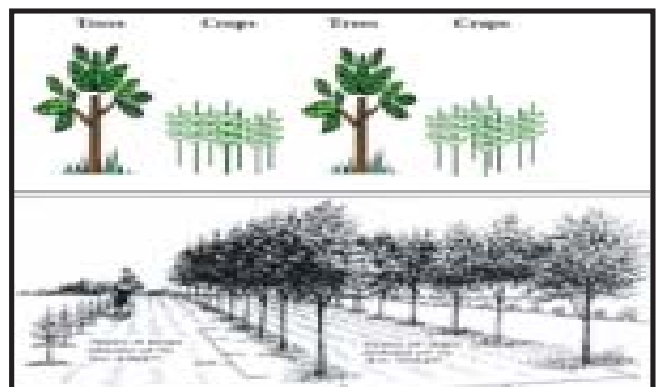
Kurima gwa kungania Imera na miiti: Kuri na njira inyingi na ingi injeru iria ikwenderea kumenyekana o igita na igita. Njira imwe ni injega gitumirwa na ingi ni inthuku. Antu ni babwiri kugeria njira mwanya mwanya na kwirana iria njega nkuruki ya iria ingi igita ria micemano ya kuritanwa.. Aja nandi ni njira iria itumagirwa mono mono kiri urimi bwa kungania imera na miiti.

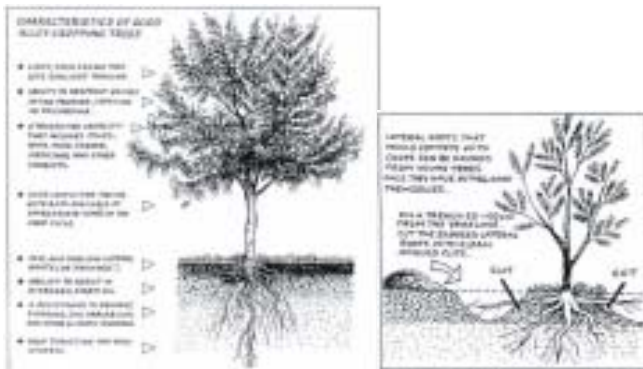
I. Mianka ya miti: Iji ni njira ya kwaanda miti itaari na muraini. Mianka iji itiendaga kaanya gakanene gati gati ka miiti na ni itethagiria kurigiria mono muthetu gukamatwa ni ruuji. Miti iji ni imiega ya gutwira iria ria ndithia kana mati ja gukunikira imeera bia kumiithia. Kionekaria gikiega ni kwaanda miiti ithiurukirite mwanka jwa muunda kana kieni. Watho bwa kwaanda ni mita imwe na nusu mwanka ijiri (1.5M – 2m). Mwaandire juria mwega ni kuungania miiti imiraja na imikui



Croton megalocarpus yaandaniritue na Euphorbia tirucalli amwe na kana na Lantana camara

2. Kwaanda na Mistari: Iji ni njira ya kwaanda miti na twaanya tutuceke mono. Twanya ja twa nusu mita (0.5 – 2M) na mistari gati gati ka mistaari iri kana ithatu ya imera na gwita na mbeere muundeene junthe. Biria bibujanagira mono na njira iji ni imera ja mpempe amwe na Leucaena kana kauwa na marigu. Miiti iria miega mono ya urimi bubu ni iria iretaga riera ririega mithetune. Mianya gatigati ga mistaari iji ni kuuma mita ithano mwanka inyanya (5-8) na igakurikia kithimi kiu. Miiti iji nibwiri kurimirwa na gwitwa sakasi ogita na igita. Miiti iji itibwiri kurekerua irea mono nontu igashindana na imera bingi na bitikura bwega ikwaga biakuria muthetune na weru bwa kungana. Mabura jaria jaiti sakasi nijatethagia kwongera unoru muthetune. Niuntu bwa untu bubu, miti iji itiumba kuriwa ni TIST niuntu no mwanka igitwe ikare iri imikui. Amwe na buu miti iji ni itenthagiria kunoria mithetu ya muunda na kwongera mantu jangi jamega kiri murimi. Miti imwe iria itumagirwa kiri urimi bubu ni kuraga bwega kinya nyuma ya gutemwa. Guku ni ja kuuga no mwanka igitwe o nyuma ya iketha rionthe kurigiria itakanenee mono yambiria gushindanira irio na weru na imera bingi. Urimi bubu bubujaa na miti imitare. Imwe ya miti iji ni Calliandra calothyrsus, Cassia Siamea, Cassia Spectabilis, Eucalyptus ssp, Grevillea robusta, Sesbania Sesban na miti imwe ya Mwiriga jwa Albiza spp.

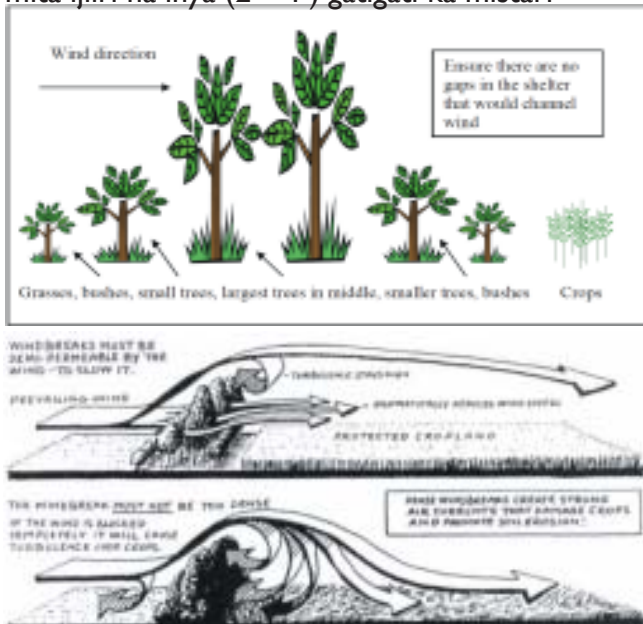




Ni Arimi babaingi bagutumira njira iji ya urimi ya kungania miti na imera amwe? Kethira niu ri, ibakwona urimi bubu bukiatethia? Borie berane uria bakwona urimi bubu bukari na beeje na ntento nkuruki mucamanione juu jungi jwa kuritanwa mantu nkuruki.

Arimi bamwe ibabwiri kugeria kwaanda mistari imikai ya miti miundene yao maanda jaja boone uria maketha jakethirwa jakari. Boona jabui no bongere mistari ingi ya miti maandene jau jangi

3. Miti ya kurigiria Ruuo: Kwaanda miiti na mistari itaraniritie ni itethagiria kurigiria kurutwa mono ni ruuo. Miiti iji ni irigagiria imera kurutwa ni ruuo rurwingi nkuruki. Anda miti imenene gatigati, na iminiini mistarine iu ingi iiri na tumiti tungi tutukui ruteere. Miiti iji ibwiri kwaandwa itegene na naria ruuo rukuma. Twanya twa kwaanda miti iji ni gatigati ka mita inya na ithano (4-5) na mita ijiiri na inya (2-4) gatigati ka mistari



Weega bwa miti lji ya kurigiria ruuo ni ati murimi atiendeka gutumira muunda jumunene kwaanda miiti lji. Miiti iji ijukagia kamunda kaniini aki na mawega ja miiti iji nijamaingi niuntu nijatethagiria kwongera maciara ja munda na kiwango gia mirongo ithatu kiri igana(30%) guntu kumwe na kumwe. ni bwega kumenya ati miti imwe ya kurigiria ruuo ikarega kwaandwa bwega ni ithukagia imera nkuruki nontu ni itemere ruuo njira kwethirwa

gutigi na twanya tutwingi nkuruki ya turia tubwirite. Ni bwega kuuria muntu uria uri na umenyo guguthenteria kubangangania kwaanda muunda jwaku.

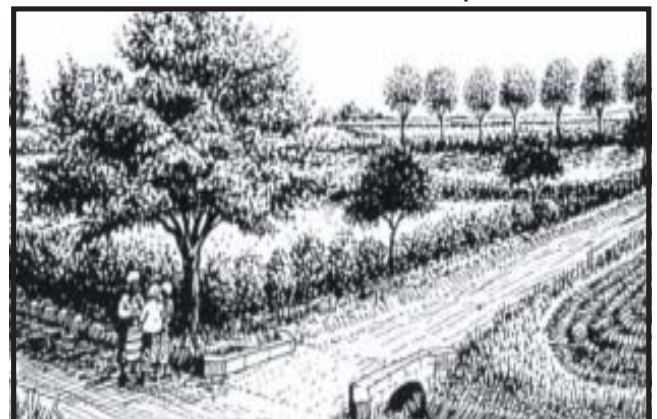
4. Kwaanda Miti Yonka: Urimi bubu ni buria mirimi andaaga miti yonka guti kimera kinya kimwe muundene jwawe. Urimi bubu ni butethagiria muthetu gucokia unoru. Ni bwega mono mono kwaanda tumiti turia twongagiria riera riria mithetu yendaaga mono (nitrogen) ja *Sebania* spp na *Gliricidia* sepium

5. Urimi bwa Kungania: Kwanadaniria miti amwe na imera ukiejaga miti twanya gatigati ka imera biaku. Mithemba imiega ni iria iri na mugunya munini na iyongagira riera ririega muthetune. Tukabwira ntento nkuruki au mber.

6. Kubwithia antu akurithiria: lji ni njira ya kubangania miti muundene jwa kurithia kenda miiti iji Yuma nku na iria ria ndithia ciaku. Ja kethirwa kuri guntu Rwanda nibwega kwaanda ja *Acaciatorilis* kana ingi ja *Salvadora persica*, *cordial sinensis*, *Acasia eliator*, *ziziphus mauritiana*, *Acacia albida*, *Acacia nubica*, *Acacia Senegal*, *Hyphaene compressa*.

Kuri guntu kuria kuumba gukura miiti nkuruki kuringana na riera ria ku ri thugania kwaanda miiti ja *Leucaena Leucocephala*, *Sesbania sesban*, *Calliandra calothyrsus* na *leucaena diversifolia*. Miiti iji no ikwee gancunci ga mirongo iri kiri igana(20%) ga iria ria ndithia ciaku.

7. Urimi bubu ni bwa kwaanda miiti rutere rwa muunda jwaku naria gutikuraa imera bwega. Ja kwaanda miti rurete rwa muunda naria kwina maiga kana mitaro imenene. Miiti iji no yaandwe mundeene amwe na imera na gutumirwa kurigiiria ruuo rurwingi kana kinya kwaandwa ja urimi buria twariririe au mbeere bwa namba inya



8. Gwita mianka. Ja *Croton Megalocarpus* na *Commiphora zimmermannii* subsp. Aritani, menyeni ati miiti ya TIST no mwanka yaandwe bwega na ikejagwa twanya turia tubwiri kenda ikura bwega na ituura muthetune igita ririraja. Njiira Imwe iria twarikia kwariria ya kwaanda miti na imera ni njira injega mono cia



uriimi Indi nibwega kumenya ati no ti mwanka iriwe ni TIST.

Njira ingi cia urimi cia nteere imwe cia Kenya iria cirimaga na njira cia kumenyera mithetu.

Nteere Iria iria iri mpio mono na muthetu ya acidi (Ja nteere iria ciandagwa majani)

Ni bwega kwaanda Calliandra calothyrsus na Morus alba. Iji niejanaga iria ria ndithia.

Gwita mianka ya miunda no waande Croton megalocarpus, Grevillea robusta, Casuarina cunninghamiana, Millettia dura, Hakea saligna.

Thugania kwaanda Plum na pear ja matunda nterene iu.

Nteere iria iti na mpio mono. Ja naria kauwa gakuraa bwega anda miti ja misakaranda (Jacaranda mimosofolia) gwita mianka

Thugania kwaanda Syzygium spp. Kurigiria ruo rurwingi na nteere cia miuro ya ruuji.

Matunda najo ni ja Cyphomandra betacea (Ntunda cia ndamu), Persea americana (mibokado)

Macadamia tetraphylla (macadamia), Passiflora edulis (ntuunda cia muugu), Casimiroa. Edulis (white sapota), Annona senegalensis (custard apple), Psidium guajava (Mbeera), Eriobotrya japonica (ndukuati).

Calliandra, Morus alba, ngirivillea and Markhamia lutea iji ni miiti imiega mono ya kurigiria mithetu gukamatwa ni ruuji.

Ngirivillea ni muti jumwega jwa kwaa kauwa mugunya jumwega.

Nteere cia mpio na guntu guti na rigiri mono na naria guti na miiti:

Thugania kwaanda miti ja Acacia mearnsii, ngiriverea robusta, Hakea saligna, Croton macrostachyus, Dombeya spp., Dodonaea angustifolia, Casuarina cunninghamiana, and Dovyalis caffra. Na kinya miiti imwe ya matunda, ni ikuraa bwega mono nteere Iji.

Mpembe cia Rift Valley na ndairi. Nontu mpembe citikuraga bwega rungu rwa kirundu, thugania kwaanda miiti miniini kana miti ya kurigiria ruo kana ya kurigiria mithetu gwitithua ni ruuji

jayo Ngiriverea robusta, Sesbania spp., Croton macrostachyus, Croton megalocarpus, Acacia abyssinica, Eucalyptus spp., Acacia mearnsii, Casuarina cunninghamiana, Dovyalis caffra, Markhamia lutea, Cordia abyssinica.

Kirikania

Rikana ati ukianda miti ati kinya kethira nikuretagira mantu jamaingi jamega, ni bwega kithithia ucunkuni bwaku kenda umenya munda jwaku bwega na uumba gutaara miti iria igakara bwega mundeene jwaku. rikana ati miri na imera ibicindanagira ruuji na imera, na Imera bingi nabio bitienda mugunya. No urie ntento nkuruki kuuma kiri ikundi biria biri akui na aritani baria bariungaga na miunda.

- Mono mono, uria nkuagaya iguru ria miiti iria iri na miiri iria yorokagira mono na Iria iri na miiri imikai Itiorokagira (ntento iji no igutenthia mono nontu miiri iria itiorokagira nio ishindanagira ruuji na irio na imera bingi) Casuarina spp., Leucaena leucocephala, cupressus lisutanica na Sesbania sesbania iiri miiri itorokagira nthi mono na ibui mono ya gucokanaria mithetu Eucalyptus spp. na Gmelina arborea ni ciitaga kimiko Irigagiria imera bikura bwega.
- Kungania imera na miti no irege kubwa nterene iria cionaga ngai yarungu rwa milimita magana 800mm o mwaka

Utethio

Kuri na mutandao jwa intaneti juejanite ntento inyingi iguru ria urimi bubu bwa kuungania imera na miti aja Kenya. Weenda ntento nkuruki, Thingata andersi iji <http://agroforesttrees.cisat.jmu.edu/>

Mitambo ya video

'Grevillea agroforestry' (6:26) ni Ikwejana ntento Inyingi nkuruki iguru ria miti ya Ngriveria. Video iji ni kwariria mantu jamaingi uria umbu kubangania miti iji kiri urimi bwaku <http://www.accessagriculture.org/node/895/en>

8. Ntento Nkuruki

CARE-International (1989) Agroforestry Extension Training Sourcebook. Module 6: Agroforestry Design. Educational Resources Development Unit, Nairobi.

NEMA (1998) Caring for our environment: A handbook for local leaders. National Environment Management Authority, Kampala.

Mazingira Bora



TIST

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

Kikuyu Version

An Environmental, Sustainable
Development and Community Forestry
Program.



Atongoria a TIST mari mucemano-ini wa Clusters ciothe (ACM) uria urari Nanyuki mweri 21/10/2016.

Thiini wa ngatheti:

TIST Kigomano: **“Kirathondeka Clusters cii na hinya”**. Page 2

Ndalani TIST Cluster: Uthii wa nambere wa ikundi nini. Page 2

TIST kwamukira ageni kuma Taylors, Natural Capital Partners na KTDA Foundation.
Page 3

Uhandi wa miti migunda-ini ya irio. Page 4



TIST Kigomano: “Kirathondeka Clusters cii na hinya”.

Clusters mirongo itatu (30 clusters) maratumite atongoria ao kumarugamirira kigomano-ini kiria kiraharirio mweri 16 – 20 mweri wa ikumi mwaka wa 2016 Gitori conference Centre – Meru.

Mitaratara ya Kigomano (**Conditions of satisfaction (COSs)**) arari; Kugayana uthii wa nambere wa o gikundi gia Cluster, guthoma uthii wa nambere wa uhaririria mwega, guthoma kuhaririria gwa tuta ya iguru, kuhaririria wa urimi mwega, guthoma biacara ya riera, kumenya wira wa o mutongoria wa Cluster, guthoma kumenyerera mititu, guthoma gwakana, guthondenda urata na gwikenia. Kigomano giki kirateithiriirie kuhaririria micemano yothe ya Clusters (ACM)

Kigomano giki ni kiraririirie uhoru wa marihi meru. Marihi maya meru riu maronania uingi wa riera riria ricunge hari o gikundi (small group). Riera ricunge nirio ritikirikanite hari irihi ria o gikundi. Kwa uguo ikundi ni irorio guthoma wega marihi riria makamukira.

Kigomano giki ni kiraririirie gitumi kiria kiratuma ikundi itirahota kugia na riera riega. Macokio kigomano-ini ni maramenyire ati quantification ndinekwo uria kwagiriirwo. No mahinda mamwe groves imwe ni njeru na matiri

maraingirio validation na verification.

Utari muru uthukitie quantification ya groves niundu wa validation na verification niundu wa marihi. Mahinda mahituku, utongoria wa TIST niugeretie kuhitukia marihi, no mahitia makeyumiria. Mahitia mamwe ni ta kuriha makiria kana marihi manini kuri ikundi. Niundu wa uguo marihi maya ti ma uma. Kwa uguo ni kwaiguithaniirio ati ikundi irihuo na njira ya uma na utheri. Uguo ni kuga ati ikundi irihwo oro mwaka kumanagia na uteri wa mieri ikumi na inana mithiru. (last 18 months).

Arimi a TIST ni moi marithi ma miti iria maramukira / marihi ma riera. Marihi maya mathii na mbere ni makunyahia faida ya carbon revenue. Kwa uguo o uria urarihwo mbere no guo marihi maranyiha no angikorwo nduri na marihi ma mbere gutiri kindu ugutinio.

Aria marari kigomano-ini ni maraririirie guteithiriria hinya wa o gikundi (Cluster) na ikundi nini (Small Groups). Kigomano giki kirarehire ikundi nini (small groups) kwaririria maundu maria mareyumiria oro muthenya macoka ikundi ciao. Oro hamwe na macio kurari na monanio ma kuhaririria tuta na urimi mwega. Aria marari kigomano-ini ni marathomire na maranyita wega kwa uguo mathii magathomithie arimi ikundi-ini ciao.

Ndalani TIST Cluster: Uthii wa nambere wa ikundi nini.

Ithui, Ndalani TIST Cluster, iri Machakos County, turi akenu kugayana na TIST Clusters aria angi, uthii witu wa nambere. Umuthi, turi na ikundi nini 49, 22 ya ici ni tuhandite na tugatarirwo miti 12,916.

Hari muteitheriria witu muthomithire, Naomi Kamau, gikundi gitu ni twikite githurano. Nitukenetio ni Cluster Best Practices ya kugarurira utongoria hari ikundi nini na micemano ya Cluster.

Ni tukenete ni gukorwo nituthomithitio kuhaririria tuta (raised seedbeds). Umuthi, ikundi nini ta Ngwatanio (2016KE44) ni mambiriirie tuta cio. Ikuni nini ingi ni marathoma kuma kuri gikundi

kia Ngwatanio na nimarehaririria kwambiriria tuta ciao.

Kumanagia na micemano ya Cluster ni tuteithanitie maundu maingi ma uria tungihurana na wagi wa mbura, gucina mahuti rungu rwa matunda, gutogereria mimera niundu wa kuingata ndingoingo na tutabi riria matunda maratara kiro.

Ni tocokete tukamenyererera miti ya unduiri ta acacia handu ha kweheria na kuhanda ingi. Ino ni iteithiriirie ikundi nini kuhanda miti maingi. Miti maingi ni yumanga niundu wa riera gukorwo ritari riega. Nitucokete tukahanda miti ya matunda na maembe.



TIST kwamukira ageni kuma Taylors, Natural Capital Partners na KTDA Foundation.

TIST Kenya kwamukira ageni kuma Taylors, Natural Capital Partners na KTDA Foundation. Hamwe nao ni, Somon Hotchkin, Mutongoria wa Sustainable Development Taylors; Ian Brabbin, Mutongoria wa Tea Taylors; Kevin Sinfield, Mutongoria wa Brand Marketing Taylors; Simon Brown, Natural Capital Partners na Mr. Ndiga kuma KTDA Foundation. Icera riao rirari hamwe na gucerera migunda ya TIST, kwaria na atongoria a Cluster kigomano-ini, gucemania na atongoria a ithii cia macani (tea factories).

Kigomano-ini kia atongoria a Cluster ni mamenyithanirio na Ben Henneke, muthomithania wa TIST na mutongoria wa CAAC o hamwe na Vannesa Henneke.

Simon Brown na Inder (matiri kigomano-ini) ni macereire Cluster ya Ndalani, na magicemania na arimi a TIST a matura ma Makomboki, Imenti na Kionyo. Simon akiuga “Kuria guothe turacerire ira, turakorire arimi erutiri wira-ini wao. Ta Ndalani turakorire arimi mari mucemano-ini wa Cluster kuria maratwirire kioneki kio gia kuhanda miti makiri tondu miti ni uteithio maica-ini mao ta ugima wa mwiri na kugia na umiritho wa ki mbea”. Ni macokire magithii gikundi-ini kia Makomboki kuria makorire arimi magariarithania makondofia (grafting avocado) na kuhanda miti kuria gutari oro hamwe na kuhaririria tuta.

Mari Imenti ni macereire Imenti Tea Factory na thutha ucio magarierera mugunda wa Joshua, murimi wa TIST. Joshua na family yake ni marutite wira wa bata muno wa miti na kuiga mahugu mirongo itano (50 bee hives), kwa uguo kuongerera umithio kuma hari uki.

Kevin, uria urokite Africa ihinda ria mbere, niakenirio muno ni wira mwega urutitwo ni arimi a TIST wa kuhanda miti kwa uguo guthondeka maria maturigiciirie niundu a macani na kahua. “No nginya njariririe andu angi aingi uria TIST ikiite guku riria ngacoka gwituu,” Kevin akirikiriria.

Mr. Ndiga wa KTDA nierire atongoria a TIST kuruta wira na gikundi giki na guthoma uhandi wa miti, guciarithania miti na matunda (grafting) na guteithia arimi kuhanda miti maingi.

Simon Hatchkin ninerire kiungano uria arakenirio ni TIST riria okire mweri wa keru 2014. Akimera, “Icera riu riatumire Taylors kwinyitithania na kuruta wira na TIST kuhanda miti kuria kuhandagwo macani niguo kwongerera umithio wao, mbea, unoru wa tari, kumenyerera kuria mai maumaga hari mangi maingi”. Ningenete muno ni wira wanyu mwega na nituguthii na mbere kurutithania wira na TIST.” Akiongerera.

Ian, uria ni mucami wa macani wa Talyor Tea akiuga ati niakenetio ni wira mwega urutago ni arimi a TIST.

Aria maragomanite ni maragiire na mahinda mega ma kuria ageni ciuria. Imwe ya ciuria iria ciurithio muno ni maheo mbegu, mathomithio guciarithania miti na matunda na mongerere kugura macani maingi. Hari kuheana mbegu, Simon Brown nierire kigomano ati kuria anacerera migunda minene ya miti ni kuria murimi agwithurira mbegu na miti iria miega kuringana na kuria ari. Niacokire akiuga, “guciarithania miti kurabatarania ugi wa iguru muno. Ni wega ugi ta uyu kugayana na arimi aria angi ikundi-ini cianyu kana guteithirio ni gikundi kia KTDA.” Arikiriirie na kuhe arimi umiriru ati kuheo mbegu ni kwirutira no tio njira iria njega. “Indo cia raithi itikorago iri njega.”

Thutha ucio, thutha wa gucerera itura ria Kionyo matongoretio ni aruti wira wa TIST; Jeniffer, Kimani na Patricia, ni macerire migunda ya TIST na Kionyo Tea Factory. Hari migunda iria macerire ni kwa George Nkonge na kwa Patrick Mureithi. Mr. Nkonge niamonirire tuta igiri (2 raised seedbeds) iria iri na mtiti mwanya mwanya. Hamwe na uguo niamonirire mugunda wake. Mari kwa Patrick, nimonirio tuta ya miti mitukanu.

TIST Kenya ni irachokaniririe mucemano wa Clusters ciothe (ACM) Nyanyuki Social Hall.



Uhandi wa miti migunda-ini ya irio.



Gutariria: Guku ni kuhanda miti hamwe na irio cia mugunda na kuriithia mahiu mugunda-ini umwe.

Gitumi kinene kia urimi uyu ni kwongerera magetha kuhitukira uhandi wa miti.

Miti niikoragwo na mawega maingi kuri arimi.

- Indo cia gwaka.
- Ngu cia riiko.
- Matunda na mangi maingi.
- Irio cia mahiu.
- Kwagirithia tiiri.
- Kwongerera unoru tiiri-ini.
- Kuiga tiiri uri mugunyu.
- Kunyihia ruhuho.
- Kuonania mihaka ya mugunda.
- Dawa cia urigitani.
- Kurehe mbeca.
- Kunyihia tiiri gukuuo ni maai.

Urimi wa agroforestry: kuri na njira nyingi na ingi cirathundurwo. Njira ingi nicikoretwo na umithio kundu kumwe no cigakorwo citakwagirira kuria kungi. Andu nimagiriirwo nikugeria njira ngurani na mathomithanie micemano-ini. Ici ni imwe cia njira cia agro-forestry.

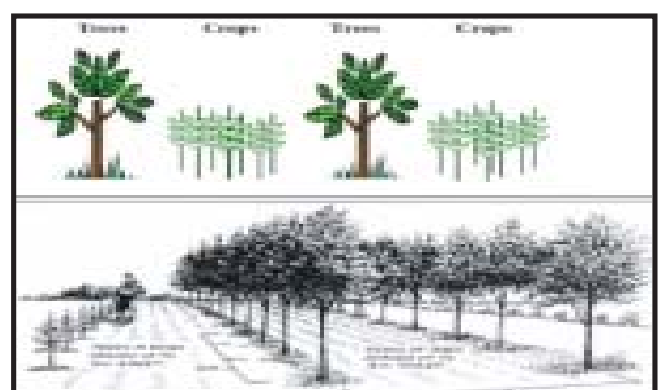
1. Hedges: ino ni njira imwe kuria ucaguraga miti iria ukuhanda na muhari na iri na umithio kuri mugunda. Hedges ibataraga mugunda munini, niugiragiriria tiiri gukuuo ni maai na nourute irio cia mahiu na mahuti ma kuiga ugungu. Muhiano wa hedges ni kuhanda muhari wa miti migunda-ini na utaganu uria mwikirikiku ni 1.5-2M. Njira njega nigutukania miti miraihu n amikuhi. Kwa muhiano *Croton megalocarpus* ihandaniirio na *Euphorbia tirucalli* na *lantana camara*.

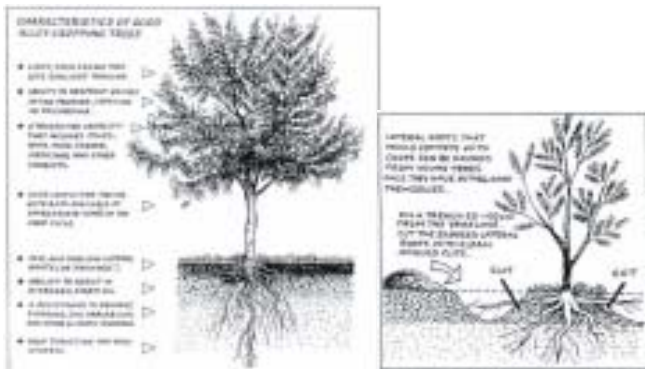
2. Alley cropping: ino ni njira ya guchagura miti ini na utaganu munini wa (0.5-2m) thiini wa muhari



mugunda-ini. Nogukorwo na muhari wa miti urumiriirwo ni mihari 2 kana 3 ya irio cia mugunda. Muhiano wa njira ino ni kuhanda mihari ya mbembe utukanitie na ya leucena kana kahuwa na marigu. Miti iria miega na alley ni iria ithondekaga tiiri. Utaganu wagiriirwo nigukorwo uri wa 5-8M. Miti thiini wa mihari niyagiriirwo nikurimirwo maita maingi kana miti yage kuraiha muno. Ningi, noicindanire irio na riia ohamwe na utheri. Mahuti maria macehwo nomarekio thi niguo mongerere unoru no miti ndingitikirika marihi-ini ma TIST tondu timiraihu , no niiguteithia migunda na njira ingi nyingi. Miti imwe miega na alley niikoragwo na uhoti wa gukura ringi ona thutha wa gutemwo. Uu nikuga ati noitemwe thutha wa kimera niguo ikure iri minene na ihote gukuranira na irio. Njira ino itagwo coppicing, na irutaga wiro na mithemba imwe. Mithemba iria ihuthikaga muno ni *Calliandra calothyrsus*, *Cassia siamea*, *Cassia spectabilis*, *Eucalyptus spp.*, *Leucaena leucocephala*, *Markhamia lutea*. Mithemba imwe niyagagirira riria iri minini, muhiano, *Casuarina spp.*, *Grevillea robusta*, *Sesbania sesban* ana ingi ta *Albizia spp.*

Nikuri murimi uhuthirite urimi uyu wa kuhandaniria miti na irio cia mugunda? Angikorwo nikuri, ni mitukanio iriko yakwagiriire? Morie mamwonie na

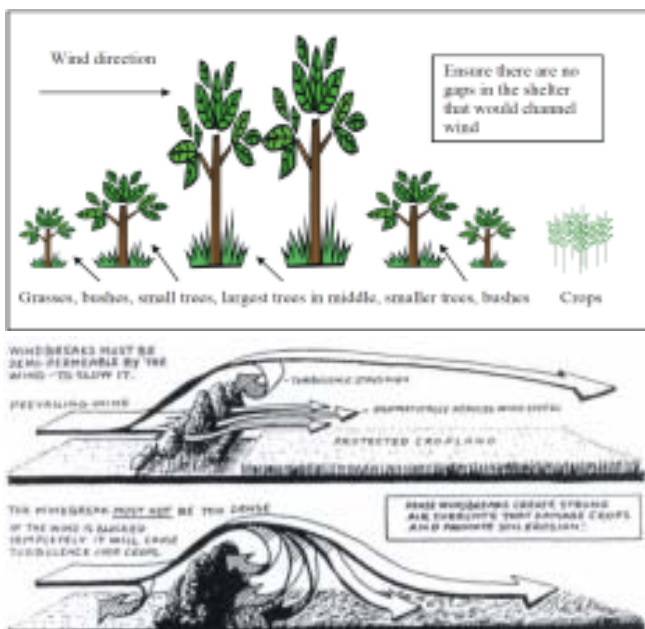




mamuthomithie mucemano-ini. Ringi arimi nomagerie mihari minini ya miti migunda-ini. Niguo macoke mone maciaro. Angikorwo nikuri na umithio, wongerere kimeara kingi.

3. Windbreak: kuhanda miti miingi niguo kunyihia ruhuho niguteithagia irio. Niwega makiria kuhanda miti minene gatagati-ini ka mugunda, mini mininanini mihari-ini iri irumiriire, ithaka na nyeki nja ya mugunda. Na ningi, niiteithagiriria kuhanda miti na njira njega niguo inyihie ruhuho. Gutagania mihari-ini ni gwa 4-5m na 2-4 mihari-ini.

Nikuri na mawega ma kuhuthira windbreaks tondu murimi to muhaka ahuthire gicunji kinene kia mugunda niguo ahande miti. Ihuthagira muconjo umwe na noyongerere maciaro na gicunji kia 30%



miena ingi. Ririkana ati, uhandi utabangitwo wega wa windbreak nouthukie irio makiria tondu nouhitukie ruhuho mianya-ini. Caria mundu uui uhoro uyu niguo akwonererie wega.

4. Fallow Cropping: njira ino ni riria murimi atiga kuhanda irio mugunda-ini na arekereria miti

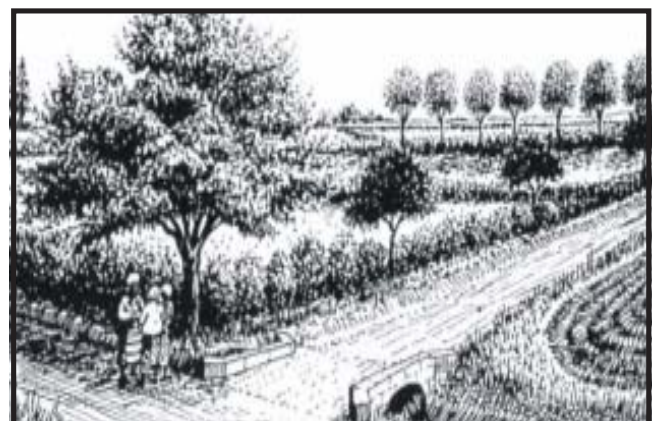
ikure niguo gucokereria unoru wa tiiri. Muno makiria miti iria ikiraga unoru tiiriini niuhuthikaga ta *Sesbania spp* na *Gilricidia sepium*.

5. Inter-cropping: kuhuthira utaganu munene wa miti gatagati-ini ka irio na kuhanda miti iri na gacumbiri kahuthu na kunoria tiiri. Makiria urimi-iri uyu niuguthomitahnio mahinda mokite.

6. Grazing Area Improvement: rira wamenyerera miti yaku mugunda-ini wa kuriithia niguo ugie na ngu hamwe na irio cia mahiu. Kuri kuria kumaga, handa miti ya *Acacia nubica*, *Acacia Senegal*, *Hyphaene compressa*. Kuri kuria kuri na maciaro mega, kuringana na riera, handa *Leucaena leucocephala*, *Sesbania sesban*, *Calliandra calothyrsus* and *Leucaena diversifolia*. Huthira mahuti kuhe mahiu(gicunji kia 15-20%) kimera kia riuwa kuri mahiu.

7. Woodlots: woodlots nini nocikurio mugunda-ini utarahuthika na utari munoru, na uria uri na mahiga maingi, woodlots nouhandwo mugunda-ini niguo unyihie ruhuho kana mugunda muinamu

8. Marking Bouderies: athomithania nimagiriirwo ni kuririkana ati miti ya TIST niyagiriirwo nigutaganio niguo ikure wega na iikare kahinda kanene. Imwe cia njira irianjega kuri urimi, no citingihuthika thiini wa TIST ta *roton*



megalocarpus and *Commiphora zimmermannii* subsp.



Rora maundu maya niundu wa kundu kungi thiini wa Kenya:

Kundu kuri na riera riega (kuria miti ikuraga wega)

Calliandra calothyrsus and *Morus alba* niundu wa irio cia mahiu.

Handa miti muhaka-ini niguu unyihie ruhuho na *Croton megalocarpus*, *Grevillea robusta*, *Casuarina cunninghamiana*, *Millettia dura*, *Hakea saligna*

Huthira orchards kuri miti ya matunda ta prumd, peaches na pears.

Riera ria thi kundu kuinamu kuria kahuwa gakuraga wega.

Huthira jacaranda mimosifolia mihaka-ini

Huthira *Syzygium* spp niguu kunyihia ruhuho na kuhanda njuui-ini.

Handa matunda ta *Cyphomandra betacea* (tree tomato), *Persea Americana* (avocado), *Macadamia tetraphylla* (macadamia), *Passiflora edulis* (passion fruit), *Casimiroa Edulis* (white sapota), *Annona senegalensis* (custard apple), *Psidium guajava* (guava), *Eriobotrya japonica* (loquat)

Calliandra, *Morus alba*, *Grevillea* and *Markhamia lutea*. Nimiega kuhanda niguu kugiririria tiiri. *Grevillea* nimiega ningi niundu wa kiiruru gia kahuwa

Kuria riera riri iguru na kuinamu hanini na miti mitaganu

Huthira windbreaks kugitira irio, mihakana rugiri ta *Acacia mearnsii*, *Grevillea robusta*, *Hakea saligna*, *Croton macrostachyus*, *Dombeya* spp., *Dodonaea angustifolia*, *Casuarina cunninghamiana*, and *Dovyalis caffra*. miti ingi ya matunda noikorwo iri miega

Ruhonge rwa urimi wa mbembe na uriithi wa mahiu Riftvalley.

Tondu mbembe nicikuraga wega handu hari na kiiruru, huthira woodlots kana windbreaks kana miti iria ikuragio kuria tiiri uramenyererwo ta *Grevillea robusta*, *Sesbania* spp., *Croton macrostachyus*, *Croton megalocarpus*, *Acacia abyssinica*, *Eucalyptus* spp., *Acacia*

mearnsii, *Casuarina cunninghamiana*, *Dovyalis caffra*, *Markhamia lutea*, *Cordia abyssinica*.

Kiririkania – ona uhandi wa miti ukirehaga mawega maguo, niwagiriirwo nikuhanda miti iria miega kuri migunda. Ririkana ati miti niicindanagira maai na irio na irio cikaga gukura wega. Caria uhoro kuma ikundi-ini na aruti wira angi.

- Makiria caria utaaro wa miti iria miega iri na miri mirumu (miti ino niikoragwo iri miega na agroforestry tondu miri yayo icindanaga na irio) *Casuarina* spp., *Leucaena leucocephala*, *Cupressus lusitanica*, and *Sesbania sesban* have *shalloe* niikoragwo na miri miega na nimiega hari guthondeka tiiri. *Eucalyptus* spp. na *Gmelina arborea* niithondekaga indo njega ciagukuria irio. Kuhandaniria miti na irio nokwage gukorwo kuru kwega miena iria itamukagira mbura nyingi.

- Resources: rurenda rweka muno ruria ruraheana uhoro wa miti iria miega thiini wa Kenya kuria ungenicaria uhoro uyu ni <http://agroforesttrees.cisat.jmu.edu/>

Video:

‘Grevillea Agroforestry’ (6:26) niwonanagia mawega maingi ma urimi . Niwonanagia imwe cia njira ici ta pollardinf na coppicing <http://www.accessagriculture.org/node/895/en>

References for #8: CARE-International Agroforestry Extension Training Sourcebook. Module 6: Agroforestry Design (1989) Educational Resources Development Unit, Nairobi.

NEMA (1998) Caring For Our Environment: A handbook for local leaders National Environment Management Authority, Kampala.

Tengnäs B (1994) Agroforestry Extension Manual for Kenya International Centre for Research in Agroforestry: Nairobi.

Mazingira Bora



TIST

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

Kiswahili Version

An Environmental, Sustainable
Development and Community Forestry
Program.



**Viongozi wa TIST pamoja wakiwa kwa mkutano wa Cluster zote (ACM) iliofanyika
Nyanyuki tarehe 21/10/2016**

Inside:

Semina ya TIST: “Kujenga Cluster zenye Nguvu”. *Ukurasa 2*

Ndalani Cluster ya TIST: maendeleo yaliyofanywa na vikundi vidogo. *Ukurasa 2*

TIST yapokea wageni kutoka Taylors, Natural Capital Partners na KTDA Foundation.
Ukurasa 3

Kilimo Endelevu: Kilimo Mseto. *Ukurasa 4*



Semina ya TIST: “Kujenga Cluster zenye Nguvu”.

Cluster thelathini(30) zilituma viongozi wao kama wawakilishi kwenye semina iliyofanyika tarehe 16 hadi 20 ya mwaka wa Oktoba kwenye jumba la mikutano la Gitoro

Hali ya kutimiza (COSs) zilikuwa: Kushiriki mafanikio ya kila moja ya Cluster; kujifunza juu ya kukuza njia bora za ukulima, kujifunza namna ya kuunda minanda iliyoinuliwa, kutengeneza shamba kwa kilimo hifadhi, kujifunza zaidi kuhusu biashara ya caboni na kuelewa zaidi juu ya jukumu yao kama viongozi wa Cluster zao, kujifunza kuhusu kuunda mipango ya misitu, kujifunza kuhusu kejengana na kufanya marafiki na kuwa na furaha. Walioshiriki kwenye semina hiyo watasaidia zaidi kupanga mkutano wa Cluster zote (ACM)

Semina pia iliongea juu ya malipo mapya ya vocha. Vocha mpya sasa inaonyesha kipimo cha caboni iliyotengwa na vikundi vidogo na vile vile kudhibitishwa. Caboni iliyotengwa ni kipimo kilicho patikana nyuma ya kupimwa wakati ambapo caboni iliyodhibitishwa ni ile ambayo inaweza kuuzwa ambayo inatoka nyuma ya kudhibitishwa na kupimwa. Caboni iliyopimwa ndio inauzwa ili kupata mapato ya caboni. kwa hivyo, vikundi vidogo vinashauliwa kusoma vocha zao wakati watakapo zipokea.

Washirika wa semina walikuwa na wasi wasi kwa nini caboni ya vikundi vidogo haijadhhibitishwa na kwa hivyo ni caboni ambayo haiwezi kuuzwa. Kwa kujibiwa, semina iligundua kwamba baadhi ya matukio haya kudhibitishwa kumefanywa kwa njia mbaya ma kwa hivyo baadhi ya mashamba hayapiti kudhibitishwa na kuhesabiwa. Baadhi ya matukio mengine ni kwamba, mashamba mengine ni mapya na bado hayajajumuishwa kwa udhibitishaji na

kuhesabiwa

Udhibitisho uliofanywa vibaya haujaadhiri tu kufuzu kwa mashamba kwa kuhesabiwa na kudhibitishwa ila pia njia ya kutoa malipo ya vocha. Miezi kadhaa iliyopita, usimamizi waTIST umekua ukijaribu kutoa vocha lakini kila wakati makosa fulani utokea. Makosa haya yanajumuisha malipo ya zaidi ama malipo ya chini kwa vikundi vidogo. kwa tukio hili, malipo yanyofanywa si uhakika na uaminifu. Na hivyo, kulikubaliwa vikundi vidogo kupokea malipo yao kwa njia iliyo rahisi kuelewa na iliyo wazi. Hii inajumuishavikundi vidogo kwa muda wa mwaka mmoja kwa kutumia data kutoka kwa udhibitisho uliofanywa hivi maajuzi (miezi 18 iliyopita)

Wakulima wa TIST wanaelewa ya kwamba malipo ya miti yalipokelewa leo ni ya mbele ama malipo ya kabla ya Caboni. Malipo haya ya kabla yatatolewa kwa faida yao ya mapato yao ya mauzo ya caboni. Kwa hivyo, vile malipo ya kabla yanavyofanywa kwa wingi ndiyo yatakayo tolewa kwa mapato. Kwa mfanokama hakuna malipo ya kabla yamefanywa, hakuna mapato yatakayotolewa. Washiriki wa semina walitiwa moyo kujadili njia mbali mbali za kusaidia kuimarisha Cluster zao na vikundi vyao vidogo. Semina ilihusisha washiriki kufanya kazi pamoja kwa vikundi vidogo kujadili mawazo mbali mbali na kutoa mawazo mema yanayoweza kutekelezwa wakirudi kwa Cluster zao. Zaidi ya hayo, kulikuwa na maonyesho ya vitendo ya minanda iliyoinuliwa na kilimo hifadhi. Washiriki walipokea vifaa vya mafunzo ambavyowalijadiliana na kuelewa zaidi ili waweze kufunza wakulima kwa Cluster zao.

Ndalani Cluster ya TIST: maendeleo yaliyofanywa na vikundi vidogo.

Sisi, Cluster ya Ndalani Kaunti ya Machakos, tuna furaha kushiriki na Cluster zingine za TIST hatua tulizopiga mbele kimaendeleo hadi sasa. Leo tuko na vikundi vidogo arobaini na tisa(49) lshirini na viwili(22) ya vikundi hivi, vimekaguliwa miti elfu kumi na nbili, mia tisa na kumi na tisa. (12,916)

Kupitia kwa msaada wa mtumishi wetu aliyehitimu hivi karibuni, Naomi Kamau, Cluster yetu imefanya uchaguzi. Tumefurahishwa na njia bora za uongozi wa mzunguko na uongozi wa utumishi ambao umetuvutia sana kwa vikundi vyetu vidogo na mikutano ya Cluster.

Tumeshukuru tumepokea mafunzo kuhusu minanda iliyo inuliwa. Leo, vikundi hivi vidogo kama hivi Ngwatanio (2016KE44) vimeanza kuunda

minanda yao imeinuliwa. Vikundi vingine vinajifunza kutoka kwa kikundi cha ngwataniro na kuanza kuunda minanda yao wenyewe.

Kupitia mikutano ya Cluster. Tumeweza kushiriki mawazo muhimu yanayotusaidia kupambana na changa moto zinazotukumba kufuatia ukame kama kuchoma mabaki chini ya miti ya maembe kuzuia wadudu wanaovamia miti hii wakati wa kutoa maua.

Vile vile tumeanza kuchunga miti inayokua yenyewe kama Acacia badala ya kungoa na kupanda ingine. Hii imesaidia wanachama wa vikundi vidogo kukuza miti mingi zaidi, miti iliyo pandwa upya inakauka kwa sababu ya ukame. Pia tunapanda miti ya matunda kama ya maembe.



TIST yapokea wageni kutoka Taylors, Natural Capital Partners na KTDA Foundation .

TIST Kenya ilipokea wageni kutoka Taylors, Natural Capital Partners and KTDA Foundation. Wanajumuisha Simon Hotchkin, Mkuu wa Sustainable Development Taylors, Ian Brabbin, mkuu wa majani chai Taylors, Kevin Sinfield, Mkuu wa Soko Taylors, Simon Brown, Natural Capital Partners na Mr. Ndiga kutoka KTDA Foundation. Safari yao ilihusisha kutembelea mashamba ya TIST, kuongea na wasimamizi wa Cluster, kukutana na wasimamizi wa viwanda vya majani vilivyochaguliwa.

Wakati wa semina hii ya wakuu wa Cluster, walijulishwa kwa washiriki wa semina na Ben Henneke, mkufunzi wa TIST na Rais wa CAAC pamoja na Vannesa Henneke.

Simon Brown na Inder (Hawakua kwenye semina) walitembelea Cluster ya Ndalani na kukutana na wakulima wa TIST wa Makomboki, Imenti na Kionyo. Simon asema “kila mahali tilipotembea jana, tulipata wakulima wenye hamu ya kazi wanayoifanya. Kwenye Cluster ya Ndalani hasa, tulikuta wakulima wakiwa kwa mkutano wa Cluster, ambapo walishiriki na sisi mpango wao wa kupanda maelfu ya miti, na vile hii miti imekuwa na manufaa kwao kwa njia ya kuboresha maisha yao, riziki, mapato na afya yao” vile vile wali watembelea Makomboki ambapo walikuta mkulima nayefanya avocado ya kupandikizwa na kupanda miti na kutengeza minanda iliyoinuliwa.

Imenti, walitembelea kiwanda cha Majani cha Imenti na baadaye wakatembelea shamba la Joshua, mkulima wa TIST. Joshua na familia yake wametengeneza shamba ashara ya miti ambayo iko na mizinga ya nyuki zaidi ya hamsini(50) ambapo wanapata mapato kutokana na asali.

Kevin, ambaye alikuwa Afrika kwa mara yake ya kwanza, haswa alifurahishwa na kazi murua inayofanywa na wakulima wa TIST ya kupanda miti hivi kwamba kutoa mazingira bora kwa upanzi wa kahawa na majani chai. “Nitaeleza watu juu ya kazi nzuri inayofanywa hapa TIST nikirundi kwetu” Kevin alimalizia kusema.

Bwana Ndiga of KTDA alikaribisha viongozi kufanya kazi na mpango kwa kuelewa kuunda minanda ya miti, miti ya kupandikizwa na kusaidia wakulima wengine kupanda miti mingi zaidi.

Simon Hotchin aliambia washiriki was Semina

vile alifurahishwa na TIST wakati alipotembea mwezi wa Februari 2014. Alisema “safari hiyo ilisisimua Taylors kushiriakana na kufanya kazi pamoja na TIST kuleta miti kwa jamii ili kuboresha riziki yao, mapato na rotuba kwa mchanga na kuongeza kiwango cha maji kwa mchanga pamoja na manufaa mengine” “nimefurahishwa na kazi yenu nzuri na nataraji kuwa na muda mrefu wa kufanya kazi na TIST” aliongeza

Ian ambaye ni mtaalam wa chai Taylors pia alisema amefurahishwa na kazi nzuri inayofanywa na wakulima wa TIST.

Washiriki wa semina walipata nafasi ya kuuliza maswali. Baadhi ya maswali yaliyo ulizwa ni kuomba kepewa mbegu, ujuzi waupandikizaji na upanuzi wa kununuliwa kwa majani chai kutoka kwa viwanda vingi zaidi. Kwa swali la kupewa mbegu, Simon alisema ya kwamba mashamba yenye mafanikio ni yale mkulima mwenyewe ameunda mnanda yeye mwenyewe ambapo anaamua kama ni miti ya kienyeji atakayopanda. Hiyo inampa mkulima umiliki” Aliongeza “miti ya kupandikizwa inahitaji ujuzi maalum. Ni muhimu kwa ujuzi huu kushiriki kwa vikundi vidogo na labda kufanywa hivyo kupitia ushirikiano wa Foundation ya KTDA” Alimaliza kwa kutia wakulima moyo kwa kuwaambia ya kwamba mbegu za bure ni njia moja lakini si nzuri kila wakati. “Vitu rahisi si vizuri kila wakati”

Baadaye baada ya kusalimia washiriki wa Seminar, walitembelea eneo la Kionyo. Wakiandamana na Mfanyi kazi wa TIST Jeniffer, Kimani na Patricia, walitembelea mashamba ya TIST and Kiwanda cha majani chai cha Kionyo. Mashamba yaliyotembelewa ni pamoja na shamba la George Nkonge nad Patrick Mureithi. Bwana Nkonge aliwakaribisha na kuwaonyesha minanda miwili (2) iliyoinuliwa ambayo imepandwa miti aina mbali mbali. Pia Nkonge aliwaonyesha shamba lake la kilimo hifadhi. Kwa shamba la Patrick waliona mnanda ulioinuliwa yenye miti mbali mbali.

TIST Kenya kufanya mkutaano wa Cluster zote Nanyuki Social Hall.



Kilimo Endelevu: Kilimo Mseto.



Mada muhimu kwa kilimo endelevu ni Kilimo mseto.

Ufafanuzi: Kupanda miti na vichaka pamoja na mimea ya chakula au mifugo.

Lengo la kijumla la klimo mseto ni kuongeza uzalishaji wa ardhi kupitia matumizi ya miti. Miti ina faida nyingi kwa mkulima:

- Vitu vya ujenzi
- Kuni
- Matunda na chakula kinginecho
- Chakula cha mifugo
- Kutuliza udongo
- Rutuba ya udongo
- Kuweka unyevu
- Wind shelter
- Kiashiria cha mipaka
- Dawa
- Mapato ya kifedha
- Kupungua kwa mmomonyoko wa udongo (iwapo safu ya taka au mimea itatandazwa)

Mitindo katika kilimo mseto:

Kuna mbinu mbalimbali na zingine mpya zinazogunduliwa kila wakati. Baadhi ya mbinu hufanikiwa mahali pamoja na kuwa na maafa kwingine. Watu wanahitajika kujaribu mbinu mbalimbali na kugawana mitindo iliyo bora zaidi katika mikutano ya mafunzo. Zifuatazo ni baadhi ya mbinu zinazotumika sana sana katika kilimo mseto:

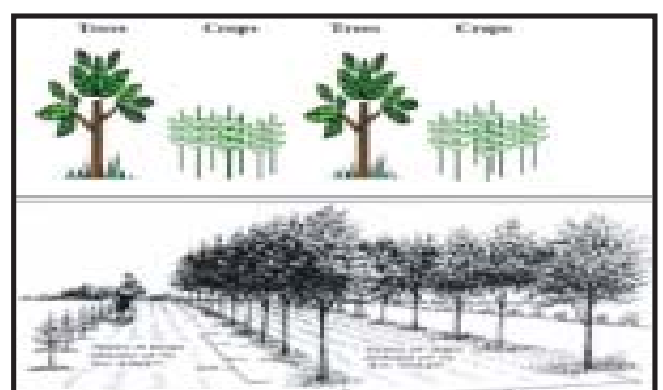
I. Nyua: Hili huhusisha kuchagua aina ya mti utakaopandwa kwa mstari na ambao una faida kwa ardhi. Nyua huhitaji nafasi ndogo, huzuia mmomonyoko wa udongo na hutengeneza majani kwa ajili ya chakula cha mifugo na matandazo. Mfano wa kutengeza ua ni kupanda miti kwa mstari ikizunguka mpaka wa shamba.

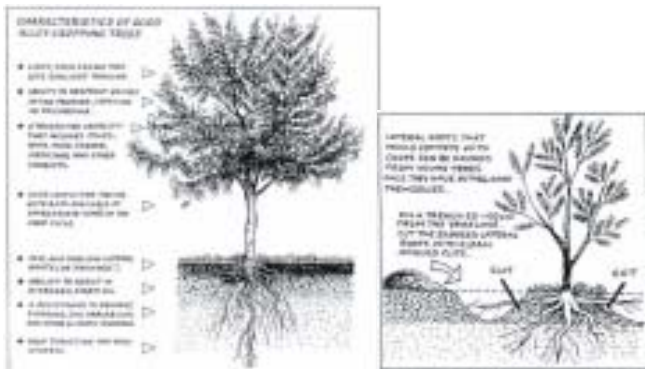
Nafasi kati ya miti inayopendekezwa ni kati ya mita moja na nusu na mita mbili. Njia bora zaidi ni kuchanganya miti mirefu na mifupi.

Kwa mfano *Croton megalocarpus* wawezwa pandwa pamoja na *Euphorbia tirucalli* pamoja na lau *Lantana camara*.



2. Kilimo mseto kwa mistari: Hili huhusisha kupanda miti iliyo na nafasi ndogo sana (nusu mita kufika mita mbili) iliyopandwa kwa mistari shamba lilivyo. Kwaweza kuwa na mstari wa miti halafu mistari miwili au mitatu ya mimea, halafu mstari mwingine wa miti, halafu mimea, na kadhalika. Mfano wa hili ni kupanda mistari ya mahindi iliyoandana na *Leucaena* au kahawa na ndizi. Miti iliyo bora zaidi ni ile ya familia ya kunde (inayoweka naitrojeni udongoni). Nafasi kati ya mistari ya miti yafaa kuwa mita tano kufika nane. Mistari hiyo ya miti yafaa kupaliliwa na kupunguzwa majani mara kwa mara. Miti hiyo isiwe mirefu au itaanza kupigana na mimea ili kupata virutubisho na mwangaza. Majani yaliyokatwa yaweza kuongezwa kwa udongo ili kuongeza rutuba ya udongo. Kwa hivyo miti hii haitaweza kupata malipo ya TIST, kwani inafaa kuwekwa ikiwa mifupi, lakini itaboresha ardhi kwa kilimo na kumpa mkulima faida zingine nyingi. Baadhi ya mimea mizuri ya kupanda pamoja na mimea huweza kukua tena inapokatwa. Kumaanisha inaweza kukatwa kila msimu wa mimea ili isiwe mikubwa sana isije ikapigana sana na mimea. Mtindo huu unaitwa 'copicing' na hufanikiwa kwa baadhi ya mimea. Aina za miti hii ni *Calliandra calothyrsus*, *Cassia siamea*, *Cassia spectabilis*, *Eucalyptus* spp., *Leucaena leucocephala*, *Markhamia lutea*. Baadhi ya miti humea tena vizuri inapokuwa change lakini haime tena inapokomaa kwa mfano *Casuarina* spp., *Grevillea robusta*, *Sesbania sesban* na baadhi ya *Albizia* spp.

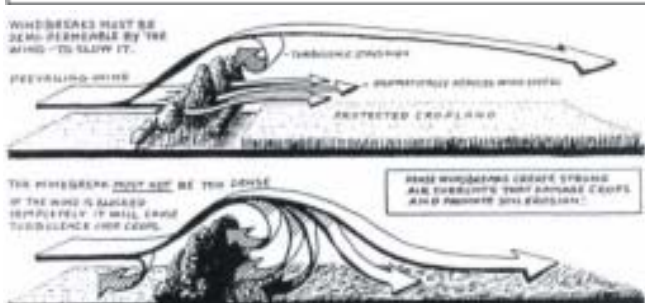
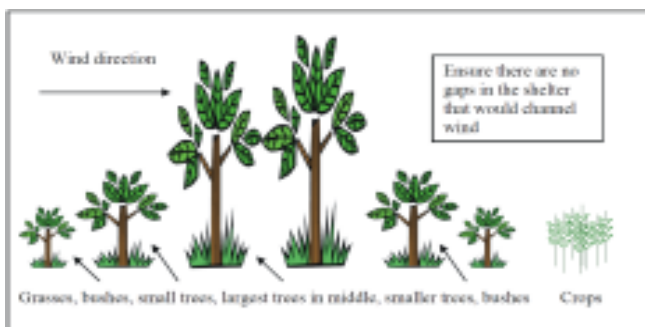




Je, wakulima wametumia jinsi hii ya kupanda miti na kulima? Kama ndivyo ni njia gani mwafaka ya kuchanganya? Wauleze wajandiliene na wakuje na majibu kwenye mkutano ujao.

Pengine wakulima wanaweze jaribu mistari kadhaa kwenye mashamba zao. Wangalie majibu. Kama majibu iko sawa waongeze mistari mingine musimu ujao

3. Kizuia upepo: Kupanda miti iliyofuatana ili kutengeneza kizuia upepo. Miti hii hulinda mimea kutokana na upepo unaokuja. Panda miti mikubwa kati kati, midogo zaidi mistari miwili inayofuata na miti mifupi, vichaka na nyasi nje. Panda ikiwa dhidi ya upepo unaokuja. Nafasi kati ya miti iwe mita nne au tano na mbili kufika nne kati ya mistari.



Faida ya viziua upepo ni kuwa mkulima si lazima hatoe shamba lote ili kupanda miti. Inachukua kipande cha ardhi na faida zaweza ongeza mazao kwa asilimia thelathini katika baadhi ya maeneo. Kumbuka kuwa viziua upepo visivyopangiwa vizuri vyaweza kuharibu mimea kwani vinaweza kupitisha upepokupitia nafasi. Tafuta mtu aliye na ujuzi kukusaidia kupanga kizuia upepo.

4. Kupumzisha ardhi:

Hapa ni ambapo wakulima huacha kupanda mimea kwa kipande cha ardhi na kuiacha miti kumea ili kusaidia kurejesha rutuba ya udongo. Ni miti mifupi inayoweka naitrojini udongoni inayochaguliwa mara nyingi kwa mfano *Sesbania* spp. na *Gliricidia* sepium.

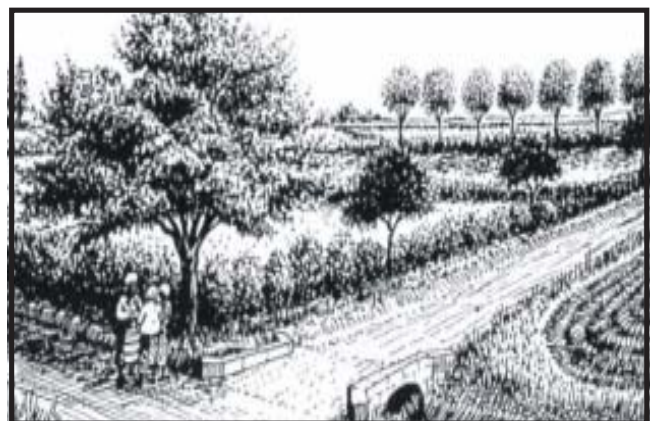
5. Kuchanganya mimea na miti: Hili huhusisha kupanda miti yenye nafasi kubwa kati kati ya mimea. Miti mizuri ni isiyo na matawi mengi na inayoweka naitrojini udongoni.

6. Kuboresha pahali pa kulisha mifugo: kuchunga miti iliyo katika ardhi ya kulisha mifugo ili kukupa kuni na chakula cha mifugo. Kwa mfano, katika maeneo kame fikiria kupanda *Acacia tortilis* ama baadhi ya miti ifuatayo: *Salvadora persica*, *Cordia sinensis*, *Acacia eliator*, *Ziziphus mauritiana*, *Acacia albida*, *Acacia nubica*, *Acacia Senegal*, *Hyphaene compressa*.

Katika maeneo mazuri zaidi, kulingana na urefu juu ya ziwa, panda *Leucaena leucocephala*, *Sesbania sesban*, *Calliandra calothyrsus* na *Leucaena diversifolia*. Fikiria kuhusu malisho ya nyongeza kutumia majani (asili mia kumi na tano kufika ishirini ya malisho) wakati wa ukame ya mifugo wako.

7. Misitu midogo wa miti:

Miti mifupi yaweza kupandwa katika maeneo yasiyotumika au yasiyozalisha, kwa mfano miti ilipondwa katika eneo lenye mawe yaliyojitokeza juu na katika mitaro. Miti mifupi pia yaweza kupandwa katika ardhi yenye mimea kufanya kazi ya kizuia upepo, ama yaweza kupandwa katika ardhi iliyopumzishwa.



8. Kuashiria mipaka e.g. *Croton megalocarpus* na *Commiphora zimmermannii* subsp.

Wanaofunza, jua kuwa miti ya TIST inapewa nafasi nzuri ili ikue inavyofaa na ikae ardhini kwa muda mrefu. Baadhi ya mbinu za kilimo mseto zilizo hapo juuni mitindo bora zaid ya kilimo lakini miti haitaweza kupata malipo ya TIST.



Fikira zingine za kujaribu katika baadhi ya maeneo ya kiasiri Kenya.

Miteremko iliyo katika maeneo ya urefu mkubwa yenye udongo wenye acidi (kwa mfano ambapo majani chai hukua vizuri).

Fikiria kupanda *Calliandra calothyrsus* na *Morus alba* kupata chakula cha mifugo.

Kupanda mipaka na viziua upepo fikiria miti kama *Croton megalocarpus*, *Grevillea robusta*,

Casuarina cunninghamiana, *Millettia dura*, *Hakea saligna*.

Kwa matunda fikiria miti ya bustani (kama plums, peaches, pears).

Miteremko iliyo maeneo yenye urefu mdogo (kwa mfano ambapo kahawa hukua vizuri)

Fikiria kupanda *Jacaranda mimosifolia* kama mti wa kutengeza mipaka

Unweza panda *Syzygium* spp. Ili kuziua upepo au kando ya mikondo ya maji.

Fikiria kupanda miti ya matunda kama *Cyphomandra betacea* (tree tomato), *Persea americana* (avocado), *Macadamia tetraphylla* (macadamia), *Passiflora edulis* (passion fruit), *Casimiroa edulis* (white sapota), *Annona senegalensis* (custard apple), *Psidium guajava* (guava), *Eriobotrya japonica* (loquat).

Calliandra, *Morus alba*, *Grevillea* na *Markhamia lutea* ni miti mizuri ya kupanda katika maeneo unayotaka kudhibiti mmomonyoko wa udongo (miundo ya kuhifadhi udongo).

Grevillea ni mti mzuri wa kuipa mimea ya kahawa kivuli

Maeneo tambarare yaliyo na urefu mkubwa, yenye ardhi iliyo na mteremko mdogo na miti michache:

Kama viziua upepo ili kulinda mimea yako, miti ya mipaka na nyua zilizo hai fikiria miti kama *Acacia mearnsii*, *Grevillea robusta*, *Hakea saligna*, *Croton macrostachyus*, *Dombeya* spp., *Dodonaea angustifolia*, *Casuarina cunninghamiana*, and *Dovyalis caffra*. Baadhi ya miti ya matunda inayokua mahali penye joto la kawaida yaweza kukua vizuri. Mfumo wa mahindi na maziwa katika bonde la ufa kwa sababu miti haikui vizuri chini ya kivuli, fikiria miti mifupi ama viziua upepo au miti inayopandwa

katika mifumo ya kuhifadhi udongo kwa mfano *Grevillea robusta*, *Sesbania* spp., *Croton macrostachyus*, *Croton megalocarpus*, *Acacia abyssinica*, *Eucalyptus* spp., *Acacia mearnsii*, *Casuarina cunninghamiana*, *Dovyalis caffra*, *Markhamia lutea*, *Cordia abyssinica*.

Kumbuka

Kumbuka kuwa ingawa kupanda miti huleta faida nyingi unahitajika kutafiti kuhusu aina bora zaidi kwa aina maalum ya ardhi yako. Kumbuka kuwa miti hushindana na mimea kupata maji na mimea mingine haipendi kivuli kingi, kwa mfano. Pata taarifa kutokana na vikundi vidogo vilivyo karibu nawe na wafanyikazi katika sekta ya kilimo.

- Pata ushauri sana sana kuhusu aina ya miti inayofaa iliyo na mizizi inayofika chini zaidi na yenye mizizi ya juu michache (miti hii ina faida katika kilimo mseto kwa sababu mizizi ya juu hushindana na mimea). Mizizi ya *Casuarina* spp., *Leucaena leucocephala*, *Cupressus lusitanica*, na *Sesbania sesban* have shallow yaweza kuwa bora kwani inatuliza udongo katika maeneo yanayohifadhiwa. *Eucalyptus* spp. na *Gmelina arborea* hutengeneza misombo inayozuia mimea kukua.
- Kupanda mimea pamoja na miti haifanikiwi san asana katika maeneo yanayopata mvua isiyozidi milimita mia nane kila mwaka.

Marejeo:

Kuna tovuti inayosaidia sana iliyo na maelezo kuhusu miti mwafaka kwa kilimo mseto katika Kenya. Waweza kutafuta maelezo kuhusu miti maalum. Ipo hapa:

<http://agroforesttrees.cisat.jmu.edu/>

Video

'Grevillea agroforestry' (6:26) hukupa utangulizi kuhusu faida kadhaa za *Grevillea* katika mseto ya ukulima. Inaeleza baadhi ya taratibu katika usimamizi kama kukata vichwa na kukata miti kabisa. <http://www.accessagriculture.org/node/895/en>

8. Marejeo

CARE-International (1989) *Agroforestry Extension Training Sourcebook*. Module 6: *Agroforestry Design*. Educational Resources Development Unit, Nairobi.

NEMA (1998) *Caring for our environment: A handbook for local leaders*. National Environment Management Authority, Kampala.

Tengnäs B (1994) *Agroforestry Extension Manual for Kenya*. International Centre for Research in Agroforestry: Nairobi.

Mazingira Bora



TIST

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

Kikamba Version

An Environmental, Sustainable
Development and Community Forestry
Program.



Atongoi ma TIST nthini wa wumbano wa Ngwatnio syonthe (ACM) ula unai Nanyuki matuku 21/10/2016

Inside:

Semina ya TIST “**Kuseuvya Ngwanio Numu**”. Page 2

Ngwatanio ya Ndalani: Kuendeeza kwa tukundi tunini. Page 2

TIST kuthokewa ni Aeni kuma Taylors, Natural Capital Partners na KTDA Foundation.
Page 3

Uimi kana ndilikasa ya kuendeeza. Page 4



Semina ya TIST “Kuseuvia Ngwanio Numu”.

Ngwatanio miongo itatu (30) ninatumie atongoi masyo nthini wa semina ila ineethiwe matuku 16 - 20/10/2016 nyumbani ya kumbania ya Gitoro (Gitoro Conference Centre).

Semina ino yaina ivuso ya kwianiwa (Conditions of Satisfaction) nikwithiwa kila umwe niwaeleasya iulu wa kila ngwatanio yake ivikiite na maunene ala mekite na moseo ma kuatiia (best practices), kumanyiany'a undu wa ivuio sya itanda na undu wa useuvia miunda na itheka kwa nima ya kusuvia (Conservation Farming), Kumanyiany'a mbeange iulu wa Viasala wa nzeve itavisaa (Carbon business), kuelewa ilio syoo na maukumu ta atongoi ma ngwatanio na ikundi, kumanyiany'a undu wa kuatiia mawalanio ma mititu (forest plan), kumanyiany'a iulu wa kwakana, kutuma nduu na kwithiwa na ivinda ya utana. Ingi ala mai nthini wa semina ino nimatetheeisyee undu wa kwikia walany'o wa ngwatanio syoonthe (All Clusters Meeting (ACM))

Ingi nthini wa semina ino nima neenaniisye mathangu meu ma ndivi (new Payment Voucher), Mathangu meu ma ndivi yu monanasya ni kiasi kiana ata kya nzeve itavisaa kitaliku kwa kila kakundi kanini na ni nzeve itavisaa yiana ata mbitukithye kutewa. Nzeve itavisaa ndaliku ni ila italawa ivinda na kuthianwa na nzeve mbitukithye ni ila itina wa kuthianwa na kuvitukithwa kutewa nthini wa soko ya uta nzeve itavisaa. Kwoou ikundi na tukundi twakwata ithangu ya ndivi nituukulwa tuisisye na kuelewa kwianana na nzeve ila nthiane na ila mbitukithye nundu ila mbitukithye niyo itonya kuete ukwati.

Alai mavikite nthini wa semina nimaseng'aa na kukulania niki nzeve ila thiane kuma tukundini itatalikaa ta ya kutewa. Kwa kukunikilwa veethiwa

kana yila kuuthianwa na kuvitukithw'a isio imwe iyikawa nesa undu vaile na miti imwe iyithiawa yitilikite ta ya kuthianwa na kuvitukithw'a. Kungi nikana miti niminini na ndinamba kwiana undu italwa. Kwa nzia ino uyithia niyanthianwa na nditonya utalika kwa kuvitukithw'a kuete ndivi.

Nthini wa myai mithelu aangamii ma TIST nimatatite useuvia mathangu ma ndivi indi omaendee vayumila uvathukanu nthini wa miti ila mithiane na kuvitukithw'a kii kiituma amwe maivwa ndivi yi iulu kwiundu maile uivwa angi mayiivwa tunini na kwoou uyithia ndivi ti sya w'o na aki. Kwoou wotheia walany'o no uetiwe ungi tukundi tukaivawa kwa nzia nthi na nzia ikueleeka ta kwa ndivi ya imwe kwa mwaka tuitumia livoti ya myai ta 18 mithelu ya kuthianwa na kuvitukithwa.

Aimi ma TIST nimesi na nimaleetwe kana ndivi ila makwataa ni aluvasi ya kuma uti wa nzeve itavisaa. kwoou miti yoo yambiia utalika ta imwe yina utonyi wa kuta nzeve isavisaa mbesa ila manengiwe ikamba kuolwa matanaivwa. Kwoou oundu makwatite aluvanzi nene now'o vaita woo ukaoleka mabiia uta nzeve kuma mitini yoo. Na ethiwa mayaanengwa alugvanzi vaita woo ukeethiwa utemuole.

Ala mai nthini wa semina nimathuthiwe maneenanisye mawoni kwikia vinya ngwatanio syoo na ikundi.

Kuneenanisya mawoni kivathukanio na undu wa mawoni maseo kwa ikundi na tukundi nikwithiwa onthe nimatumite andu nthini wa semina ino. Ingi nimeethiwe na mawonano ta mauseuvia kivuo kya kitanda, na nima ya kusuvia. Ingi ala maivo nimamanyiiw'e na manengwe syindu sya uvundisya na maneenanisya na kuelewa nesa undu wa kuitumia nikana makavundisye aimi ala angi me ikundini na ngwatanioni syoo.

Ngwatanio ya Ndalani: Kuendee kwa tukundi tunini.

Ithi aimi ma ngwatanio ya Ndalani, Kauti ya Masaku twina utanu kumumanyinya inywi ma ngwatanio ingi

syaa TIST iulu wa undu tuendee kuvika vau. umunthi twina tukundi 49 tunini na kati wa tw'o 22 ni ithianiwe miti 12,916.

Kwa kukwatwa mbau ni muthukumi wa ikundi Naomi Kamau, ngwatanio yitu niyanyuvanie. twina utanu nundu wa utongoi wa kithyululu vate mundu umwe kutongosye kwa ivinda iasa nthini wa ngwatanio yitu na tukundi.

Twina utanu kumanyiw'a iulu wa ivuio sya kitanda, umunthi twina tukundi twitawa ngwatanio (2016KE44) kivuio kitu. Tukundi tula tungi

nituendee naimanyisya kwitu na kuseuvia ivuio syoo.

Kwa nzia ya mbumbano sya ngwatanio na ikundi nitumanyiatitye undu wa kukila mautatwa na tukakwata utuika ta kuvivya matu ma iembe ala metika kulungya syingolondo na mavivi ala malikaa malaani na matundani ma miti.

Nitwambiie kusuvia miti ya kikwitu vandu na kumivetanga na kuvanda ingi mweu kii kitetheesye amemba kuvanda miti ingi kwa wingi nundu miti ya kuma kundu kungi niyumaa yavandwa nikwithiya kiso kitu nikyumu.

Ingi nituendee na uvanda miti ya matunda ta miembe.



TIST kuthokewa ni Aeni kuma Taylors, Natural Capital Partners na KTDA Foundation.

TIST Kenya nimathokeiwe ni aeni kuma Taylors, Natural Capital Partners na KTDA Foundation. Masyitwa moo ni Simon Hotchkin, munene wa Sustainable Development Taylors; Ian Brabbin, munene wa maiani Taylors, Kevin Sinfield munene wa Brand Marketing Taylors, Somon Brown, Natural capital Partners na Mr. Ndiga from KTDA Foundation. Nthini wa ndambuka yoo nimavikiie utembea miundani ya TIST na kunenania na atongoi ma ngwatanio kivathukanio nthini wa semina na kukomanana na na atongoi ma mavakitoli ma Kyai asakue.

Nthini wa semina ya atongoi ma ngwatanio Ben Henneke niwe wamamanyithaniseye vamwe na amanyisa ma TIST namwe na musumbi wa CAAC na Vannesa Henneke.

Simon Brown na Inder (mayai nthini wa semina) nimathokie ngwatanioni ya Ndalani, vala makomanie na aimi ma TIST ma isio sya Makomboki, lmenti na Kioyo. Simon niwaisye “Kila vandu tuendi ioo nitwithiie aimi mena wendi iulu wa wia ula meukuna. Nthini wa ngwatanio ya Ndalani nitweethiie aimi me nthini wa umbano wa kila mwai na maieleania na kwia walanio undu me uima na kuvanda miti mbua yukite, na miti yina vaita mwao kwoo kwa kuete ukwati, kwailya mathayu ma kila muthenya, uima wa mwii na ukwati”.

Nimasyokie mathi Makomboki vala makomanie na muimi wa Makolovia/mavakato ma usingania aivanda miti thini wa nguumo sya usi na ena kivuio kya kitanda.

Nthini wa lomenti nimavikie kithini kya maiani kya lmenti na itina mavika miundani wa Joshua ula ni muimi wa TIST. Joshua na musyi wake nimekite wia wa kwiyumya nundu nimavandite miti na makanika myatu ta 50 kwou kwithiwa na ukwati mbeange kwisila kuta uki wa nzuki.

Kevin, ula wai ndambukani yake ya mbee nthini wa Africa, niwataniw’e mubno ni wia museo wa aimi ma TIST wa uvanda miti na kwou kusevya mawithyululuko kwa maiani na kaawa. “Ngamatavya andu angiiulu wa wia wenyu museo aimi ma TIST navika nthi yakwa” niw’o Kevin waisye.

Mr. Ndiga wa KTDA niwathokisye atongoi ma TIST nthini wa kwimanyisa iulu wa kusevya kivuio kya miti na undu wa umisingania na kuethesya aimi kuvanda miti kwa wingi.

Simon Hotchin niwaisye nthini wa semina undu wendeeiw’e mbee ni TIST yila wathokie mwai wa keli 2014.

Niunaisye “Ndambuka isu niyathuthisye Taylors kukwatana na kuthukuma na TIST kuete miti kwa aimi ma maiani na kwailya mathayu moo, kwithiwa na ukwati, kwongela unou wa muthanga, kwikalya kiw’u na moseo angi maingi” “nina utanu ngooni nundu wa wia museo na niikwatya kuendee na nduu/unyanya wakwa na TIST” inwongelelele na kwasya.

Ian, ula ni musami wa maiani wa Taylor niwaisye kana niwataniw’e ni wia museo ula Aimi ma TIST mekite.

Ala mai nthini wa semina nimeethiwe na ivuso iseo ya ukulya makulyo aeni maitu.. Kati wa makulyo ala makulilw’e ni vamwe na kwitya mbeu na , umanyi iulu wa usingania mivai ya miti, na kuthathasya kuua maiani kuma ithiini/ kambunini ingi. lulu wa mbeu na utethyo wa mbeu Simon Brown niwamatavisye aimi kana kana vala miti ikuvandwa nivo uvuii wa miti wikawa na niw’o wika nesa mbee, kwoo amatavya aimi kana muti kuma kisioni kiiu niw’o utonya kwika nesa kwi muti kuma nthi ya nza na utumnaa muimi ew’a ena kilio kyake nthini wa wia wa muti usu. Niwongelelele na kwasya kana kusingania miti nikwendaa umanyi wina utuika na umanyi usu niwaile unenganwe nthini wa tukundi tunini na kumanyiw’a etw’o, kwa kukwatana na KTDA Foundation”. Niwaminie na kuthuthia aimi kana kukwata mbeu ya mana ti uthuku unakutwika ti nzia kila ivinda nzeo “nundu syindu ila ikwatawa kwa laisi ti indi yothe syithiawa nzeo”

Itina wa ukethania nthini wa semina, n kizio kya Kionyo, mena athukumi ma TIST ala ni Jeniffer, Kimani na Patricia, nimatembeleie aiomi ma TIST nthini kambuni wa maiani wa Kionyo.

Nimavikie miundani ya George Nkonge, na Patrick Murethi, Nkonge niwamathokisye na amonia ivuio ili sya kitanda syina mithemba kivathukanio ya miti.

TIST Kenya nimeethiwe na wumano woo wa ngwatanio syoonthe (ACM) nthini wa Nanyuki Social Hall.



Uimi kana ndilikasa ya kuendee.



Nima ya miti la liu Kilungu kya vata kya uimi na ndilikasa ni nima ya liu na miti.

Ualyulo: Kuvanda miti, ikuthu vamwe na liu kana mimea na kana ndithya ya indo Mwolooto wa nima ya miti na liu yithiawa na mwelekelo umwe ula ni kwongela w’umi wa kitheka kwa nzia ya kutumia miti.

Miti yithiawa ya vaita mwingi kwa muimi ta:-

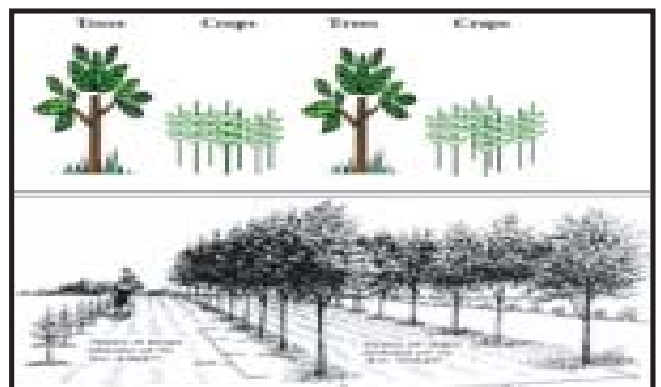
- Miti ya kwaka
- Ngu
- Matunda na liu
- Uithyo / Wovo
- Kulumya mbithanga
- Kwongela muthanga unou
- Kwikalya kimeu
- Kusii kiseve
- Kwikia muvaka
- Ndawa
- Kuete mbesa
- Kuola kukuwa kwa muthanga.

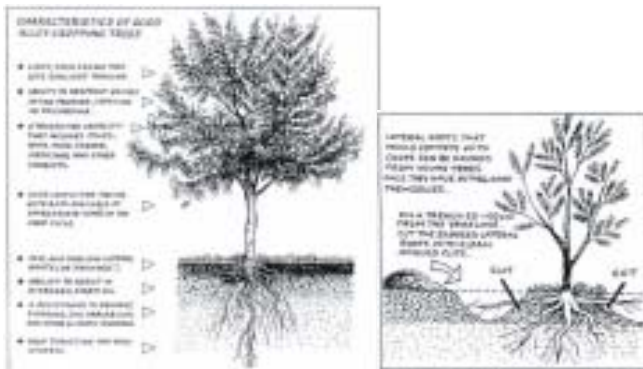
Nzia sya uvandi na uimi wa miti na liu; Kwi nzia mbingi ila iatiawa na kwi ona ingi nzau. Nzia imwe ni nzeo kwa isio imwe na nithuku kwa isio ingi. Andu nimendaa kutata nzia kwiana na kisio kila mai na kuete ona nzia ingi nzau na kwona nisyiva syaile kisio kyoo, ingi nimaile kwonasya ala angi yila mena mbumbano undu wa nzia ithi. Vaa ve nzia imwe ila itumiawa kaingi nthini wa nima ino:-

I.Wiio: Nzia ino yendaa ukamba usakua muthemba wa miti ula wavandwa lainini wikaa nesa na unengae muthanga vaita. Wiio wendaa kisio kinini, nusiiia muthanga kukuwa, niwumasya matu ma liu wa indo na kuvwika muthanga. Ngelekany’o ni kuvanda miti ithyululukitwe kiwanza ta muvaka. Miti ino niyaile uvandwa na utaaniu wa 1.5 - 2m. Kingi wiio withiawa museo yila wavanda miti miasa na mikuvi ivulene ngelekany’o Mithulu na ndau kana mutavisi.



2. Kuvanda mitauni:- Nzia no yendaa kuvanda kwa misitali ithengeanie tanyusu itambya kuvika matambya eli. No uvande mutau wa miti, mitau ili kana itatu ya liu ngelekany’o mutau wa mbemba mutau wa lusina kana maiu na kaawa. Miti ila miseo ya uvandaniw’a na liu ni ila inengae muthanga nzeve ya nitrogen. Utaaniu wa miti waile matmbya 5 - 8(m). Utaaniu niwaile kwika uyiimwa na iisewa nikana ndikasindane na liu undu wa unou na kyeni. Matu ala masewa no mavulanwe namuthanaga kuete unou kana makanengwa indo ta liu. Kwoou miti ino nundu niseawa ndikaasave muno ndithiawa yaile kwondu wa nima ya ndivi nthini wa TIST onakau nimiseu niseuvasya mawithyululuko undu wa nima nzeo na kwithiwa yi ya vaita kwa muimi. Miti imwe ila ivanda mitauni yithiawa nzeo nundu nithongooa nesa na kwoou noyithiwe itemwe kila mbua nikana inenge mimea/liu nzeve nesa. Nzia ino yithiwa nzeo na mithemba imwe ya miti ta Cassia siamea, Cassia Spectabilis, musanduku, Lusina, Kyoo miti imwe niyithiawa miseo ila mini no yeananga withiaa ndivandaniw’a na kindu nayo nita Mvinje, mukima / muvaliti, munyongo na Albzia spp.

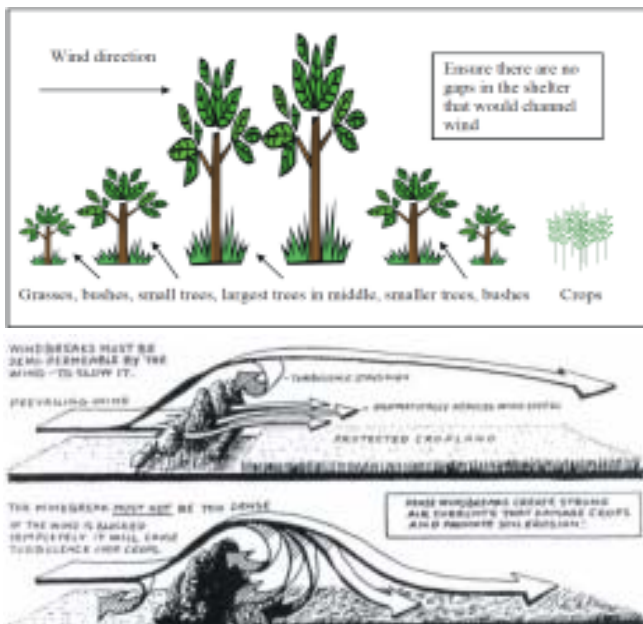




Ve muimi waatumia nzia ino ya kuvanda miti na liu vamwe? ethiwa evo, ni miti na liu wiva syeekie nesa syavandaniw'a? Makulye mamunenge uvoo iulu wa kila mamanyie kumanana na mbanda ino na muyuka na umanyi uyu ila ingi kukwithiwa na mauvundisyo.

Imwe aimi no matate kwa kuvanda mitau o minini niundani yoo na kwona kana vena kivathukany'o na mbua ila ingi.

3. Kusiia kiseve: Kuvanda miti laini itaanie nisiiaa kiseve. Uu naw'o nusiiaa mimea/liu kumana na kukomwa ni kiseve na kwanangika, Vanda miti ila minene kati, miti ila mini iatiioe lainini usu ungi, na ikuthu na nyeki iyatiia. Vanda isiie kiseve. utaaniu wa laini sya miti waile ithiwa wi 4-5m na 2.4m katikati wa miti ila yi lainini.



Useo wa kuvanda miti ya kusiia nzeve nundu muimi ndeithiawa ayumya kisio kinene kya muunda kuvanda miti no viata wa miti ino niwonekaa na ukatuma withiwa na ngetha nzeo nundu kiseve kila kitonya kwananga liu nikisiie. Ingi miti ya kusiia nzeve yavandwa nai nitonya utuma liu wangika nundu ethiwa nzeve yeelekelw'a ngali ila itaile kana mwina mwanya nzeve itonya ulikila nitonya

kwananga mimea. Sisyu mundu wisi undu miti ya kusiia nzeve ivandawa autetheesye ethiwa wienda uvanda miti ya kusiia nzeve.

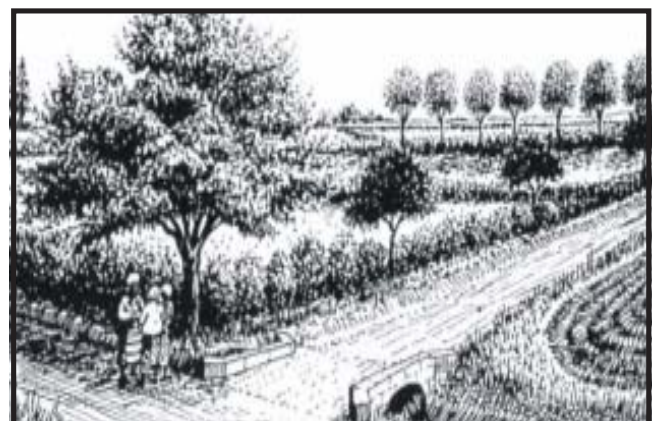
4. Kutiia uvanda:- Vaa ni vala muimi wambaa ukilila mbia siana una ate kuima kisio kina kya muunda na ayieka ikuthu iimeka nikana muthanga utunge unou. Kana nutonya uvanda ikuthu ila syongelaa muthanga nitrogen ta munyongo na wuti.

5. Nima ya Kuvulany'a: vaa ni vala muimi uvandaa miti na liu vamwe indi miti uyithia ivanditwe mataila. Miti miseo ya nima ino ni miti ila ietae muunyi na kwongela unou wa muthanga. Uvoo mbeange kilunguni kingi.

6. Kwailya kisio kya ndithya: Kusuvia miti kisioni kya ndithya nikana wongele uithyo/ wovo na ngu. Kwa ngelekany'o kundu kula kumu miti ya imwea na isemei kana imwele, ivoa, muthiia, kyaiki, mulaa, kilului nimiseo nundu matu mayo ni maseo kwa kwa liu wa indo yila kwi thano.

7. Kuvanda miti ta tukuthu:- Kuu ni kuvanda miti mingi vandu vamwe tusio tusio- tula twavandwa liu tutekaa nesa na no ivandaniw'e na liu ngelekany'o kuvanda muundani vala vakue ni kiw'u na kuu utee uivanda liu. ingi miti ino nisiiaa nzeve. Miti ino no ivandwe vandu vamosu kuseuvya muthanga wavo.

8. Kwikia movaka: ngelekany'o Mithulu kana commiphora zimmermannii subsp.



Amanyisya, lilikanai kana miti ya TIST niyaile ithiwa itaaniw'e undu vaile nikana yiane na kwikala kwa ivinda yila yaile. Nzia imwe kati wa ila ineenewe vaa iulu ni nzeo kwa nima ya uvandi wa miti na liu kana ndithya yoka na itonya utumika kwa nima ya TIST ya ndivi.



Mawoni angi ma kusisya nundu wa mbua isioni imwe sya Kenya.

Isio ila syi iimani syithiawa na muthanga wina asiti mbingi (kula maiani mekaa nesa)

Sisya kuvanda Calliandra Calothyrsus na Morus alba kwa uithyo wa indo.

Kwa muvaka na kusii kiseve vanda Mithulu, Mikuvulya, Casuarina Cunninghamiana, Millettia dura kana Hakea saligna.

Kwonda wa matunda vanda miti ite uthui ta Ndunda, Ndula kana mapeasi.

Isio ila syinthe (ta kula kaawa kekaa nesa)

Sisya uvande jacaranda Mimosifolia mivakani Kwa kusii nzeve na w'umo wa kiw'u vanda mumba-aume/kisambalau.

Kwonda wa matunda vanda kitanda, kiluma, kivakato, kikandania, kikundi, casimiroa. Edulis (white sapota), Annona senegalensis (custard apple), ivela, na Eriobotrya japonica

Vala ukwenda usiia kukuwa kwa muthanga no uvande Calliandra, Morus alba, Grevillea na Markhamia.

Mukima ni muti museo kwa muunyi wa kaawa.

Kundu kula kwiiulu muno na kwikitheo kite kinene na miti ni minini.

Vanda miti ya usiia kiseve na wiio ila nita Imwea, Mikima, Hakea saligna, Mithulu, Dombeya Spp., Dodoneae angustifolia, Casuarina cunninghamiana, Dovyalis caffra. Na mithemba imwe ya miti ya mitunda noyikaa nesa kuu

Memba na ndithya ya ngombe syeia nthini wa Rift Valley.

Nundu mbemba iyikaa nesa vandu ve muunyi sisya uvande na isio sya miti ithengeanie (wood lots) kana miti ya usiia nzeve undu wa kusuvia muthanga ta mikima, Sesbania Spp., Mithulu, mutundu, imwea, ndau, mithiia, ming'olola, casuarina cunninghamiana, Dovyalis Caffra, Markhamia lutea, cordia abyssinica. kililikany'o

Lilikana

Kila miti ietae na uyika ukunikili umanye muthemba ula museo kwa kisio kyaku. Lilikana miti niyuania kiw'u, liu na mimea na mithemba ingi ya miemea ndyendete muunyi. Osa uvo na utao mbeange kuma kwa tukundi twaku kana kwa athukumi maitu ma TIST.

- Kwa ngelekany'o kulya muti ula withiawa na mii miliku na mii minini vaa yiulu kwonda wa uimi wa miti na liu/mimea. Casuarina Spp. Leucaena leucocephala, Cupressus lusitanica na Sesbania sesban syithiawa na mii yi vaa iulu na noyithiwe miseo kwa kusuvia muthanga kukw'a. Ndau (eucalyptus spp na Gmelina arborea niyumasya sumu ula wuaa mimea ila ingi kana ukethia ndimea.
- Nima ya kuvulanya ndikaa nesa kwa isio ila ikwataa mbua yi itheo wa 800mm kwa mwaka.

Vala utonya ukwata umanyi:

Vewna uvo wa vata unenganitwe iulu wa nima ya miti na mimea kuma website ya Kenya foest na no wisyaisye kwisila ([http:// agroforestress.cisat.jmu.edu/](http://agroforestress.cisat.jmu.edu/))

Videos

"Grevillea Agroforestry" (mutalakwe) (6:26) Ninenganite vaita mbingi sya mutalakiwe kwa muimi na nthini wa uimi. ni ieleetye undu wa kusuvia na undu utonya uvandaniw'a na liu/mimea. Wenda sisya <http://www.accessagriculture.org/node/895/en>

8. Mavuku /Kundu kwa usisya na masyitwa mamu

CARE-International (1989) Agroforestry extension Training Source book. Module 6. Agroforestry Design. Educational Resources Development unit, Nairobi

NEMA (1998) Kusuvia mawithyululuko- A kavuku ka kw'oko na atongoi ma nduani. National Environment Management Authority, Kampala.

Tengnas B (1994) Agroforestry Extension Manual for Kenya. International Centre for Research in Agroforestry: Nairobi

Mazingira Bora



TIST

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

Kipsigis Version

An Environmental, Sustainable
Development and Community Forestry
Program.



TIST leaders in their All Clusters Meeting (ACM) held in Nanyuki on October 21, 2016.

Inside:

Konetisietab TIST; **Ketookilasta ne kim.** Page 2

Ndalani TIST Kilasta: Bandab Tai ne kikotesak en kurubit. Page 2

Kinyor TIST toekkoyob Taylors, Natural Capital partners ak KTDA foundation. Page 3

Tononetab minutik: Minetab ketik ak minutik. Page 4



Konetisietab TIST; Ketookilasta ne kim.

En tuiyet ne kotesetai en Gitoro Conference Center en kongeten 16-20 October 2016 kokiyoktokilastaisiek 30 kondo ikwak kotononji en tuiyonoton.

Enkonetisietkokitinyeya metab geinebo kelunoi kcheki gonyorkilasta, kotinygeia kboisietnemie, konetisietabbetit ne kabtaat, olekitoundoimbaret ne magiibat, ak obo mungaretabkoristo, boisiet abkondoik en kilastaakboisienyuan, ole kimuchek etoundoosnet, ole kimucheketechgeiak ole kimuchekobitun en choruandit. Kites taikogu yotuiyet ole kiteti doite tetabki lastaisiek.

Kinyortuiyetkoguiyetakobo ole kinyor undome lekwek en vochaisiek. En oranito nkoboru komiek it netenkayumanikchebokiristo en kurubit.

Nitonkonei boruyekako bitkoitetne boketik kenaikeletianayekakochikilchikilik. Koke mwochi temikkele yeinyoru vochaito kerkomi eamuiboru kit agatukul.

Kotinyetuiyetkobekoleeneiasi en kurub isiek komonyor chikile takamu neiasi makia Itakoristo.

Kiitkoguiyokolemitentugukchekiterkoukoitetabketik ne mali titak miteni mbarenik chetomo konyorchi kiletakkeret.

Ngoliotake koniimba renikchem

itenketikko lela chentomokoitkeretakchikilet.

Nito nko momi singkele kiuitko baten mitenkou kimongis vochaisiek chebome lekwek. En betu siekch ekikob atakoki yome TIST korib konu netab vochai siek kokibi tukewel natet en abakora. En niton kokima kobitu kogoi toet ne kararan ne lititakoneiyanat.

Kotok koleki mochekonyor kurubit kit ne nyum nyumne ikuitosako ne keroksei. En inguni konyor ukuru bitlibanet ne kigochin nebo kwenyita karow eksisit kosi bgeiak kereta bboisienyuan.

Tinye ikoku iyet temik chebo TIST ag oboli banetab ketika munti nyeiwalat ne ole kigo nundo ilibanetab koristo.

Amun mitenche kobose ichebo (carbon revenue). En koru bisiekc het omo koitko nyormelek tokom otinyeikiy kobatenche kikoitkonyoruboset.

En biik cheki miten tuiyono tonkokinyor charset neo kogimit kilasta isiek kwakak kurubisiek en ngala letasi koitko kimit en bchee tabkobwotutik. Kibi two lutik chechang en kingoyo mokeiku rubisiek en bchee tabko bwotutikak ngalale nywan. Ye kimwoe chechang en ichek kolekii beak kebekinde boisionikkou kanametabkabetiak (CF) asikebe kinetmembaek en kurubisiek.

Ndalani TIST Kilasta: Bandab Tai ne kikotesak en kurubit.

Echek biikab Ndalani Kilasta kokiboi boikeb chei bandab tai akbii kalaka chemiten en Kilasta isiek, kimiten County nebo Machakos. En inguni ketinye kurubisiek 49 en chotonkokikonyor 22 koi tetab ketik chetinyei ketik 12916.

Koyob toretet nebo kiboitiot nebo Kilasta Naomi Kamau kikenyo rukeya iilewenisiet. Ki kebo iboen jiboisiet ne mi e nebo waletab kandoina tet en kondoik chekitinye en Kilasta.

Kikenyoru kone tisie takobokabeti nekanab

taat. Kikotoo en inguni kurubit nebongwan tanio (2016 KE-44) kabeti.

Tinye imaket kuru bisie kalak kona makichek niton.

En tuiyosiek chekimi kokiko toretet en bcheeta bkone tutikkeit inkenyo runoleki mucheke istoengei koimutikalakkoukebelsaratikchemiten en kwen usieka blogoek kou Maembea sikomuchiyetkoistokiptorurusiekye katabten.

Kikinamkorakeribketikabkipgaakoukotok ne kata kiswoc henitonk onyoru nentemik borointoa mutesei ketika muninge minkoyom tosamun momiten robta. Kitinye ketik koumaembe.



Kinyor TIST toekkoyob Taylors, Natural Capital partners ak KTDA foundation.

TIST Kenya kokinyor toek koyob Taylors, Natural Capital partners ak KTDA foundation koboto Simion Hotchkin, Head of sustainable development Taylors, Ian Brabbin, Head of Tea Taylors, Kevin Sinfield Head of Brand marketing Taylors, Simion Brown, Natural partners ak Mr. Ndiga of KTDA foundation. En tokine nyuan kokimochei korute chitemikak konyorkondoik en komit ense minaak konyor tui yetab kontoichebo factory chekilewen.

Ye kin konyor tuiyetab kondoik en tuiyetko Ben Henneke ne kiororunoiyet en biik, ne inendet koko ndoindet, CAAC president ak kimiak Vennesa Henneke.

Kimagomiten Simon Brown a kinder kigoru tokoba Ndalani Kilasta, kobama komboki, ImentiakKionyo. "kimwa Simion koleo lekak ibeke nyorute mik kotinyeitetet ne kimoche ne kararan." Kinyor en Ndalani bcheetabngalalet ole kimuche kemindaketik chechangak ole toretitoketichuton ensobenyuan, kelunoik, aktililindo en boruekkwak. Ye kinkot Makomboki konyor temik cheki kom inavokato cherobotin, minetabketik en ingegu siekak be tisek chekon obotin.

En Imentikorutechi factory ak en let kobaimbaretat Joshua, temindo niton kotinye iosnet nemiten moingonika bsekemik 50.

Kevin kokibe tinyinnebo tai korutei Africa ole kinyo konyor temik chebo TIST cheki minke tikasi konyorunen chai akkawekitondo ne kararan.

Kimwa koleo wentio mwo chini biikalaka

kobo boisingwong ye awekekaa.

M r. Ndiganabo KTDA ko kitach kondoik chekii nete keia kobobetit, ngom notetab robotab ke tikak minetab ketik chechang.

Simon Hotchkin, kim wochituiyeta kobo betu nyinnebo tai ne kinyoak konyor temikab tisten arawe tabangan 2014. Ole kimitenak Taylors kib chin ketik mengi kab factory asi komuch kotoretengei, asiko nyoru nen melekwek, asi kogimit ngungunyek, asikoter bee kakalak chechang. Kimwa kolea tinyei maket kemi tenak TIST.

Ian koagenge en kiboiot en factory nebo Taylors, kom wako lebok wongut boisetab temikab TIST.

Kinyor tuiyetboroi ndokote ben tebutik koukonyor toretet nebo kesuekab ketikak koiti konyor boroinwek en factoris ekalak kwalen chai. Kimwochi Simonko chengkesuot ne kararan koneitin en olemiten.

Ye kigobata kogotieyet en semina korutechi Kioyoko mitenak Jeniffer, Kimaniak Patricia temikak koba factory.

Kiru te chiimbareta George, Nkongge, ak Patrick Murethi. En imbaretab Nkongge kokinyorka betio engche kikonob totin chemiten kombot ketik chebesiotin, akimbaret ne makibat. En kab Patrick kokinyor kabeti netinyeiketik chebesiotik.

Temik tugul chekimuch koitiko kimiten tuiyet nebo Kilasta isek en Nanyuki social Hall.



Tononetab minutik: Minetab ketik ak minutik.



Ororunet: minetab ketik ak bugonok koboto minutikab imbar anan ko baetab kiyakik en kayumetab niton kotogingei minetab ketik ak rurutik asi kotes rurutik chebo emet ye kiboisien ketik.

Tinye temik kelulenoik chechak en ketik.

- Kitekseen, logoek ak omitwogik alak.
- Kinyorunen kwenik, omitwogikab tuga.
- Ngungunyek chegororon, ngetunen beek ngungunyek, tere koristo, toreti kiwotosiek.
- Kerichek, konu rabinik, tere ngungunye komoib beek.

Koborunetab minutik ak ketik.

Miten kobotutik cheterchin chechang ak ortinuwek chelelachen chekinyoru en kasarta age tugul, kobowotutik alak kinyorunen kelut en komosto age ak kewelnatet en orage, kimoche biik koboisien kobotutik cheter ak kobchei en tuyosiek, cheisibu ko ortinuwek chebo.

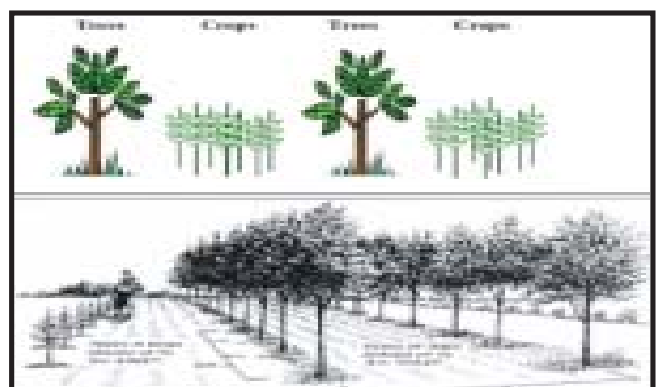
Koletab minutik ak ketik;

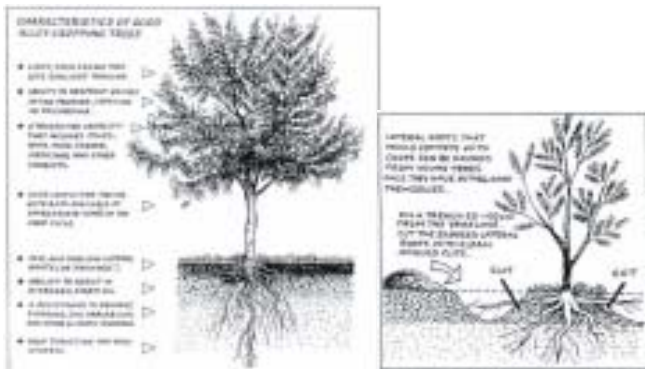
1. Ngotuuet: Niton kotinyegei ak lewenet nebo ketik cheichome asi imin koik ngotuuet an chetoreti



imbaret, ketichuton kemin komoginge kokwoutik che mengech asi komuch koter ngungunyek ak kogonon beek ak kinyorunen omitwogikab tuga, koborunet nebo ketichu kemine en kiwoto komuti moche anyun kokwoutik kongeten 1.5-2m niton ko koborunet ne kararan komiten ketik chemengech ak chenuongen kou kelelwet ak lantana camara

2. Ketik chetinye boronik: Niton kotinyegei ak kakwoutik chemengech (0.5-2m) en tebesindo imuchi kolainitab ketik ko oeng konebo minutik agichek ko somok kounoton en imbar korogunet ko kou bandaek ak indabibit ana ko gawek ak ndisinik, ketik anyun chegororo ko cheteche omitwogik en ngungunyek, en kokwoutik chebo ketik komosire (5-8m) en ketichun konyolu anyun kechoror en abogora asi komoegitun asi kobor chigei omitwogik ak loboiyet, sogek anyun kogochin konyor okwoiyet ngungunyek en abogora ketichon anyun komoliboni TIST amun ibe kasarta ne mingin toreti temik en tugul alak chechang,

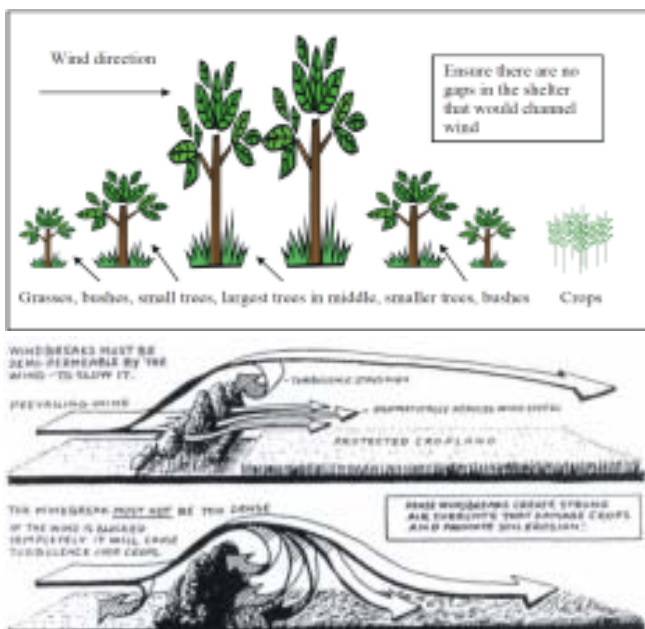




chechang en ketichu ko ingetil kongotos, niton kogochin ko moegitun koba barak, chenootin mising ko kou, calliandra, cassi siameo, cassia spectabilus, eucalyptus spp, leucaena, markhamia alak kogororon yon mengechen kou chesarur, sebesebe, sesbania sesban

Ara anyu miten temik che kogotiem koyai kouniton agot kogitiem konee ne kararan, ongebchei en tuiyosiek yon kitinye en abogora, asi kesuen walet

3. Tere koristo: kemin ketik chetinye kimnotet asi komuchi koter minutik en kasarta nemiten



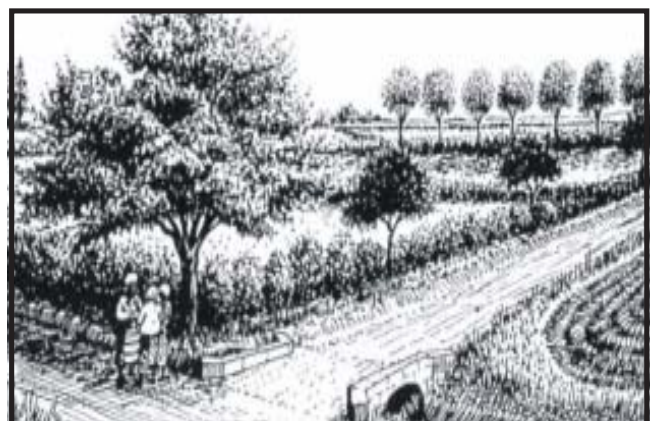
koristo ko kararan ingeminchin kwenetab imbar, kosib ketik chemengech en lainisiek oeng ak bugonok, ak susuek en komosta age, ibe kokwoutik (4-5) kongen ketit kot koit ak kokwouk (2-4m) en lainit, toret mising temik amun nyurenen ketik

chechang, toronito bo koristo komoche biik cheigen amun imuch kogon asenet agot komanai ole keminte

4. Keter imbaret amakikol: Niton komu che timik kobat imbaret ak kebagach koma kigol minutik alak tugul asi korut ketik kowegik okwoiyet ngungunyet, choton cheteche ngungunyek ko kou sesbania spp and gliricidia sepium

5. koyometar minutik ak ketik: Nito koibe kokwoutik cheboroen en minutik ak ketik asi kengalalen en kasarta ne nyone

6. Kiyagen kiyakik kotoreti: Yeimuch irib ketik en imbar inyoru ibai tuga amun inyoru kwenik ak omitwokikab tuga en komosto ne momiten robta kekole ketik kou chepnyolilok, sertuwet, chebitet, nikiruwet, chepkomon en emet ne miten robta komuche koboisien kou; callianda calothyru, sesbania, sesban ak leucaena, diversifolia, kiboisien sogek cheyomiotin keboen tugaana ko lego



7. Kimin kosibiny: En minaniton kemine ketik kosibiny en ole morutunen kii anan ole miten koik anan ko chepnyesut, toreti koter kosito ana ketem agebagach ko magigol



8. Kiyoen kinotosiek: Toretikab TIST kongen kole en minetab ketik chebo TIST kotinye kokwouting asi konyor ketik koengitun ago cheibe kasarta negoi, kararan niton baten monyoru chekondok chebo TIST kou; kelelwet, ak commiphora zimermnii susp

Kerchinel kabwatan ak kebeberuwek chemiten en kenya;

- Korotinuwek chemiten barak ago tororen ago birir ngungunyat (kemine ketitab chaiyat)
- Kerchinen callianda calothyru ak morus aiba en bayetab tuga
- Kerchinen kiwotosiek ak koristo kou; kelelwet, sebesebe, chesarur, milletia dura ak hakea saliga
- Kerchinen ketikab logoek kou; plums, peaches and pears
- Ole burgei ago chortaat ole rure kawek komie
- Kerchinen jacaranda ole kagiminen en kiwotosiek
- Kerchinen lamaiyat ye kagimin kosim oinet ak kotoreti koristo
- Kerchinen ketikab logoek kou; tree tomoto, perseia american (avocado) macadamia teraphylla, passiflora aduilus (kirintila) psidium guajara (maberiat) eriobotrya japonica (lakwat)
- Miten ketik chegororon en teretab ngungunyek kou; calliandra, morus alba, sebesebe ak markhamia lutea sebesebe ko kararan en uronok en kapchain ana en kawek

Koret nemi barak amaleike ako miten ketik che ngerin

Kerchinen ketik chetoreti minutik chemiten kiyotosiek ak ketik kou; chebitoik, sebesebe, hakea

saliga, kelelwet silibwet, chesarur ak logoek koyoe komie

Baetak kiyakik ak minetab bandek en rift valley.

En bandek komorure en olemiten uronok chebo ketik kou olekagiminen ketik chechang, olemiten che tere koristo, olemiten chetere ngungunyek ketik kou; grevillea robusta, sesbania spp, croton macrostachyus, kelewet, chepnyaliliet, eucayptus ssp ak corchia abbyssnica

Kibwat: yon kimine ketik ko konech kelunoik chechang ko nyolu ilewen komie chebo oleimenye, alage kogororon en minutik alak komomoche keurto onyoru konetisiek koyob kurubit anan ko en kiboitnikwok

Ketik chetinye tigitik che koen ko kororon amun motinye en baragunyin chechak nomegei niton ak minutik miten che mogororon en minutik kou; eucalyptbhus spp ak gmelina arborea

Tukuk chekonech konetisiet; Miten kou website kenyorunen ketik chegimu chekegol ak minutik en emenyon kinyorunen <http://agroforesttrees.cisat.jmu.edu/>

Videos: Gravillea aggravillea agroferesty.

(6: 26) ororu mising agobo ketik ak minutik en <http://www.accessagriculture.or/node/8951/>

Ibuwotun en

8: Care:-international.

Agroforesty extension training source book module 6: agroforesty design (1989) educational resources development unit Nairobi