

Mazingira Bora



TIST

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

English Version

An Environmental, Sustainable
Development and Community Forestry
Program.



'Come and See' participants from new areas take a group photo after a seminar held at Gitoro Conference Centre, Meru last month.

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TIST Kenya hosts East Africa Seminar comprising participants from TIST Uganda and TIST Tanzania.

TIST participants across three East Africa Countries – Kenya, Uganda, Tanzania had a joint seminar at Gitoro Conference Center, Meru from 18th – 21st October 2015.

The seminar which the main Condition of Satisfaction (COS) was to learn Best Practices from one another involved indoor trainings as well as field visits. Participants shared their recent

achievements and what their goals will be in the next 40 days.

Field Trip

TIST Tanzanians and Ugandans had field trips where they visited TIST Kenya members farms. From this visits, this is what they reported back to the seminar to have learnt and promised to try some of the Best Practices they learnt.

TIST Kenya Completes Verification Trip.

Last month, we mentioned of the Verification happening this month. We are glad to inform we completed the Verification field exercise from 20th – 25th October 2015.

The verification exercise involved visiting a prior selected TIST groves by the Verifiers. While at the grove, the Verifiers would check the accuracy of the data collected by quantifiers, check whether that data matches with their own observation.

The visit went to more than 200 groves in different Clusters. The Verifiers will be analysing their data, will ask questions and clarifications, and will issue the results to us in near future.



Dr. Madhukar, a Verifier, interview TIST farmer as Mary Wanjira, TIST Cluster Servant looks on.

First Seminar for Tea Farmers from Imenti, Kionyo and Makomboki Tea Factories.

Farmers from selected tea growing areas attended their first seminar in Gitoro Conference Center, Meru. TIST has now expanded to new areas of Kionyo, Makomboki, Imenti and Ngeru. These areas are tea growing areas. The seminar involved learning TIST Best Practices in tree planting, Small Group and Cluster leadership, and understanding the carbon business among oth-

ers.

Also present in this seminar were farmers from Taita/Taveta. This is not a tea growing area, but has very important indigenous bird species.

From the seminar, participants learnt to develop Action plans and Conditions of Satisfaction. At the end of the seminar, each of the participant prepared Action plans for their areas.



Nyamira TIST Clusters: We have learned alot since joining TIST.

By Peter Mithiru

We, TIST farmers in Nyamira Clusters are glad for the support we have continued to receive from other TIST Servants. Last month, another team of Quantifiers from Nyahururu visited us to help us quantify our groups and learn quantification.

More than ten Small Groups were quantified. We learnt alot during this process. Most importantly, the need to plant more trees per group towards the five-year goal of 5,000 trees.

Minimum spacing of 2m by 2m. Agroforestry was also taught with emphasis of fruits and indigenous trees for cropland and riparian areas.

We are now consulting among ourselves about the persons to be trained as Cluster Servants / Quantifiers. Our criteria for selection of this role is that s/he must be an active member, ready to abide by TIST Values – We are: Honesty, Accuracy, Mutually Accountabilty, Servant to each other and adhere to low cost- High results.



We are continuing spreading TIST to new farmers. Those interested are required to attend Cluster meetings where they will undergo application process before they are formally regisitered in TIST. They will be issued with Application forms. The purpose of application process is to help potential members fully understand TIST well, so that s/he can make an informed decision on whether to join or otherwise.

We are grateful to the two Cluster Servants/ Quantifiers from Nyahururu who came to train and quantify our groups. They were Peter Mithiru and David Thuku. We also thank our volunteers who assisted the Cluster Servants. Thanks to Simon Abere, LilianMaangi, Dennis Momanyi, AlferiousOteyo , FelistersNyakagwa, Charles Mochache.



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:

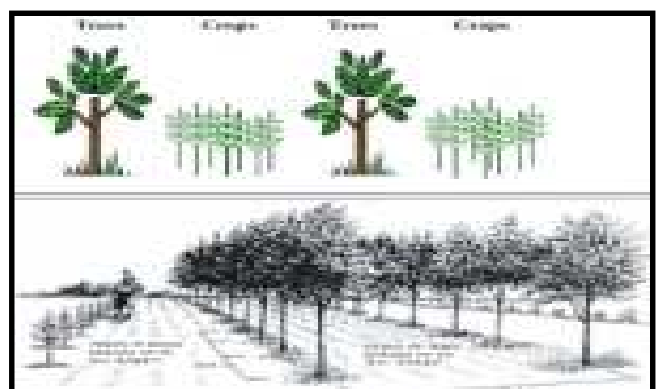
- Building material
- Fuel wood
- Fruits and other food
- Fodder
- Soil stabilization
- Soil fertility
- Moisture retention
- Wind shelter
- Marking of boundaries
- Medicine
- Cash income
- Reduced erosion (if a layer of litter/mulch is kept)

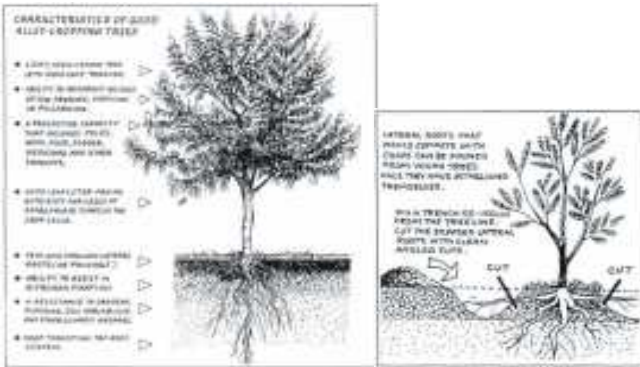
Agroforestry practices: There are many different techniques and new methods are being discovered all the time. Some techniques are successful in one place and a disaster in others. People need to try different techniques and share the best practices in the training meetings. The following are some common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

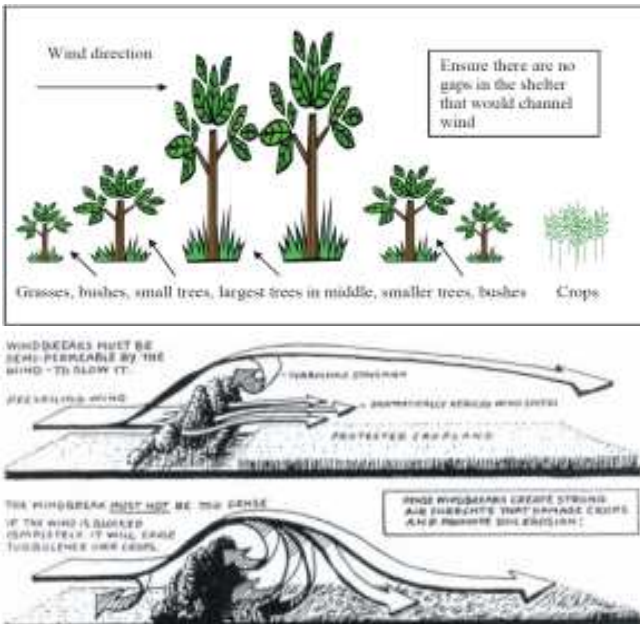




Have any farmers used this method of planting trees and crops together? If so, what were suitable combinations? Ask them to share their experiences and bring the information to the next training session.

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*.

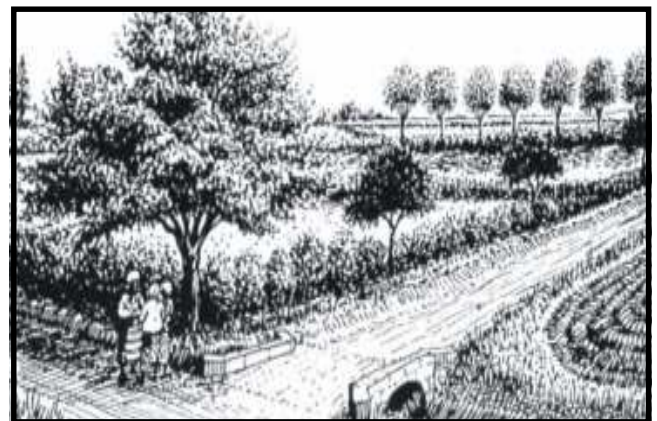
5. Inter-cropping: This involves wide and even spacing of trees among food crops. Good trees are those that have light canopies and fix nitrogen. More on this in the next unit.

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

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'Come and See' participants from new areas take a group photo after a seminar held at Gitoro Conference Centre, Meru last month.

Inside:

TIST ndene ya Kenya yathithia semina ya East Africa iria yari na arungamiri kuuma TIST ndene ya Uganda na TIST ndene ya Tanzania. *Page 2*

TIST ndene ya Kenya ikuthiria ndiunga ya gutegerwa ngugi. *Page 2*

Semina ya mbele ya arimi ba majani kuuma ibanda bia majani bia Imenti, Kionyo na Makomboki. *Page 2*

Cluster ya TIST ya Nyamira: Nituthomete jamaingi mono kuuma tugutonya kiri TIST. *Page 3*

Urimi bwa Kungaania miiti na Imera Bingi. *Page 4*



TIST ndene ya Kenya yathithia semina ya East Africa iria yari na arungamiri kuuma TIST ndene ya Uganda na TIST ndene ya Tanzania.

Arungamiri ba TIST kuuma nthiguru cioithatu ndene ya East Africa – Kenya, Uganda na Tanzania nibari na semina naria Gitoro Conference Centre ndene ya Meru kuuma tariki ikumi na inyanya gukinya tariki mirongo iiri na imwe mweri jwa ikumi, 2015.

Semina iu iria yari mono kwegie kuthoma mitire iria miega buru ya kuthithia mantu kuumania nab aria bariku niyegie mono uritani bwa nyomba ndene na kinya kuriunga miundene. Baria bari kiri

semina iu nibaaganire ba bangi kwegie mantu jaria bathithitie ruua na bioneki biao bia ntuku mirongo inna iria ciijite.

Ndiunga miundene

Arimi ba TIST kuuma Tanzania na Uganda nibariungire miundene naria bariungiire miunda ya amemba ba TIST ba Kenya. Kuumania na ndiunga iji. Kuumania na ndiunga iu, Jaja nijo baugire bagucoka kiri semina ati nijo bathomere na bagita igamba kugeria miitire imiega iu bathomere.

TIST ndene ya Kenya ikuthiria ndiunga ya gutegerwa ngugi.

Mweri muthiru nitwaugire ati utegi ngugi nibukuthithika mweri juju. Turina gikeno tukibwira ati nitwarikirie ngugi iu ya utegi ngugi kuuma tariki mirongo iiri mwanka mirongo iiri na ithano mweri jwa ikumi, 2015.

Utegi ngugi bubu nibwathithiriu na njira ya kuriungira miunda imwe ya TIST iria yatarirwe ni ategi ngugi. Bari miundene iu, ategi ngugi nibategaga uuma bwa mantu jaria jaandiki ni atari miti, batega kethira mantu jaja jaandiki nijetanagia na jaria boonaga boongwa.

Ndiunga iji yari kiri nkuruki ya miunda Magana jairi ndene ya cluster mianya. Ategi ngugi bau bagategera jaria baandikire, borie biuria na bereithua jaria batekwerewa na bagatutumira macokio ndene ya ntuku inkai ciijite.



Dr. Madhukar, a Verifier, interview TIST farmer as Mary Wanjira, TIST Cluster Servant looks on.

Semina ya mbele ya arimi ba majani kuuma ibanda bia majani bia Imenti, Kionyo na Makomboki.

Arimi kuuma ntuura cia uandi majani iria citaritwe nibetire semina yao ya mbele naria Gitoro Conference centre, Meru. TIST nandi nitambite yatonya ntuura injeru cia Kionyo, Makomboki, Imenti na Ngeru. Ntuura iji ni cia uandi majani. Semina iji yegie kuthoma mitire iria miega buru ya uandi miti ndene ya TIST, utongerieria ndene ya ikundi bibinini na cluster, na kuelewa thoko ya ruugo amwe na mantu jangi.

Bangi baria bari ndene ya semina iji bari arimi kuuma Taita/Taveta. Iji ti ntuura ya uandi bwa majani, indi irina mithemba ya gintwire ya nyoni ya bata mono.

Kuumania na semina iu, baria bariku nibathomere kwegie kuthithia mibango ya ngugi na kuandika mantu jaria babati gukinyira nikenda bagwirua. Muthiene jwa semina iu, o muntu nathithirie mubango jwa ngugi jwa ntuura ciao.



Cluster ya TIST ya Nyamira: Nituthomete jamaingi mono kuuma tugutonya kiri TIST.

Ureteri ni Peter Mithiru

Batwi arimi ba TIST ndene ya cluster ya Nyamira turina gikeno niuntu bwa utethio buria twitite na mbele gukinyirwa nibu kuumania na nthumba cia TIST. Mweri muthiru, gikundi kingi kia Atari miti kuuma Nyahururu nibaturiungire gututethia gutara miti ndene ya ikundi bietu na gututethia tumenya utari miti. Nkuruki ya ikundi bibinini ikumi nibiatarirwe miti. Nitwathomere jamaingi mono kuumania na untu bubu. Burina na bata nkuruki, ni bata ya kuanda miti ingi kiri o gikundi nikenda tukinyira kioneki kia miaka itano kia gukinyia miti ngiri ithano itarenie na metre ijiri ntere cionthe.

Uandi miti amwe na irio kinya bu nibwaririrue mono mitunda na miti ya gintwire ntuurene iria ciri na uandi bubwingi bwa irio na kinya nthuurene iria ciri nterene cia nduuji.

Nandi nitukwaranirie gatigati getu kwegie antu baria bakaritanwa ja anthumba cia cluster kana Atari miti. Gutaara gwetu kwa antu baba kuthingatanaga na ati no mwanka uria ugatarwa ethire ari mumemba uria wonekaga ngugine cia TIST rionthe, uria uri tayari kuthingatira mantu jaria TIST ikiirite - Turi ba; Uuma, Jaria jari jongwa, kuumba gucokaniria kwegie mantu jonthe, nthumba gatigati ka bangi na ukuumba kuthithia mantu agitumagira mbeca inkai indi akathithia mantu jamanene.

Nitugwita na mbele gutambia TIST ndene kiri arimi baberu. Baria bakwenda gutonya kiri TIST nibabati gwita micemanione ya clusternaria bakathingatira matagara ja gutonyithua kiri TIST mbele ya kuumba kuandikithua baa amemba ba TIST. Bakanenkerwa fomu cia gutonya kiri TIST. Ubatu bwa matagara jaja ja gutonyithua ni gutethia baria bakwenda kua amemba kumenya TIST bwega nikenda boomba kugita igamba ria gutonya kana kurega baiji jonthe.

Turina nkatho inyingi kiri nthumba cia cluster yetu ijiri kuuma Nyahururu baria bejire guturitana na gutara miti ndene ya ikundi bietu. Baba ni Peter Mithiru na David Thuku. Turina nkatho kinya kiri baria baciritire gutethia ntumba iji cia cluster. Nkatho kiri Simon Abere, Lilian Maangi, Dennis Momanyi, Alferious Oteyo, Felisters Nyakagwa, Charles Mochache.





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

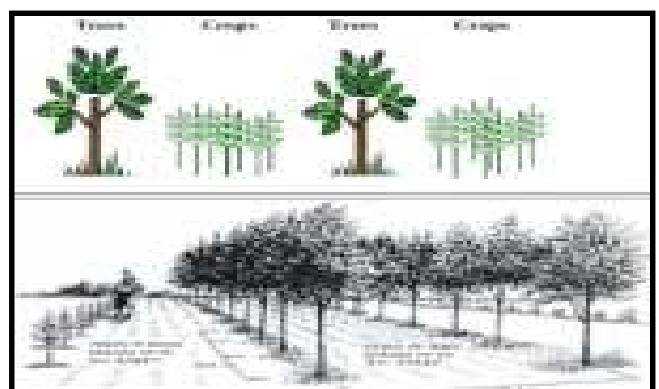
Kurima gwa kungania Imera na miiti: Kuri na njira inyingi na ingi injeru iria ikwenderea kumenyekana o igita na igita. Njira imwe ni injega gitumirwa na ingi ni inthuku. Antu ni babwiri kugeria njira mwanya mwanya na kwirana iria njega nkuruki ya iria ingi igita ria micemanio ya kuritanwa.. Aja nandi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

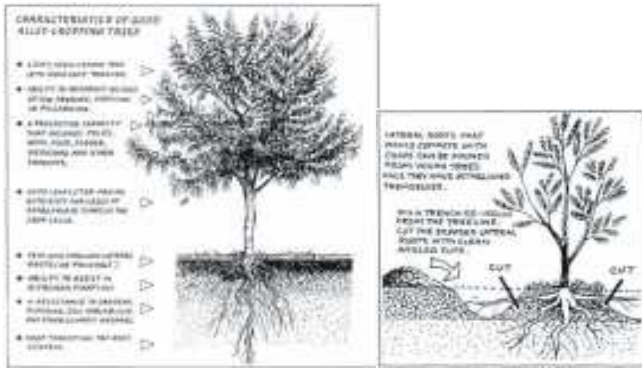
1. Mianka ya miti: Iji ni njira ya kwaanda miti itaari na muraini. Mianka iji itiendaga kaanya gakanene gati gati ka miiti na ni itethagiria kurigiria mono muthetu gukamatwa ni ruuji. Miti iji ni imiega ya gutwira iria ria ndithia kana mati ja gukunikira imeera bia kumiithia. Kionekaria gikiega ni kwaanda 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 miraaaja na imikui



Croton megalocarpus yaandaniritue na Euphoria 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.

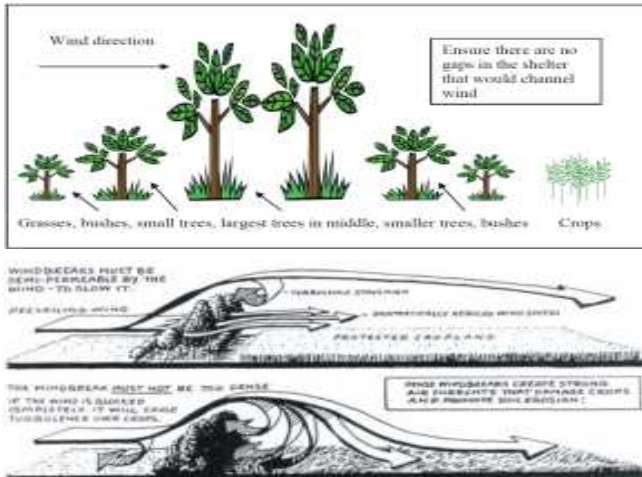




Ni Arimi babaingi bagutumira njira iji ya urimi ya kungania miti na imera amwe? Kethira niu ri, ibakwona urimi bubu bukibatethia? Borie berane uria bakwona urimi bubu bukari na beeje na ntento nkuruki mucamanione juu jungi jwa kuritanwa mantu nkuruki.

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 Ruu: Kwaanda miiti na mistari itaraniritie ni itethagiria kurigiria kurutwa mono ni ruu. Miiti iji ni irigagiria imera kurutwa ni ruu rurwingi nkuruki. Anda miti imenene gatigati, na iminiini mistarine iu ingi iiri na tumiti tungi tutukui ruteere. Miiti iji ibwiri kwaandwa itegene na naria ruu 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 ruu 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 ruo ikarega kwaandwa bwega ni ithukagia imera nkuruki nontu ni itemere ruo njira kwethirwa gutigi na twanya tutwingi nkuruki ya turia tubwirite. Ni bwega kuuria muntu uria uri na umenyu 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*

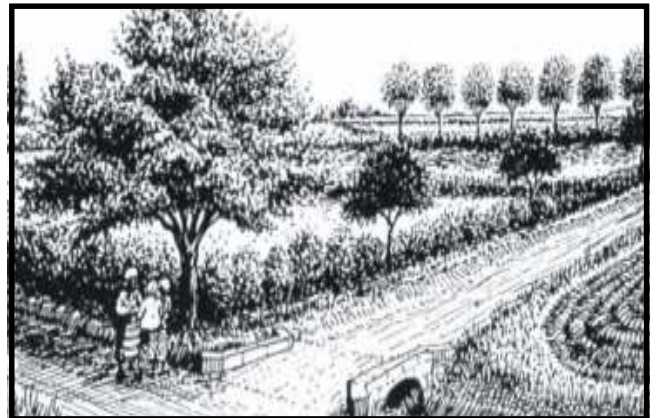
5. Urimi bwa Kungania: Kwanadaniria miti amwe na imera ukiejaga miti twanya gatigati ka imera biaku. Mithemba imiega ni iria iri na mugunya munini na iyongagira riera ririega muthetune. Tukabwira ntento nkuruki au mbere.

6. Kubwithia antu akurithiria: Iji 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, Acacia 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 ruo 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.

Mpempe cia Rift Valley na ndairi. Nontu pempe citukuraga 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 itiorokagira 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 umba 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.



**'Ukai mwone' ageni eru mbicha-ini yao thutha wa mathomo mao maria mari Gitoro
Conference Centre, Meru mweri ucio urathirire.**

Inside:

**TIST Kenya kuhariria themina ya East Africa iria yokitwo ni arimikuma TIST Uganda na
TIST Tanzania. Page 2**

TIST Kenya kuriria guthuthuri (Verification). Page 2

**Semina ya mbere ya arimi kuuma ichigo cia machani kuma Imenti, Kionyo and Makomboki
Tea Factories. Page 2**

Clusters cia TIST Kuuma Nyamira: Nituthomete maingi kuuma twambiriria TIST. Page 3

Uhandi wa miti migunda-ini ya irio. Page 4



TIST Kenya kuhariria themina ya East Africa iria yokitwo ni arimikuma TIST Uganda na TIST Tanzania.

Arimi a TIST kuuma maburi ma irathiro ria Africa, - Kenya, Uganda, Tanzania nimanyitaniire gukurwo na seminar mucii wa Gitoro, Meru mweri 18th – 21st October 2015.

Seminar iriyaharirirwo niundu wa kuthoma njira iria njega (Best Practices) yakonie ithome cia gucera migunda ya arimi a TIST iria migaciru hamwe na guthomera thiiniwa hall. Makiria ya uguo, arimi nimaheanire maundu maria mahingitie kwa kahinda

gakuhi na magocooka magithondeka mutaratara wa wira (Action plan) wa kahinda ga thiku 40.

Guceera migunda-ini

Arimi a TIST Tanzanians na Ugandans nimacereire migunda ya arimi a TIST Kenya. Nimathomire na macooka Gitoro nimatariire manundu maria monire mega na maguthii kugeria kwao.

TIST Kenya kuriria guthuthuri (Verification).

Mweri muthiru, nitwakumenyithire ati mweri ucio nitugukurwo na athuthuria (Verifiers) akorara kana riera ritu ria carbon nirikinyanire . Twina na gikeno kumunyethia ati Verifiers nimatucereire kuuma mweri 20th – 25th October 2015.

Uthuthuria uyu wakonie gucerera migunda ya miti ya TIST. Athguthuria nio machagurite migunda iria maguguthie. Makinya mugunda, marora kana uria Quantifier (mutari wa miti wa TIST) niarutite wira wake na njira ngachiru hari utariwa miti .

Uhuthuria ucio niwacererire migunda (groves ni muunda uria murimi wa TIST ataragirwo miti yake) makiria ya 200 kuuma Clusters nurani. Thutha ucio, magicooka kwao India kuria magokorwo makirora makiria kana tukinyitie kana kuhitukia ikorwo iria ciendekanaga niguo tuonjorithie riar. Gwa kahinda gatari haraya, nimaritumethia maumirira maria ona ithui tugakumenyithia.



Dr. Madhukar, a Verifier, interview TIST farmer as Mary Wanjira , TIST Cluster Servant looks on.

Semina ya mbere ya arimi kuuma ichigo cia machani kuma Imenti, Kionyo and Makomboki Tea Factories.

Arimi a ichigo cia machani nimakorirwo na seminar yaoya mbere mucii Gitoro Conference Center, Meru. TIST riu niitheremeta ng'ongo cia Kionyo, Makomboki, Imenti na Ngeru. Icigo ici niukuragia machani. Seminar ino yakonie guthoma njira ngaciru (Best Practices) hari uhandi wa miti, utongoria a Cluster na ikundi nini , utauku wa biashara ya riera ria

carbon, na mangi maingi.

Ningi semina ino noyokitwo ni arimi kuuma Taita/Taveta . Gichigo giiki gitukuragia machani no nikiabata muno hari nyoni (birds)

Arimi acio othe nimathomire guthondeka mitarara ya wira (Action plans) na makiria semina o gichigo nigithondikre Action plan iria makuruthia wira.



Clusters cia TIST Kuuma Nyamira: Nituthomete maingi kuuma twambiriria TIST.

Mwandiki ni Peter Mithiru

thui, arimi a TIST kuuma Nyamira twina ngatho niundu uteithio na kunyitirirwo na atungati aria angi thiinie wa TIST. Mweri muhituku, nitwacereirwo ni Atari a mii kuma Nyahurururu aria matuthomirie hamwe na gutarira ikundi ciitu miti.

Makiria ya ikundi ikumi niciatarirwo miti. Nitwathomire muno uhoru ukonie gutara miti. Na wa bata muno, bata wa kuhanda makiria ya miti ngiri ithano o gakndi hutha wa miaka itano.

Nitwathomithirio uhoru ukonie utiganu wa muti nginya hari uria ungi (minimum spacing of 2m by 2m) . Nitwathomire uhoru wa gukuria miti hamwe na irio (Agroforestry) na gwikirira miti ya kiunduire nay a matunda muno hari migunda-ini itu hamwe na ndere cia njuui.

Gwa kahinda gaka nituracokaniria meceria tuone nuu umwe witu ugothomithio atuike mutari wa miti (Cluster Servants / Quantifiers).Turenda mundu wi kio thinie wa TIST nauriota kurumirira TIST Values –Tuuri: Ehokeku, (Honesty), Akinyaniru (Accuracy),

Aigiririku (Mutually Accountabilty), Atungatani (Servant to each other) na utumiri wa ngarama nini na kuna maciaro maingi (low cost- High results) Niturathie na mbere nagutheremia TIST kuri arimi aingi. Turamoria magokaga micemanio ya TIST nigetha mataririo TIST wega, metuire matua mao kana nimekwenda kuingira TIST mbere ya meyandikihie.

Nitugocokia ngathokuri Cluster Servants/ Quantifiers kuuma Nyahururu aria matuthomithirie na gututarira miti - Peter Mithiru na David Thuku. Ni ngatho kuri arimi aria merutire kumanyita ugeni na nio Simon Abere, LilianMaangi, Dennis Momanyi, AlferiousOteyo , FelistersNyakagwa, Charles Mochache.





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.

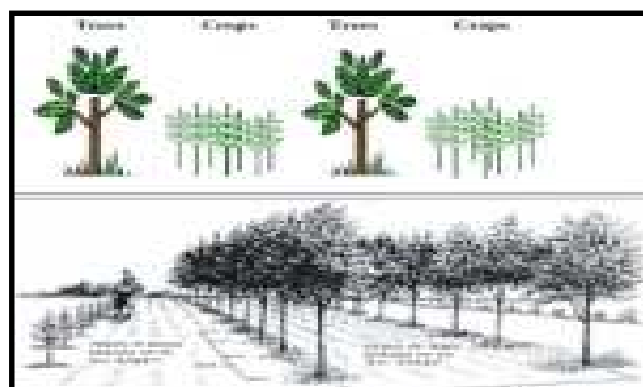
- Indo cia gwaka.
- Ngu cia riiko.
- Matunda na mangi maingi.
- Irio cia mahiu.
- Kwagirithia tiiri.
- Kwongerera unoru tiiri-ini.
- Kuiga tiiri uri mugunyu.
- Kuniyihia ruhuho.
- Kuonania mihaka ya mugunda.
- Dawa cia urigitani.
- Kurehe mbeca.
- Kuniyihia tiiri gukuuo ni maai.

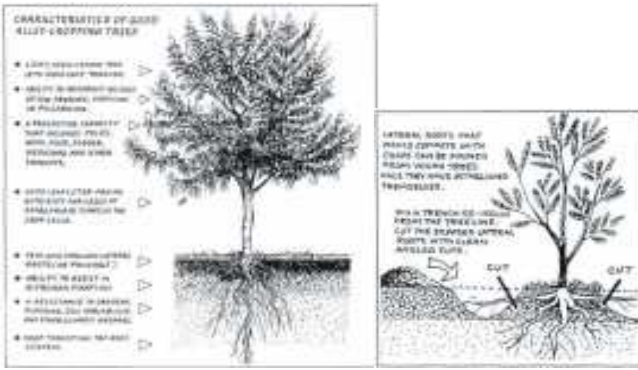
Urimi wa agroforestry: kuri na njira nyingi na ingi cirathundurwo. Njira ingi nicikoretwo na umithio kundu kumwe no cigakorwo citakwagirira kuria kungi. Andu nimagiriirwo nikugeria njira ngurani na mathomithanie micemanio-ini. Ici ni imwe cia njira cia agro-forestry.

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 uggunyu. Muhiano wa hedges ni kuhanda muhari wa miti mugunda-ini na utaganu uria mwitikiriku ni 1.5-2M. Njira njega nigutukania miti miraihu n amikuhi. Kwa muhiano *Croton megalocarpus* ihandaniirio na *Euphorbia tirucalli* na *lantana camara*.



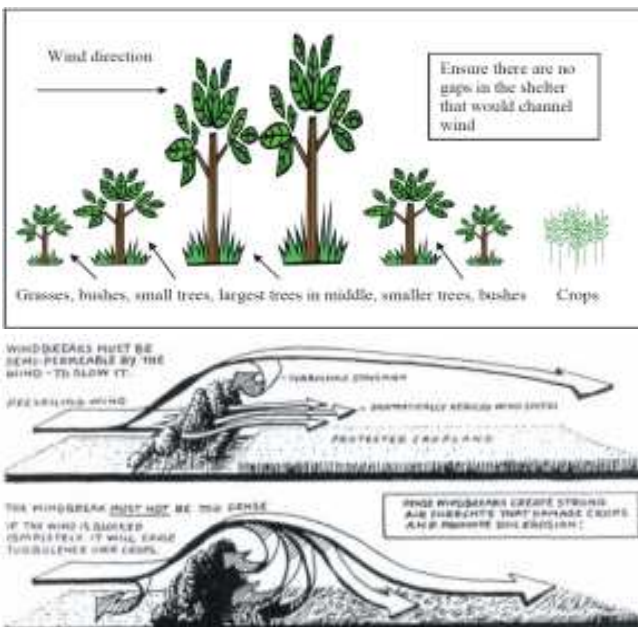
2. Alley cropping: ino ni njira ya guchagura miti ini na utaganu munini wa (0.5-2m) thiini wa muhari mugunda-ini. Nogukorwo na muhari wa miti urumiriirwo ni mihari 2 kana 3 ya irio cia mugunda. Muhiano wa njira ino ni kuhanda mihari ya mbembe utukanitie na ya leucena kana kahuwa na marigu. Miti iria 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. Ngingi, noicindanire irio na riia ohamwe na utheri. Mahuti maria macehwo nomarekio thi niguu 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 niguu ikure iri minene na ihote gukuranira na irio. Njira ino itagwo coppicing, na irutaga wiwo 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.



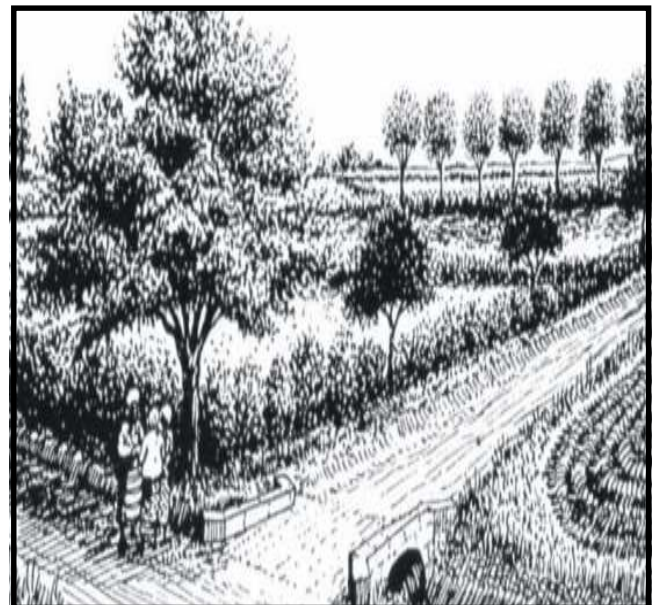
Nikuri na mawega ma kuhuthira windbreaks tondu murimi to muhaka ahuthire gicunji kinene kia mugunda niguo ahande miti. Ihuthagira muconjo umwe na noyongerere maciaro na gicunji kia 30% miena ingi. Ririkana ati, uhandi utabangitwo wega wa windbreak nouthukie irio makiria tondu nouhitukie ruhuho mianya-ini. 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-ini 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 riuu 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 *Syzgium* 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 kwegu miena iria itamukagira mbura nyingi.
- Resources: rurenda rweka muno ruria ruraheana uhoro wa miti iria miega thiini wa Kenya kuria unguicaria 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.

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'Kuja uwone' Washirika wapya waliokuwa kwa seminar ilifanyika Gitoro Conference Centre, Meru mwezi uliopita.

Ndani ya gazeti:

TIST katika Kenya yakuwa mwenyeji wa semina ya Afrika Kati iliyokuwa na washiriki kutoka TIST katika Uganda na TIST katika Tanzania. Ukurasa 2

TIST katika Kenya yamaliza matembezi ya Uhakiki. Ukurasa 2

Semina ya kwanza ya wakulima wa majani chai kutoka vibanda vya majani chai vya Imenti, Kionyo na Makomboki. Ukurasa 2

Cluster ya TIST ya Nyamira: Tumejua mengi tangu kujiunga na TIST. Ukurasa 3

Kilimo Endelevu: Kilimo Mseto. Ukurasa 4



TIST katika Kenya yakuwa mwenyeji wa semina ya Afrika Kati iliyokuwa na washiriki kutoka TIST katika Uganda na TIST katika Tanzania.

Washiriki wa TIST kutoka nchi tatu za Afrika ya Kati – Kenya, Uganda na Tanzania walikuwa na semina ya pamoja kule Gitoro Conference Center, mjini Meru kutoka Mwezi wa kumi tarehe kumi na nane hadi ishirini na moja, mwaka wa 2015.

Semina hiyo ambayo hali kuu ya kutosheka ilikuwa kufunzwa njia bora za kufanya mambo mbali mbali kutokana na kila mmojawao ilihusisha mafunzo ya ndani na pia matembezi mashambani. Washiriki

waligawana waliyoweza kufikia hivi karibuni na pia malengo yao katika kipindi cha siku arobaini zilizofuatilia.

Matembezi mashambani

Washiriki wa TIST kutoka Tanzania na Uganda waliyafanya matembezi yao ambapo walitembelea mashamba ya memba wa TIST katika Kenya. Kutokana na matembezi haya, haya ndiyo waliripoti katika semina; kuwa walifunzwa mengi na wakaahidi kujaribu baadhi ya njia bora walizofunzwa.

TIST katika Kenya yamaliza matembezi ya Uhakiki.

Mwezi uliopita, tulitaja kuwa uhakiki ungefanyika mwezi huu. Tuna furaha kuwajua kuwa tumemaliza kazi ya uhakiki kati ya terehe ishirini hadi ishirini na tano mwezi wa Oktoba, 2015.

Uhakiki ulihusisha kutembelea mashamba yaliyokuwa yamechaguliwa hapo awali na wahakiki. Huko mashambani, wahakiki waliangalia usahihi wa takwimu zilizokusanywa na wakaguzi, kuangaliwa ikiwa takwimu hizo zinaambatana na waliyoyaona wao wenyewe.

Matembezi hayo yalikuwa kwa zaidi ya mashamba mia mbili katika cluster tofauti. Wahakiki hao watakuwa wakichambua takwimu zao, watauliza maswali na ufafanuzi na watatupa matokeo hivi karibuni.



Dr. Madhukar, a Verifier, interview TIST farmer as Mary Wanjira, TIST Cluster Servant looks on.

Semina ya kwanza ya wakulima wa majani chai kutoka vibanda vya majani chai vya Imenti, Kionyo na Makomboki.

Wakulima kutoka maeneo yaliyochaguliwa ya upanzi wa majani chai walihudhuria semina ya kwanza kule Gitoro Conference Centre, Meru. TIST sasa imetambaa maeneo mapya ya Kionyo, Makomboki, Imenti na Ngeru. Maeneo haya ni ya majani chai. Semina hii ilihusu kupata mafunzo kuhusu njia bora zaidi kulingana na TIST za upanzi wa miti, uongozi katika vikundi vidogo na katika cluster na pia kuelewa

biashara ya kaboni pamoja na mengine.

Pia katika semina hii walikuwa wakulima kutoka Taita/Taveta. Hili si eneo la majani chai lakini ni eneo lililo na aina nyingi za ndege wa kiasili ambao ni muhimu sana.

Kutokana na semina, washiriki walifunzwa kuendeleza mipango ya hatua na masharti ya kuridhika. Mwishoni mwa semina hiyo, kila mshiriki alitayarisha mpango wa hatua wa eneo lake.



Cluster ya TIST ya Nyamira: Tumejua mengi tangu kujiunga na TIST.

Umeletewa na Peter Mithiru.

Sisi, wakulima wa TIST kutoka cluster ya Nyamira tuna furaha kwa sababu ya usaidizi tunaendelea kupata kutokana na Watumishi wengine katika TIST. Mwezi uliopita, timu nyingine ya Wahesabu miti kutoka Nyahururu walitutembelea ili kutusaidia kuhesabu miti katika vikundi vyetu na kutufunza uhesabu miti.

Zaidi ya vikundi vidogo kumi vilihesabiwa miti. Tulifunzwa mengi katika mkakati huu. Zaidi, haja ya kupanda miti mingine katika kila kikundi ili kukaribia lengo la miaka mitano la miti elfu tano. Nafasi kati

ya miti iwe mita mbili kila upande. Upanzi wa miti pamoja na mimea pia ulifunzwa sana sana miti ya matunda na miti ya kiasili katika maeneo ya upanzi wa vyakula na maeneo yaliyo kando ya mito.

Kwa sasa tunashauriana kati yetu kuhusu watu watakaopata mafunzo kuwa watumishi katika cluster/Wahesabu wa miti. Vigezo vyetu katika uteuzi wa wenye kupewa jukumu hili ni kuwa lazima awe memba hai, awe tayari kufuatilia maadili ya TIST – sisi tu wenye: Uaminifu, sahihi, Wawajibikaji, watumishi kwakila mmoja pamoja na kuwa mwenye kutumia gharama ya chini kupata matokeo ya juu. Tunazidi kueneza TIST kwa wakulima wapya. Walio

na mvuto wa kuingia katika TIST wanafaa kuhudhuria mikutano ya cluster ambapo watapitia mchakato wa maombi ya kuingizwa kabla ya kuweza kusajiliwa kirasmi katika TIST. Watapewa fomu za maombi ya kuingia. Madhumuni ya mchakato huu wa maombi ni ili kuwasaidia walio na uwezo wa kuingie kujua TIST vizuri, ili wawe na maamuzi sahihi kuhusu iwapo waingie au wasiingie.

Tuna shukrani nyingi kwa watumishi katika cluster waliotoka Nyahururu na ambao walikuja kutupa mafunzo na kuhesabu miti katika vikundi vyetu. Hawa ni Peter Mithiru na David Thuku. Pia tunawashukuru waliojitolea kusaidia watumishi hawa. Asante kwa Simon Abere, Lilian Maangi, Dennis Momanyi, Alferious Oteyo, Felisters Nyakagwa, Charles Mochache.





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:

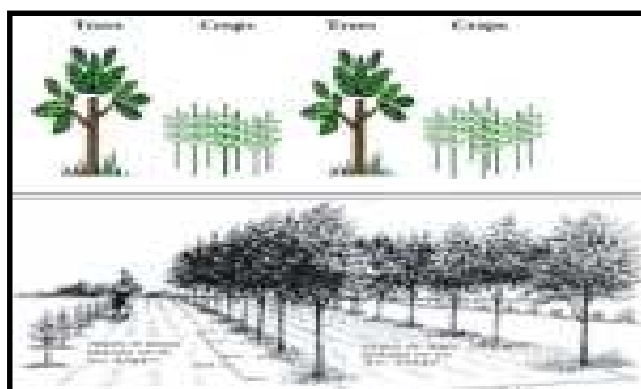
I. Nyua: Hili huhusisha kuchagua aina ya mti utakaopandwa kwa mstari na ambao una faida kwa ardhi. Nyua huhitaji nafasi ndogo, huzuia mmomonyoko wa udongo na hutengeneza majani kwa ajili ya chakula cha mifugo na matandazo. Mfano wa kutengeza ua ni kupanda miti kwa mstari ikizunguka mpaka wa shamba.

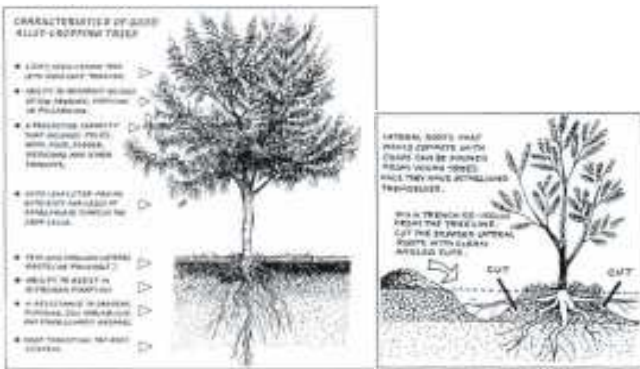
Nafasi kati ya miti inayopendekezwa ni kati ya mita moja na nusu na mita mbili. Njia bora zaidi ni kuchanganya miti mirefu na mifupi.

Kwa mfano *Croton megalocarpus* wawezwa pandwa pamoja na *Euphorbia tirucalli* pamoja na *Iau 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 itanza 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 haimeji tena inapokomaa kwa mfano *Casuarina spp.*, *Grevillea robusta*, *Sesbania sesban* na baadhi ya *Albizia spp.*

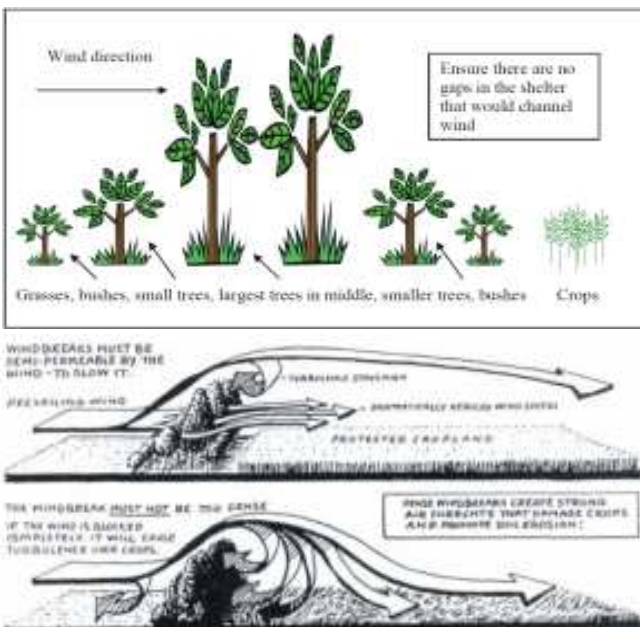




Je, wakulima wametumia jinsi hii ya kupanda miti na kulima? Kama ndivyo ni njia gani mwafaka ya kuchanganya? Wauleze wajandiliene na wakuje na majibu kwenye mkutano ujawo.

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

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 kupangia kizuia upepo.

4. Kupumzisha ardhi:

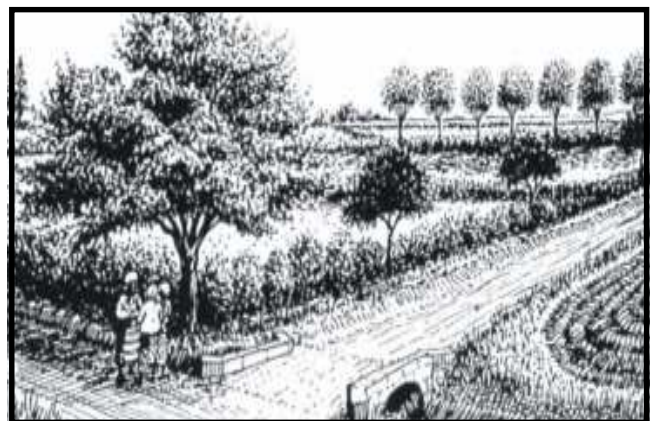
Hapa ni ambapo wakulima huacha kupanda mimea kwa kipande cha ardhi na kuiacha miti kumea ili kusaidia kurejesha rutuba ya udongo. Ni miti mifupi inayoweka naitrojini udongoni inayochaguliwa mara nyingi kwa mfano *Sesbania spp.* na *Gliricidia sepium*.

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. Mitsu 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 juu ni 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 shaloe 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 miseto 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.



Uu ni visa wa “Uka wone” ula ni wa ala maumite isioni nzau ala mai nthini wa semina ila ya Gitoro Conference Centre, Meru mwai muthelu

Inside:

TIST Kenya kukwata ueni East Afrika samina ila yai na aimi kuma TIST Uganda na TIST Tanzania. Page 2

Aimi ma TIST Kenya kumina ndambuka ya kuvitukithw’a. Page 2

Semina ya Mbee ya aimi ma maiani kuma vakitoli sya Imenti, Kionyo na Makomboki. Page 2

TIST Ngwatanio ya Nyamira: Nitwimanyiitye maundu maingi kuma twalika nthini wa TIST. Page 3

Uimi kana ndilikasa ya kuendee. Page 4



TIST Kenya kukwata ueni East Afrika samina ila yai na aimi kuma TIST Uganda na TIST Tanzania.

Aimi kuma nathi itatu sya East Afrika - Kenya, Uganda na Tanzania nimavikie thini wa semina ila yai Gitoro

Conference Center, Meru kuma katuku 18/10/2015 kuvika 21/10/2015.

Semina ino ya iundu wa Condition of Satisfaction (COS) iulu wa mawiko maseo ila vaina umanyisyo wa nyumba na kutambuka muundani. Ala maivo nimatavanasya maundu ala mavikiite na

mawalanio ala mekwithiwa namo kwa ivinda ya mithenya 40.

Kutambuka miundani

Aimi ma TIST Tanzania na Uganda nimavikie miundani ya aimi ma TIST Kenya. Itina wa kutembea miundani ino ivindani yii ya semina uu niw'o maisye mamanyie na mathana kutata maundu amwe ma mawiko maseo mamanyie ivindani yii.

Aimi ma TIST Kenya kumina ndambuka ya kuvitukithw'a.

Mwai muthelu, nitwaweti iulu wa kuvitukithw'a mwaini uu. Twina utanu kumumanyithya kana uu niweethiwe katikati wa matuku 20 - 25/10/2015.

Kuvitukithw'a kuu nikweethiwe vala vaina miti ila yai inasakuwa kwoondu wa kuvitukithw'a. Yila maendie kwika wia uu nimavikie na kusyaanisa uw'o wa uvoo iulu wa miti ii kana niwa w'o na kusianisya kana kila kiandike.

Ndembea ino niyavikiie ikuthuni kivathukanio mbee wa 200 ngwatanioni kivathukanio. Ala mathianaa na kuvitukithya nimekwikala na kusianisya na kutunenga usungi wa kila mekwata ivinda yukite.



Dr. Madhukar, muthiani, aneenania na muimi wa TIST Mary Wanjira, Muthukumi wa ngwatanio ya TIST asyaiisye.

Semina ya Mbee ya aimi ma maiani kuma vakitoli sya Imenti, Kionyo na Makomboki.

Aimi kuma isioni ila ivandawa maiani nimeethiwe na semina nthini wa Gotoro Conference Center, Meru. Titst yu nithanthaite kuvika isioni ta Kionyo, Makomboki, Imenti na Ngeru. Isio ithi ivandwawa maiani. Semina ino yaina umanyisya iulu wa Mawiko maseo ma Tist kwa uvandini wa miti, tukundi na utongoi wa ngwatanio na iklundi ya Understanding the Carbon Business maivo kati wa angi.

Angi maivo ni aimi kuma Taita / Taveta. Onakau kisio kii kivandwa maiani nikyavata nundu nikwimwe kithiawa na mivai ya kiene ya tusuni.

Kuma seminani ino, ala maivo nimeemanyiisye iulu wa Walanio wa meko na ivuso ya kwianiwa (Action Plan na Conditions of Satisfaction). Itina wa samina ino, kila umwe waivo niwaseuvisye ivinda ya kiko kwa kiso kyake.



TIST Ngwatanio ya Nyamira: Nitwimanyiitye maundu maingi kuma twalika nthini wa TIST.

na Peter Mithiru

Ithi aimi ma TIST kuma ngwatanioni ya Nyamira twina utanu kwa utethyo ula tukwatite kuma kwa athukumi angi ma TIST. Mwai muthelu timu ya Athiani na Avitukithya kuma Nyahururu nimatuthokeie kututetheesya kuvitukithya na kutumanyisya undu wa kuvitukithya.

Tukundi mbee wa ikumi nitwavitukithiwe. Nitweevundiisye maundu maingi. Kyavata mbeange nikwithiwa nitwamanyie kana kila kakundi nikaile ithiwa na mwolooto wa kwithiwa na miti 5,000 kwa ivinda ya myaka itano yukite. Miti ino yaile ithiwa

na utaaniu wa matambya eli kwa eli. (2mx2m). Kuvanda miti kula kwenge nitwavundiw'e iulu wakw'o na undu wa uvanda miti ya kienen na munamuno nguumoni sya mbusi.

Kwayu tuendee na kuneenania ithyi kwa ithyi iulu wa nuu thini wa ngwatanio yitu ukumanyiwa kutwika muthukumi na muvitukithya. Twitumia kulimana kwa mundu uyu niwaile ithiwa e memba ukuthukuma na utonya kwikalya mwolooto wa TIST na mawalanio mayo nundu ithyi twi Alau, twithiawa na w'o, tuatiia ulungalu, na

notutalike kwa masavu, twi athukumi umwe kwa ula ungi na kuatiia walanio wa kutumia kanini kukwata vaita munene.

Nituendee na uthuthya aimi angi malike thini wa TIST. Ala mena wendi nitumathokasya nthini wa mbumbano sya kila mwai vala mamuua kulika manengawe mathangu makaususya na mayielew'a nesa iulu wa TIST mbee wa kwiyumya kulika.

Twina muvea kwa athukumi eli ma TIST kuma Nyahururu ala mookie uvundisya ikundi situ ala ni Peter Mithiru na David Thuku. Ingi nituutunga muvea kwa aa ala meeyumisye kumatetheesya aa ala ni Simon Abare, Lilian Maangi, Dennis Monayi, Alferious Oteyo, Felisters Nyakagwa na Charles Mochache.





Uimi kana ndilikasa ya kuendeeza.



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:-

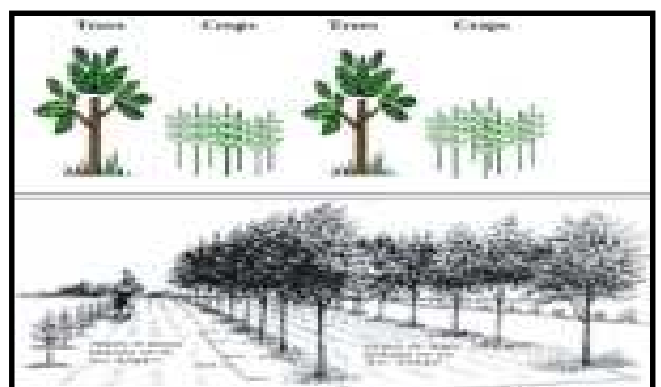
- Miti ya kwaka
- Ngu
- Matunda na liu
- Uithyo / Wovo
- Kulumya mbithanga
- Kwongela muthanga unou
- Kwikalya kimeu
- Kusii kiseve
- Kwikia muvaka
- Ndawa
- Kuete mbesa
- Kuola kukuwa kwa muthanga.

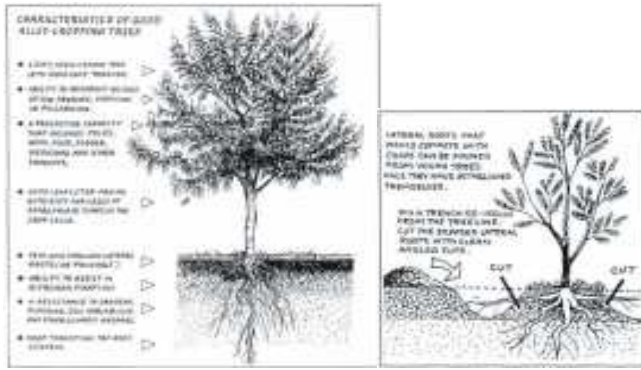
Nzia sya uvandi na uimi wa miti na liu; Kwi nzia mbingi ila iatiawa na kwi ona ingi nzau. Nzia imwe ni nzeo kwa isio imwe na nithuku kwa isio ingi. Andu nimendaa kutata nzia kwiana na kisio kila mai na kuete ona nzia ingi nzau na kwona nisyiva syaile kisio kyoo, ingi nimaile kwonasya ala angi yila mena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

1. Wiio: Nzia ino yendaa ukamba usakua muthemba wa miti ula wavandwa lainini wikaa nesa na unengae muthanga vaita. Wiio wendaa kisio kinini, nusiiiaa 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.

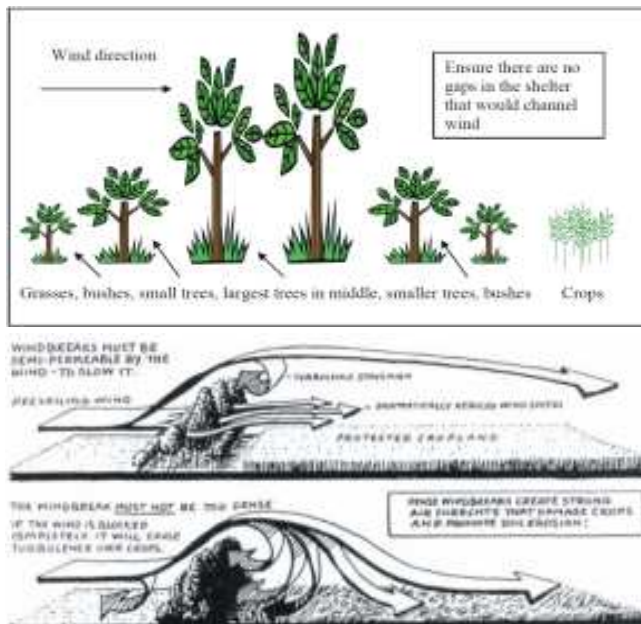




Ve muimi waatumia nzia ino ya kuvanda miti na liu vamwe? ethiwa evo, ni miti na liu wiva syeekie nesa syavandaniw'a? Makulye mamunenge uvoo iulu wa kila mamanyie kumanana na mbanda ino na muyuka na umanyi uyu ila ingi kukwithiwa na mauvundisyo.

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. utaanu 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 ndeithiwa 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. Sisy mundu wisi undu miti ya kusiia nzeve ivandawa autetheesye ethiwa wienda uvanda miti ya kusiia nzeve.

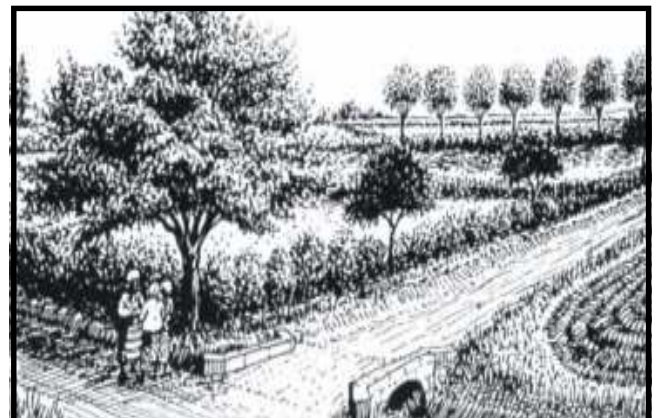
4. Kutiia uvanda:-Vaa ni vala muimi wambaa ukilila mbia siana una ate kuima kisio kina kya muunda na ayieka ikuthu imea nikana muthanga utunge unou. Kana nutonya uvanda ikuthu ila syongelaa muthanga nitrogen ta munyongo na wuti.

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 kuseuuya muthanga wavo.

8. Kwikia muvaka: 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 angu 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, naEriobotrya 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 niyuaniia kiw'u, liu na mimea na mithemba ingi ya miemea ndyendete muunyi. Osa uvoa 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 uvoa 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 mutalakwe 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 mamo

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.



'Come and See' participants from new areas take a group photo after a seminar held at Gitoro Conference Centre, Meru last month.

Inside:

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TIST kenya ko korutechi, East africa, TIST Uganda, ak TIST Tanzania:

K imiten tuiyet neo nebo bororosiechuton kenya-meru en 18-21 october 2015. En koyomenyuan ko kitogingei konetisiet agobo (COS) condition of sastification ne koborunet nebo boisiet nemie en age tugul en konetisienyuan ak rutoito.

Kitinye amdaet agobo keluloik che kigonyor

ak toginenyuan nebo betusiek 40 chebuwone Rutoito :

TIST Uganda ak Tanzania ko kiyai korutechi imbarenik chebo temigab kenya che kigomin ketik ak boisiyonik alak. Kin kobata anyun rutoito kowol kole en tugul kagenyuru ak che kagesuwe keibe koba emenyo koik koborunetab boisiet nemie.

Ko kituyosi chigilisiet ne komite TIST kenya.

En arawanigonye ko kigagimwa agobo niton kele miten en arwani toek chebo chigilisiet. Ki bo boisiyonoton 20-25 october 2015.

En kiprutoinik chon ko kiyom korutechi imbarenik che kigagolen kotomo kobwa. Kimoche konai komie kole ingo lititen boisiyonikab koitikab ketik (Quatifiers) igonomegei boisiyonik chetiye ak chemiten imbarenik.

Kirutechi koitetab imbarenik chesire 200 en komuwek cheterchin. Ko komolo kenyoru wolutikwak agobo boisiet ne kiyai.



Dr. Madhukar, a Verifier, interview TIST farmer as Mary Wanjira , TIST Cluster Servant looks on.

Konetisiet netai nebo minikab chaik koyob, imenti, kionyo ak makomboki.

K itoo konetisiet netai temik che kiyo komosuwek che kigilewen en Gitiro conference center en meru. Niton ko kotigetab tist en kionyo, makomboki, imenti ak ngeru minikak chai komosuwechuton. Kinyor konetisiet agobo boisiet nemiye, minetab ketik, ketoo kurubit ak agobo kandoilatet en kilaster ak mungaretab koristo.

Biik chegimiten en tuiyet ko kiboto temikab Taita /Taveta iche ko mokole chaik baten tinye iche itonuwekab Toritik chechang.

En kongesunetab tuiyet konyor konetisiet ole imuchi kotet agobo boisiet ne noton (Action plan) ak yametab boisiyonoton (COS). En let ko tetigei chi tugul boisiyet nebo komostanyin.



Nyamira TIST cluster: Kiginegei chechang kongeyen ketou TIST .

mwoe Peter Mithiru.

Kimwo kongoi mising en toretet ne kigeyoru en kiboitinikab TIST. En arawanikonye ko kigabuwa koitikab ketik koyob Nyahururu konyo koituwech ketik.

Kinyor koitet kurubisiek 10, kiginyoru konetisiyet neo mising kot kenai kele koboto kenysisiek 5 kenyonu ketik 5000 en kurubit age

tugul. Ak kokuwotik 2m by 2m en ketik got kit ketit. Kiginyoru kora konetisiet agobo minetab logoek koik osnet ak ketigab kipgaa keminchi ngeusiekab oinet.

Kitinye maget kenyorun kiboitiyot en kilaste asi kituwech ketik. En anyon agobo tolochikab TIST ko konech kenyorunen kiboitiyot.



Kiteseitai kemuwotoi agobo TIST en temik chetomo kochut asikinet ak kesir chut tist. Asi koguyo biik mising agobo niton.

Kimuwo kongoi neo mising en kiboitinik oeng che kiyob Nyahururu kibwa kogonech konetisiet, choton ko Peter Mithiru ak David thuku kimwochi kora biik che kiimutat ichek koborchinot imbarekab temik_Simion Abere, Lilian Maangi, Denis Momanyi, Alferious Oteyo, Felister Nyakagwa ak Charles Mochache.



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.

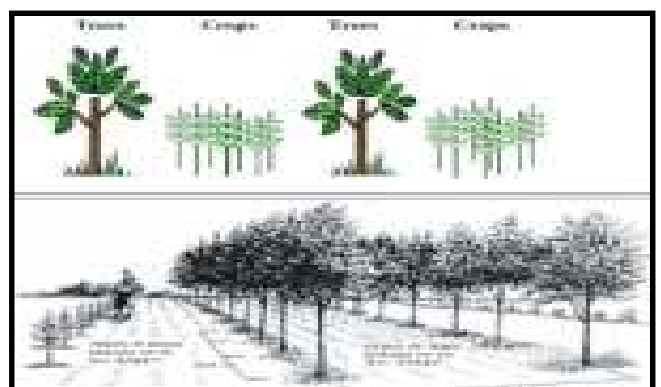
Miten kobotutik cheterchin chechang ak ortinuwek chelelachen chekinyoru en kasarta age tugul, kobowotutik alak kinyorunen kelut en komosto age ak kewelnatet en orage, kimoche biik koboisien kobotutik cheter ak kobchei en tuyosiek, cheisibu ko ortinuwek chebo.

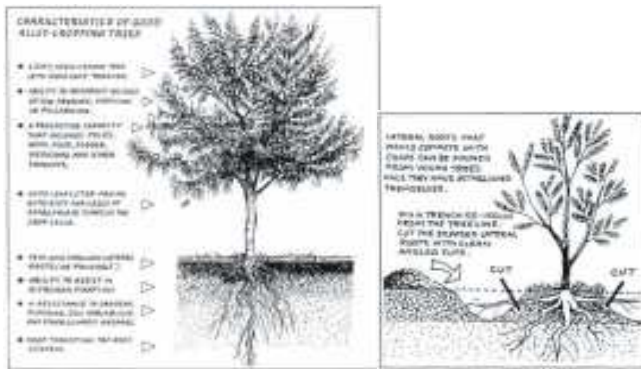


Koletab minutik ak ketik;

1. **Ngotuet:** Niton kotinyegei ak lewenet nebo ketik cheichome asi imin koik ngotuet an chetoreti imbarret, ketichuton kemin komoginge kokwoutik che mengech asi komuch koter ngungunyek ak kogonon beek ak kinyorunen omitwogikab tuga, koborunent nebo ketichu kemine en kiwoto komuti moche anyun kokwoutik kongeten 1.5-2m niton ko koborunet ne karanan komiten ketik chemengech ak chenuongen kou kelelwet ak lantana camara

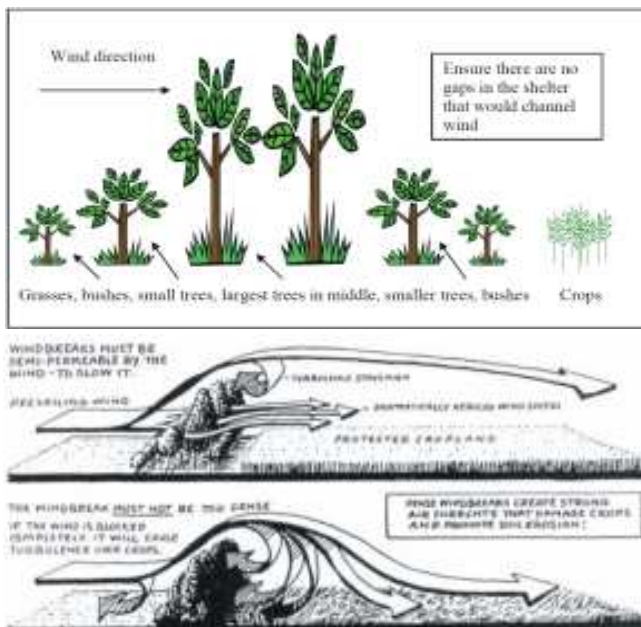
2. **Ketik chetinye boronik:** Niton kotinyegei ak kakwoutik chemengech (0.5-2m) en tebesindo imuchi kolainitab ketik ko oeng konebo minutik agichek ko somok kounoton en imbar korogunet ko kou bandaek ak indabibit ana ko gawek ak ndisinik, ketik anyun chegororo ko cheteche omitwogik en ngungunyek, en 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 kogotiem konee ne kararan, ongebchei en tuiyosiek yon kitinye en abogora, asi kesuen walet



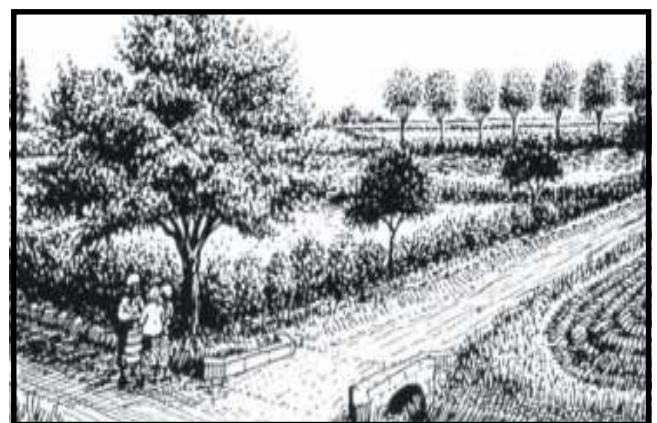
3. Tere koristo: kemin ketik chetinye kimnotet asi komuchi koter minutik en kasarta nemiten koristo ko kararan ingeminchin kwenetab imbar, kosib ketik chemengech en lainisiek oeng ak bugonok, ak susuek en komosta age, ibe kokwoutik (4-5) kongen ketit kot koit ak kokwouk (2-4m) en

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 ngungunyek, 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 kiboitinikwok

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 chegimuche kegol 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