

KUJENGA MAISHA EAST AFRICA -KUMEA



FEBRUARY 2020

REPORT OF AGROFORESTRY AND MODERN FARMING METHODS FOR FOOD SUFFICIENCY

“Improving integrated farming
through Agro-forestry”



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1.0 EXECUTIVE SUMMARY

Agroforestry is a collective name for land use systems and technologies where woody perennials (trees, shrubs, bamboos etc.) are deliberately used on the same land management units as agricultural crops and/or animals, in some form of spatial arrangement or temporal sequence. In agroforestry, systems there are both ecological & economical interactions between different components.

Types of agroforestry systems:

1. Agrisilvicultural systems - combination of crops and trees, such as alley cropping or home gardens, shifting cultivation, forest gardens, multipurpose trees and shrubs on farmland, alley cropping and windbreaks as well as integrated multistory mixtures of plantation crops.
2. Silvopastoral systems – combination of forestry and grazing of domesticated animals on pastures, rangelands or on-farm. Include cut- and – carry fodder production, live fences of fodder trees and hedges and trees and shrub grown on pastureland
3. Agrisylvopastoral – integration of trees, animals and crops. Illustrated by home gardens involving animals as well as scattered trees on croplands used for grazing after harvests. Include home gardens and woody hedges used to provide browse, mulch green manure, and erosion control and riverbank stabilization.

Other types of agroforestry systems include:

- Apiculture - bee keeping using honey-producing trees
- Aquaculture – trees lining fishponds provide leaves as well forage for fish and multipurpose woodlots that serve various purposes such as wood, fodder or food production and soil protection or reclamation.

Benefits of agroforestry systems include the following:

- Control runoff and soil erosion, hence reducing losses of water, soil material organic matter and nutrients.
- Maintain soil organic matter and biological activity at levels satisfactory for soil fertility. This depends on the proportion of trees in the system normally at least 20% crown cover of trees to maintain organic matter over systems as a whole.
- Can lead closed nutrient cycling than agriculture and hence to more efficient use of nutrients.
- Agroforestry can provide a more diverse farm economy and stimulate the completely rural economy leading to more stable farms and communities. Economic risks are reduced when systems produce multiple products.
- Nitrogen fixing trees and shrubs can substantially increase nitrogen inputs to agroforestry system

Modern farming is farming using modern (up to date or new) techniques or technology.

Some of the advantages of the modern methods/technology in agriculture include;

- Modern machines can reduce efforts of farmers'/human labor
- Reduces production time
- Improves fertility of the soil
- Increases price and demand of the products

2.0 TRAINING PROCESS 25TH – 26TH FEBRUARY 2020

ACTIVITY 1: PARTICIPATORY INTRODUCTION

Purpose

- To introduce participants and facilitators, establish training expectations and practicalities.
- To reduce social distance, breaking ice amongst the participants and building group spirit.

Before the beginning of the training clarity on the following issues were made. Including:

- Toilet facilities
- Switching off mobile phones
- Start and close times
- Smoking policy

In addition, all participants agreed upon the following ground rules:

- Confidentiality
- Time keeping
- One person talking at a time
- Equal participation among participants
- Respect
- Constructive challenging
- Responsibility for learning

ACTIVITY 2: WORKSHOP EXPECTATIONS AND OBJECTIVES

Purpose

- To make participants gain insights on their capabilities.
- Help participants to learn new things and make them comfortable to adopt
- Help participants with techniques with which they need to do things
- Help each participant to blend with teammates when it is a group task.

Below are objectives of the training in relation to agroforestry

- What is agroforestry
- Importance of agroforestry
- Types and uses of various trees
- Relationship between trees and crops and its importance to the farmer
- Methods of propagation of trees.

ACTIVITY 3: USES/ BENEFITS OF TREES IN AGROFORESTRY

Purpose

Participants to appreciate the need for agroforestry and take appropriate action in promotion of integrated farming methods involving agroforestry

Plenary presentation

- **Improves soil fertility** – trees helps in soil formation through physical, biological & chemical weathering of the parent rock materials and through addition of foliage and its subsequent decomposition thus ensuring soil is never depleted as a crop-growing medium.
Research has proved that crop production increases to 200 % or more in two – thirds of cases of farms where trees are incorporated.
Trees also increases the amount of water that soil can hold, for instance; for every 1% increase in the soil organic content, the soil can hold an additional 60,000 litres per acre.
- **Controls soil erosion** - they reduce the effect of erosive forces using their root systems and foliage.
The roots hold the soil in place and improve the drainage of soil. They also prevent soil compaction and help water soak into the ground instead of flowing over the surface. Tree roots tend to grow more deeply than other plants and provide a greater resistance to erosion on hillsides than grasses and other small plants.
On the other hand, tree foliage intercepts falling rainwater and reduces the force it exerts when it hits the ground thus reducing splash erosion by a great margin. Although the area a single tree protects is limited, trees with broad foliage planted together can reduce the force of falling raindrops over a significant area.
- **Trees play a major role in biodiversity** – forests and trees support food security and nutrition in numerous ways. Forests and wild biodiversity provide nutritionally important foods (including fruits, vegetables, bush meat, fish and insects), that contribute to the diversity and nutritional quality of diets of people living in the heterogeneous landscapes. Trees provides fuel wood, an essential component and often overlooked component of the food systems in rural areas across the globe.
In developed countries where there is large – scale monoculture agricultural systems, they depend on distant forests and biodiversity for ecosystem services such as water regulation and genetic material for future breeding and innovation thus rendering trees a key component when whenever biodiversity is mentioned.
- **They assist in increased carbon storage** – during photosynthesis, trees absorb carbon dioxide from the atmosphere, and later use it to build new materials such as trunks, stems and roots. Because of this, trees are capable of absorbing carbon dioxide from the air and storing it as carbon for a long time.
- **They have ornamental/ beauty value** – trees, shrubs, grasses and other plants are usually cultivated and planted for aesthetic and utility purposes in urban landscapes including yards, parks, gardens, sports fields, cemeteries and roadsides.

- **Used as a source of energy** – fuelwood and charcoal provide many people across the world with energy for their daily activities.
In Africa, 80% of households' energy comes from these sources. The trend of using charcoal is going up especially since; compared to other biomass it is lightweight, cheap and easily accessible by communities.
Even developed countries are increasingly using biomass as their source of energy, for instance Finland, 23 % of energy derived from wood, which is more than the total generating capacity of most countries in Africa.
- **They assist in reduced greenhouse gas emissions** - as they grow trees help stop climate change by removing carbon dioxide from the air, storing carbon in trees and soil, and releasing oxygen into the atmosphere.
New research estimates that a worldwide tree-planting programme could remove two – thirds of all the emissions from human activities that remain in the atmosphere today.
- **Trees have a medicinal value** – since 1978 world health, organization has been making a study of medicinal plants.
The study prompted the initial identification of 20000 species of medicinal plants and a more detailed investigation of a short list of 200. A great many of these plants have their origins in the world's tropical forests and their present use is largely rooted in traditional medicines which play a major part in maintaining the health and welfare of both rural and city dwellers in developing countries.

ACTIVITY 4: SEED BED AND NURSERY REQUIREMENT PRACTICES

Purpose

To assist farmers, develop nurseries for production of agroforestry and improve farm yields

Plenary presentation

4.1) DEFINITIONS:

- **Seedbed**- a bed of fine soil preparations in which seedlings are germinated
- **Nursery**- is a place where plants are grown, nurtured and sold out. Generally, various commercial crop growers require a good quality saplings or grafts of genuine type

4.2) TYPE OF NURSERIES

Nurseries are categorized in different ways. According to time, duration nurseries are classified in two types:

1) **Temporary nursery** – This type of nursery developed only to fulfill the requirement of the season or a targeted project. The nurseries for production of seedlings of transplanted vegetables and flower crops are of temporary nature. Likewise temporary arrangement for growing forest, seedlings for planting in particular area can also be done in temporary nursery.

2) **Permanent nursery** – This type of the nursery placed permanently to produce plants continuously. These nurseries have all the permanent features. The permanent nursery has permanent mother plants

4.3) WHAT IS A TREE NURSERY?

A tree nursery is an area/ place where young trees (seedlings) are given special care.

Factors to consider when deciding on the type of nursery

- The number of plants required
- The period the demand is likely to last
- Availability of transport/market

4.5) NURSERY ESTABLISHMENT

You need to consider; size, location, availability of water, skilled labor force and market for the seedlings.

Basic considerations for a nursery site

The ideal nursery site should have at least $\frac{3}{4}$ of the following requirements

- Easily accessible,
- Good permanent water supply e.g. spring, river, well, piped water system. The borehole is preferable but usually not reliable at times,
- Gently sloping, well drained site,
- Good supply of suitable soil materials.

Avoid the following sites

- Heavy clay soils, Swampy valley bottoms and Exposed hilltops.

Materials needed for Nursery establishment

In all these, nursery operators are encouraged to use locally available material where feasible e.g. Jerry cans, hoes, basins, winnowers, pangas, tins and banana fibres, Poles, timber, grass, mats and nails.

Steps to taken while preparing new nursery site

- Cut down all the trees/ shrubs on site
- Destroy any termite mound,
- Dig the area thoroughly,
- Allow some time for the grass to grow and stabilize
- Protect the nursery site against animals and thieves

Procedure for nursery establishment

- Level the site of the beds and firm the soil,
- Mark out the shape and sizes of the beds,

- Erect the beds using durable poles,
- For the shade, one can use any local material available,
- Erect rivets (sawn timber or poles) around the beds,

Common mixtures for the nursery seedbeds and transplant beds

- Standard seed- bed soil mixture (SSM):
This is composed of 50% sieved black forest or top soil and 50% sieved sand. Therefore, the ratio of soil to sand for SSM should be 1:1 but can keep varying depending on whether clay or sand component is higher in the soil build up.

Use of components

The forest soil give sufficient moisture holding capacity to promote good germination whereas the sand is to produce a very porous, textured soil which allows good penetration of the roots of the germinating seeds and easy to lift when pricking out.

- Standard transplant bed mixture (STM)
This is the mixture of soil that to be used in the transplant bed. It contains; 60% Un-sieved forest soil, 10% sand, 10% small stones (1cm diameter), 10% clay and 10% composite manure.

Use of each component

Sand and small stones: Gives good root penetration and drainage characteristics, Clay and top forest soil: Assists to bind near the roots to improve on the moisture intake and nutrient retaining qualities, Composite manure: Supplies organic matter and nutrients to the soil. The above mixtures is left to mature for 2-4 weeks before use. Keep it moist.

4.6) NURSERY LAY OUT

To obtain the maximum effect of the shade, beds should be orientated to run East- West to avoid direct sunshine. During March to September when the sun is in the northern hemisphere, the shade should slope towards the north and the rest of the year when it is in the southern hemisphere, it should slope towards the south.

Methods of sowing seed

- Broadcasting: This is the method of spreading seed on top of the SSM, either by hand or a mechanical broadcast. This mainly applies to small sized seeds.
- Drill -sowing: Is the method of making ruts or drills in the SSM into which seeds are linearly dropped in and lightly covered with SSM.

4.7) WHEN TO USE SEEDBEDS

- When seed is old or when the germination is low or unknown, use a seedbed to test viability before filling too many containers and wasting resources,
- If seed does not store very well (that is if it is “recalcitrant”),
- If containers are not available, or not filled in time to use, seedbeds can be used until the containers are ready.

iii) Direct sowing:

Is when sizeable (large sized seeds) are directly sown into containers or to the field? Depending on the conditions in your nursery, including the tree species (size of the seed), number of plants to be produced and labor availability, a combination of direct sowing and use of seedbeds may be your best way of operating. Most nurseries use seedbeds to germinate seeds.

4.8) NURSERY MANAGEMENT

There are several recommended operations and activities while carrying out proper management of a tree nursery

4.8.1) WATERING.

The regular supply of clean water is essential to plant growth. Plants are made out of more than 90% water. When grown in containers plants do not have the ability like mature trees to search for water from far below the soil surface.

The amount of water that seedlings require depends upon; Seedling age, amount of sunlight, soil type and turbulence (presence of wind).

AVOID:

Dirty water as it contains many plant diseases. Salty water is also not good.

Some of the good nursery watering practices include:

- Regularly check the water status of the leaves to determine when to water,
- Water in the early morning and / or late in the evening,

Some of watering practices include; the poor nursery

- Watering according to a fixed schedule,
- Directing the water to the leaves and not the soil,
- Watering during mid-day,
- Watering quickly and only wetting the soil surface. Remember;
- Over watering weakens plants and causes many diseases,
- If the soil is covered with, green moss or algae that mean you are watering too often.

4.9 .0 WEEDING

This is the operation of removing weeds in order to reduce competition for water and nutrients

Root pruning

Is the cutting back of the actively growing roots of the transplants? Root pruning is carried out so as: to avoid the roots of the seedlings inter – twining, to enable the transplants to develop a well-established root system fit for easy establishment in the field and for the transplants not to penetrate into the soil and get established within the nursery site.

Hardening off

This is the process of creating hard conditions to the seedlings towards the planting season. Reduce the amount of water 4 weeks before seedlings are transplanted.

Nursery hygiene practices

Good hygiene of the nursery site will lead to healthy and quality seedlings produced in the nursery.

4.9.1 COMMON PESTS AND DISEASES FOUND IN NURSERIES

a) Pests

- Gallflies are occasionally found in nurseries. The condition gets more serious when the seedlings are water stressed and the condition improves when the seedlings get enough water

b) Diseases

- Damping off is a condition young seedlings rot at the root collar, die and fall over. This is a sign that the seedlings are getting a lot of water and this condition is controlled by reducing or stopping watering until the improvement of the situation,

ACTIVITY 5: AGRO-FORESTRY MANAGEMENT PRACTICES

Purpose

Participants to understand the various agroforestry management practice for effective integrated farming improvements

Plenary presentation

5.1 Thinning

Felling made in immature stand for improving the growth and form of the trees that remain without permanently breaking the canopy. It is mainly done:

- To improve the hygiene of the crop by removing dead, dying and diseased trees
- To ensure best physical conditions of growth
- To obtain a desired type of crop
- To afford protection from the spread of insects and diseases
- To improve the quality of wood
- Increase the net yield and financial return from the crop

5.2 Pruning

- Removal of live or dead branches or multiple leaders from standing trees for the improvement of the tree or its timber.
- It allows the grower to manipulate the growth and development of the trees left after thinning to improve the quality of the tree and to increase agriculture returns
 - Natural; natural death and fall of branches of standing trees grown closely due to deficiency of light or decay etc.
 - Artificial: Removal of branches with sharp tools in a dense crop.

- Pruning lower branches close to the trunk of tree makes small knotty core, which gives clear straight grain timber.
- Removal of too many branches will retard the growth
- If pruning is done too late, the central core of knotty wood become large thus reducing value of tree

5.3 Pollarding:

Pollarding consists of cutting a sapling or pole tree at some height above the ground level so that it produces new shoots from below the cut. Pollarding is done at a height of 2- 2.5 m above ground level; e.g. in *Salix spp.*, *Hardwickia binata*, *Grewia optiva*, *Morus alba*, etc.

5.4 Lopping:

Removal of one year shoots or fresh growth from entire crown of the tree/plant in order to get sufficient fodder for livestock is known as lopping. Lopping is extensively done in *Morus*, *Grewia*, *Bauhinia*, etc.

5.5 Coppicing:

Cutting or heading back of main stem at 20-30 cm from the ground level. Strong coppicers: *Acacia catechu*, *Albizia lebbek*, *Anogeissus latifolia*, etc.; Good coppicers: *Aesculus indica*, *Chloroxylon swietinia*, *Hardwickia binata*, etc.; Bad coppicers: *Adina cordifolia*, *Bambax ceiba*, etc.; and Non-coppicers: All conifers.

5.6 Bending:

Restricting the development of bole to allow more food material to new leaf shoots. Bending and coppicing are useful when it is desirable to produce large quantity of foliage close to ground level.

5.6 Training:

In agroforestry, vertical spread of the tree is a desirable feature, therefore trees raised in agroforestry systems must be vertically trained to avoid shade and light competition to underground crop

ACTIVITY 6: IMPORTANT FODDER TREES/SHRUBS

Purpose

Understand the various tree breeds that are good fodder trees for livestock development and integrated farming

Plenary presentation

6.1 GRAVILLEA ROBUSTA-MUKIMA

Grevillea Robusta is a deciduous tree with a dense, conical crown; it can grow 12 - 25 metres tall with exceptional specimens up to 40 metre

The tree is often cultivated in the tropics for timber and as a windbreak. It is a very ornamental plant, valued especially for its attractive fern-like foliage and brilliant orange floral display; its often grown in gardens and as a street tree. The tree flowers freely in subtropical areas, but only poorly in the lowland tropics



6.2 CORDIA ABYSSINICA

Local Names:

Boran (Waddessa); Embu (Muringa); Kamba (Muvutu); Kikuyu (Muringa); Luhya (Kumukikhili, Kumukomari); Meru (Muringa); Nandi (Samutet); Sabaot (Mugunguret); samburu (Chibulukwa, Lboringo); Swahili (mringamringa, mukumari, Mkobokobo); Taita (Mringaringa); Taveta (Muringaringa); Tugen (Samut).

Cordia Abyssinica found in Guinea in W. Africa east to Ethiopia to S. Africa. Its also found in the Arabian Peninsula. It is widespread in Kenya where is common in pastures mainly in Central Province, around Nairobi, in Meru, Marsabit, Kakamega, and Kisii Districts and in parts of Rift Valley Province.

The heartwood is hard and takes a good polish, so the timber is prized for furniture, but it can be twisted and difficult to saw. Often found in cropland where it has managed to reduce shade. Provides very good mulch.

PRODUCTS

As the name suggests (Multipurpose), this tree has many uses, which include but not limited to the following;

- **Timber:** is used for high-quality furniture, doors, windows, cabinet making, drums, beehives, joinery, interior construction, mortars, paneling and veneering.
- **Fuel:** it is a good source of firewood.
- **Food:** when mature, fruits have a sweet, mucilaginous, edible pulp.
- **Medicine:** fresh, juicy bark can be used to tie a broken bone; this splint is changed occasionally with a fresh one until the bone is healed.
- **Fodder:** source of animal feed in dry season.
- **Apiculture:** It is a good source of bee forage, as the flowers yield plenty of nectar. Beehives are often placed in the trees.

Services:

- **Soil conservation:** its leaves are a good source of mulch.
- **Boundary marking:** planted along boundaries.
- **Ornamental:** planted in amenity areas.
- **Shade:** shade tree in coffee plantations; it is usually left in the fields, as it provides excellent shade for crops.



Cordia Abyssinica (MORINGA)

6.3 CALLIANDRA

Calliandra (*Calliandra calothyrsus* Meisn.) is a small tropical legume tree valued for its multipurpose attributes. Used in agroforestry systems, it yields many products (fuelwood, fodder, fibre, honey, shellac) and provides services (shade, erosion control, weed control, soil improvement, as an ornamental plant

A very versatile species, calliandra does well under a wide range of soils and is outstanding in those of low fertility. Calliandra is an almost evergreen, thornless small legume tree, usually about 5-6 m high, but it can reach a height of 12 m. It has a straight trunk up to 30 cm in diameter and many branches that form a dense canopy

Distribution

Calliandra is native to the humid and subhumid regions of Central America and Mexico. It was introduced into Indonesia in 1936 for green manure and as a shade tree, its planting being financially encouraged during the 1970s. It has since been introduced into many other tropical countries, particularly in South-East Asia and Africa (Ethiopia, Uganda, Kenya, Tanzania, Rwanda, Zimbabwe), and in Australia, Brazil, Bolivia, Colombia and Hawaii.

Environmental impact

Soil improver, erosion control and afforestation

Calliandra is an N-fixing legume that roots abundantly and nodulates readily with *Rhizobium* bacteria. It yields high amounts of biomass and has been recommended for green manure in areas of low fertility. It can be used in rotation with cash crops like sugarcane or maize (in alley cropping systems). However, the high tannin content of the leaves reduces the microbial breakdown of organic matter in the soil



calliandra calothyrsus

6.4 MORUS PLANT

Morus, a genus of flowering plants in the family Moraceae, consists of diverse species of deciduous trees commonly known as **mulberries**, growing wild and under cultivation in many temperate world regions

Generally, the plant has three main species ostensibly named for the fruit color of the best-known cultivar: white, red, and black mulberry (*Morus alba*, *rubra*, and *nigra*, respectively), with numerous **cultivars**,^[4] but more than 200 species are identified in taxonomy

USES

Consumption

As the fruit matures, mulberries change in texture and color, becoming succulent, plump, and juicy.

Other uses:

- ✓ As supplements
- ✓ Pigments
- ✓ Paper industry
- ✓ Silk industry



Morus Plant

6.5 GLIRICIDIA SEPIUM

Gliricidia sepium is a medium-sized tree that grows 10–12 m (33–39 ft) high. The bark is smooth, and its color can range from a whitish gray to deep red-brown.

The flowers are located on the end of branches that have no leaves. These flowers have a bright pink to lilac color that is tinged with white. A pale yellow spot is usually at the flower's base.

USES:

- ✓ Fodder – used in dairy farming
- ✓ Soil stabilization
- ✓ Intercropping
- ✓ Shade trees



Gliricidia Sepium

ACTIVITY 7: CONCLUSION AND KEY OBSERVATIONS

Following this study, we define agroforestry as a dynamic, ecologically based natural resource management practice that, through the integration of trees and other tall woody plants on farms and in the agricultural landscape, diversifies production for increased social, economic, and environmental benefits.

Agroforestry could help conserve tropical biodiversity: by reducing the pressure to deforest remaining forest land and degrade forest through the unsustainable extraction of its resources, by providing suitable habitat for forest-dependent plant and animal species, and by creating a biodiversity-friendly matrix to facilitate movements between existing patches of natural habitat and buffer them against more hostile land uses.

ANNEX 1: WORKSHOP PHOTOS



1. Participants in plenary



2.0 Participants in group discussions

ANNEX 2: LIST OF PARTICIPANTS.

25-2-2020

<u>NAME</u>	<u>GROUP</u>	<u>GENDER</u>
<u>1.STANLEY MBAE</u>	<u>MAKENA KATHANGENE</u>	<u>M</u>
<u>2.JOSHUA MUTHAURA</u>	<u>MAKENA KATHANGENE</u>	<u>M</u>
<u>3.PETER MUSYOKA</u>	<u>MAKENA KATHANGENE</u>	<u>M</u>
<u>4.JULIUS KINOTI</u>	<u>MAKENA KATHANGENE</u>	<u>M</u>
<u>5.AGNES MUKWANJI</u>	<u>MAKENA KATHANGENE</u>	<u>F</u>
<u>6.JANE MWENDE</u>	<u>MAKENA KATHANGENE</u>	<u>F</u>
<u>7.DORCAS KAGENDO</u>	<u>MAKENA KATHANGENE</u>	<u>F</u>
<u>8.STELLA WANJIRA</u>	<u>MAKENA KATHANGENE</u>	<u>F</u>
<u>9.REBECCA NKATHA</u>	<u>MAKENA KATHANGENE</u>	<u>F</u>
<u>10.EUNICE KANANU</u>	<u>MAKENA KATHANGENE</u>	<u>F</u>
<u>11.JULIA KAMENE</u>	<u>MAKENA KATHANGENE</u>	<u>F</u>
<u>12.SABINA SYOMBUA</u>	<u>MAKENA KATHANGENE</u>	<u>F</u>
<u>13.TERESIA MWOKIRIA</u>	<u>MAKENA KATHANGENE</u>	<u>F</u>
<u>14.SARAH KAMBURA</u>	<u>MAKENA KATHANGENE</u>	<u>F</u>
<u>1.FLORENCE KATHAMBI</u>	<u>MWENDWA AKUI</u>	<u>F</u>
<u>2.ESTER NKATHA</u>	<u>MWENDWA AKUI</u>	<u>F</u>
<u>3.AGNES NCORORO</u>	<u>MWENDWA AKUI</u>	<u>F</u>
<u>4.CATHERINE MUTHENYA</u>	<u>MWENDWA AKUI</u>	<u>F</u>
<u>5.FLORENCE KAMAMI</u>	<u>MWENDWA AKUI</u>	<u>F</u>
<u>6.JANET KAWIRIA</u>	<u>MWENDWA AKUI</u>	<u>F</u>
<u>7.ESTER KAOME</u>	<u>MWENDWA AKUI</u>	<u>F</u>
<u>8.BEATRICE NKIRINA</u>	<u>MWEMDWA AKUI</u>	<u>F</u>
<u>9.MARIAM KARIMI</u>	<u>MWENDWA AKUI</u>	<u>F</u>
<u>10.DORIS KATHOMI</u>	<u>MWENDWA AKUI</u>	<u>F</u>
<u>11.JERUSHA NCORORO</u>	<u>MWENDWA AKUI</u>	<u>F</u>
<u>12.AGNES KAGURI</u>	<u>MWENDWA AKUI</u>	<u>F</u>
<u>13.PURITY KAGWIRIA</u>	<u>MWENDWA AKUI</u>	<u>F</u>
<u>14.JULIA KANGAI</u>	<u>MWENDWA AKUI</u>	<u>F</u>

26-2-2020

NAME	GROUP	GENDER
1.FLORENCE KAMAMI	MWENDWA AKUI	F
2.JULIA KANGAI	MWENDWA AKUI	F
3.AGNES NCORORO	MWENDWA AKUI	F
4.JANET KAWIRIA	MWENDWA AKUI	F
5.HARRIET KAREMA	MWENDWA AKUI	F
6.CATHERINE MUTHENYA	MWENDWA AKUI	F
7.JERUSHA NCORORO	MWENDWA AKUI	F
8.ANN MUKOITI	MWENDWA AKUI	F
9.MARIAM KARIMI	MWENDWA AKUI	F
10.PURITY KAGWIRIA	MWENDWA AKUI	F
11.ANN KAGURI	MWENDWA AKUI	F
12.ESTER KAOME	MWENDWA AKUI	F
13.ESTER NKATHA	MWENDWA AKUI	F
14.REBECCA KARAUKI	MWENDWA AKUI	F
15.NICHOLAS MWETERI	AKUI SECONDARY SCHOOL	M
1.PETER MUSYOKA	MAKENA KATHANGENE	M
2.TERESIA MWAKIRIA	MAKENA KATHANGENE	F
3.STELLA WANJIRA	MAKENA KATHANGENE	F
4.STANLEY MBAE	MAKENA KATHANGENE	M
5.JULIUS KINOTI	MAKENA KATHANGENE	M
6.AGNES MUKWANJIRU	MAKENA KATHANGENE	F
7.JANE MWENDE	MAKENA KATHANGENE	F
8.JULIA KAMENE	MAKENA KATHANGENE	F
9.JOSHUA MUTHAURA	MAKENA KATHANGENE	M
10.REBECCA NKATHA	MAKENA KATHANGENE	F
11.DORCAS KAGENDO	MAKENA KATHANGENE	F
12.EUNICE KANANU	MAKENA KATHANGENE	F
13.SARAH KAMBURA	MAKENA KATHANGENE	F
14.SABINA SYOMBUA	MAKENA KATHANGENE	F
PURITY K. MAITIMA	TRAINER	F
DANSON N.G KAMAU	TRAINER	M