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MEMBERS EDUCATION
2025

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PROGRAM DURING MEMBERS' EDUCATION 2025

Arrival and Registration of participants ……	9.00 a.m - 10:00 a.m
Opening prayer & Introductions……	10.00 a.m. – 10.10 a.m.
Agribusiness (As per region)……..…	10.10 a.m.–10.50 a. m.
Sacco Products and Services …….....	10.50 a.m. – 11.10 a.m.
Chairman's Report……	11.10 a.m. – 11.40a.m.
Plenary Session……	11.40 a.m. –12.10p.m.
Response to plenary session……	12.10 p .m - 12.30p.m.
Speeches……..……	12.30 p.m. – 1.00 p.m.
Closing Prayer & Departure……	1.00 p.m. – 1.10 p.m.

SILAGE MAKING FOR IMPROVED DAIRY PRODUCTION

MAIZE SILAGE BASED FEEDING

Problems to be addressed	Low growth rate of weaner dairy calves in the dry season due to high cost and poor quality of weaner dairy calf feeds
	Low milk production by dairy cattle in the dry season due to high cost and poor quality of feeds for lactating dairy cattle. High methane gas emission by dairy cattle fed poor quality dry season feeds
Justification	Weaner dairy calves are vital for the future of the dairy industry, yet they often receive insufficient attention, particularly regarding their feeding. As a result, their rearing period can extend to a costly 40 to 47 months due to poor feeding. This increases feed expenses substantially and contribute to high methane gas emission by weaner dairy calves fed poor quality dry season feeds.
	A baseline survey in Kenya revealed low average daily milk yields of 6.7 kg per dairy cow, largely attributed to the high costs of feeds, constituting over 60% of total production expenses, and subpar dairy cattle nutrition. High methane gas emission by dairy cattle fed poor quality dry season feeds. On the other hand, there is a surging demand for milk driven by population growth, rising incomes, and urban consumers' preference for high-quality food. This requires development of gender-sensitive, cost-effective, and eco-friendly technologies to boost milk production during the dry season.

SILAGE MAKING

Silage is a high-moisture fodder preserved through fermentation in the absence of air that can be made from grasses, fodder sorghum, green oats, green maize or napier grass.

Design an appropriate silo depending on the type of material available and method of pressing e.g 1 acre.

SIZE OF SILO.

Size will depend on:

- material
- length of dry weather
- number of cattle.

Example

A cow needs approximately 40kg of silage per day if no other feed is available.

assuming proper compaction, $1m^3$ of silage weigh 300kg therefore volume of silage

An ideal crop for silage making should:

a. Contain an adequate level of fermentable sugars in the form of water-solublecarbohydrates

b. Have dry matter content in the fresh crop above 20%

c. Possess a physical structure that will allow it to compact readily in the siloafter harvesting

Crops not fulfilling these requirements may require pre-treatment such as:

a. Field wilting, to reduce moisture

b. Fine chopping, generally 20–25 mm preferred to allow compaction

c. Use of additives, to increase soluble carbohydrates

a.) Harvesting stages

Different crops have differ in their stage of harvest

a. Napier grass should be harvested at about 1 metre when protein content isabout 10%.

b. Maize and sorghum should be harvested at dough stage that is when the grain is milky. The grains will provide water-soluble sugars and molasses is not necessary when ensiling.

When ensiling napier grass, molasses should be added to increase the sugar content.To improve silage quality, poultry waste and legumes like lucerne and desmodium may be mixed with the material being ensiled to increase the level of crude protein.

b.) Silos

A silo is an airtight place or receptacle for preserving green feed for future feeding onthe farm. Silos can be either underground or above ground, airtight and allow compaction.

Types of silos are; Tube, pit, above ground, trench and tower.

Silage can be made in large plastic sacks or tubes, which have no holes to ensure no air enters. This is popularly referred to as tube silage. The recommended gauge is 1000.

Silage can also be made in pits that are dug vertically into the ground, filled andcompacted with the silage material.

An above ground silo is made on slightly slanted ground. The material is compacted,covered with a polythene sheet and a layer of soil is added at the top.

When finished, it should be dome-shaped so that it does not allow water to settle atthe top but rather collect at the sides and drain away down the slope.

The trench silo is an adaptation of the pit silo, which has long been in use. It is muchcheaper to construct than a pit silo. Construction is done on sloping land.

A trench is dug and then filled with silage material. This method is ideal for large-scale farms where the tractor is used. Drainage from rain is also controlled toavoid spoiling the silage.

Tower silos are cylindrical and made above ground. They are 10 m or more in height and 3 m or more in diameter. Tower silos containing silage are usually unloaded fromthe top of the pile.

An advantage of tower silos is that the silage tends to pack well due to its own weight,except for the top few feet.

Qualities of well-prepared silage

To be able to determine the quality of silage produced check for the following

a. Bright or light yellow-green
b. A smell similar to vinegar
c. Firm texture.

Natural microorganisms turn the sugars in the plant material or any added as molassesinto weak acids, which then act as a preservative.

The result is a sweet smelling, moist feed that cattle like to eat once they get used toit. Bad silage tends to smell similar to rancid butter or ammonia.

Storage and feeding

Tube silage should be stored under shade, for example in a store. Rodents like ratsthat could tear the tube need to be controlled.

When feeding, open the tube and scoop a layer and remember to re-tie withouttrapping air inside. When feeding from the pit, scoop in layers and cover after removing the day's ration, making sure there are no nutrients lost.

Tube silage

There are many methods for silage making but use of plastic tube is among those suitable for a farmer with one-two cows and limited napier acreage, rhodes grass andmaize thinning.

Use a standard tube of 2.5 m length/1000 gauge, which has a 450-500 kg capacityNapier.

Silage making procedure

- Cut the material for ensiling and leave it spread in the farm to wilt for 2 to 3days
- Chop forage (using a chaff cutter or a panga) into chops of 2.5 cm.
- Spread a canvas or plastic sheet of 500 gauge on a flat surface and spread 70kg (about two half sacks of chopped and compacted Napier grass) of thechopped material into a thin layer;
- Take 1lt molasses (about 1lt *Kasuku* tin-full) and dilute with 3lt of water (1lt*Kasuku* tin-full x3). If there is need to improve the Crude Protein content of Napier, add 200 grams of urea into the molasses and dissolve completely;
- Using nursery watering can, or 2-lt *Kasuku* tin perforated

at the bottom, spread the molasses/ water mixture on the Napier evenly and mix thorough to ensure an even spread . If the weather is not conducive for Napier wilting or when themolasses is very expensive spread 1.5kg of maize germ on to the chopped Napier and mix as above;

- Tie one end of the 2.5m plastic tube (width 1.5m) to make a large plastic bag. Place the 70kg of forage already mixed with molasses, or maize germ, into theplastic tube and compacted as much as possible.
- Repeat bullet 1-5 as many times as is necessary to fill the plastic bag;
- Tie the top of the plastic bag tightly to ensure air tight;
- Place heavy objects on the tied plastic tube to maintain the compaction.

Note : the filled silage plastic bag is very heavy and it is recommended that its filled at the point of storage : or alternatively use smaller tubes of 1.5m length which will contain less material, will consume more plastic tube to make 2.5m and also double the number of tubes, posing storage problem.

Losses

There are various losses associated with silage making

a. Nutrients may be lost in the in the field during cutting,
b. Respiration losses during wilting will be about 2% per day.
c. Leaching losses caused by rain.
d. Overheating due to poor sealing gives a brown product, which may smell like tobacco and result in severe damage to nutrients e.g. proteins.
e. Effluent losses of 2–10% that occur from moisture seepage contain soluble and highly digestible nutrients; seepage should be avoided bywilting the herbage.

Silage additives

During silage preparation, different types of additives can be added to improve thequality. These include

- Fermentation stimulants. Some crops may not contain the right type or the right number of lactic acid bacteria. Bacterial inoculants and enzymes can hasten and improve fermentation by converting carbohydrates to lactic acid. Most inoculants contain Lactobacillus plantarum.
- Fermentation inhibitors include acids such as propionic, formic and sulphuric.Inorganic acids are more effective but are strongly corrosive thus not recommended. Of the organic acids, formic is more effective than propionic, lactic or acetic.
- Substrate or nutrient sources (grains, molasses, urea or ammonia) are used when there are insufficient soluble carbohydrates in the material to be ensiled(e.g. legumes, Napier grass, crop residues). They are also used to increase thenutritive value of the silage. Molasses can be added at about 9 kg/t of silage. Note: Use of additives is not a prerequisite for making good silage, but it is good for problem crops.

Feeding silage

Silage is fed to dairy cows according to their body weight or 6-15kgs per cow perday. Feeding should be done 3 hours before milking or fed after milking to avoid the milk picking the silage smell.

The feeding troughs should be washed after feeding silage to avoid contaminationand infection of the dairy cows.

DAIRY GOAT PRODUCTION

INTRODUCTION

Dairy goat rearing is very beneficial for farming families, apart from the milk which is very nutritious; goat meat is also a delicacy for many households. Goats can also be used to provide manure for the farm and also earn the farmer more income. With limited capital a farmer can start a dairy goat project and be able to reap benefits from it within a short time.

Why keep dairy goats

- Goats Milk is easy to drink and is a richer food because it has more calcium, phosphorous and chlorine than cow's milk.
- Milk is used at for family income
- "High Nutritional Content." This means it is a very high quality food and very good for young and old.
- Nobody is allergic to goat's milk!

1.3. Goats are good for the farm

- Less feed is needed to keep a goat than a cow;
- Goats will eat many different plants-so they are easier to keep fed through the year
- Droppings are used as manure for organic farming;
- Goats are good at keeping bush under control - they stop too much shrub growth;
- Goats will live even where there is a drought as they do not need a lot of water and can go for quite a long time without water in very dry times.

1.4 Housing the goat

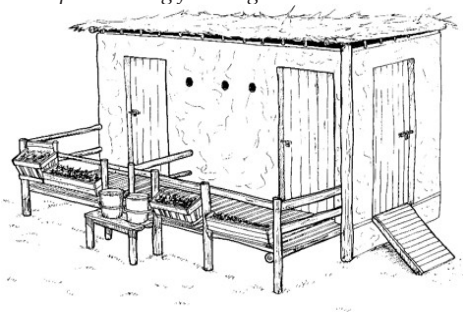
A good goat house should be:

- Rain proof; Damp proof; Well ventilated; Free from direct wind; Free from sharp objects that might cut the goat; Pest and wild animal proof; Slats on floor for free fall of droppings; and With an area of at least 2 meters per animal.

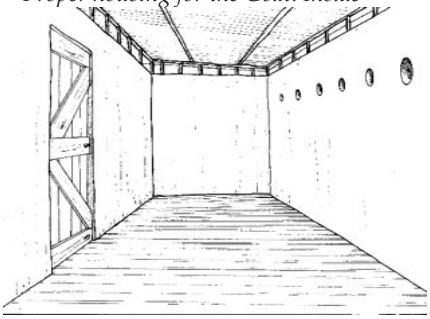
Types of Houses

At the beginning of the project it's assumed the farmer is working on a limited Budget so construction of a simple house but comfortable house for the goats is recommended. The house can be built using local material

Proper housing for the goat: Outside



Proper housing for the Goat: Inside

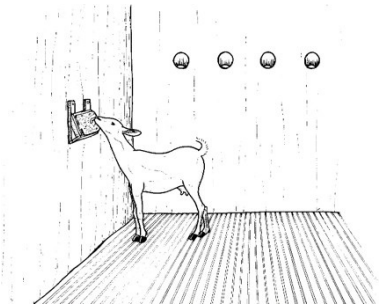


Off-cuts houses

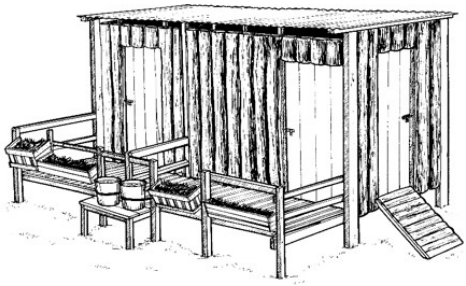
This house costs a little more but it will last longer.

Materials: posts; off-cut planks; nails; iron sheets wood-rafters or planks for the floor.

Sleeping area of the house



Off-cut housing



The house parts

Floor

- House should be raised 1.5feet ; A slatted wooden floor ; Use of local materials means you can use off cut planks, etc.
- The floor racks made of rafters should be put where the goats feed and sleep, this stops foot rot when it is wet, keeps the house clean and dry.

Feed trough

- Built1meter(3feet) above the platform; Easy to clean through; made of off cuts ; and Must be able to hold hay.

Water trough

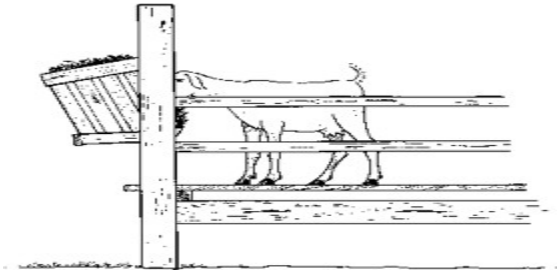
- Placed1foot above the floor in the feeding area;
- The door should have a small window so that goats can have access to water-day and night.

Kid pen

- Toggenburgs often give birth to twin kids so don't make the pen small!
- Kid pen should be for at least six kids; and
- Be half the area for the four does, i.e. 4 m^2.

Mineral trough

- Where the goats sleep made of 1 foot square box is ideal for the purpose.
- A halved long ways plastic container nailed to aboard,



- 1 foot wide can be useful, or just as good, hang the salt so the goat has to reach for it.

FEEDING THE DAIRY GOAT

How does a goat like to eat?

Feed above the ground often standing on their hind legs and resting their fore legs up on the bush or goat house wall.

Advantages of stall feeding

- Does not need a large amount of land and no grazing pastures;
- Can use many farm products, banana leaves, maize, maize thinning, bean husks, etc.;
- Saves time and labor, do not have to take goats out of the farm for grazing or spend time looking for them;
- Less death amongst the kids WITH proper housing to provide warmth for the kids
- Makes collecting manure very easy; and
- Helps in controlling diseases.

The best way to feed goats

Feed only clean, fresh and dry fodder;

- Always have fresh water for goats to drink at any time;
- Dusty feeds and concentrates should be wetted a little;
- Provide fresh and clean water daily.
- Give mineral Lick[block] always to all goats;
- Mix feeds with grass, hay, straw or napier to balance; and

What kind of feed should the goat be given?

1. Sweet potato vines-It is useful in feeding kids whose mothers die early in their life.

2. Napier-Plant napier along river beds, along soil terraces, road reserves, etc.

3. Fodder trees and legumes

These have lots of protein for example: *leuceana*, *calliandra*,*sesbania* and *desmodium* Which can be planted along the fences and terraces.

4. Maize

While maize is grown for farmer's food, there is a lot of fodder which can be used for feeding the goat which will not stop the farmer getting a good maize yield.

- Thinning:
- Remove extra leaves
- Cutting the tops
- Stover-
- Broken grains- but should be fed carefully to avoid grain overload

COMMERCIALIZATION OF FODDER AND PASTURES FOR ENHANCED SMALL HOLDER DAIRY PRODUCTIVITY

INTRODUCTION.

Broadly successful dairy production revolves around quality dairy animals achieved through breeding, rearing and their management, feeds and feeding through use of fodders pastures and other nutrients, animal health and sustainable ready market for milk and milk products, availability of appropriate technologies and innovations.

Animal breeding, management, animal health milk marketing and regulatory frameworks have addressed above issues variously but fodder pastures and related innovation issues have lagged behind. This area is the greatest constraint in our dairy production setup and places us apart from other major dairy producers in the world.

Observation through our small dairy producers is that their dairy cows are grossly underfed both in quantity and quality.

Importance of fodder in dairy production.

- Fodders and pastures form 80% of dairy animal feeds.
- 70% of costs in Dairy production constitutes of fodders, pastures and other feeding materials.
- Thus fodder and pastures role in dairy production in terms of availability, quality and quantities required and their costs is critical in Dairy production.
- No viable dairy production whether large or small scale production will thrive without putting fodders and pastures into consideration.
- Innovation in fodders and pastures is a must in order to get quantities and quality of the fodders and pastures required in order to make profits.

Objective of fodders and pastures in Dairy production

- To supply nutrients to the dairy cows for metabolic maintenance, good health, production (Milk and growth) and reproduction.
- Enhance dairy productivity and profitability
- Promote sustainable land use

Types of fodders and pastures.

Fodders are classified according to main nutrients they supply to the dairy cow.

- Energy fodders – nappier grass, Maize, sorghum, pasture grasses, boma Rhodes, oats, barley, rye grass amongst others.
- Protein fodders – Lucerne, tree Lucerne, calliadra, and leukaena, sesbania and desmodium.

All the above have vitamins and minerals in certain concentrations that may not satisfy the animals and thus requires supplementation.

KEY CHALLENGES

- Inadequate skills and knowledge fodder conservation
- Inadequate investment fodder equipments.
- Climatic changes affecting growing of fodders
- Land sub-division
- Limited use of technologies and innovations.
- Deterioration of soil fertility

INTERVENTIONS

- Promote high quality forage crops that are drought resistant. Use of technologies in fodder preservation
- Sustainable waste management practices
- Encouraging farmers to buy group equipments i.e. chaff cutters county governments of Nyandarua have provide chaff cutters to the farmers in the wards.

BUSINESS OPPORTUNITIES

- Value Addition: By making silage and Hay
- Aggregator to sale to dairy farmers by bulking

TECHNICAL GUIDE FOR ESTABLISHING A PIGGERY PROJECT

Before setting up commercial pig production, the following are key prerequisites:

- Land- A land is recommended to accommodate buildings
- Water- A reliable source of clean water
- Managerial skills and experiences
- Market-market outlets such as food processors, local butcheries, retailers, hotels, wholesalers and individual consumers.
- Capital- For a profitable pig project, access to finance is important as it enables the farmer to implement the business idea and acquire

farm equipment and inputs

The greatest production performance of the pig project depends on the following;

- Constructing appropriate housing structures
- High levels of gilts production
- Servicing gilts well on time
- Maintaining high levels of hygiene in the farrowing house
- Maintain gilts production records to help in making sound decisions
- Control of diseases and parasites to help reduce mortality rate
- Efficient allocation and utilization of inputs
- Controlling costs
- Keeping highly productive sow breeds with good maternal and paternal attributes and is capable of producing 16 piglets twice a year.
- Maintaining use of proper feeds for fast growth and weight gain It should be noted that properly managed pig projects will enable sows to produce the highest number of pigs that can be sold in the shortest possible time. If pigs are poorly managed, they become very wasteful.

Production process

The steps the farmer should adhere to when planning to stock a start-up project follows;

- Buy gilts at the age of 6 – 7 months at 125kgs at seven and a half to eight months when they are ready to be mated near a boar pen
- Flush gilts for 10 – 14 days and increase nutritious feed intake to come on heat. The mating ratio is 1 boar to 25 sows.
- After mating the gestation period will take approximately114 days (three months, three weeks and three days)
- The farrowing pens should be cleaned the thoroughly, disinfectedand left unused for 5 – 7 days.
- Clip the 8 sharp needle teeth to reduce injury tothe sows' teats and litter mates from fighting.
- A sow will be in the lactation period for 8 weeks (2months) after which it should be weaned from its litters to allow them to dry off for 4 – 7 days
- Give iron injection in the neck muscle (1ml) and remove tail from

3 days to 3 weeks

Cull if; fail to conceive/ poor litter size, forexample, less than 8 piglets/ physical problems that may be difficult to correct.

FEEDING GUIDE

Type of pig	Feed types	Intake(Kg/day)	No. of days fed
Dry sow	Dry sow & boar meal	2	121
Boars		2	365
Furrowed Sows	Lactating meal	7	56
Piglets	Creep meal	0.08	35
Weaners	Weaner meal	0.8	35
Growers	Grower meal	1.5	42
Finishers	Finisher meal	2.6	28

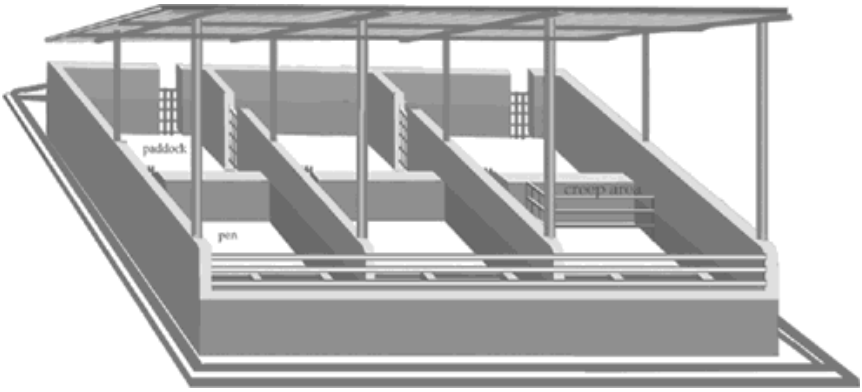
Records management

As such, the following records should be adequately kept;

- Production
- Sales
- Disease control

RECOMMENDED FLOOR SPACE REQUIREMENTS/WEIGHT OF A PIG

WT OF PIG	MINIMUM FLOOR SPACE M^2
23	0.6
45	1.4
68	1.9
91	2.5
101	2.8



THREE-DIMENSIONAL VIEW OF A PIGSTY SHED

ZOONOTIC PIG DISEASES THAT REQUIRE PROPER HOUSING STRUCTURES

Types	Symptoms	Management
SWINE INFLUENZA	• Fever; Cough; Sore throat; Muscle pain • Fatigue	• Strict bio-security farm measures • Vaccination • Protective clothing
Leptospirosis	• Fever • Headache • Pain • Jaundice • Liver damage	• Disinfect areas contaminated with pig urine • Control rodents • Protective gear • Avoid contact with contaminated water
Brucellosis	• Fever • Headache • Pain • Inflammation of the heart	• Meat inspection • Protective gear • Bio-security
Samonellosis	• Diarrhea • Abdominal cramps • Fever • Vomiting	• Hygiene, all-in all-out Quarantine • Proper cooking
Taeniasis and cysticercosis	• *Abdominal pain* • Digestive disturbance • Seizures • Neurogical symptoms	• Proper cooking • Regular Deworming • Hygiene

NB- PROPER DISPOSAL OF WASTE IS KEY TO DISEASE CONTROL BLACKSOLDIER FLY PRODUCTION AS ALTERNATIVE PROTEIN SOURCE FOR POULTRY AND BIOWASTE MANAGEMENT

INTRODUCTION

A big problem in the current agricultural sector of Kenya is the high prices for poultry feed due to high protein prices. For chicken, feed is around 70% of the total production costs (FAO, 2007). Of these percentages, around 60% of the total feed costs are because of protein (Kimuge, 2019). These high protein prices lead to low-quality and very expensive animal feed.

The production of the BSF on the waste products of smallholder farmers gives farmers an opportunity to produce protein rich poultry feed without having to buy expensive poultry feed with foreign protein sources as soybean- and fishmeal. The usage of the black soldier fly larvae as feed would decrease the costs of poultry feed for farmers and can lead to a more food secure economy.

The dried larvae can be used as a substitute for soy and omena / fishmeal in animal feed. The larvae can survive a lot of environmental differences and are therefore a suitable implementation for farmers to produce themselves. They are able to survive huge differences in temperature, humidity and feed substrate.

Temperature (around 27 degrees Celsius) but range from 25 to 30 degrees Celsius. Temperatures outside the range will increase time to develop into the larvae

How to produce them?

A. Prepare yourself

- These are; a pair of overalls, non-dispatchable rubber gloves and a pair of gumboots.
- Protect your hands from bacteria.
- Protects the BSFL from bacteria and mites.

Basins are needed to grow the larvae in. depending on the size of your farm, the amount of crates needed can be calculated. For example; a farmer with 30 chicken needs only 2 crates to replace the recommended protein content with BSFL.

Tape and markers are needed to mark the crates with the date of the start of the production, this keeps everything structured.

A kitchen scale is needed to measure the amount of kitchen waste and manure. Besides, a scale can beused to measure the harvest. Lastly, a sieve is needed to separate the BSF manure and skins from the harvesting-ready larvae.

B. Preparing feed substrate

Each bag of 5-DOLs needs 12 kg's of feed substrate. The feed substrate can be a mixture of **animal manure** and different kinds of kitchen waste. The re commended amount is 60% animal manure and 40% kitchen waste. Research has shown that the larvae fed on a percentage with this substrate had the highest harvest outcome.

It is recommended to cut the kitchen waste into smaller pieces before mixing, the larvae are then able to consume the substrate better and faster. It is also recommended to first create a substrate out of kitchen waste before mixing it with the animal manure.

	Kitchen waste	Manure	Total
% Kg	40	60	100
	4.8	7.2	12

Different kinds of waste can be fed to the larvae.

When the kitchen waste substrate is mixed through correctly, animal manure can be added into the BSFL crates. Afterwards, the kitchen waste substrate can be mixed with the manure to create the final feeding substrate.

When the feed substrate is ready, a bag of larvae needs to be added in each crate. When the larvae are active, the temperature in the crates increases. The recommended outside temperature is between 25 and 35 degrees Celsius. This leads to a higher productivity and development rate of the larvae. For humidity, the feed substrate needs to have a high water content. When the feed substrate is pressed together in one hand, it needs to stick together, but only a little bit to no water has to come out of the substrate, this can be seen in *figure 10*.

One bag of larvae with substrate weighs 100 grams and can lead to a harvest between 1.8 kg 2.5 kg of end product. The amount of harvest depends on several factors; feed substrate, temperature and relative humidity. When the feed substrate does no contain enough nutrients, the larvae tend to be smaller and have a longer development time.

Risks

The production of the larvae has a few risks which are not severe. These risks are; mites, birds and houseflies.

- Birds are attracted towards the larvae and are likely to consume them when possible. To decrease this risk, a net can be placed on top of the crates.

- Mites can be recognized because of their red colour. They feed themselves on the blood of the larvae. Mites are attracted towards chicken manure. When the larvae are contaminated with mites, the time before the larvae reach harvesting stage can be extended. After harvesting crates with chicken mites,

the crates need to be clean dried properly.

- The pupae of houseflies can be recognized because of its colour and shape. Houseflies are nothreat for the larvae, but they are in competition because of the feed substrate.
  The developing time of the housefly larvae is shorter and therefore they do not form a big risk.

Harvesting
The harvesting of the BSFL needs to happen when the protein content of the larvae is the highest. This can be recognized by their beige colour. Before harvesting stage, the larvae have a white colour. When thelarvae are past their harvesting stage, they turn into a black / grey colour and are most likely to escape the crates.

The harvesting can be done by sieving. A sieve will be part of the smallholder starter kit. The process of sieving can be seen below. The manure/frass received from the sieving process can be used as fertilizer on land.

The end products are then the larvae in harvesting stage and the manure of the larvae.

Processing

After the harvesting of the larvae, they need to be processed. For chicken, the larvae can also be fed .The cleaning of the larvae needs to be done via blanching. The larvae needto be boiled for 3 minutes in water. This will kill bacteria and clean the larvae. After this process, the larvae need to dry in the sun for two weeks ready to be fed to chicken.

Cleaning :

- When the processing of the larvae is done, the crates can be cleaned.
- Done properly to reduce any risks and create a hygienic environment.
- The crates need to be washed with warm water and soap.
- Disinfectant can be used afterwards to kill present bacteria. Let the crates dry at least one day beforeusing them again.

BILL OF QUANTITIES FOR A STANDARD STRUCTURE				
ITEM	**QTY**	**DESCRIPTION**	**RATE**	**AMOUNT**
POLY.PAPER	1	ROLL	5000	5000
TIMBER(4"X2")	100	FT	35	3500
" (3"X2")	100	FT	30	3000
" (2X2")	150	FT	28	4200

" (8"X1")	50	FT	35	1750
NAILS(Ordinary)	10	KG	130	1300
" (Roofing)	2	KG	240	480
USED OIL	5	LTR	100	500
SUB-TOTAL				**19,730**
PRODUCTION COST				
KITCHEN SCALE	1	PCS	300	300
BREEDING CRATES	2	PCS	600	1200
BREEDING NET	1	KITS	3000	3000
POLYTHENE ROPE	1	ROLL	500	500
BIOWASTE CARRIER	2	PCS	600	1200
DUST COAT	1	PAIR	1300	1300
FARM GLOVES	1	PAIR	500	500
PARENTSTOCK(Lavae)	1	KG	1000	1000
COMPOSTED WASTE /POULTRY WASTE/ KITCHEN WASTE/ OVACADOS/MANGOS	20	KG	100	2000
SUB-TOTAL				**11,000**

BEE KEEPING

THE HONEY BEE AND ITS IMPORTANCE

The honeybee castes in a colony

Queen bee

- lay eggs and produce queen substance (pheromones).
- A good queen lays between 1,500 - 2,000 eggs per day but after two years she lays fewer
- She lives for three to five years.

Drones

- The Drones are males and are bigger than the workers.
- They develop from unfertilized eggs and their major task is to mate with the queen.

The Workers

- Most of the bees in the hive are workers- they are all sterile females.
- The workers are also responsible for the honey formation process.
- The lifespan of a worker bee is 7-8 weeks

THE IMPORTANCE OF BEEKEEPING

1. As source of food.
2. As source of medicine
3. For income generation
4. Pollination
5. Conservation of natural resources
6. For cultural purpose

POLLINATION

Pollination is the transfer of pollen grains from the anther to the stigma of the same flower or another flower of the same plant or another plant but of the same species. In other words, pollination is the mixing of the male and female parts of a flower. Pollination is a vital step in the reproduction of flowering plants and is necessary for all seed and

fruit production.

Plants require pollen to be transferred from one plant to another and many depend upon insects todo this as they forage.

There are commercially available and major sources of forage for bees to produce excellent honeys, and can flowerall year round.

The following are examples of such plants: black berry (*Rubus argutus*), calliandra (*Callindra callothyrsus*), Citrus (*Citrus* spp.) e.g. tangerine and orange, coffee (*Coffea* spp.), clover (*Trifolium incarnatum*), sunflower (*Helianthus* spp.), cotton (*Gossypium* spp.), mango (*Mangifera indica*), cashew (*Anacadinaceae*), neem (*Azadirachita indica*), eucalyptus (*Eucalyptus* sp.), banana (Musa sp.), bottle brush and passion fruit.

MANAGEMENT OF THE HONEY BEE

Currently, there are various beekeeping systems used,ranging from the local/traditional methods to the modern systems. There are 3 categories of beekeeping namely:-

- Local/traditional beekeeping in fixed comb hives.
- Transitional (between local/traditional beekeeping
- modern beekeeping): in top bar hives. Modernbeekeeping: in frame hives

BEEKEEPING EQUIPMENT

Many different types of equipment are used in beekeepingindustry right from the apiary through harvesting and processing to transporting and storage of hive products.

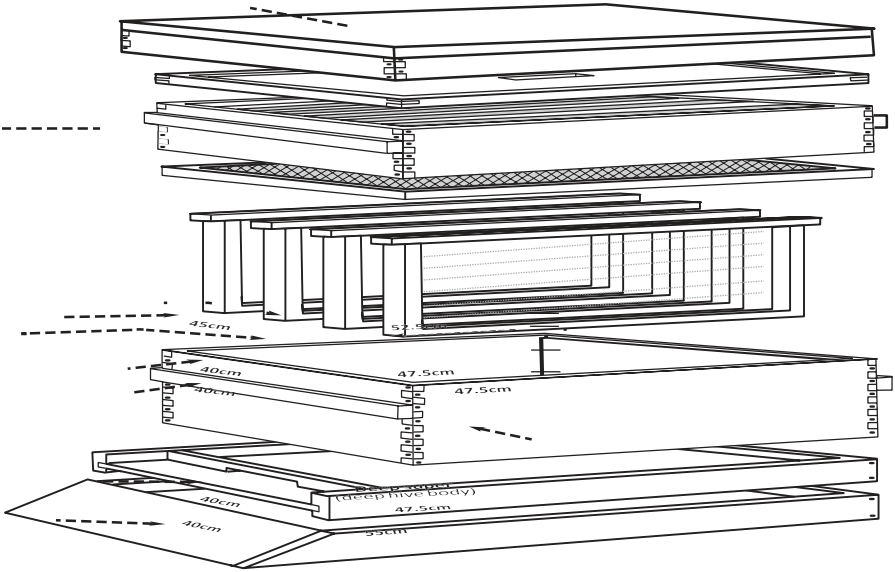
Beekeeping equipments include beehives, harvesting gear,processing gear, storage and transportation facilities.

Types of beehives

A KTB hive

- All top bar hives should have top bars withdimension of width of 3.2 cm and a length of approximately 48cm.
- Kenya top bar hive can be made out of bricks, timber, bamboo, papyrus, basket andclay.
- The cover can be fabricated provided it iswaterproof material e.g. Plastic sheets, grass, banana fibers, and mats

3. Modern hives (Movable frame hives): meter



APIARY MANAGEMENT

Apiary siting

- The site must be easy to get to and from in order for you to check the hives regularly.
- An apiary can house up to 20 hives bees forage up to 3 km from the apiary.
- A high hedge separate the bees from people and animals, as bees can be aggressive. The apiary should be away from human and livestock dwelling areas, roads and public areas.
- It should be safe from strong direct sunshine,
- I safe from strong direct wind
- Near a fresh water supply; this can be a river, pond
- It is better if the apiary is away from areas where children

play or any source of continual noise. Noise can disturb the bees and make them defensive.

PROCESSING HONEY

Honey should be processed in a space where bees cannot enter (all openings must be closed with fine wire mesh). It is also possible to work in the evening. You can also spin honey in a tent which seals well with the ground so that there are no gaps. If necessary you can store well-capped frames in a well-sealed container. If your honey contains too much water, you can dry your uncapped honey by making a chimney of the honey supers and blowing air through them with a ventilator. If you place newspapers on the floor of the room you can easily remove spilt honey.

GUIDE TO FARMING TILAPIA IN PONDS

Introduction

More and more people want to eat fish because it is healthy and is tasty. There is a good market for fish from ponds, because fish prices have doubled in the past two years and the catches from the lakes have gone down. If you manage your ponds well, you can earn a good amount of money; in addition fish eating is also very healthy!

This quick guide gives an overview on:

- Pond construction
- Marketing and making money from farming fish
- Record keeping
- Post-harvest handling and processing

1. Pond preparation

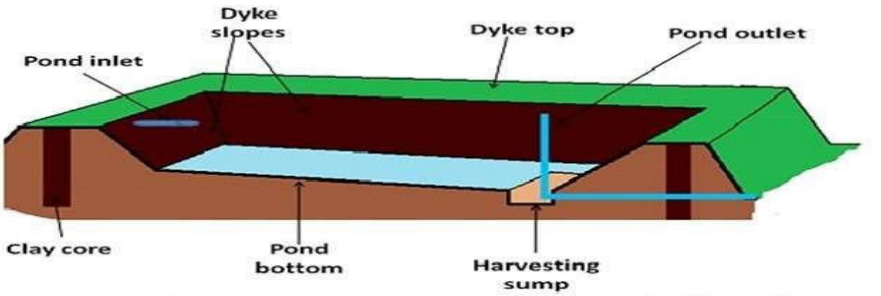
Drying of the pond

The pond is completely dry when all water puddles have been dried out by the sun and the first cracks appear at the pond bottom. Proper drying of a pond will take 2 to 3 weeks, but it has huge benefits.

It will improve availability of nutrients in the pond bottom, the mud will decompose and most pests, water insects, amphibian larvae (e.g. tadpoles) and unwanted wild fish will disappear.

Small pond repairs

When drying the pond, it is important to carry out pond repairs. The pond (especially the dykes) should be cleaned and weak spots reinforced, cracks filled in, holes dug by crabs or rats should befilled in to avoid water seepage and prevent the dykes from collapsing



A cross section of a typical earthen fish pond showing the pond profile and important features

A cross section of a typical earthen fishpond showing the pond profile and important features (Source: FAO)

It is recommended to have 1 to 1½ meters (3 to 5 feet) of water in the pond. with a depth of 1 meter is recommended. Don't use the mud from the pond bottom, but the soil to reinforce the dykes.

2. YOUR 6 STEPS TO SUCCESS FARMING

1. Disinfection: Always disinfect the pond after the final harvest. This will keep your fish healthy, reduces infections, pests, predators and stops unwanted natural fish reproduction

Disinfection with lime

Lime kills most smallcreatures (parasites, insects, tadpoles, etc.) which are harmful to your fish, or which might transfer diseases.

Liming

Disinfecting the pond is possible by increasing the pH to 10 or 11.

Agricultural lime: Rule of thumb: use 500 gram of agriculture lime

(CaCO3) per m^2. Sprinkle it over the whole pond if it is still wet or sprinkle it only over the area which has water puddles.

Quick lime: Rule of the thumb: use 250 gram of Quick lime (CaO) per m^2.

Liming to improve the pond (soil) fertility is different from liming for disinfection. By knowing the pH of your pond you are sure you give the right amount and do not waste your money.

Amount of Agricultural lime (CaCO3) to be used for liming (DISINFECTING) a pond

Soil pH	Amount of Agric. lime(CaCO3) per m^2	Calculation:	Amount of Agric. lime(CaCO3) per 300 m^2
Below 5	0.3 kg	0.3 kg x 300=	90 kg
5 – 5.5	0,25 kg	0.25 kg x 300=	75 kg
5.5 – 6.0	0,2 kg	0.2 kg x 300=	60 kg
6.0 – 6.5	0,15 kg	0.15 kg x 300=	45 kg
6.5 - 7	0,1 kg	0.1 kg x 300=	30 kg

1kg= 1000 Grams, 0,1Kg = 100 grams

2. Fertilization: Always apply the right amount of good quality and effective fertilizers to create a good algae bloom and maintain green waters. This will help you to maintain good water parameters, to keep your fish healthy and reduces your feeding costs.

Filling the pond with water & fertilization

Filling the pond with water in 7 days.

Example calculation:

5 fish of **200** grams each = 1 Kg. Each piece is sold at 140 shillings which is in total **700** Ksh

2 fish of **500** grams each = 1 Kg. Each piece is sold at 250 shillings which is in total **500** Ksh actually you make more profit with the smaller fish, but if people in your area only like the bigfish you will not be able to sell them!

Fertilization

Fertilizing the pond is to stimulate the growth of algae. Too much fertilizer deteriorates the water quality and oxygen levels. On the other hand, with too little fertilizer your algae will grow slowly. If the secchi disk (or your hand) is visible below a depth of 30-40 cm continue applying fertilizer every week as specified in the table below:
Stocking & Sampling

Mortality:

When starting with fry or small fingerlings overall mortality can be over 20%.

Stocking

All male tilapia fingerlings grow much faster than mixed sex tilapia fingerlings. This means you spend more on stocking, but in the end you will make more profit.

3. Fingerlings: Always stock your pond with the right numbers of good quality fingerlings. Do notoverstock (maximum 3 fish per m^2). Use all male fingerlings as the males grow faster and unwanted reproduction will be prevented. Stock big fingerlings (> 5 g) to your ponds.

4. Feeding: Preferably use quality fish feeds and fertilize your pond well to keep the water green. Monitor the quality of your feed by calculating the FCR.Feeding your fish is the most important daily routine task at your farm and with wrong feedingtechniques you can make losses. In fact correct feeding is more an art than a business.

Daily amount of feed

Weeks in production	Size of Fish (in g)	Feed amount (% of bodyweight)	Total daily amount of feedper fish in gram	Sizeof feed Diameter*	Protein content in %
Fry	0.2 - 1			1 mm	
Fingerling	1 - 3			1 mm	
1	10	5.0	0.5	2 mm	35
2	13	4.8	0.6	2 mm	35
3	17	4.8	0.8	2 mm	35
4	22	4.6	1.0	2 mm	35
5	29	4.5	1.3	2 mm	35
6	37	4.5	1.7	2 mm	35
7	46	3.8	1.7	2 mm	35

8	56	3.7	2.1	2 mm	35
9	69	3.5	2.4	3 mm	35
10	83	3.4	2.8	3 mm	30
11	98	3.4	3.3	3 mm	30
12	115	3.2	3.7	3 mm	30
13	132	3.2	4.2	3 mm	25
14	149	3.0	4.5	3 mm	25
15	167	3.0	5.0	3 mm	25
16	185	2.9	5.4	3 mm	25
17	204	2.8	5.7	3 mm	25
18	223	2.6	5.8	3 mm	25
19	243	2.5	6.1	3 mm	25
20	263	2.4	6.3	3 mm	25
21	284	2.3	6.5	3 mm	25
22	305	2.3	7.0	3 mm	25
23	326	2.0	6.5	5 mm	25
24	347	2.0	6.9	5 mm	25
25	368	2.0	7.4	5 mm	25
26	389	2.0	7.8	5 mm	25
27	410	2.0	8.2	5 mm	25
28	431	1.8	7.8	5 mm	25
29	452	1.8	8.1	5 mm	25
30	473	1.8	8.5	5 mm	25
31	494	1.7	8.4	5 mm	25
32	515	1.7	8.8	5 mm	25
33	536	1.4	7.5	5 mm	25

Note!: The 25% protein feeds is ONLY applicable where the ponds are adequately fertilized (green). If the pond water is not well fertilized (not always green) continuewith 30% protein feed.

* 2mm and smaller is crumble, 3mm and above are pellets

5. Record keeping: Always keep records . Write down all the expenses of you business. Do regular fish sampling and calculate growth and bodyweight. Also document all losses of fish and mortalities. Calculate the FCR and the feeding costs. Record your amount of harvested fish and the sales prices for different fish sizes and the total revenue to calculate your profits.

6. Post-harvest: In order to receive the highest price for your fish inform potential buyers before harvesting. Make sure that the buyer gets fresh fish or if you take it to the market yourself make sure that the fish is kept fresh and chilled until you reach the selling point (market).

Act as a professional, responsible and business oriented fish farmer!

AFRICAN LEAFY VEGETABLES (ALVs) PRODUCTION.

1.0. **INTRODUCTION**

- In Kenya, African Leafy Vegetables (ALV) are among profitable vegetable production ventures.
- ALVs including: Managu (Black Night Shade), Mchicha (Amaranth), saga (Spider Plant) and kunde (cow peas) have become profitable vegetables for commercial farmers across the country.
- Today, these are grown under intensive commercial farming systems using irrigation and greenhouses.
- In Sub-Saharan Africa, there are more than 45,000 species of plants, of which about 1,000 can be eaten as green leafy vegetables. Most of them fall within the category of African leafy Vegetables (ALVs).
- They have high nutritional, profits and medicinal values and are rich in vitamins, proteins, minerals and micronutrients such as selenium, zinc, potassium, beta-carotene, iron, folate, copper and iodine.

2.0. **ECONOMIC IMPORTANCE**

- Very high nutritional contents to address micro-nutrient deficiency
- Medicinal benefits
- Food security
- Adapted to different environments
- Good resistance to pests and diseases
- Economic empowerment, especially for women

3.0. **ECOLOGICAL REQUIREMENTS FOR PRODUCTION OF ALVs**

Temperature: range of 18 to 30°C has been shown to be ideal for growing these vegetables with high light intensity

Rainfall: ALVs require moderate rainfall especially during vegetative phase. Too much rainfall may cause frost bites and also encourage spread of fungal diseases.

Altitude: 0-2400 meters above sea level

Soils: ALVs do well in soils with high water retention capacity, well

aerated and high in organic matter content with pH of 5.5 to 6.8

4.0 GROSS MARGIN

ITEM	DESCRIPTION	UNIT	NO OF UNITS	UNIT COST KES	TOTAL COST PER ACRE
SALES REVENUE	Area planted	SQM	4,048.00		
	Expected yields	KGS	6000	40.00	240,000.00
Total Sales Revenue					240,000.00
COST OF PRODUCTION: Seeds and soil testing	Seeds	Seeds	89,000	0.03	2,670.00
	Soil testing	KES	1	2500.00	2500.00
	Water testing	KES	1	3500.00	3500.00
					8670.00
Land preparation	Seedbed preparation		1	10,000.00	10,000.00
	Hiring land	ACRE	1	5000.00	5,000.00
	Ploughing	ACRE	1	3000.00	3,000.00
	Harrowing	ACRE	1	3000.00	3,000.00
					21,000.00
Fertilizers	Manure	TONS	4	2000.00	8000.00
	Planting Fertilizer	50KGS	1.5	5000.00	7500.00
	Top dressing Fertilizer	50KGS	4	4500.00	18,000.00
	Foliar Feed(Easy Grow)	KGS	2	500.00	1000.00
					34,500.00
Agrochemicals	Fungicide: Mancozeb + cymoxanil	KGS	2	1600.00	3200.00
	Insecticide Belt Bio stimulant	100ML 100ML	6 1	900.00 500.00	5,400.00 500.00
					9,100.00
Crop management	Transplanting	Man-day	5	300.00	3,000.00
	1st weeding & top dressing	Man-day	5	300.00	3,000.00
	Second weeding	Man-day	5	300.00	3,000.00
	Agrochemical application	Man-day	12	300.00	36,000.00
	Harvesting and packing	Man-day	40	200.00	8,000.000
					50,000.00
Total Cost of Production					123,270.00
GROSS INCOME (Revenue - CoP)					**116,730.00**
OTHER COSTS	Field scouting	Trips	25	50.00	1,250.00
	Transport costs	Trips	15	100.00	1,500.00
	Contingency	KES	1	1,000.00	1,000.00
					3,750.00
NET INCOME (Gross Income- Other Costs)					112,980

5.0 CHALLENGES

1. Recycling of previous seeds
2. Seasonal production
3. No standardized units of measure
4. High perishability
5. Pests causes a reduction in quality and quantity of produce.

6.0 INTERVENTIONS

1. Use certified seeds or seeds from a clean source for planting materials
2. Use irrigation to produce through-out the year
3. Units should be used kiligramme
4. Store in cool areas/equipment.
5. Hand removal since the pest is easily found near the damaged plant, especially at the beginning of infestation & early weeding to destroy sites for egg laying. Apply ash; and pesticides such as – Karate 2.5 WG®

7.0 CONCLUSIONS

- ALVs have high returns when planted on fertile soils
- They are rich in different types of nutrients required by our bodies.
- There is business opportunity in value addition; Sorting, Cleaning & Grading. Fresh leaves should be stored in the refrigerator or stored in a cool place or preserved by sun drying (Omunyonyo).

AVOCADO PRODUCTION

INTRODUCTION

Avocado is a fruit in the family that has gained a lot of nutritional importance in the world, over the years. It is high in protein, minerals and vitamins (A, C and E). It is eaten ripe and flavours soups, ice creams, milkshakes, smoothies. It contains avocado oil which is easily digestible and largely unsaturated.

CLIMATIC CONDITION

- **Rainfall**: 1000 to 1600mm of well distributed rainfall annually.
- **Temperatures:** 16 to 30^{O}C.
- **Soils:** Soils should be deep (1.2M), well aerated, fertile, preferably Sandy loams with; pH range of 5 to 7

ECONOMIC IMPORTANCE

- **Crop for Export**: In countries like Mexico, Peru, Kenya, and South Africa, avocado farming is a major contributor to agricultural exports
- **Job Creation**: The cultivation of avocados create jobs in farming communities, ranging from farm workers to logistics and packaging staff.
- **Oil Production**: Avocado oil is a highly valued product in the culinary and cosmetic industries
- **Processed Products**: Beyond whole fruits, avocados are processed into various products like guacamole which increases their marketability and extends shelf life.
- **Health Benefits**: The growing trend toward healthy eating has spurred demand, as avocados are often associated with benefits such as improving heart health, reducing inflammation, and supporting digestion.

CHALLENGES

- **Pests and diseases**

  Pests like thrips, mites, borers, caterpillars, and lace bugs can damage orchards.

- **Water consumption**

  Avocado trees require a lot of water, around 1,000 liters per kilogram of fruit.

- **Soil depletion**

  Growing avocados as a single crop for many years can deplete the soil and remove most of its mineral properties.

- **Early fruit drop**

  Avocado trees naturally release immature fruit to relieve themselves of having too much fruit. This is called the fruit set, or early fruit drop period.

INTERVENTIPONS

- Implementing efficient irrigation systems such as drip irrigation can help in water-scarce regions and manage water use effectively.
- Combining biological control, resistant varieties, and organic pesticides can reduce pest damage without harming the environment.
- Practices such as mulching, contour planting, and terracing can reduce soil erosion and improve land productivity.
- Implementing a well-maintained irrigation system that ensures consistent moisture levels can prevent stress and early fruit drop.

MARKET OPPORTUNITIES

1. **Rising Demand for Healthy Foods**

With the growing trend of health-conscious eating, avocados are in high demand due to their rich content of healthy fats, vitamins, and minerals.

2. **Emerging Markets**

In Africa, local consumption is growing, and export opportunities are emerging, especially in countries with suitable growing conditions like Kenya and South Africa.

3. **Growing Export Opportunities**

Demand in Developed Markets: Avocados are a popular item in developed countries, especially in the U.S., Europe, and Canada. Exporting to these markets presents significant opportunities for growers.

4. **Value-Added Products**

Avocado Oil: The growing popularity of avocado oil as a healthier cooking oil presents an opportunity for producers to diversify their product offerings.

5. Sustainability and Organic Markets

- **Sustainable Farming Practices**: As consumers become more environmentally conscious, there is a growing demand for sustainably sourced, organic avocados. This opens the door for organic farming practices and certifications to appeal to eco-conscious buyers.

GROSS MARGINS

Gross Margin analysis for Production of Avocado in 1 Acre

1 acre (80trees, spacing 7m by 7m) 5year tree yield of 300kg per year	**Units**	**Quantity**	**Cost ksh/ unit**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Gross income	Kgs	24,000kg (5^{th} year)	80	-	-	320,000	640,000	1,920,000
Variable costs								
Land preparation		1	5,000	5,000	-	-	-	-
Soil analysis		1	2500	2500				
Seedlings		80	200	16,000	-	-	-	-
Holes		80	50	4,000	-	-	-	-
Manure		1	4,000	4,000	8,000	10,000	10,000	10,000
Planting		1	4,000	4,000	--	-	-	-
Fertilizer								
CAN	Kgs	25kg,	120	1500	2400	3000	4500	6000
DAP	kgs	50kg	120	1500	2400	3000	4500	6000
Farmyard manure	Kgs	20bags	100	2000	2000	2000	2000	2000
(boron,	ml	500ml		500	1000	1500	2000	2500
Sub totals				**41,000**	**15,800**	**19500**	**23000**	**26500**
Gross margin						**243,700**	**617,000**	**1,893,500**

CONCLUSION

The avocado industry's growth presents both opportunities and challenges, particularly concerning environmental impacts and social implications for farming communities. Nevertheless, with mindful cultivation and ethical trade practices, avocados can remain a valuable resource for consumers and farmers alike, contributing to both nutrition and economic development.

BEAN PRODUCTION

1.0 INTRODUCTION

- Beans are seeds from various plants in the Fabaceae family, commonly used as vegetables for human and animal consumption.
- They are rich in protein, fiber, iron, and vitamins, making them a nutritious food choice.
- Beans can be cooked in numerous ways and are valued for their health benefits, including promoting heart health, aiding digestion, and providing essential nutrients like potassium and magnesium

2.0 ECONOMIC IMPORTANCE

- Food Security: Beans are a staple food in many regions worldwide, providing essential nutrients and protein.
- Export and Trade: Beans are a major agricultural crop contributing to the economies of producing countries through export earnings
- Employment: Bean cultivation and processing create employment opportunities in agriculture, including farming, harvesting, processing, and distribution
- Crop Rotation and Soil Health: Beans help improve soil fertility by fixing nitrogen, reducing the need for synthetic fertilizers, and promoting overall soil health.

3.0 AGROCLIMATIC CONDITIONS FOR GROWING BEANS

- Beans do well between 1,000-2,000m above sea level
- Beans grow optimally at temperatures of 18 to 24°C
- A wide range of soil types but thrive best in soils that are deep, well drained, and high in organic matter
- Soil pH of 6.0-7.0

4.0 GROSS MARGIN

COST BENEFIT ANALYSIS OF BEAN PRODUCTION				
		SCENARIOS		
		TRADITIONAL	LOW INPUT	HIGH INPUT
Inputs	Improved seed		3,000	6,000
	Herbicide (Weed control)			1,240
	Foliar fertilizer		1,302	1,302
	Basal fertilizer			3,720

	Herbicide (Land preparation)			465
	Pesticides		930	930
Field operation	1st ploughing	3,100	3,100	3,100
	2nd ploughing		2,480	2,480
	planting	1,500	1860	1860
	weeding	1,240		1,612
harvesting	Harvesting	310	930	1550
	Drying/ threshing	310	620	1,240
	Winnowing/ cleaning/sorting		1,240	2,480
marketing	Transport to market		310	620
	Packaging bags	93	155	310
Total production cost		6,553	15,927	28,909
Expected yield		200	500	1000
Production cost/kg		33	32	29
Total sales @70sh/kg		14,000	35,000	70,000
Gross margin		7,447	1,973	4,1091
Return on investment (ROI)		**14**	**20**	**42**

5.0 CHALLENGES

- Low soil fertility can be a major constraint to bean production in Africa. Low levels of available nitrogen and phosphorus are common problems.
- Climate change: Climate change can lead to moisture stress and shorter growing seasons, which can cause poor germination and

crop failure.

- Pests and diseases: Pests and diseases can affect the quality and productivity of beans. This problem can be especially severe when pesticides are limited.
- Market information: A need for more market information can be a challenge to bean farming.

6.0 INTERVENTIONS

- Conduct soil tests regularly to know the pH level, nutrient content, and organic matter in the soil.
- Encouraging farmers to adopt climate-smart agriculture practices like rainwater harvesting, mulching
- Promoting integrated pest management (IPM) strategies, such as the use of resistant varieties, biological control agents, and safe pesticide use
- Strengthening farmer cooperatives, providing training on market linkages, and facilitating access to financial resources like loans

7.0 CONCLUSION

- Bean farming in Kenya is a significant agricultural activity due to the country's favorable climate and soil condition.
- Farmers can get access to various market such as:

1. Local and national markets
2. Sales to local stores:
3. Farmers can export beans to other countries.
4. Contracts with wholesale shippers
5. Sell to schools

CAPSICUM PRODUCTION

INTRODUCTION

Capsicum is a tender, warm season crop belonging to the solanaceae family. In Kenya, capsicum farming performs well in relatively hot areas like in Eastern and Coastal regions.

CLIMATIC CONDITION

Temperature

Capsicums grow best in warm climates with temperatures between 18–30°C. The ideal temperature for fruit setting is 16–21°C, and for good fruit development, the day temperature should be 24–30°C and the night temperature should be 15–17°C

Soil

Capsicums grow best in well-drained, loamy, or heavy cracking clay soils that are rich in organic matter. The ideal soil pH range is 5.5–6.8.

Rainfall

Capsicums grow well in areas that receive 600–1,200 mm of rainfall annually, which is well distributed throughout the growing period

ECONOMIC IMPORTANCE

1. Global Demand: Capsicum (including varieties like bell peppers, chili peppers, and sweet peppers) is a widely consumed vegetable, integral to numerous cuisines around the world. This generates demand in domestic markets and export opportunities.

2. Capsicum is used fresh in salads, stir-fries, and other dishes, while dried and ground forms are used as spices (e.g., paprika, chili powder) or for hot sauces. Its versatility in food production drives its value.
3. Rich in vitamins A and C, capsicum contributes to the health food market. Its antioxidant properties are also valued, with consumers becoming more health-conscious and seeking functional foods that promote wellness.

4. Capsicum extracts, particularly from hot peppers, are used in pain relief creams, ointments, and dietary supplements. Capsaicin, the compound responsible for the heat in chili peppers, is recognized for its therapeutic benefits.

5. Countries that cultivate capsicum can earn foreign exchange through the export of fresh peppers, dried pepper products, and processed items like sauces or spice blends.

CHALLENGES

- Capsicums require a lot of water, and inadequate water can cause stress, wilting, and other issues. In dry areas, drip or furrow irrigation can help maintain high yields. Sprinkler irrigation can encourage fungal diseases.
- Capsicum requires consistent moisture, but both waterlogging and drought can harm the crop.
- Capsicum crops are prone to a range of pests such as aphids, whiteflies, and thrips, as well as diseases like bacterial wilt, blight, and powdery mildew.

Interventions:

- Capsicum plants are nutrient-demanding, and poor soil fertility can lead to stunted growth, poor fruit production, and reduced yield.
- Capsicum plants require a well-balanced supply of nutrients, including nitrogen, phosphorus, potassium, and trace elements.

INTERVENTIONS

- Soil testing: Regular soil testing to determine nutrient deficiencies and proper fertilization.
- Integrated Pest Management (IPM): Use of biological control methods (e.g., natural predators) alongside chemical treatments when necessary.
- Efficient water use that delivers water directly to the plant roots, minimizing water wastage.
- Regular soil tests help determine nutrient deficiencies, allowing farmers to apply the right fertilizers in the correct amounts.

POSSIBLE MARKETS

1. **Local Domestic Market**

- **Supermarkets & Groceries:** Supermarkets like Carrefour, Nakumatt, and Tuskys, along with local grocery stores, sell fresh capsicum to consumers.
- **Retail Markets:** Open-air markets (such as Gikambura Market, Muthurwa, and Kariokor Market) in urban areas are also a key outlet for capsicum.
- **Street Vendors:** Street food vendors and local restaurants also provide a steady demand for capsicum as a key ingredient in various dishes like stews, salads, and sauces.

2. **Export Market**

- **Regional Exports:** Kenya has a well-established agricultural export sector, and capsicum is one of the crops that can be exported to neighboring East African countries like Uganda, Tanzania, and Rwanda. This market is often driven by demand for fresh vegetables and horticultural products.
- **International Exports:** There is a growing market for Kenyan capsicum in international markets, especially in Europe (e.g., the Netherlands, UK) and the Middle East. Capsicum is exported as fresh produce, and sometimes as processed products (such as dried peppers or capsicum paste).

3. **Processing Industry**

- **Value-Added Products:** Capsicum can be processed into sauces, chutneys, and spice powders, offering a market opportunity in the local and export sectors. Companies like Kenblest, based in Nairobi, produce processed foods from capsicum.

GROSS MARGIN

Particulars	Members of FPO	Non-members of FPO	% change over non members
Family labour	7,639 (13.59)	7,254 (11.73)	5.31
Hired labour	22,084 (39.28)	19,765 (31.97)	11.73
Machinery	2,212 (3.93)	2,993 (4.84)	-26.09
Seeds	4,809 (8.55)	5,007 (8.10)	-3.95
FYM	9,043 (16.08)	5,244 (8.48)	72.44
Poultry manure	2,509 (4.46)	1,194 (1.93)	110.13
Organic/chemical fertilisers	2,302 (4.09)	8,855 (14.32)	-74.00
Irrigation	3,040 (5.41)	3,876 (6.27)	-21.57
Bio-pesticides/PPC	1,701 (3.02)	6,100 (9.87)	-72.11
Others	889 (1.58)	1,544 (2.50)	-42.42
Total input costs	56,227 (100)	61,831 (100)	-9.06
Yield (kg/acre)	5,519	7,205	-23.40
Gross returns	1,51,759	1,33,291	13.86
B:C ratio	2.69	2.16	

Figures in parenthesis indicate percent to the total

CONCLUSION

Capsicum, whether consumed fresh, cooked, or dried, offers a rich array of benefits to human health and culinary experiences. Its vibrant colors, varied flavors, and nutritional profile make it a versatile ingredient in many cuisines worldwide. Rich in antioxidants, particularly vitamin C, and compounds like capsaicin, capsicum supports immune health, aids digestion, and has potential anti-inflammatory properties.

GROUNDNUT

INTRODUCTION

Groundnut is a major annual oilseed crop and its economic makes the crop a beneficial enterprise for rural farmers. With the constraints on land due to increased population and emergence of other enterprises groundnut remains a dominant crop in the area and continues to play a critical role as a source of income to the rural farmers

CLIMATIC CONDITIONS

- **Temperature**

Groundnuts grow best in a mean daily temperature of 22–28°C. The ideal germination temperature is between 20–30°C, with a minimum of 18°C.

Soil

Groundnuts grow best in deep, well-drained, fertile, sandy, sandy-loam, or loamy-sand soils with a pH of 5–7.

Rainfall

Groundnuts need 500–700 mm of reliable rainfall over the growing period.

ECONOMIC IMPORTANCE

1. **Source of Food and Nutrition**

Groundnuts are consumed in various forms: raw, roasted, ground into paste (peanut butter), or used in cooking oil.

2. **Income Generation**

Groundnut farming supports the livelihoods of farmers, laborers, and traders. In many regions, groundnuts are a critical component of rural economies.

3. **Industrial Use**

Groundnuts are a key source of edible oil. Groundnut oil is widely used for cooking and in the production of margarine and other food products.

4. **Export Revenue**

Groundnuts are a significant export commodity for many countries, contributing to foreign exchange earnings.

5. **Economic Development and Rural Growth**

Groundnut production fosters rural development by creating employment opportunities in farming, processing, packaging, and trade.

CHALLENGES

- **Pests and Disease**

Groundnuts are susceptible to pests like the aphid, thrips, and termites.

- **Soil Fertility and Water Stress**

Groundnuts require well-drained, loamy soils with adequate nutrients

- **Aflatoxin Contamination**

Aflatoxin, produced by the *Aspergillus* mold, is a major concern as it contaminates groundnuts, making them unsafe for consumption and export.

- **Climate Change**

Changes in rainfall patterns, rising temperatures, and increasing frequency of extreme weather events can lead to reduced yields and poor crop performance..

- **Market Access and Pricing**

Groundnut farmers often face challenges in accessing local markets due to inadequate infrastructure and fluctuating prices.

POSSIBLE SOLUTIONS

A) **Climate-Resilient Varieties**: Developing and promoting drought-resistant and heat-tolerant groundnut varieties.

B) **Value Addition**: Encouraging farmers to engage in value-added products like peanut butter

C) **Drying Techniques**: Ensuring groundnuts are adequately dried to moisture content below 10% can minimize aflatoxin production

D) Integrated Pest Management (IPM): Combining biological, chemical, and cultural methods to control pests.

E) Soil Health Improvement: Using organic fertilizers, crop rotations, and agroforestry techniques can help improve soil structure and fertility.

Table 4. Gross Margin for groundnut production	**Amount**
Average yield of groundnut (Kg/ha)	659
Average price of groundnut (KES/Kg)	52
Total revenue (KES)	**34,268**
Variable costs	

o Land preparation	5,000
o Seed (48 kg @100/=)	4,800
o Planting (20 MD@ 100/=)	2,000
o Weeding (20MD@ 100/=)	2,000
o Harvesting (Digging and stripping) 20MD@100/=	2,000
o Shelling and drying (20MD @ 100)	2,000
o Marketing costs (Packaging, transport)	1,200
Total Variable Cost (KES)	**19,000**
Gross Margin (KES/ha)	**15,268**
Total Fixed Costs*	**2,360**
Net Farm Income	**12,908**
Return to KES invested	**0.71**

CONCLUSION

In conclusion, groundnuts are a versatile and valuable crop with significant nutritional, economic, and environmental benefits. Rich in proteins, healthy fats, and essential vitamins, they contribute to the dietary needs of millions worldwide. Beyond their nutritional value, groundnuts are an important cash crop, providing income for farmers, particularly in developing regions. Their cultivation also offers environmental benefits, such as improving soil fertility through nitrogen fixation

SUGAR CANE PRODUCTION- *Saccharum officinarum*

1.0 INTRODUCTION

- Sugar cane is a world- wide crop planted for sugar production and it was first domesticated in New Guinea from wild species.
- It was introduced in Kenya by Indian settlers in 1920s and first cane plantation was established in Kibos in 1922.
- It is a major cash crop in Kenya contributing significantly to the economy.
- It is third most important crop in Kenya after tea and coffee.
- Large plantations of sugar cane are located in Western region, South Nyanza, Nyando and Mombasa among others.

2.0 ECONOMIC IMPORTANCE

1. Income generation
2. Creation of employment
3. Foreign exchange (Uganda, Tanzania, Rwanda and Democratic Republic of Congo)
4. Contributes to economic growth through contribution to GDP

3.0 ECOLOGICAL REQUIREMENTS

Soils: well drained loam or sandy soils with a pH of 6.5
Rainfall: 1200- 1500mm
Temperatures: 20 ^{0}C – 28 ^{0}C
Altitude: 0- 1800M ASL

4.0 POSSIBLE MARKETS

- Sugar cane milling factories eg Kabras millers, Mumias Sugar company, Butali sugar factory, SONY, Chemelil among others
- Jaggeries

5.0 GROSS MARGIN FOR ONE ACRE

Item	Quantity	Unit cost (Kshs.)	Total
First ploughing	1	3000	3000
Second ploughing	1	2500	2500
Seed-cane	2 tons	5000	10000
Fertilizer- DAP	2 bags (50kg)	6000	12000
Fertilizer-Urea	2 bags (50kg)	5500	11000
Preparing furrows	10 MDs	300	3000
Planting	10 MDs	300	3000
1st weeding	10 MDs	300	3000
2nd weeding	10 MDs	300	3000
Top dressing	8 MDs	300	2,400
Harvesting	15 MDs	400	6000
Total variable costs			**58900**
Yield	**40 tons**	**4000**	**160000**
Gross margin			**160,000 - 58900= 101100**

6.0 CHALLANGES

- Low productivity
- High cost of inputs
- Late payment of farmers
- Pests and diseases- Nematodes, Termites, Sugar cane mosaic disease and Ratoon stunting disease

7.0 INTERVENTIONS

- Use high yielding varieties for example KEN 82-216 and use the right amount of fertilizer
- Form groups and purchase in bulk
- Practice contract farming
- Crop rotation with a legume, Drenching setts in a pesticide before planting, plant resistant varieties and use of disease- free setts and disinfect tools used to prepare setts

6.0 CONCLUSION

- Sugar cane production contributes to food security through income generation for the farmer.
- It is a source of employment for those working in that industry.

We also have business opportunities in Value addition, Diversification, Irrigation and Export market

SUNFLOWER PRODUCTION

1.0 INTRODUCTION

- The sunflower (*Helianthus annuus*) is a plant belonging to the Asteraceae family, commonly known for its large, bright yellow flowers.
- Sunflowers are known for their edible seeds and oil, which are widely used in food products and cooking.

The **common sunflower** (***Helianthus annuus***) is a species of large annual forb of the daisy family Asteraceae.
The common sunflower is harvested for its edible oily seeds, which are used in the production of cooking oil, as well as other uses such as food for livestock, bird food, and planting in domestic gardens for aesthetics.

2.0 ECONOMIC IMPORTANCE OF SUNFLOWER

 Oil Production: Sunflowers are renowned for their high oil content, contributing around 87% of global vegetable oil production. Sunflower oil is preferred for its quality and is widely used in the food industry for cooking, margarine, and other processed products.

 Food Industry: In addition to oil, sunflower seeds are consumed as snacks, used in cereals, and in confections. The seeds are also processed into animal feed, adding another layer of economic benefit.

 Agricultural Sustainability: Sunflower farming is a sustainable option, contributing to agricultural diversification. It grows well in various climates and can provide a steady income for farmers, enhancing their resilience against market fluctuations.

 Byproducts: Sunflower seed husks are used in manufacturing items like animal feed, alternative charcoal, and even shoe polish, offering additional economic value

3.0 GROSS MARGIN

INPUT/OUTPUT	UNIT	RECOMM. RATE	ACTUAL COST OF PRODUCTION(in Ksh)								
			HIGH PERFORMERS			AVERAGE PERFORMERS			LOW PERFORMERS		
			QTY	PRICE/ UNIT	TOTAL (KSH)	QTY	PRICE/ UNIT	TOTAL (KSHS	QTY	PRICE/ UNIT	TOTAL (KSHS
A:OUTPUT											
Yield\Revenue	kg		1400	20	28000	1200	20	24000	100	20	20000
B.Cost of Production											
1.cost of intermediate inputs											
seeds/seedlings	2kg	2kg/acre	2	170	340	2	170	340	2	170	340
Fertilizers DAP	50KG	1Bag/acre	1	2000	4000	1	2000	2000	1	2000	2000
CAN	50KG	1bag/arce	1	1400	1400	1	1400	1400	1	1400	1400
Sub-Total intermediate cost					**3740**			**3740**			**3740**
2.Operational/labour costs											
Seedbed preparations											
Ploughing 1st	ACRE		1	1800	1800	1	1800	1800	1	1800	1800
	ACRE		1	1600	1600	1	1600	1600			
PLANTING	ACRE		1	1000	1000	1	1000	1000	1	1000	1000
WEEDING	ACRE		1	1600	1600	1	1600	1600	1	1600	1600
FERT. APPLIC	ACRE		1	200	200	1	200	200	1	200	200
BIRD SCARRING	MD		20	100	2000	20	100	2000	1	20	2000
Sub-total labour costs					**8200**			**8200**			**8200**
5.Marketing costs											
Harvesting	arce		1	1400	1400	1	1200	1200	1	1000	1000
Threshing	MD		10	100	1000	8	100	800	8	100	800
Gunny/Packaging bags		T	20	30	600	17	30	510	15	30	450
Transport to store	TRIPS		1	800	800	1	600	600	1	400	400
TRansport to Market	BAGS		20	20	400	17	20	340	15	20	300
sub total mrkting costs					**4200**			**3450**			**2950**
TOTAL cost					**16140**			**15390**			**13290**
Gross margin					**11860**			**8610**			**4110**

5.0 CHALLENGES

- Weed management- Weeds can compete with sunflowers for resources and reduce yields
- Moisture stress- Moisture stress is a major environmental stress that can affect
- sunflower productivity
- Disease and pests- Diseases like yellow blotch can cause leaves and flowers to distort and turn yellow.
- Market Fluctuations- Farmers may struggle to predict profitability and may face challenges in finding consistent buyers for their crops.

6.0 INTERVENTIONS

- Use pre-emergent herbicides: Apply pre-emergent herbicides in liquid or granular form to control weeds during the critical weed-free period.
- Surface residue covers can help improve soil structure and water availability.
- Physical structures like stone walls, earth bunds, and ridges can help slow down runoff and increase infiltration time.
- Choose sunflower varieties that are resistant to downy mildew. Buy seeds from a registered supplier and ensure they are certified and allow enough space between plants to improve air circulation and reduce humidity.
- Diversify Your Products and Market Research & Forecasting.

7.0 CONCLUSION

- Sunflowers play a crucial role in global agriculture, contributing to both food and industrial sectors.
- From producing edible oil and seeds to supporting biodiversity,
- There is business opportunity in sunflower on value addition - oil production

SWEET POTATO PRODUCTION

1.0 INTRODUCTION

Sweet potato (Ipomea batatas) is an important food security crop in Kakamega
Can be white, yellow, red, purple or orange. The orange-fleshed sweet potatoes are sweeter than the other varieties
Mean estimated yields of 13.7 tons/ha
Kenya is one of the leading Sweet potato producers in sub Saharan Africa with an output of about 700,000 metric tons.
Africa is second largest producer of Sweet potatoes, accounting for 10.6 percent of total world production.
China is the world's biggest producer and consumer of sweet potato - 70,963,630 metric tons (30 tons/acre)

2.0. ECONOMIC IMPORTANCE

α) Sweet potato is able to perform well even on poor soils and in dry conditions;
β) Can be harvested in piece meal and stored un harvested in the ground after reaching maturity.
χ) Its nutritional value is high. It contains Vitamin A Vitamin B and C, calcium, iron, manganese, potassium, zinc, niacin, phosphorous and dietary fiber
δ) Its leaves can be used as vegetable and also as animal feed
ε) It offers many opportunities for value addition; it can be processed into flour to blend with wheat flour in bread, cakes and other bakery products.

3.0. ECOLOGICAL REQUIREMENTS

Temperature: Between15^0 and 33^0 with optimal temperatures at 24^0
Altitude: Optimal altitude is between 1000-2100 meters
Rainfall: Average rainfall of 750-1000mm per annum
Soils: Well-drained sandy loams are preferred with a pH between 5.5 and 6.5

4.0 GROSS MARGIN

ENTERPRISE OUTPUT	UNIT	QTY	UNIT COST (KSHS)	PRICE (KSHS)	TOTAL REVENUE (KSHS)
YEILD	**50kg**	**100**	**1000**	**100000**	**100,000**
VARIABLE COST					
Ploughing	acre	1	3500	3500	
Harrowing	acre	1	2000	2000	
Ridging	md	10	300	3000	
Vines	bags	14	800	11200	
Gunny bags for vines	bags	14	50	700	
sub total input costs				**20,400**	
labour costs					
planting	md	6	300	1800	
weeding 1st	md	6	300	1800	
weeding 2nd	md	6	300	1800	
Harvesting	md	10	300	3000	
sorting/grading	md	6	200	600	
washing	md	6	200	600	
Sub total labour costs				**9,600**	
marketing costs @ Farm gate					
Gunny bags for packaging	bags	100	50	5000	
sub total				**5000**	
TOTAL VARIABLE COSTS				**35,000**	**35,000**
Gross margin per acre: Total revenue – total variable costs (100,000−35,000)					**Kshs. 65,000**

5.0 CHALLENGES

1. Pests and Disease Control; Sweet potato Weevil, Sweet potato Virus Disease and Rodents

2. Drought- Climate change effects
3. Unavailability of markets – Due poor market linkages
4. Low prices- due to low demand
5. Inadequate extension services – low recruitment of extension staff.
5. Postharvest losses- spoilages during handling
6. Inadequate vines – shortage of quality planting materials**.**

6.0 INTERVENTIONS

1. Plant at onset of the rain season, use clean planting materials- Earth up and rogue out affected plants, harvest promptly and removal of crop residue, practice crop rotation and use of rodent traps.
2. Use climate smart agriculture technologies and innovations
3. Aggregation of producers into larger marketing groups for local markets, export market, market for value addition i.e processing.
5. Use of both public and of private service extension providers
6. Use appropriate handling and preservation methods.
7. Introduction of on farm bulking sites for quality planting materials.

7.0 CONCLUSIONS

- Its an important crop for food and nutrition security, generates income and creates employment.
- Sweet potatoes has some business opportunities–
1. Value addition – Tubers/roots are processed into dried chips and flour to preserve the roots for household food security. It can also be processed into relishes, stews, main dishes, snacks, weaning foods, and baked items. The following are some the sweet potato products;

Drying sweet potato chips

Sweet potato four

Sweet potato crakies

Sweet potato chips

Sweet potato crisps

Sweet potato chapati

2. Animal feed; Fodder production for Cattle, Sheep and Goats

BANANAS PRODUCTION

1.0. INTRODUCTION

- Banana is one of the widely grown and consumed fruit in all parts of the world due to its distinct aroma and taste.
- It is a staple food and economic life line for many countries.
- It is a cheap source of carbohydrates and rich source of potassium, calcium, antioxidants and other micronutrients.
- The fruit is highly perishable owing to its high water content and is susceptible to many diseases, especially fungal infection.

2.0. ECONOMIC IMPORTANCE

- Income generation
- Creation of employment
- Provision of many opportunities for value addition
- An alternative for carbohydrates
- It is used in wine making

3.0 CHALLENGES

- Limited access to profitable markets occasioned by limited access to market information
- Price fluctuation
- Meeting high quality standards for high end markets is a challenge to smallholder farmers
- Post harvest loss
- Competition from other producing regions

4.0 INTERVENTIONS

- Create market linkages
- Group marketing
- Capacity building production of quality bananas
- Capacity building
- Improve on quality of bananas produced

5.0 GROSS MARGINS

Input	Unit	High performers			Average Performers			Low Performers		
		Qty	Priceunit	Total (Ksh)	Qty	Price/ unit	Total (Ksh)	Qty	Price Per unit	Total (Ksh)
A: Output										
Yield/ Revenue	Kg	12000	25	300000	10000	25	250000	8000	25	200000
1: Cost of intermediate inputs										
Seedlings	No.	400	200	80000	400	200	80000	400	200	80000
Fertilizers : DAP	50kg	2	3300	6600	2	3300	6600	1	3300	3300
CAN	50kg	4	2300	9,200	2	2300	4600	1	2300	2300
Sub-Total intermediate Costs				**95,800**			**87,060**			**8560**
2. Operational/ Labour Costs										
Ploughing	Acre	1	3000	3000	1	3000	3000	1	3000	3000
Harrowing	Acre	1	2000	2000	1	2000	2000	1	2000	2000
Hole making	Acre	400	100	4000	400	100	4000	400	100	4000
Planting	MD	10	300	3000	10	300	3000	10	300	3000
Weeding: 1st	MD	10	300	3000	10	100	1000	10	100	1000
2nd	MD	10	300	3000	10	100	1000	10	10	1000
Fertilizer Application (CAN)	MD	4	300	1200	3	300	900	2	300	600
Sub-Total labour costs				**22,200**			**15900**			**15,600**

5. Marketing Costs										
Harvesting	MD	20	300	6000	14	300	6000	10	300	3000
Loading	MD	10	300	3000	8	300	2400	6	300	1800
Transport to market	7 ton lorry	2	2000	4000	2	2000	4000	1	1000	2000
Sub-total Marketing Costs				**13000**			**12,400**			**6800**
Cumulative Total Cost (1+2+3+4+5)				**131,000**			**115,360**			**108,000**
Gross Margin	**Bananas**	**12,000 kg**	**25**	**300,000**	**10,000**	**25**	**250,000**	**8,000 kg**	**25**	**200,000**
Net profit	**Net profit**			**300,000-** 131,000 = 169,000			**250,000-** 115,360 = 134,640			**200,000** - 108,000 = 92,000
Profit margin/kg	**Gross margin**			**300,000-131,000/300,000x 100 = 56%**			**250,000-115,360/250,000 x 100= 54%**			**200,000-108,000/200,000 x 100 = 46%**

Banana's Possible markets are;

- Twiga foods – a key off-taker for bananas in the Meru Region
- Fresh Produce Exporters Association of Kenya (FPEAK) – helps smallholder farmers connect with export markets and offers support in compliance with quality standards
- East African Growers – a major player in the export market
- Local aggregators and traders –.

6.0 CONCLUSION

- Banana production has high returns under better management
- The crop still has a lot of potential in the County
- There other business opportunities in value addition into the following products;

1. Banana chips, 2.banana peel pasta, Banana flour and Banana jam





SACCO PRODUCTS AND SERVICES

PRODUCT NAME	MAXIMUM REPAYMENT PERIOD	QUALIFICATION	SECURITY	PROCESSING PERIOD	REQUIREMENTS	MULTIPLIER	NOTES
1. **Haraka Loan**	24 Months	Subject to ability to repay.	Non-withdrawable Deposits, Salary, Savings and Guarantors	Within Fortnight	Latest Payslip, Duly filled and signed Loan application Form	N/A	*** One can apply for Haraka Loan as many times as one can repay.
2. **Normal Loan**	60 Months	Subject to ability to Repay	Non-withdrawable Deposits, Salary, Savings, Guarantors and Sacco acceptable tangible securities.	Within Fortnight	Latest Payslip, Duly filled and signed Loan application Form	5 times your Non-withdrawable Deposits.	
3. **Automobile Loan**	72 Months	Subject to ability to Repay	Non-withdrawable Deposits, Salary, Savings, Guarantors and Sacco acceptable tangible securities.	Within Fortnight	Latest Payslip, Duly filled and signed Loan application Form	5 times your Non-withdrawable Deposits	
4. **Fanikisha Loan**	108 Months	Subject to ability to Repay	Non-withdrawable Deposits, Salary, Savings, Guarantors and Sacco acceptable tangible securities.	Within Fortnight	Latest Payslip, Duly filled and signed Loan application Form	5 times your Non-withdrawable Deposits.	
5. **Prime Loan**	72 Months	Subject to ability to Repay	Non-withdrawable Deposits, Salary, Savings, Guarantors and Sacco acceptable tangible securities.	Within Fortnight	Latest Payslip, Duly filled and signed Loan application Form	5 times your Non-withdrawable Deposits.	***Must capitalize dividend annually for the period the loan will be under repayment.
6. **Jipange Loan**	24 Months	Subject to ability to Repay	Non-withdrawable deposits, Savings, Commitment Letter from Pensions Department and at least 3 guarantors.	Within 4 hours	Certified copy of retirement letter and Duly filled and signed Loan application Form	1.5 times your Non-withdrawable Deposits.	
7. **Empowerment Loan**	84 Months	Subject to ability to Repay	Non-withdrawable Deposits, Salary, Savings, Guarantors and Sacco acceptable tangible securities.	Within Fortnight	Latest Pay slip, Duly filled and signed Loan application Form	10 times your Non-withdrawable Deposits.	*** Salary should have been paid through FOSA for at least 12 months Consecutive months.

8. Fosa Loan	24 Months	Subject to ability to Repay	Non-withdrawable Deposits, Salary, Savings, Guarantors and Sacco acceptable tangible securities.	Within 4 hours	Latest Payslip, Duly filled and signed Loan application Form	10 times your Non-withdrawable Deposits.	*** Salary should have been paid through FOSA for atleast 3 Consecutive months.
9. Fosa Plus Loan	12 Months	Subject to ability to Repay	Non-withdrawable Deposits, Salary, Savings, Guarantors and Sacco acceptable tangible securities.	Within 4 hours	Latest Payslip, Duly filled and signed Loan application Form	10 times your Non-withdrawable Deposits.	*** Salary should have been paid through FOSA for atleast 3 Consecutive months.
10. Progressive Loan	48 Months	Subject to ability to Repay	Non-withdrawable Deposits, Salary, Savings, Guarantors and Sacco acceptable tangible securities.	Within Fortnight	Latest Payslip, Duly filled and signed Loan application Form	10 times your Non-withdrawable Deposits.	*** Salary should have been paid through FOSA for atleast 3 Consecutive months.
11. Akiba Loan	24 Months	Subject to ability to Repay	Non-withdrawable Deposits, Salary, Savings, Akiba Savings, Guarantors and Sacco acceptable tangible securities.	Within 4 hours	Latest Payslip, Duly filled and signed Loan application Form	3 times your Akiba Savings.	
12. Salary Advance	1 Month	Salary being channeled through FOSA	Non-withdrawable Deposits, Salary, Savings and Guarantors	Within 4 hours	Latest Payslip, Duly filled and signed Salary advance application Form	Subject to a MAXIMUM of 75% Net pay	*** Salary should have been paid through FOSA for atleast 3 Consecutive months.
13. Pension Advance	1 Month	Pension flowing through FOSA	Non-withdrawable Deposits, Pension, Savings and Guarantors	Within 4 hours	Latest Payslip, Duly filled and signed Pension advance application Form	Subject to a MAXIMUM of 75% Net pay	*** Pension should have been paid through FOSA for atleast 3 consecutive months
14. Loan Advance	Recovered upon disbursement of loan applied	Subject to approval of loan applied	Non-withdrawable Deposits, Salary, Savings, Loan approved and Loan Guarantors	Within 4 hours	Latest Payslip, Duly filled and signed advance application Form	Subject to a MAXIMUM of 75% Net take home	

OTHER SERVICES, PRODUCTS & ACCOUNTS

1. BANKERS CHEQUES

Available to members who wish to make payments through cheques.

2. SALARY/PENSION/INCOME PROCESSING:

Available to members who wish to earn their Salary/Pension/income through IG Sacco FOSA.

3. PESA PEPE M-BANKING

Available to members who wish to transact their Sacco business on a digital platform conveniently e.g. – Cash withdrawals, payment of utilities, check account and loan balances, access Salary/Pension/Dividend Advances, access mobile loans etc.

E- FOSA Loan – Enables a member to borrow up to KES 75,000/= through their Mobile Phone for 24 Months with **E-Gurantorship.**

E-Loan – Enables a member to borrow up to KES 75,000/= through their Mobile Phone for 12 Months.

E-Advance – Enables a member access Salary/Pension Advance at the comfort of their homes.

E-Dividend Advance – Enables a member access their dividend advance through their Mobile Phones.

4. FIXED DEPOSIT RESERVE (FDR):

Available to members who wish to earn higher returns on their FOSA Savings subject to a minimum account balance of KES. 10,000 for at least a minimum period of 3 months.

5. NYOTA NDOGO ACCOUNT

Available to members who wish to make savings for their children's future.

The minimum monthly contribution is KES. 300. Interest is payable annually subject to minimum account balance of KES.5, 000.

Requirement: Children under 18 years of age, certified copy of Birth certificate and colored passport size photo of the child.

6. HOLIDAY SAVERS ACCOUNT

Available to members who wish to save for a holiday in future or any other future event e.g. Weddings, Parties etc.

Minimum monthly contributions of KES.1, 000. Interest is payable annually subject to minimum account balance of KES. 5,000.

7. AKIBA SAVINGS

This is a savings account for members who wish to save for retirement or other projects. The scheme requires:

Minimum monthly contributions of KES. 100.

The savings on this account earns an interest that is payable annually subject to minimum account balance of KES. 10,000.

Akiba Savings can be used as security to get an Akiba loan.

CHAIRMAN'S REPORT DURING EDUCATION TO MEMBERS PROGRAM 2025.

PREAMBLE

Honorable members, guests, we are delighted to meet once again during this education program. We thank the Almighty God for protecting us throughout the year 2024. We sincerely appreciate you for the continued business support despite the hard economic challenges, which has enabled us realize a steady performance.

IG Sacco Ltd is a SASRA licensed Deposit-Taking Sacco with an Asset base of over Kes. 15 Billion as at 31st December 2024. The COG. Chairman Mr. Kennedy Keya governs the Sacco with a team of nine Directors led by. Three Supervisory Committee Members led by Chairman Mr. Justine Omutanyi carry out oversight function to the Sacco.

Sacco operations are conducted by a team of Seventy six (76) staff under the guidance of the management team led by the CEO. Dr. CPA Peter A. Vuhyah. Through this steadfast leadership and governance, we have managed to realize tremendous growth over the past years.

1. SACCO PERFORMANCE AS AT DECEMBER 2024.

The Sacco assets grew from Kes.14 Billion in 2023 to Kes.15 Billion in 2024 realizing a positive variance of 7 % (Kes. 1Billion). Our income increased to Kes. 2.1 Billion in 2024 compared to Kes.1.9 Billion in 2023 thus a positive variance of 11% (200 Million). Loan portfolio increased to Kes11.9 Billion from Kes. 10.8 Billion in 2023 thus a positive variance of 10% (Kes.1.1 Billion) as summarized below;

NO	CATEGORY	DECEMBER 2024 (Kes)	DECEMBER 2023 (Kes)	VARIANCE (Kes)	% VARIANCE
1	Assets	15 Billion	14 Billion	1 Billion	7 %
2	Income	2.1 Billion	1.9 Billion	200 Million	11%
3	Loan Portfolio	11.9 Billion	10.8 Billion	1.1 Billion	10%

The Sacco asset base grew through continuous contribution towards Share Capital and other monthly subscriptions to Non-Withdrawable Deposits as guided by our strategic plan. Loan portfolio also increased by 10% due to high uptake in loans arising from the review of our credit policy that enabled members to access more affordable credit.

2. MEMBERSHIP GROWTH AND MOTIVATION

The Sacco has an active membership of 27,138 members out of which 16,018 members are FOSA salary earners. We still have a great potential to recruit more members to channel their salaries through FOSA to leverage on a wide range of FOSA products such as E- Loan, E –FOSA Loan at Kes.75, 000 and Empowerment loan at 84 months.

Membership growth decreased from 1,391 members in 2023 to 1,325 members in December 2024 thus a negative variance 66(5%) members. We have enhanced marketing team with sales executives who will be aggressively in the field targeting newly employed teachers and especially confirmed Junior Secondary School teachers. We urge our members to help in recruiting teachers in their respective schools to enable the Sacco achieve its strategic plan membership growth pillar by 10%.

Our subsidiary savings accounts stands at 19,445 Akiba savings subscribers, 1,256 Nyota Ndogo and 679 Holiday savers. We urge all our members to patronize these saving products and enjoy more benefits such as annual interest and Akiba loan product.

Total of 238 members voluntarily withdrew from the Sacco compared to 299 members in 2023 and equally lost 89 members through death compared to 140 members in 2023.

The Sacco has rolled out motivational programs such recruitment rewards of Kes. 300 for a new member and Kes. 500 for FOSA salary earner, Super savers workshop, Holiday savers and Nyota Ndogo funfair.

We have so far rewarded 778 members with a total of Kes.353,400 for successfully recruiting new members and salary earners.

3. CREDIT PERFORMACE AND DIGITAL LENDING.

The Credit disbursed as at December 2024 increased by (15%) i.e. Kes. 602,635,114 whereby it increased to Kes. 8,981,020,103 Billion from Kes. 8,378,384,989 Billion as per the breakdown below; -

LOANS	2024 (KES.)	2023 (KES.)	VARIANCE	% VAR
Investment (BOSA)	4,533,439,688.00	4,098,624,031.00	434,815,657.00	11%
Income(FOSA)	4,447,580,415.00	4,279,760,958 .00	167,819,457.00	4%
TOTAL	**8,981,020,103.00**	**8,378,384,989.00**	**602,635,114.00**	**15%**

We realized a growth in Investment based loans by 11% compared to last year due to reviewed product features as facilitated today. Income based loans increased by 4% due patronage of investment based products by our members i.e. Digital loans such as IG E- FOSA Loan with guarantors. Generally, credit

disbursement increased by 15% attributed to innovative member centric products and services that are affordable.

We appreciate all our members who have patronized our Sacco products and services to realize the above performance.

As guided by our Strategic Plan, we promise our members that we shall continuously digitize our products and services to ensure we meet your financial needs seamlessly from wherever you are.

The Regulator (SASRA) subjects the above figures to the final Audit and approval as at December 2024.

4. IG SACCO BRANCH EXPANSION

In our progressive five-year strategic plan (2023 - 2027), under the Business Operation and Membership Growth pillars, we have done feasibility surveys in Bungoma, Busia, Kisumu and Siaya to ascertain the viability of setting up branches or Satellite offices. We are delighted to inform our membership we shall be setting up branches in Bungoma, Busia and satellite offices in Kisumu and Siaya to bring our services closer to our members.

Once we operationalize these branches, we urge members to patronize them so that they can breakeven in the shortest time possible.

5. AWARDS ACHIEVED IN 2024

The following awards were won by the Sacco;-

S/No	Category	Awards
	ASK Show – Kakamega County	Best Financial Institution other than Bank – Position 1. The Best Stand that Interprets Current Show Theme (Financial Industry) – Position 2. The Best Stand Embracing ICT & Communication System – Position 2. Best Co-operative Movement/Sacco sector– Position 1.
	Ushirika Celebrations	Best Managed – DTS under Employer Based Sacco Tier 1, Credit Management.
		Certificate of participation in Vihiga County & Best Sacco in Education & training.

	Kenya National Chamber of Commerce & Industry (KNCCI – Vihiga County)	The Best Financial Institution – Saccos Sector

6. **IG SACCO DIGITAL PLATFORMS**

a. Mobile Banking Platform - PESA PEPE (USSD *879*5#, *879# and *806#)

b. Mobile APP

Accessible on the play store where members can download and enjoy all Sacco services conveniently.

c. Online loan calculator

Accessible on our Sacco website www.igsaccoltd.co.ke under Resource Centre section. Members can do self-appraisal of all our loan products to ascertain their qualification, which will enhance on service delivery and efficiency during loaning process.

d. E- gurantorship

We have rolled out E- gurantorship through our mobile banking platforms to enable members' grantee each other digitally through E-FOSA Loan. We intend to digitize all our loan products and services to enable members from within and diaspora to access us seamlessly from wherever they are.

7. **SACCO ELECTIONS**

In accordance with the relevant Co-operative Legislations and our By Laws, we shall conduct the Sacco elections in three (3) Electoral Areas of Kabras, Vihiga and Ikolomani as well as By-Elections in bases that have vacancies on and Supervisory elections for Kakamega B (Kabras, Lugari and Lurambi Electroral Areas) on 1st February 2025.

We notify all members' especially aspiring candidates in future to familiarize themselves with the eligibility requirements and clearance process as set out in the amended Sacco By - Laws of 2017.

8. **EMMERGING ISSUES**

a. Data of Spouse Details;-

We are in the process of collecting our members spouse details to facilitate the processing of claims from the Insurance Company. This will facilitate timely payment of our funeral rider and deposits in case of

death. We urge all members to complete and submit the online form shared on various base WhatsApp platforms.

b. Nomination;-

We remind our members to review and or nominate Next of Kin by filling IG Sacco Nominee Card that is available at our Branches and Customer Care desks. This will enable your benefiaries to access your investments in case of demise without tedious legal procedures and or surrender to Unclaimed Financial Assets Authority.

9. **CONCLUSION**

We appreciate everyone for attending this important Sacco function, as it is one of the Cooperative principles (Education, training and information). We hope the information gained today will enable us scale greater heights as the economy opens up from the effect of the pandemic.

Thanks and may God Bless you all as we aim to Invest and Grow IG SACCO to greatness.

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Mr. Kennedy L. Keya

COG/ Chairman – IG (***Invest*** & Grow) Sacco Ltd

SCHEDULE FOR MEMBERS EDUCATION DAYS 2025

DATE	GROUP	DIVISION	VENUES	TOPICS
4/1/25	A	TIRIKI WEST	GIMINOI PAG CHURCH	Banana and Poultry
	B	MUNICIPALITY	PEFA CATHEDRAL CHURCH TOWN	Entrepreneurship and Local vegetables
	C	MUMIAS	MUMIAS CULTURAL CENTRE	Dairy and Groundnuts
	D	LUGARI	LUMAKANDA FRIENDS CHURCH	Beans and Dairy
11/1/25	A	KABRAS SOUTH	KAKUNGA S.A CHURCH	Dairy and Avocado
	B	IKOLOMANI	MAKHOKHO SEC. SCHOOL	Pigs and Sweet Potato
	C	VIHIGA	VIHIGA FRIENDS CHURCH	Dairy and Banana
	D	LUANDA	EBUSAKAMI ACK CHURCH	Banana and Dairy Goat
18/1/25	A	KHWISERO	KHWISERO ACK CHURCH	Bee keeping and Groundnuts
	B	CHAVAKALI	IVONA FRIENDS CHURCH	Poultry and Bananas
	C	SHINYALU	LIRHANDA FRIENDS CHURCH	Bee keeping and Local Vegetables
	D	LURAMBI	ESHISIRU WORD OF FAITH CHURCH	Dairy and Local Vegetables
25/1/25	A	MATUNGU	KHOLERA CATHOLIC CHURCH	Sunflower and dairy
	B	KABRAS NORTH	MATSAKHA FRIENDS CHURCH	Dairy and Sweet Potatoes
	C	ILEHO	SHANDEREMA FRIENDS CHURCH	Bee keeping and Sugar cane
	D	SABATIA	VOKOLI FRIENDS CHURCH	Poultry and Local Vegetables
1/2/25	ELECTION	KABRAS, VIHIGA, IKOLOMANI KABRAS, LUGARI, LURAMBI (SUPERVISORY)	TBC	N/A

8/2/25	A	TIRIKI EAST	ABUDANT CHURCH CHEPTULU	Bananas and Dairy
	B	NAVAKHOLO	CHEBUYUSI HIGH SCHOOL	Dairy Goats and Sweet potatoes
	C	LIKUYANI	KONGONI PAG CHURCH	Fish farming and Sunflower
	D	EMUHAYA	ST.BAKHITAS GIRLS HIGH SCHL	Bananas and Poultry
15/2/25	A	BUTERE	BUTERE ACK CATHEDRAL	Poultry and Fodder production
	B	SOUTH WANGA	ST. BEDAS BUKAYA SEC. SCH	Fish farming and Sunflower
	C	MATETE	KIVAYWA FRIENDS CHURCH	Bee keeping and Sweet Potatoes
	D	BUNGOMA LOWER H/SEC	BUNGOMA BOYS HIGH SCH.	Poultry and Banana
22/2/25	A	NANDI SOUTH- CHAIRMAN	ACK CHURCH KOIBATOK	Dairy and Banana
	B	MUMIAS	SHIANDA CEC CHURCH	Fish farming and Groundnuts
	C	BUNGOMA CENTRAL	KIMILILI PAG CHURCH	Dairy and Local Vegetables.
	D	BUTERE	INAYA ACK CHURCH	Poultry and Banana
1/3/25	A	NANDI NORTH-CHAIRMAN	NOBLE PENTECOSTAL CHURCH	Poultry and Fodder production
	B	BUSIA LOWER – HON.SEC	ST. AUGUSTINE BOARDING PRI. SCH	Fish farming and Beans
	C	SIAYA - WABUKO	CHIEFS CAMP MUTUMBU	Dairy Goats and Banana
	D	KISUMU – ORIEDO	ARYA PRI. SCHOOL	Poultry and Local Vegetables.
8/3/25	A	BUSIA UPPER – HON.SEC	NAMBALE BOYS HIGH SCHOOL	Dairy Goats and Beans
	B	BUNGOMA UPPER – VC	NAITIRI RC SCHOOL	Dairy Goat and Local Vegetables
15/3/25	VIRTUAL	DIASPORA MEMBERS AND THOSE WHO WILL HAVE MISSED THE PHYSICAL MEETINGS	HEAD OFFICE	Bee Keeping and Local Vegetables

IG SACCO
INVEST & GROW

MEMBERS EDUCATION

2025

www.igsaccoltd.co.ke

Our Investment, Our Growth