E-COBSI

Module 6: Cultivation Technics for Horticulture Crops (cont'd)

Making *BOKASHI* Compost

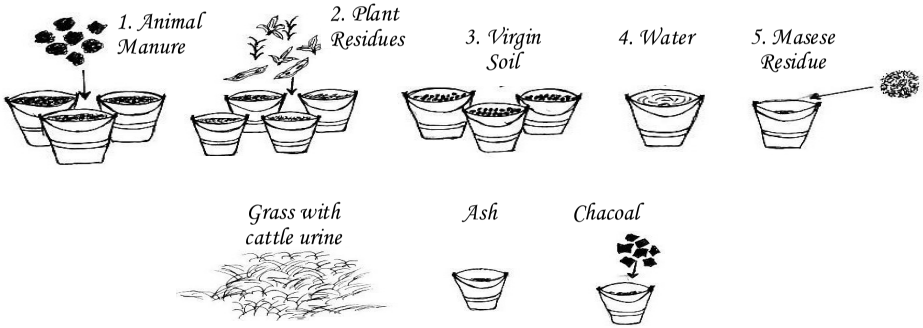
- Quick made compost, a secret of high productivity from Japan-

Choices of Various Methods

Methods	Time Required	Labor	Remarks
Pit Compost	3-4 months	Mid-Intensive	Easier but need more time
Windrow Compost	2 months	Mid-Intensive	Require plastic sheet
Liquid Manure	1 month	Less-Intensive	Require buckets/ short effect
Bokashi Compost	**2-3 weeks**	**Intensive**	**Labor intensive but quick to be ready for dry season Ag.**

Materials

Must Need		*If Available*	
1. Animal manure:	3 buckets	5. Masese residue:	1/2 bucket
2. Plant residues:	4 buckets	6. Bokashi previously:	1 bucket
3. Virgin Soil:	3 buckets	7. Dry yeast :	1/2 teaspoon
4. Water:	As required	8. Rotten fruits:	1/2-1 bucket



Materials

Materials added if you have

- **Ash: A half bucket,**

It is mainly for pH control of Bokashi. Ash provides K and the other minerals. However, don't burn plant residues for it, because if you burn the plant residues, you lose N and C from it, which are important nutrients for making compost.

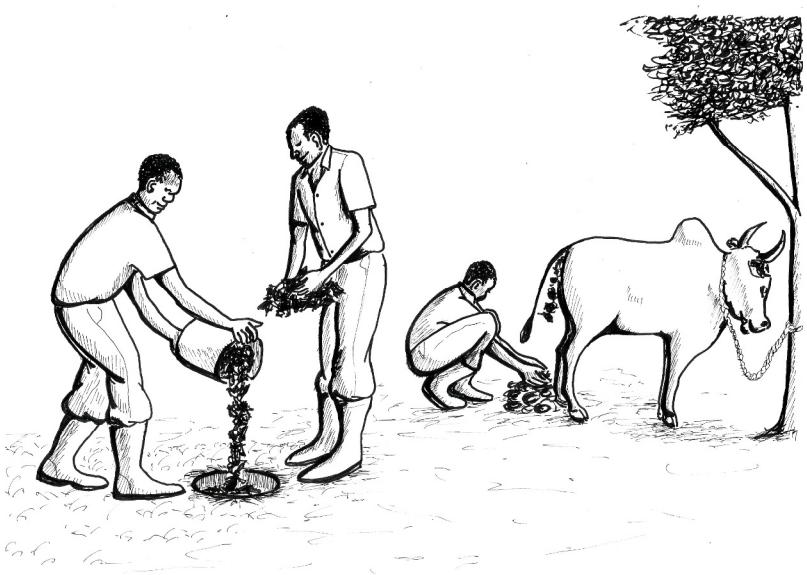
- **Charcoal: A half bucket,**

Break down into small pieces to be mixed with the other materials. It is a kind of microbes' house, which means that it can provide spaces (microspores of charcoal) to increase effective microbes' population.

Implements:

Hoe, Shovel, Panga knife, bucket

Collect Animal Manure



Collect Virgin Soil

Collect Yeast Rich Materials

Rotten Fruits

Masese residues

Cut Plant Residues

Cut Plant Residues (Remarks)

- **Legume residues** are recommendable because they are rich in nitrogen. However, the legume leaves are easy to decompose so that the nitrogen is easily lost. To mitigate the nitrogen loss, fresh materials should be used. It should be noted that the leaves are not good for aeration of the heaps.
- **Maize bran** is recommendable, because it is another good energy source for microorganism and is useful to increase yeast population.
- **Sugarcane** residues are also good because they contain a lot of sugar. Sugar is a very good source of energy and is easily taken by microorganisms; microbe's activities are accelerated.
- **Leeds residue** is not recommended as it does not easily decompose. However, in terms of aeration, it has good effect. Other materials improving the aeration are maize cob, ground nut pods, and rice chaffs.

Bokashi Making

Mix All the Materials

BOKASHI Seed accelerate the decomposition process [Explained Later]

Bokashi Making

Pour Water

Bokashi Making

Pile Up the Mixed Materials

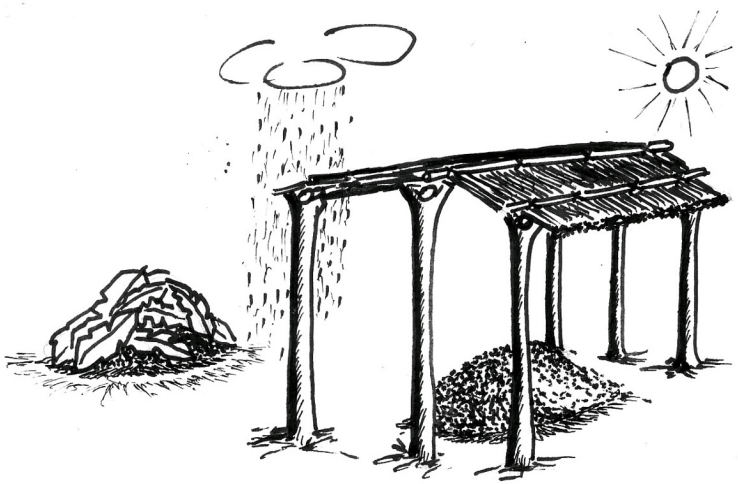
Cover the Finished Pile and Leave it for a Few Days

Check the Temperature and Moisture

Mix it When it Reaches 60ºC or More—continue it

Ready in 2-3 Weeks Keep it under shed

Ready in 2-3 Weeks
Keep it under shed



Let's Try!

Dig a Hole When Apply

Amount of Application per Lima (Standard):

(a) Standardized amount of chemical fertilizer for maize cultivation in Zone III in Zambia
- D-compound (10:20:10-5s): 50 kg/lima
- Urea (N=46%) : 50 kg/lima

(b) Amount of each nutrient applied
- N : 50 kg by 10%+50 kg*46%=28 kg/lima
- P : 50 kg by 20%=10 kg/lima
- K : 50 kg by 10%=5 kg/lima

(c) If you want to add same amount of nutrients in terms of N, add the following amount of Bokashi.
- 28 kg/2.05%(*)=1,366 kg/lima

(d) If the weight of one heap of compost is 20kg, you need:
- 1,366 kg/ 20kg/heap = 68 heaps/lima

(e) Amount of other nutrients added
- P : 1,366 kg by 0.04 %(*) = 0.546 kg
- K : 1,366 kg by 0.43 (*)% = 5.87 kg

(f) If you want to add same amount of nutrients of chemical fertilizer, you should additionally apply,
- P : 10kg - 0.546 kg = 9.45 kg/lima
- K : 5 kg - 5.87 kg = N/A

Nutrient contents of Bokashi Compost and Compost

Type	Data source	% N	% P	% K
Bokashi (Cattle dung)	Study Team	2.05	0.04	0.43
Compost (Cattle dung)	Japanese Average	1.6-2.1	1.5-3.5	2.0-4.0

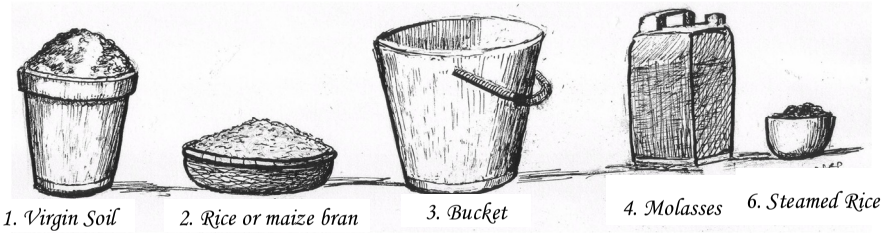
In Japan, the amount of Compost application recommended is 5 ton/ha (Cattle Dung)

Bokashi Seed
(Powder Type)

- Materials and Procedure -

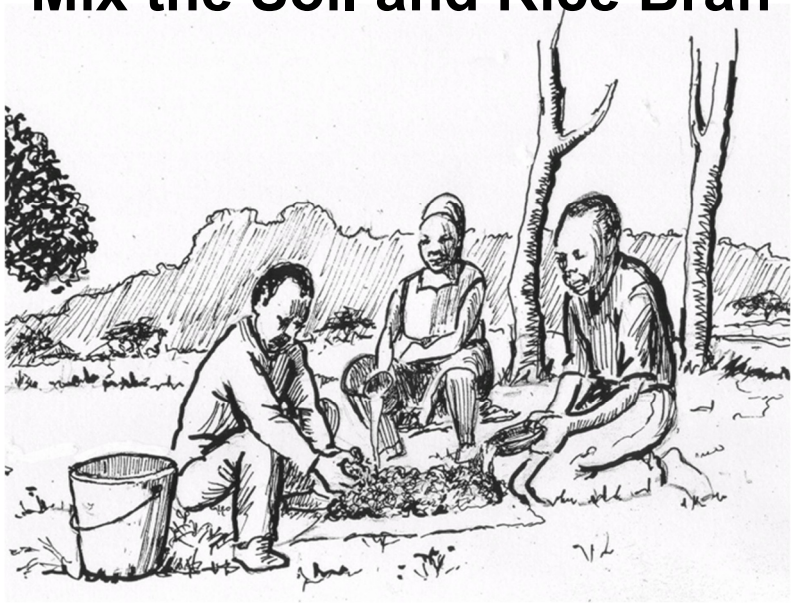
Materials

1. Virgin soil	1/10 bucket (2.0kg)
2. Rice bran	1 bucket (6.0kg) or
Maize bran	1 and 1/4 bucket (8.0kg)
3. Plastic Bucket	1 unit
4. Molasses	0.5 litter
5. Water	40 litters
6. Steamed rice	1 grab



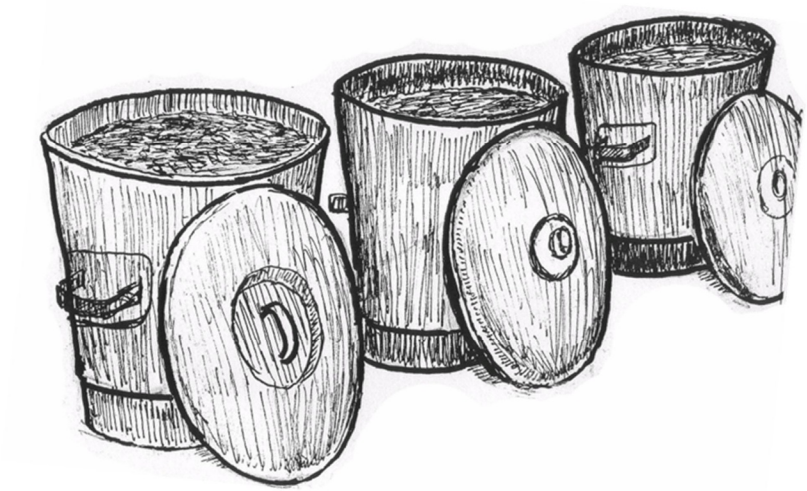
Collect Virgin Soil

Mix the Soil and Rice Bran



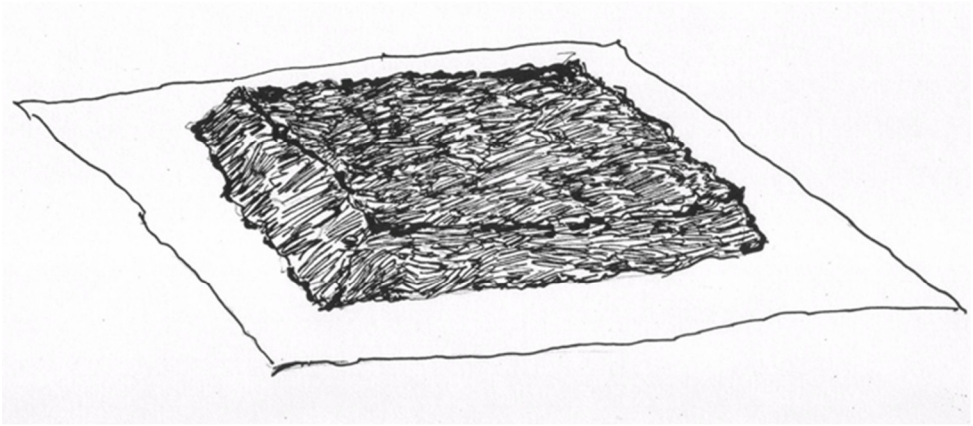
Check the Moisture

Keep the Mixture for 3-5 Days



Increase the Volume

Make it Dry

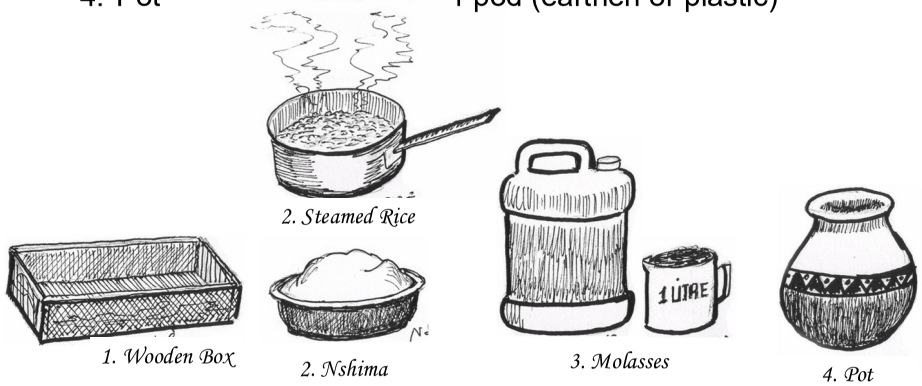


Bokashi Seed
(Liquid Type)

- Materials and Procedure -

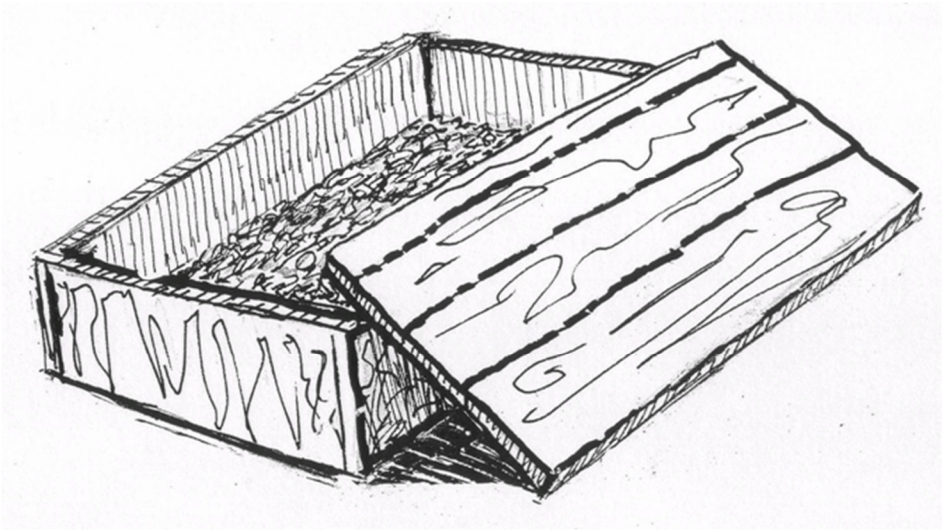
Materials

1. Wooden box: 30cm x 20cm x 6cm
2. Steamed rice or Nshima: A half of the wooden box
3. Molasses: 1 litter (or crude sugar)
4. Pot 1 pod (earthen or plastic)



1. Wooden Box *2. Nshima* *2. Steamed Rice* *3. Molasses* *4. Pot*

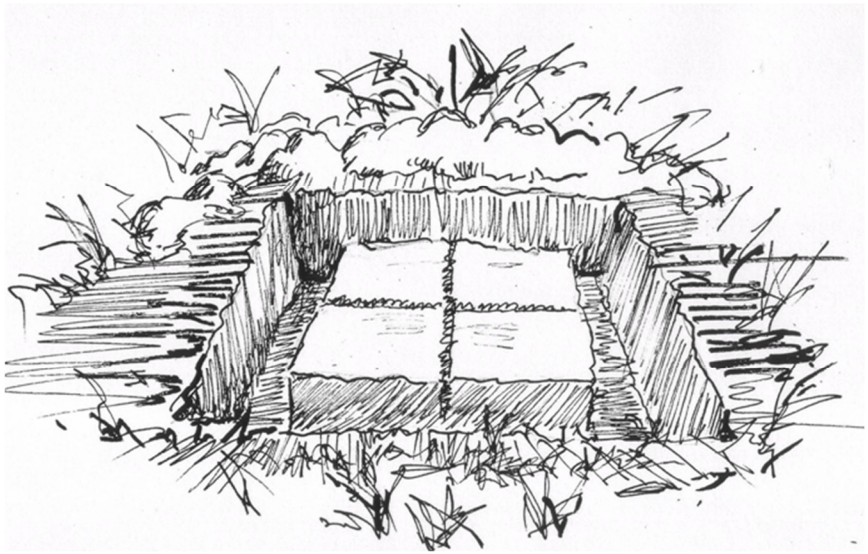
Put Steamed Rice/Nshima in the Box



Bury the Box in a Pit and Leave it for a Week or Two

Bokashi Seed (Liquid Type)

Bury the Box in a Pit and Leave it for a Week or Two



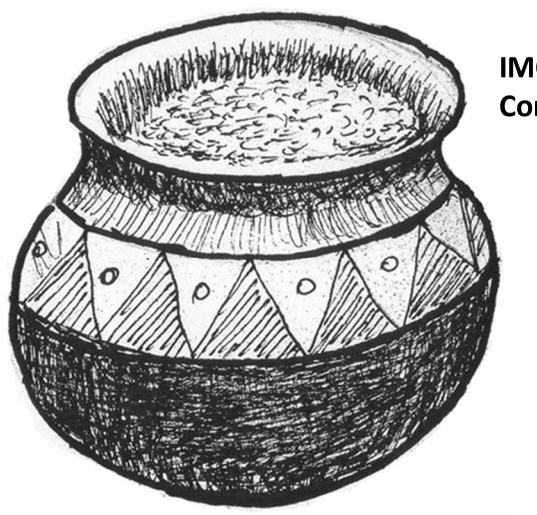
Bokashi Seed (Liquid Type)

Dig Out the Box after a Week

Bokashi Seed (Liquid Type)

Remove Molded Material to a Pot

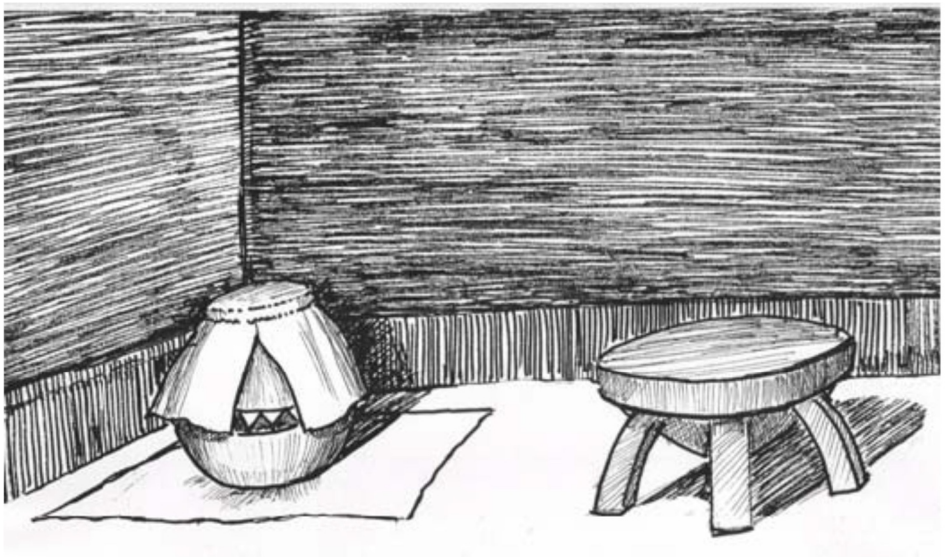
Keep it for a Week or So



IMO
Concentrate

How to Make “Bokashi” using IMO (Bokashi Seed)

How to preserve IMO



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Module 6: Cultivation Technics for Horticulture Crops (cont'd)

Organic pesticides And Disease Control

Recipe of Organic Pesticide

***Tephrosia Vogelii* as an insecticide**

Tephrosia vogelii can be grown to improve soil fertility, for firewood, as an insecticide against storage pests and mites on plants. It can also be used as a medicine for skin diseases and internal worms. Extract of Tephrosia leaves can be used for the control of pests such as termites, ants, beetles, aphids, cutworms, various bugs and weevils, stalk borers, flies and so on in the field, in storage or on domestic animals. It leaves no residue on crops because rotenone breaks down within 3 - 5 days after application.

How to make an insecticide

1. Crushing leaves. It does not need to be done perfectly.

2. After soaking the leaves in water for two hours or boiling them for 30 minutes, filter the juice through a cloth and use directly in a sprayer.

※ Approximately 1 kilogram of leaves for 5 liters of water
＝Approximately 3 coke bottles of leaves for 15 bottles (1 bottle=300ml)

3. Add a bit of soap to help the spray stick to the plant.

WARNING: Tephrosia is dangerous to fish, humans, animals and wild life !!

- Wash hands with soap as soon as you have finished using it.
- Do not use Tephrosia to poison fish.

2. PAWPAW

METHOD OF PREPARATION

- Collect leaves 1 kg, pound them
- Soak them in 1 Lt of water for 24 hrs (some do 6hrs)
- Strain and add 5gms of soap
- Dilute (1:4) and spray to Crops

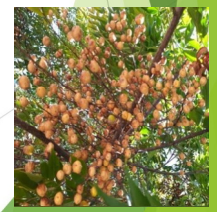
3-1. Neem (seed)

METHOD OF PREPARATION

1. Collect fallen fruits underneath the tree.
2. Remove the flesh from the seeds and then carefully dry the seeds to avoid fungus forming.
3. Pound 30g neem kernels of (that is the seed of which the seed coat has been removed) and mix it with in 1 litre of water. Leave that overnight.
4. The next morning, filter the solution through a fine cloth and use it immediately for spraying. It should not be further diluted.

Note:

1. A neem solution loose its effectiveness within 8 hours after preparation, and when exposed to direct sunlight.
2. It is most effective to apply neem in the evening, directly after preparation, under a humidity or when plants are damp.



3-2. Neem (leaves)

METHOD OF PREPARATION

1. Collect leaves 1 kg, pound them
2. Add 3 tbs of cooking oil and 3 tbs of dish soap
3. Soak them in 10 Lts for 72 hrs
4. Strain and dilute (1:10) spray around crops

References

- Thomas Ribble. Companion Planting : the ultimate companion gardening guide. 2020, 86p.

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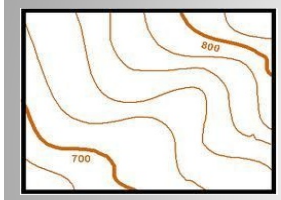
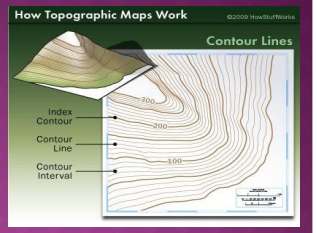
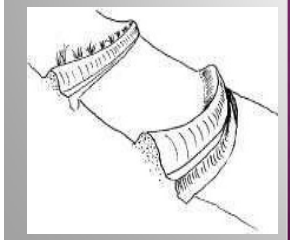
Module 7: Irrigation Agriculture Development







CONTOUR RIDGE FOR SOIL CONSERVATION

Objectives

- Discuss why soil is a valuable resource.
- List ways that soil can lose its value.
- Identify ways that soil can be conserved.

The Value Of Soil

- A natural resource is anything in the environment that humans use.
- Soil is one of the most valuable natural resources because everything that lives on land, including humans, depends directly or indirectly on soil.
- Plants depend directly on soil to live and grow.
- Humans and animals depend on plants-or on other animals that depend on plants-for food.

The value of soil cont..d

- Fertile soil is valuable because there is a limited supply.
- Less than one eighth of the land on Earth has soils that are well suited for farming.
- Soil is also in limited supply because it takes so long to form.
- It can take hundreds of years for just a few centimeters of soil to form.

Soil Damage And Loss

- The value of soil is reduced when soil loses its fertility and when topsoil is lost due to erosion.
- Soil can be damaged when it loses its fertility.
- soil lost from unprotected land is about 120 t/ha/yr and may go as high as 300 t/ha/yr.

Loss Of Topsoil

- Whenever topsoil is exposed, water and wind can quickly erode it.
- Plant cover can protect soil from erosion.
- Plants break the force of falling rain, and plant roots hold the soil together.
- Wind is another cause of soil loss.
- Wind erosion is most likely to happen in areas were farming methods are not suited to dry conditions.

Soil Conservation

Biological Soil Conservation measures Have Been Presented

Choice & design of S & W conservation measures depend on :

- Soil
- Land Slope
- Rainfall
- Wind Characteristic of the Area

Measures adopted are classified as:

- Agronomical
- Biological &
- Engineering Measures

Agronomical Measures:

- Vegetative Cover
- Strip Copping
- Stubble Mulching
- Windbreaks & Shelterbelts
- Tillage Practices

Water Erosion Control Measures

- Contour Farming
- Strip Cropping
- Mulching & Crop Residue Management
- Vegetative Barriers/Live Bunds
- Land Smoothing
- Ridges & Furrows/Dead Furrows

Engineering Measures:

- Stone Wall Terrace
- Waterways with Vegetative Cover
- Gully Plugging
- **Contour/Graded Bunds/Ridges**

What is a Contour then?

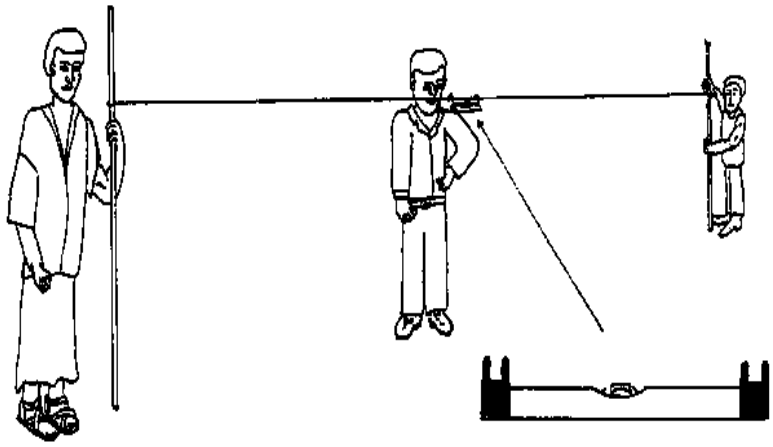
An imaginary line on the ground surface joining the points of equal elevation

Contour continued…

In other words, contour is a line in which the ground surface is intersected by a level surface obtained by joining points of equal elevation. This line on the map represents a contour and is called contour line.

What about The Line Level?

- Lay out contours and gradients,
- To measure the slope of land.
- Simple to operate and is easier to transport.
- Quick and very accurate when used properly.
- Require three people to operate it.



A Line Level Consists Of Two Poles, Between Which A Length Of String Is Suspended. A Spirit Level Is Hung On The String.

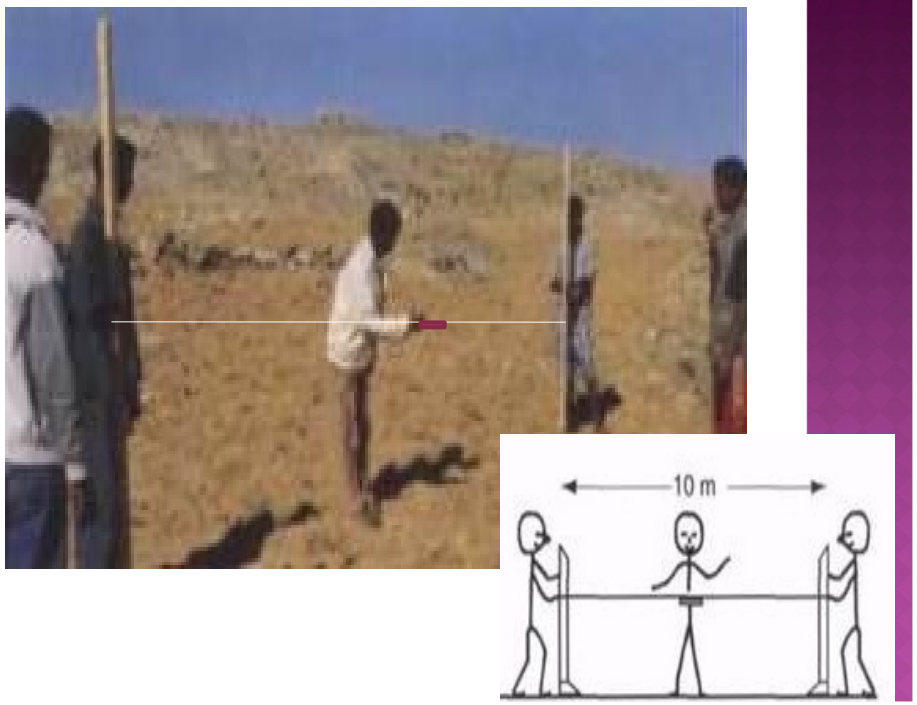
A notch is made in each pole at exactly the same height
(say 1.4 m above ground level)

Poles Should Be Of Even Height (About 1.5 M)

…and the ends of the string tied around these notches.

How To Lay Out A Contour

- Each pole is held by an operator and the line level read by a third person. The first pole is held by operator "A" who remains stationary. Operator "B" then moves up and down the slope until the level reads dead centre.



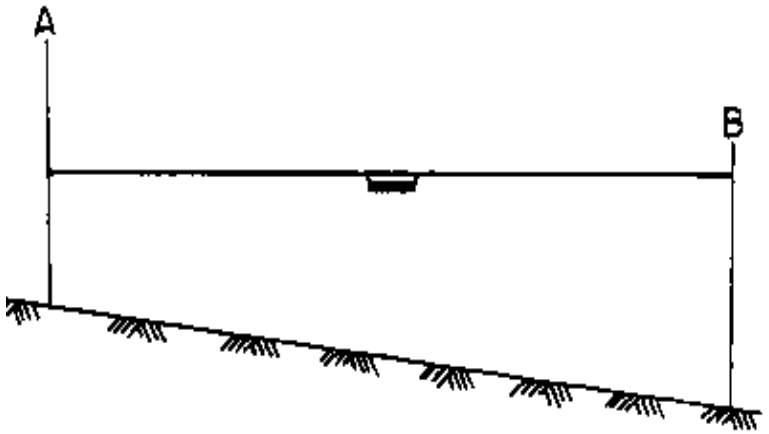
Laying Out A Contour cont…

- The two positions are marked, and while "A" moves to "B's" old position, "B" moves onwards and the process continues until the length of contour required has been completed.

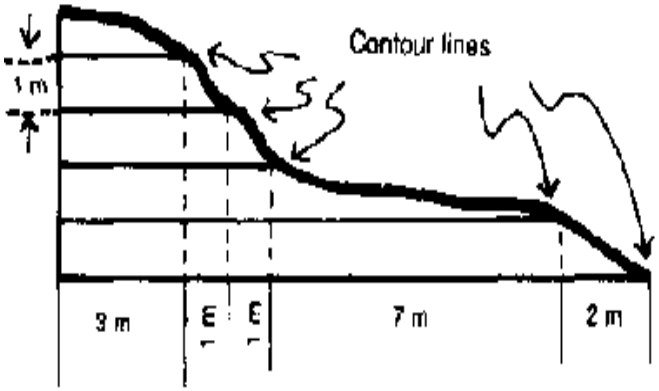
Laying Out A Contour cont…

- The true contour is then "smoothed" by eye to give a better shape for ploughing.

Measuring The Slope Of The Land



Horizontal Interval



Procedure

1. It is simple to use the line level to measure the slope of the land. Operator A stands exactly upslope of Operator B and adjusts the string to the notch which gives a level reading.

Up to 21 notches should be marked on pole A and the following table shows the percentage slope indicated by each.

Position	Notch on Pole A Top	% Slope
2nd	(2 cm below top)	0.25
3rd	(4 cm below top)	0.50
4th	(6 cm below top)	0.75
5th	(8 cm below top)	1.00
7th	(12 cm below top)	1.50
11th	(20 cm below top)	2.50
21st	(40 cm below top)	5.00

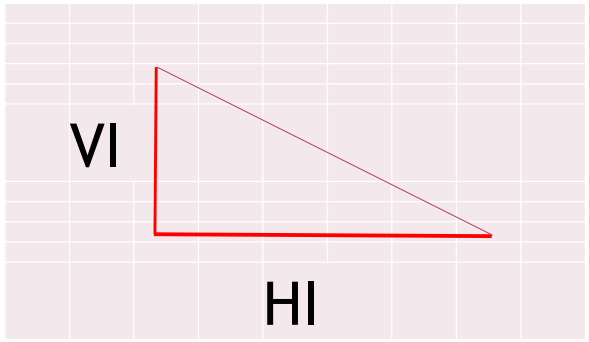
Important Points To Remember

- Always check the spirit level - by placing it on a horizontal surface and noting the position of the bubble which should be between the two marks.
- Check the centre point of the string each day and its length also,

Important Points To Remember

- Remember that when laying out a gradient that operator (A) is upslope.
- Make sure poles are held vertically.
- Avoid placing the poles in depressions or on top of minor high spots in the field.

Contour Spacing



Where : VI is the Vertical Interval
HI is the Horintal Interval

How To Go About It

Refer to the flip chart on determining the horizontal distance

E-COBSI

Expansion of Community-Based Smallholder Irrigation Development Project

Module 7: Environmental and Social Considerations

Necessity of Environmental and Social Considerations

To work inline with **Laws** and **Regulations** of Zambia:

- ✓Agricultural Lands Act - 1994
- ✓Environmental Management Act No.12 - 2011
- ✓Forests Act -2015
- ✓Land Act - 1995
- ✓Land Acquisition Act - 1994
- ✓National Heritage Conservation commission Act - 1989
- ✓Water Supply and Sanitation Act No.28 - 1997
- ✓Water Resources Management Act No.21 - 2011
- ✓Environmental Impact Assessment (EIA) Regulations - 1997

Environment Related Institutions in Zambia

- Zambia Environmental Management Agency (ZEMA)
- Water Resources Management Authority (WARMA)
- The Forestry Department of Ministry of Lands, Natural Resources (MLNR)
- Ministry of Agriculture MoA)
- Department of Wildlife and National Parks
- Department of Water Resources Development

Main things to be considered in E-COBSI

The aspects from……

1)Zambia Environmental Management Agency(ZEMA)

2)Water Resources Management Authority (WARMA)

3)The Forestry Department of the Ministry of Lands, Natural Resources (MLNR)

Zambia Environmental Management Agency(ZEMA)

There are 2 types of Environment Impact Assessment;

1. Environmental Impact Statement (**EIS**)
2. Environmental Project Brief (**EPB**)

Environmental Impact Assessment Regulations of Zambia states that:

- Dam and barrage covering a total area less than **25**ha do **not** required Environmental Impact Statement (**EIS**)
- Irrigation schemes covering an area less than **50**ha do **not** require **EIS**

ZEMA suggests;

If the command area is more than 25 ha, you need **EIS**

But you need only Environmental Project Brief (EPB) in case below 25 ha

Since COBSI command areas are small and water flows through simple weir down stream, so environmental damage is minimum. So **you only need consent from ZEMA (simple weir).**

NOTE: When you select permanent weir sites, inform ZEMA (Lusaka) with brief information (e.g. stream name, design of construction….)

Officer in ZEMA Lusaka :
Ms. Elizabeth Phiri (0977-990458)

WATER RESOURCES MANAGEMENT AUTHORITY (WARMA)

Zambia's Waters ! Our Future !

WARMA suggests;

✓ More than 1 ha or 10 m³ /day of water use :Water permit

✓ Less than 1 ha or 10 m³ /day of water use : Consent to WARMA

It does not matter if your site is permanent or simple. It depends on quantity of water abstracted from the river.

Officer in Lusaka: Mr. Mwenya 097-9486-534

Ministry of Agriculture plans to start negotiations with WARMA on water permit, since E-COBSI will not use the river/ stream water for commercial purposes.

The Forestry Department of the Ministry of Lands, Natural Resources (MLNR)

- **Confirm** with local Forest Officers in your area regarding existence of **protected forest** or **species** in the proposed site, and seek guidance on the matter.
- **Cutting** any tree with **more than 14-centimeter** diameter at breast height (about 1.3-meter) from ground surface, needs **permission** from local **Forest Office** against **payment** as price of the tree.

  e.g. **225 K**wacha must be **paid** to Forest Office for cutting a Mukwa tree, and **175.5K** for a **Mofu** tree.

- **Caution!** trees within 60-meter distance from river is recommended not to be cut, and left for nature conservation purpose.
- In case **objects** of **historical, cultural, religious/spiritual** values exist in the area, consult with the respective authorities and seek their guidance on the matter

Other issues to be considered

1. When diverting water to irrigation scheme, **some amount should remain flowing in its original course** for downstream and environment purposes
2. Prevent leakage in canal system, and overwatering in the fields to **minimize the soil erosion/land degradation.**
3. To assure that the diverted water is proper distribution and well managed, encourage establishment of **water user's group** and a neutral **organization** to **oversee** all the water related **issues**, including operation and maintenance aspects.

Thank you for your attention !

E-COBSI

Expansion of COmmunity-Based Smallholder Irrigation Development Project

Additional Module (a): Cultivation Technics for Horticulture Crops (cont'd)

Popular Crop selected by SHEP Farmers:

Wheat Cultivation

Contents

1) Introduction

- Wheat (Triticum aestivum L) is the most extensively grown cereal crop in the world
- Current wheat production in Zambia stand at about 340,000 metric tonnes.
- . Annual national wheat consumption is about 450,000 tonnes
- Wheat is suitable for household food security because of its high protein content of 11 – 16%.

- Wheat provide household food security to the growers
- marketing of the crop also provides an important source of income to the farmers

1) Introduction (cont'd)

- In winter the crop has very few pests and disease problems, compared to rainy season crop.

- Wheat is widely consumed in Zambia in the form of bread, biscuits, cakes and other wheat product.

The wheat stalks are used in a variety of applications such

- mulch
- construction material
- animal bedding

2) Cultivation Environments

Temperature

- Optimum air temperature for growth and the development of grain is 13℃ – 25℃.
- High temperatures during developmental stages hasten growth and development, while shortening various developmental stages, making it impossible to achieve full yield potentials of the crop.

Soil Condition

A minimum pH of 4.8 is advisable.

Soils with lower pH values should be amended with lime based on soil tests.

2) Cultivation Environments (cont'd)

Cultivation Season

- The crop is grown in cool season
- Plant between Mid -April and June

3) Variety Choice

- Choose high yielding and disease resistant varieties with good baking quality.

3) Variety Choice

Common varieties in Zambia

- Loerrie II
- Mampolyo
- Nseba
- Lumbe
- Sisi
- Timba

4) Field Management

①Land Preparation

Spacing

- Drill spacing of 20 - 30 cm between rows
- Plant 4 -5 cm deep and cover

Seed rate

- Seed rate of 120-140 kg/ha is recommended when sowing wheat

30cm

4) Field Management

Land Preparation

Fertilizer application

Basal Fertilizer

- 125 -150kg WVC per Lima (500 kg/ha) broadcast at the time of planting and incorporate into soil

Top dressing

- 63kg Urea per Lima (250kg/ha) broadcast four to six weeks after planting.

4) Field Management (cont'd)

Irrigation

- The total water requirement over the growing season is between 400 and 500 mm (4,000 -5000 m 3 /ha).
- Irrigation should continue until the crop is at harvest stage.

4) Field Management (cont'd)

Weed control

- Weeding should be done by a hoe or chemicals (herbicide)
- Weed at two weeks and four weeks after planting
- Afterwards depending on the weed pressure

5) Pest & Disease Control

Insect (Pest)

- Insect pest are not a serious problem on irrigated wheat.
- Termites can be a problem when dry conditions prevail during the growing season. These can be controlled by termicide.
- The crop is attacked by **red spider mites**.
- Also attacked by aphids.
- Control measures might include use Monocrotophos, Cypermethrin, Malathion, and others to treat insects. For red spider mites, use an acaricide.

5) Pest & Disease Control

Disease

- Powderly mildew
- leaf rust
- head blight
- Bacterial leaf streak
- stem rust

Bird control

- Bird control is done by scaring.
- Should start immediately on heading.

Harvesting

- Harvesting should begin about two weeks after the crop has started drying.
- When wheat is ready for harvest, the heads of the grain start to bend.
- The golden colour indicates that it is time to harvest the wheat.

Harvesting

- Small scale use sickles to harvest.
- Commercial farmers use combine harvesters
- crop is then winnowed to separate the chaff from the grain.
- Grain can be processed and used or stored until required.

Yield

- 12 x 50 kg bags (600kg) per lima.
- Yields of over 900 kg (18 bags) per Lima have been obtained in wheat research trials.

Lessons learnt from previous projects

- Need for high yielding varieties
- Bulking of produce to access markets
- Proper Management of the crop

References

- Zari wheat production brochure
- https://www.researchgate.net/publication/310458715
- Olabanji, O.G., Omeje, M.U., Mohammed, I., Ndahi, W.B. and Nkema, I. (2007) Wheat. In Cereal Crops: Principles of Production and Utilization

KOT(2023)
Expansion of Community-based Smallholder Irrigation Development (**E-COBSI**)

Nutrition Improvement Hand Scale for serving food per day

Agenda of Presentation

1) Food Groups
2) *Tebakari Heiyouhou*(Hand Scale Method)
3) Tips for using Tebakari Eiyouhou (Hand scale)

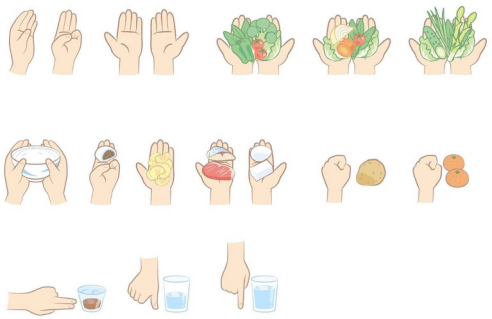
Recommendation :

Eat different types of food from each of the six food groups every day to stay strong

KNOWING THE SIX FOOD GROUPS

Food function of Six food groups

Food Group	Main function
1. Vegetables	Protective
2. Fruits	
3. Beans, pulses, legumes and nuts	Body building
4. Poultry, fish, insects, mice and meats	
5. Milk and milk products	
6. Cereals and starchy roots and tubers	Energy giving



2) *Tebakari Eiyouhou* (Hand Scale Method)

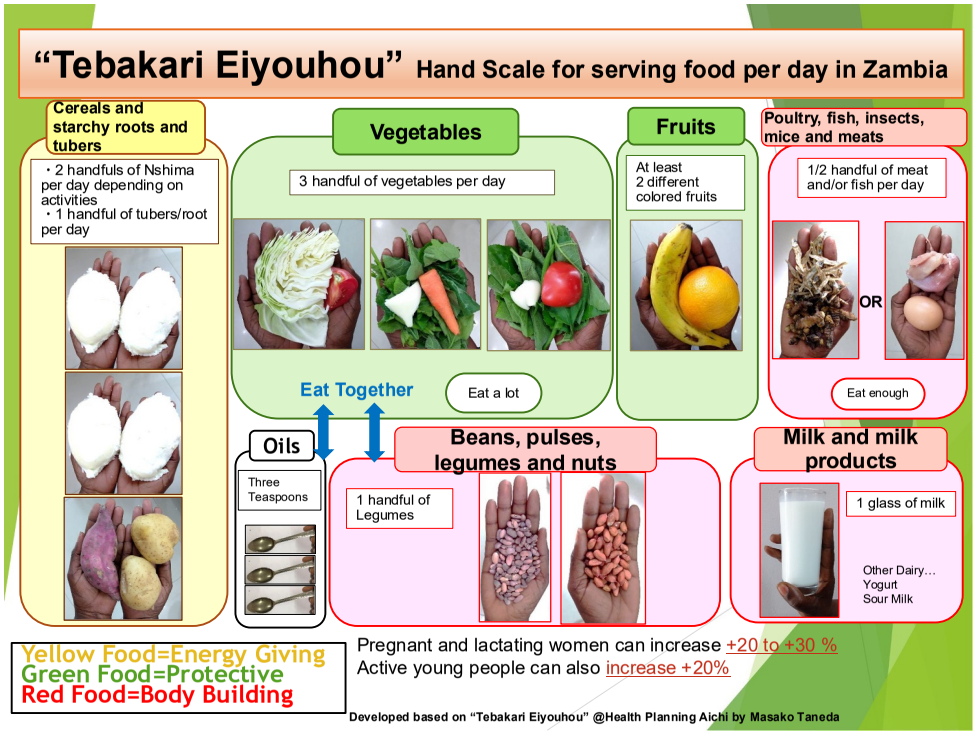
Compare the size of your hand with your neighbor

- Compare the size of your hand with your neighbor
- Taller person has bigger hands and shorter person has a smaller hands. Body size is roughly proportional to necessary dietary allowances.

That is why we use our hand to measure amount of food to be served daily

The purpose of Hand scale method

- *Tebakari Eiyouhou* (Hand scale to serve food daily) is a method of controlling calories using the palm of your hand as a scale.
- You can manually measure what food you should eat and how much you should eat in a day by using *Tebakari Eiyouhou* (Hand scale to serve food daily) .



3) Tips for using *Tebakari Eiyouhou* (Hand scale)

Tips for using *Tebakari Eiyouhou* (Hand scale)

- Pregnant and lactating women can increase +20 to +30 % of food to be served from the standard. But at the beginning of the pregnant, some women cannot eat food enough due to morning sickness, they can eat whatever they feel they can eat. During late pregnancy, they should eat enough protein and calcium.
- During pregnancy, please add another green and yellow vegetables for both hands.

⇒Green and yellow vegetables contain a lot of "folic acid" which is important during pregnancy.

- Try to drink milk every day with a grass of 200 ml (One grass)per day.
- Calcium has the role of making bones and teeth in babies.
- Take vitamin D supports calcium absorption
- Vitamin D: Highly contained in mushrooms, salmon, etc.
- Pregnant women should stop drinking altogether

Tips for using *Tebakari Eiyouhou* (Hand scale)

- Active young people can also increase +20% of food to be served from the standard. They should eat enough protein and work well and then the muscle is maintained.

- Since elderly people decrease amount of works, they can reduce 20% of Cereals, starchy roots & tubers from the standard. But they should eat the other well-balanced food. Elderly people should maintain amount of protein and calcium.

Tips for using *Tebakari Eiyouhou* (Hand scale)

- Eat different types of food from each of the six food groups every day to stay strong.
- Eat well-balanced three meals (breakfast, lunch and dinner). Ideally, the Recommended Daily Dietary Allowances should be spilt into three meals
- Taking too much protein damages your kidney and liver and extra protein convert to fat. Therefore, maintain proper recommended amount of protein (e.g. 1/2 handful of meat and fish per day)
- If farmers cannot buy meat and chicken, they should eat fish enough. If you eat whole fish including fish skin and bones, you can take calcium and Vitamin D. Since meat and fish is high quality protein, eating only beans as protein source is not recommended. CEOs can instruct farmers to buy fish and meat from earned money, not beans only.

Grevenco Habanero Chili Presentation

By Green Ventures Concept

Table Of contents

Who is Green Ventures Concept - Grevenco

- Green Ventures Concept – Grevenco is an Agribusiness Company that deals in Farming, marketing of Agricultural Commodities such as Crops and Livestock. Our field further includes Resource Management, Conservation Farming, Ranching and sales. We also promote Small Holder Farmers through a farming Input support program by providing them with Seeds, Organic Fertilizer, conduct Trainings, Field visits and Farm Management. We are currently working in Northern, Luapula, Central and Lusaka Provinces.
- As demand and Technology are progressing, where also Markets are becoming increasingly Global, Grevenco was developed as a Farmers Final hope to meet and solve high-tech farming needs and problems

Why grow Chili?

- Being a perennial crop, The Farmer will harvest from January to December for 3 to 5 years which will increase their disposable income.
- The Farmer will have money throughout to manage their wants and needs such as Children to school, improve their farming models, access good health care services, etc
- In terms of theft, there is very minimal loss compared to Maize, groundnuts and other crops as there is limited market
- Chili is drought resistant
- Chili is rich in nutrients
- Chili Improves the taste/flavour of food

Health benefits of Chili

1. Help prevent or control the risk of diabetis
2. Helps reduce pain and inflammation
3. Habanero can help with respiratory conditions by increasing air into the lungs
4. Habanero peppers has been known to boost immunity system and makes digestion easier.
5. It has been proven to aid with weight loss.
6. Blood flow increases by habanero peppers.
7. Helps control blood pressure.
8. Helps manage Arthritis.
9. Eating habanero peppers can increase the body's ability to fight off disease and improve overall health.

Grevenco

Chili production Budget and expected returns

uction for 1 Lima							
Sn	Description	Quantity	Amount	Total			
1	Membership fee	12 months	K350	K350			
2	Seed	1 packet (6200seeds)	K300	K300			
3	Plant Catalyst	1 litre bottle	K350	K350			
4	Organic Folia Fertilizer	1 litre bottle	K350	K350			
5	Trainings	Free					
6	Scheduled Extension services	Free					
7	Scheduled Extension services	1 packet (6200seeds)	K300	K300			
	Total expenses		**K1,650**	**K1,650**			
	Expected returns for 1 Lima						
	Minimum harvest per plant is 1 k	6200	K10	K62,000			
	Less expenses			K1,650			

Grevenco

Chili production Budget and expected returns

chili production for 10x10 meters							
Sn	Description	Quantity	Amount	Total			
1	Membership fee	12 months	K350	K350			
2	Seed	1 packet (500seeds)	K150	K150			
3	Plant Catalyst	500ml bottle	K175	K175			
4	Organic Folia Fertilizer	1 Litre	K350	K350			
5	Trainings	Free					
6	Scheduled Extension services	Free					
7	Unscheduled Extension services	per visit	K350	K350			
	Total expenses		**K1,375**	**K1,375**			
	Expected returns for 1 Lima						
	Minimum harvest per plant is 1kg	500	K10	K5,000			
	Less expenses			K1,350			
	Profit			**K3,650**			
	Note that labour costs have not been included as they vary from area to another						

Grevenco

How to become a Grevenco member

- One has to have land (owned or rented)
- Can be an individual or belong to a Cooperative, Group or Club
- For Cooperatives, Groups and Clubs a Lead Farmer has to spearhead the members
- Lead Farmers will attend regular trainings and in turn training their members

Grevenco

Benefits of being a Grevenco member

- Lead Farmers will attend regular trainings and in turn training their members
- Lead Farmers will be given incentives to help with Communication with their members
- Camp Extension Officers will be paid 5% of membership fee for a minimum of 100 Farmers recruited who will have paid membership fee, bought seed and Plant Catalyst. This means 100 recruited Farmers x K350 equals K35,000. 5% of K35,000 is K1,750

Grevenco

The End

- For questions, queries, clarifications contact Patricia on 0977752202

Grevenco

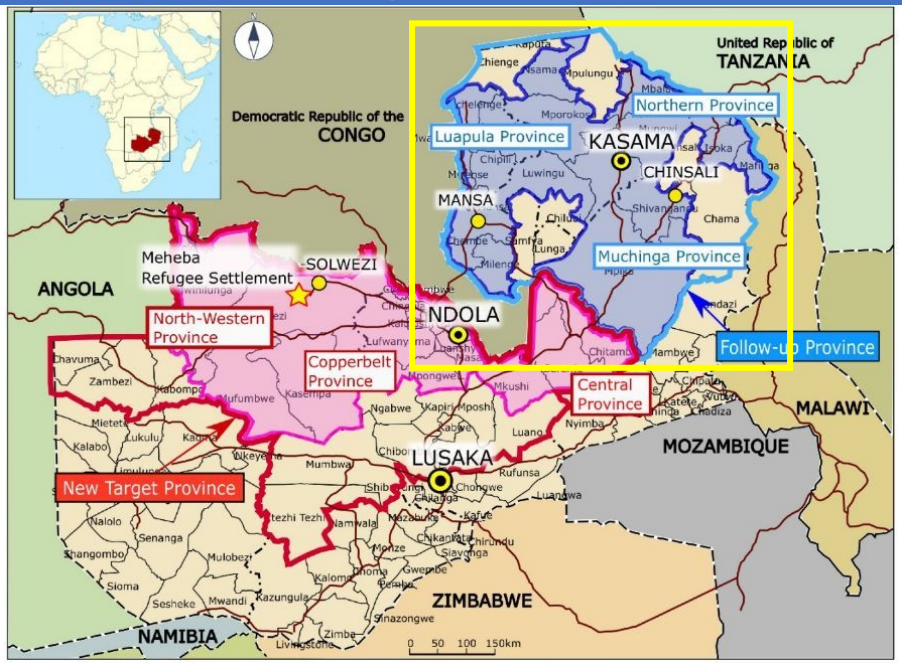
E-COBSI

Expansion of **Co**mmunity-**B**ased **S**mallholder **I**rrigation Development Project

Progress Report of Follow-up Province Year 2022

E-COBSI Training Done in 2022 in Follow-up Provinces

Target Area



Modification of Training Schedule in FU Provinces

	Training Contents	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Year 2022 (Plan)	・Market Oriented Agriculture ・Water Management ・O&M of Irrigation Facilities ・Nutrition Improvement	Market Survey	Preparatory Meeting KOT				Preparatory Meeting MTT				Preparatory Meeting AEW		We are here
			OJT & Monitoring, Follow-up										

	Training Contents	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Year 2022 (Actual)	・Market Oriented Agriculture ・Water Management ・O&M of Irrigation Facilities ・Nutrition Improvement	COVID-19		Preparatory Meeting Market Survey KOT			Agri-show	Preparatory Meeting MTT				Preparatory Meeting AEW	We are here
					OJT & Monitoring , Follow-up								

No. of Target COBSI Sites in Follow-up provinces in 2022

Name of Province	District Model Site	Camp Core Site	Other COBSI Sites	Sites improved/ revamped	Total
Nortern	9	22	20	5	56
Luapula	8	23	23	6	60
Muchinga	7	17	8	6	40
Total	**24**	**62**	**51**	**17**	**156**

Name of Province	As of 2021 (Inclusive of District Model Site)		Activities in this Irrigation Season (2022)		Total Irrigated Area (2021 + 2022) (Lima) =(A)+(B)	No. of fish pond	
	Canal length as of 2021 (Km)	Area Irrigated as of 2021 (Lima) (A)	Canal length newly dug in 2022 (km)	Area newly irrigated in 2022 (Lima) (B)		As of 2021	Total in 2022
Northern	103.9	896.0	28.9	167.3	1,063.3	102	125
Luapula	60.6	378.2	13.2	89.1	466.9	116	195
Muchinga	50.1	399.5	9.8	49.2	448.6	18	19
Total	**214.6**	**1,673.7**	**51.9**	**305.6**	**1,978.8**	**236**	**339**

No. and Date of Farmer Day at District Model Site

Name of Province	No. of District conducted Field day	No. of Participant
Northern	7	257
Luapula	5	679
Muchinga	7	385
Total	19	1,321

Profile of Target COBSI Site in Follow-up provinces in 2022

Name of Province	Total No. of Household participated in all the sites targeted in 2022	Total No. of member farmers		
		M	F	Total
Northern	735	706	516	**1,222**
Luapula	955	984	609	**1,593**
Muchinga	705	782	637	**1,419**
Total	**2,395**	**2,472**	**1,762**	**4,234**

Name of Province	SHEP Approach	Water Management	O&M	Total
Northern	3,376	2,299	2,278	**7,903**
Luapula	5,349	5,567	5,562	**16,478**
Muchinga	3,894	4,249	3,830	**11,973**
TOTAL	**12,619**	**12,115**	**11,670**	**36,404**

Field Photos

Date: 03/2022	District Name: LUWINGU
Camp Name: Fikonkonta	Site Name: Fibulumo
Description: SENSITIZATION MEETING (SHEP and Nutrition)	

Field Photos

Date: 04/2022	District Name: MPOROKOSO
Camp Name: CHISHAMWAMBWA	Site Name: CHILALA
Description:MAAKET SURVEY	


Field Photos

Date: 06/2022	District Name: LUPOSOSHI
Camp Name: MUFILI	Site Name: CHIBWALE
Description: IRRIGATED ONION, CABBAGE AND BEANS	



Field Photos

Date: 07/2022	District Name: NSAMA
Camp Name: KANANDA	Site Name: KANANDA
Description: INFIELD TRAINING IN BOKASHI AND COMPOSIT MAKING	


Field Photos

Date: 15/05/2022	District Name:Mwansabombwe
Camp Name:Ciilange	Site Name: Kapweshi
Description: Canal maintenance	

Field Photos

Date: 22/10/2022	District Name: Chipili
Camp Name: Lupososhi	Site Name: Fitungulu
Description: Cooking demonstration	

Field Photos

Date: 25/05/2022	District Name: Chipili
Camp Name: Kalundu	Site Name: Tambalala
Description:Cultivation for on farm water management	

Field Photos

Date:	District Name: MPIKA
Camp Name: CHALWE	Site Name: MUSAKANYA KOMBE
Description: MARKET SURVEY	

Field Photos

Date: AUGUST 2022	District Name: MPIKA
Camp Name:	Site Name: LUBANGA
Description: COOKERY DEMONSTARTION	

Field Photos

Date:	District Name: LAVUSHIMANDA
Camp Name: LUKULU	Site Name: THOMPSON
Description: TRANSPLANTING CABBAGE UNDER FURROW IRRIGATION	

Photo of Each Activity in year 2022

Exposure visit of Agric Staff From Mozambique

SHEP Approach in Follow-up provinces in 2022

Good Practices/Good Findings

- **Adoption of SHEP concept:** able to conduct market surveys, select crops and implement cropping calendar, determine gross margins, then try new crops.
- There was **high female participation**
- Farmers are able to utilize digital platforms to **acquire market information** for their target crops
- Traders buying from **bulking and at farm gates. (farmers bulking produce)**
- **Improved record keeping,** and farmers are beginning to maximize profits.
- **Roadside Markets** for a few sites are being adopted.
- Farmer **asset base is being improved**: farmers are able to acquire assets such as bicycles, Television sets, and solar systems, just to mention a few.
- Districts have started **hosting field days** at model sites.
- Farmers are able to make **purchases of food supplements** for nutritious foods using money from their horticultural products.

SHEP Approach in Follow-up provinces in 2022

Challenges

- **Long distances to the big markets.**
- High cost of inputs.
- **Lack of records on crop sales and expenses on inputs in some groups**
- Unstable markets in some districts.
- **Highly ranked crops sometimes may not be grown due to prevailing conditions which may not favor a particular crop.**
- No group in any formal agreement/supply contract with off-takers.
- Poor phone network.
- Unpredictable cost of production (fuel increases) of transportation.
- Poor marketing infrastructure.

O&M in Follow-up provinces in 2022

Good Practice/Good Findings

- Farmers cleaning the canals and farrows.
- **Maintenance of both simple and permanent weirs.**
- Some groups contribute funds for O&M but need to intensify collection of user fees.
- **Groups practicing rotational irrigation.**
- Set out dates for inspecting the facilities.
- **Established the Maintenance committee.**
- Farmers are able to serve more time to expand their areas.
- Farmers are able to reduce water logging e.g. Chansamalamba
- Farmers can use **locally available materials to carry out maintenance work.**
- Farmers are **practicing teamwork** and good cooperation in the maintenance of infrastructure.
- There is **increased participation** by female farmers.
- Groups have started **registering and acquiring certificates**, this is expected to earn them legal recognition and assist them in accessing financial support.

Nutrition Improvement in the Follow-up provinces

Good Practices/Good Findings

- Intergraded farming (fish farming and other nutritional value crops).
- **Farmers are sensitized to reserve part of their crop produce for home consumption & on the importance of balanced diets.**
- **Increased income from cash crops leading to household food security.**
- Synergised implementation of activities (SUNTA, SNV & World Vision).
- Some farmers **willing to adopt the use of hand scale** (***"Tebakari Eiyouho"***).
- **Increase in irrigated crop utilization**.
- Farmers have developed an **interest in the nutritional value of crops**.
- Female farmers are able to categorize food into **three main food groups**.
- Officers are taking advantage of other funders' activities to promote nutrition improvement.
- **Farmers appreciated the knowledge share** with them during the cookery demo.

O&M in Follow-up provinces in 2022

Challenges

- Some sites have no maintenance routine/plan.
- **Some farmer groups not registered i.e. no by-laws on water user fees which can be used for O & M.**
- Still challenge to collect WUA fees.
- **No water permits**.
- **Low participation in canal clearing and maintenance**.
- **Reduced canal flows** due to low stream flow (October – December).
- Poor relationship between farmers and GRZ wings such as WARMA, ZEMA, Forest etc.
- Inadequate knowledge and skill when to open and close gates (stop logs).
- Other activities (FRA and FISIP) were **preoccupied with some farmers in august**, September and October.
- Some farmers were **busy with caterpillar collection** and neglected infrastructure during that period (October-November)
- Some **maintenance materials are quite costly** for the farmers.

Nutrition Improvement in the Follow-up provinces

Challenges

- **Low production of highly nutritious vegetables** such as fortified vegetables.
- **Limited knowledge** of the preservation of crops.
- **Low staffing in the Nutrition section** under the ministry.
- **Misunderstanding of the hand scale** (***"Tebakari Eiyouho"***) method.
- Farmers' **inability** to meet the required food varieties.
- **lack of variety in vegetable production** for home consumption.
- **Low participation by men** in planning meals at home.
- **Inadequate capacity** to make annual food calendars.
- Inadequate knowledge of the relationship between nutrition improvement and irrigation activities.

Field day in the Follow-up province

Good Practices/Good Findings

- Most of the target districts conducted field days.
- Farmers are able to learn and adopt the technologies disseminated.
- Good attendance by non-scheme members.
- The field day was farmer driven and provided food for the attendants.
- A lot of techniques are displayed or shown for learning.
- Marketing by seed company and farmers as well.
- The field days were well attended, indicating the wiilingness of farmers to learn new techniques and technologies.
- Traditional leadership was in attendance in some districts.

Field day in the Follow-up province

Challenges

- **Conflict among farmers** led to District Model Site not successful.
- Officers only want to conduct one off-field day and not stage by stage.
- **Farmers expect handouts** from GRZ, JICA and other donors.
- **Poor access paths**, no roads!
- Pest and disease infestation was experienced in some districts despite them having pesticides and chemicals.
- FISP activities **affected participation** in some districts.
- Some farmers **did not keep records** of demo activities.

Actions to be taken for Implementing E-COBSI Approach for the year 2023

- **Continued monitoring** by CPU (counterpart funding).
- **Timely establishment** of DEMO farms.
- Enhance formalization of farmer groups through farmer organization sensitization meetings and training.
- **Promoting exchange visits** for both Officers and farmers.
- All districts to hold Food fairs/cooking demos at district model sites.
- Implement training as scheduled
- CEOs manning model sites in In-direct districts should be attending all E-COBSI trainings.
- Engage irrigation groups for road make-shift markets.
- Strengthening leadership skills for improved water use collection.
- Promotion of larger reservoirs in the face of climate change.
- Engagement by the National CPU of WARMA on the water fees.

Actions to be taken for Implementing E-COBSI Approach for the year 2023

- Further trainings for CEOs and farmers **on when to close and open stop logs or gates** to avoid canal breaches..
- More sensitization on ***"Tebakari Eiyouho"*** (hand scale).
- More **trainings on need to have variety of crops** produced.
- Demonstrations need to be conducted on organic pesticides such as effectiveness of tephrosia, chilies, pawpaw, neem, etc.
- Engage farmers to **put up posters** to their irrigation schemes.
- Facilitate visitation of farmers to field days of other irrigation groups.

Actions to be taken for Implementing E-COBSI Approach next year [2023]

Activity	Budget (ZMW)			Budget Source
	Northern	Luapula	Muchinga	
・Simple Weir Construction	60, 000.00	360,000.00	70,000.00	JICA/GRZ/FARMERS/other partners
・Permanent Weir Construction	4,000,000.00	1,200,000.00	1,400,000.00	WV/GRZ/TRALARD
・SHEP	200,000.00	120,000.00	153,269.00	JICA/GRZ/LTDP/WV
・O&M	150,000.00	60,000.00	113,682.00	JICA/GRZ/PARTNERS
・Nutrition Improvement	400,000.00	120,000.00	524,808.00	JICA/GRZ/SUNTA/SNV
・Farmer Organization	200,000.00	60,000.00	71, 345.00	GRZ/PARTNERS
・Gender	50,000.00	60,000.00	140,000.00	GRZ/PARTNERS
・Others (Administration)	172, 000.00	17,196,761.73	172, 000.00	GRZ/PARTNERS/TRALLARD
TOTAL	**5,232,000.00**	**19,176,761.73**	**2,645,104.00**	**27,053,865.73**

Customization of SHEP Approach for Zambia

	Approach to be taken
In Zambia	• **Conduct exposure visits** to countries that have advanced in the SHEP approach • Introduce the approach **countrywide.** • At national level, efforts should be directed at conducting research on ways how the CEO should sensitize the local farmers to motivate them. • The national-level headquarter **should endeavor to provide transport and other logistics** to enable the CEO to carry out his / her work. • The national level headquarter **should take the role of publishing research tools.** • The national-level HQ shall together with the province monitor the • Institutionalize SHEP activities in the agriculture sector and develop policy to promote SHEP. • Include SHEP topics **in the training curriculum of agriculture training institutions**. • **Provide funding for SHEP activities.**

Customization of SHEP Approach for Zambia

	Approach to be taken
Provincial Level	• Review annual market information • **Enhance use of interactive online/Mobile platforms offering market information to counteract the challenges of long distances to the markets** • Encourage stakeholder interactions among the market players and promote market days where farmers can meet to market their produce • **Spreading market surveys to chain stores and all potential open markets** • **Continue to invite farmers to all farmer input shows (agric shows)** • Provide to CEOs techniques on **sharing vision** to farmers (sensitize) to harness their natural resources locally available for **income generation**. • support to **conduct market surveys** or any other such surveys to understand the market. • Once market surveys are conducted, **most feasible (target) crops should be decided and selected** for production and timing is set. • There is a need to include SHEP in day-to-day activities and frequently engage local radio stations to create awareness and enhance SHEP knowledge to farmers. • Introduce **SHEP award** at district and provincial shows.

Dissemination of E-COBSI Impact

	Approach can be taken
By "Farmer to Farmer" extension	• By using **demonstration plots** and **farmer field schools**. • Holding **Radio programs**. • Promote farmer **exchange visits** to E-COBSI project sites to help share knowledge and experiences. • Holding **field days** at district model sites (using Lead farmers). • **CAC meetings**.

Dissemination of E-COBSI Impact

	Approach can be taken
By "Officer to Officer" extension	• **Promote exchange visits** for officers to enable them to share knowledge and experiences about E-COBSI. • Conduct **camp exchange** and exposure visits. • **Create a WEB page** for dissemination and exchange of Info. • **Use of social media groups** such as WhatsApp and Facebook to share successes and challenges. • **Exchange visits should be extended** at the provincial level at least once a year to appreciate the level of project technologies adoption rate and interest from farmers' points of view. • Twining of new officers with old ones to enable them to gain experience.

Emphasized points on E-COBSI activity in 2022

- **Demonstration plot establishment at district model site,**
- ***"Tebakari Eiyouho"* Hand Scale Method, Nutrition Improvement.**

Demonstration Plot Establishment

Good Practices and Challenges

GOOD PRACTICES

- ✓ The activity was implemented using COBSI & SHEP approaches & some districts successfully hosted field days.
- ✓ Dissemination of E-COBSI Project to farmers in the districts.
- ✓ Can be likened to Farmer Field Schools where farmers themselves can acquire knowledge and skills.
- ✓ During well-organized field days, farmers can sell their produce.
- ✓ Learning of new technologies or practices e.g. wheat and garlic production in Chipili district.
- ✓ Farmers actively participated and cultivated demo plots well.
- ✓ Farmers conducted field days successfully.

CHALLENGES

- ✓ Late procurement of inputs by the district.
- ✓ High cost of inputs.
- ✓ Low water levels in Luwingu.
- ✓ Most districts had not conducted field days at the time of reporting.
- ✓ Current land tenure does not encourage new entrants.
- ✓ Most of the demo plots are not accessible by car.
- ✓ Pest and disease infestation.
- ✓ Poor seed quality in some districts resulting in poor crop.
- ✓ Low involvement of CEO at demo sites in some districts.

Demonstration Plot Establishment

Evaluation and Observations, Recommendations for Improvement of the Activity

EVALUATION AND OBSERVATIONS

- ✓ Activity is good for the dissemination and transfer of technologies
- ✓ The idea of a demonstration plot has proved to be quite effective.
- ✓ There was not enough documentation of the agronomic practices at demo sites.
- ✓ The district budgets were adjusted downwards, thereby reducing the demo plot sizes.

RECOMMENDATIONS FOR IMPROVEMENT OF THE ACTIVITY

- ✓ Activity is good for the dissemination and transfer of technologies.
- ✓ Procure inputs as per plan (timeliness).
- ✓ Farmers appreciated the support from JICA & the activity should continue even next year.
- ✓ Enhancement of record keeping by the provision of record books.
- ✓ FISP to be extended to irrigated activities (this year is a learning year coz of Draughts)
- ✓ Add a nutrition component.
- ✓ Include the production of indigenous vegetables.
- ✓ Conduct cooking demos.
- ✓ Good for business by agro-dealers and farmers as well.
- ✓ Easy for farmers to learn by seeing.
- ✓ Reforms are required for communal agricultural land.
- ✓ Farmers to be engaged to provide access roads.
- ✓ Train farmers on the importance of record keeping.

"Tebakari Eiyoho" Hand Scale Method

Good Practices and Challenges

GOOD PRACTICES

- ✓ Farmers are now that they were not meeting the minimum nutrition reequipment for each person
- ✓ Taking food from the same group in bulk instead of a balanced diet
- ✓ Some farmers showed interest in adopting the newly introduced ***"Tebakari Eiyouho"*** (hand scale)
- ✓ Provision of visual aid.
- ✓ A simple measure of food requirement.
- ✓ The farmers did appreciate the methods intention of improving nutrition.

CHALLENGES

- ✓ Farmers are not sure of whose hand palm to use, especially for under five years children.
- ✓ There is still some resistance from farmers due to the technology being new (also cultural issues)
- ✓ Insufficient sensitization.
- ✓ Low adoption rate.
- ✓ Not easy to acquire all food classes by the small scale farmer e.g. diary and protein
- ✓ Complaints on food quantities.
- ✓ Concerns on the applicability of the method.
- ✓ Lack of actual demonstration for farmers to appreciate the scale.
- ✓ Farmer complaints that nutritional foods are expensive.

Epela mukwai

"Tebakari Eiyoho" Hand Scale Method

Evaluation and Observations, Recommendations for Improvement of the Activity

EVALUATION AND OBSERVATIONS

- ✓ The hand scale method is an excellent way to measure daily food intake if well understood
- ✓ The farmers did appreciate the method's intention of improving nutrition.
- ✓ Farmers expressed eagerness to try.

RECOMMENDATIONS FOR IMPROVEMENT OF THE ACTIVITY

- ✓ More awareness meetings to be carried out.
- ✓ Due to cultural differences, develop a Zambian way of measuring other than by hand.
- ✓ Visual aid should continue.
- ✓ The simple measure to continue.
- ✓ Improve methods of sensitizing farmers.
- ✓ To produce and diversify (integrated agriculture).
- ✓ Using the hand scale, food wastage is anticipated to be minimized.
- ✓ Distribution of copies to some farmers as requested.
- ✓ There is a need for more sensitization meetings on the importance and usage of hand scale method.
- ✓ The charts need to be revised and put locally available foods.
- ✓ Incorporate the model into the school curriculums.

E-COBSI

Expansion of **CO**mmunity-**B**ased **S**mallholder **I**rrigation Development Project

Module 8. Progress & Entry Planning [for Presentation]

KOT for FU Provinces: xxxx District 2023

Profile of District Model Site and Camp Core Sites in 2023 [XXX District]

Items	District Model Site	Camp Core Site 1	Camp Core Site 2	Camp Core Site 3
Name of Camp				
Name of CEO				
Name of Site				
No. of household (HH)				
No. of member farmers (Total)				
Present irrigated area (ha)				
Command (Potential) irrigable area (ha)				
Type of weir (incline, single, double, trigonal, Permanent)				
Length of weir (m)				
Height of weir (m)				
Length of furrow (m)				
Three major irrigated crops				

Progress since MST & Entry Planning to July [XXX District]

1-1. Number of SHEP training done by District team and CEO since MST and Next Target to July (by the time of MTT)

Name of CEO and Name of camp	(1) New Sites		(2) Improvement Sites	
	Achievement by March	Target from April to July	Achievement by March	Target from April to July
District TSB (Name of District)	(Times)	(Times)	(Times)	(Times)
CEO 1 (Mr./Ms. A) (Name of camp)	(Times)	(Times)	(Times)	(Times)
CEO 2 (Mr./Ms. B) (Name of camp)	(Times)	(Times)	(Times)	(Times)
CEO 3 (Mr./Ms. C) (Name of camp)	(Times)	(Times)	(Times)	(Times)
CEO (District Model Site) (Mr./Ms. D) (Name of camp)	(Times)	(Times)	(Times)	(Times)

1-2. Number of farmers who participated in the SHEP trainings

No.	Name of Camp	Name of Site	Jan	Feb	Mar	Total
ex	Nyoka	Monbo	20	0	20	40
1						
2						
3						
4						
5						
6						
7						
8						
Total						

2-1. SHEP Activities done by the farmers after MST in Jan.

(Describe what activities have been done since MST)

No.	Name of Camp	Name of Site	Activities
ex	Nyaoka	Monbo	Market Survey, Crop Selection,,,,,
1			
2			
3			
4			
5			
6			
7			
8			

5

2-2. Number of farmers who participated in those activities

No.	Name of Camp	Name of Site	Jan	Feb	Mar	Total
ex	Nyoka	Monbo	20	0	20	40
1						
2						
3						
4						
5						
6						
7						
8						
Total						

6

3. Activities are done by the farmers of the District Model Site

(Describe what activities have been done by March)

	Activities by March
	Ex. Simple Weir construction, Canal maintenance, Water management, Formulation of the by-law, Collection of Maintenance fee,,,,,
Name of Model Site (****) Name of CEO (****)	

7

4. Major Findings (Sites implemented in 2023)

Category of Site	Name of Camp & Name of Site	Findings, Challenging and its countermeasures taken, Proudness, Success story, etc.
District Model Site		
Camp Core Site 1		
Camp Core Site 2		
Camp Core Site 3		

E-COBSI

Expansion of COmmunity-Based Smallholder Irrigation Development Project

Module 9: Reporting and Feedback Mechanism

From xxth to xxth March

Module 9: Reporting and Feedback (Monitoring System)

2. Reporting Format

CEO

- Monthly Camp Report (submit by the end of month)

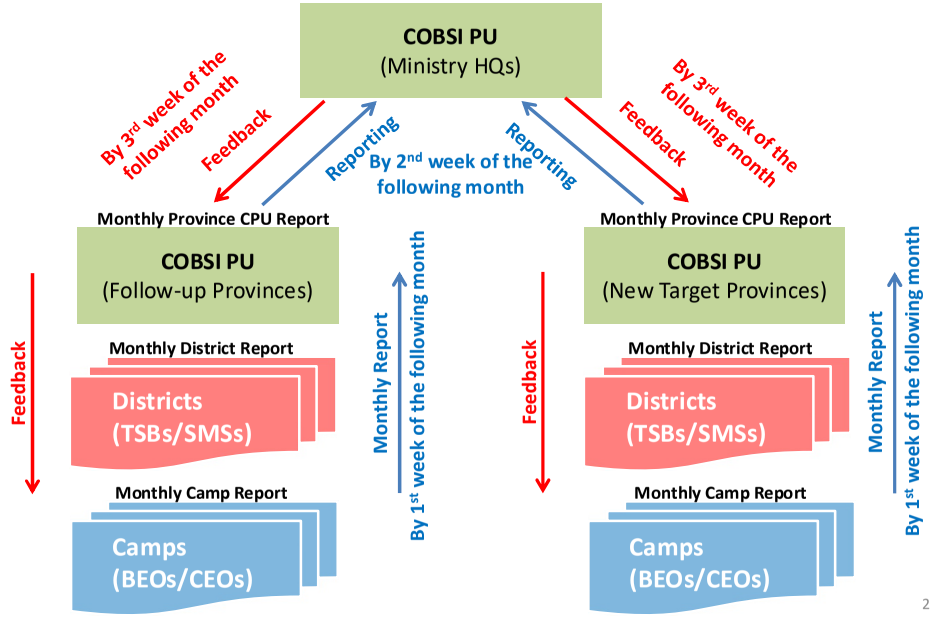
District Office

- Monthly District Report (submit by 1st week of next month)
- Site Visit Report (Make it after every site visit and submit with Monthly District Report)

Provincial CPU

- Monthly CPU Report (submit by 2nd week of next month)
- CPU's Site Visit Report (Make it after every site visit and submit with Monthly CPU Report)

Module 9: Reporting and Feedback (Monitoring System)



Formats of District Model Site to be submitted by the end of April

1) **Plan of Demonstration Farm at District Model Site**
2) Market Survey Questionnaire
3) Target Crop Ranking Sheet
4) Target Crop Selection Sheet
5) Crop Calendar

Important Evidence for the Demo Plot Plan

MTT 2023
in Follow-up Provinces

ver. 1

Agenda of Mid-term Training for MoA/JICA E-COBSI

Date: From XXX to XXX, 2023
Venue: At XXXXX, XXXX Province

(Officer in Charge)

DAY 0 (Date/Month, 2023): Gathering to the Venue

DAY 1 (Date/Month, 2023): Orientation

(Officer of the day: Mr. or Ms. XXXX)

Module 1 – Program Orientation (Mr. or Ms. XXXX)

08:00-08:30 Registration
08:30-08:45 Prayer, welcome remarks, and program orientation (housekeeping issues)
08:45-09:15 Opening (PACO/PAO), self-introduction, and overview of the training

Module 2 –Purpose of MTT

09:15-09:30 Purpose and Expectation for MTT (Mr. or Ms. XXXX)

Module 3 – Nutrition Improvement *(Mr. or Ms. XXXX)*

9:30-11:00 Food Based Dietary Guidelines by MoA
- Lecture: 90 min

11:00-11:15 Health break

11:15-12:00 Work Plan and Operational Guidelines by MoA (Lecture)
- Lecture and Conclusion: 45 min

12:00-13:00 Lunch

Module 3 – Nutrition Improvement (continued) *(Mr. or Ms. XXXX)*

13:00-16:00 Nutrition Improvement (Presentation of Tebakari-Eiyouhou)
- The Purpose of Tebakari-Eiyouhou (Hand Scale for Nutrition)
- How to make Tebakari-Eiyouhou
- Tips for using Tebakari-Eiyouhou
- Q & A on Tebakari-Eiyouhou
- Feedback from officers on using Tebakari-Eiyouhou
- Sharing food recipe which would be introduced in Cooking Class in DAY3

16:00-16:30 Briefing of Field Visiting

DAY 2 (Date/Month, 2023): Field Visiting **(Officer of the day: Mr. or Ms. XXXX)**

※Inform the farmers what to do, and what to prepare in advance so that they can work smoothly.

07:45- Registration
08:15- Recapitulation (review and clarification of the Day 1 activities)

08:30-10:00 Moving to COBSI District Model Site (XX district, XX site)

Module 4 – Cultivation technics for Horticulture *(Mr. XXXX & Ms. XXXX)*

10:00-10:30 Discuss benefits and challenges of cultivation technics taught in KOT, especially organic pesticide, among trainees and farmers

※1. Appoint one note-taker who submits the memo after the training
※2. Getting feedback from farmers

Module 5 – Nutrition Improvement *(Mr. XXXX & Ms. XXXX)*

10:30-11:30 Demonstration of Tebakari-Eiyouhou to Farmers

※1. Hear from farmers about their daily diet and health condition and impression on Tebakari-Eiyouhou
※2. Distribute laminated materials for each district.

- Learn how to use the Hand Scale and recommend it to farmers through demonstration

Module 5 – Nutrition Improvement *(Mr. XXXX & Ms. XXXX)*

11:30-14:00 Cooking class

※Use the PPT material of DAY2, the slide on good food combinations.

- Learn how to cook balanced food (prepare the materials for the project, use the utensil of the farmers)
- Learn good food combination

14:00-15:00 Lunch

※We ask farmers to prepare the lunch in the morning in addition to the food of cooking class. The food materials are funded from the JICA project team. Though the utensils are prepared by farmers.

16:00-17:30 Moving to the venue

DAY 3 (Date/Month, 2022): Progress of E-COBSI Activities so far & Entry Planning and Closing (Officer of the day: Mr. or Ms. XXXX)

07:45- Registration
08:15- Recapitulation (review and clarification of the Day 2 activities)

Module 6 – Progress of E-COBSI Activities so far & Entry Planning for Remaining Period

(Mr. or Ms. XXXX)

8:30-10:30 Reviewing the progress of E-COBSI Activities and Making the target & implementation schedule for the remaining period

Activity- 1) Reviewing progress: since KOT to July

Points to review the Progress since KOT

Province	Points to review the Progress since KOT
Follow-up Provinces	- Number of E-COBSI training done - Number of farmers who participated in those training - Activities by the farmers of SHEP approach,

	Water management, Maintenance, and Nutrition improvement - Activities are done by the farmers of the District Model Site - Progress of Road Map in District Model Site - Activities are done by the farmers at the Demo-farm, etc.

Activity-2) Making the target & implementation schedule taking the progress since KOT into consideration from August to November

※It is very important to confirm the progress of simple weir construction by July and to formulate a plan from August to November.

10:30-10:45	**Health break**	
10:45-12:00	Presentation from districts	**(SAOs)**
12:00-13:00	**Lunch**	
13:00-14:00	Presentation from districts	**(SAOs)**

Module 7 – Online Reporting and Feedback Mechanism *(Mr. or Ms. XXXXX)*

※The trainer will be the officer who is in charge of collecting reports in province. Need to confirm who is the officer.

14:00-15:00 Online Reporting Mechanism and the Reporting Form

Module 8 –Achievement Test *(Mr. or Ms. XXXX)*

※Send the sample of last year to the province and finalize the test by yourself.

15:00-15:30 Filling the Achievement Test and collection

Module 9 – Program Evaluation and Closing *(Mr. or Ms. XXXX)*

15:30-15:45	Evaluation of the training program
15:45-16:15	**Collection of the documentation (the achievement test, the training evaluation sheet, Receipt of Demo-farm inputs)**
16:15-16:30	Closing (PACO/PAO), Certificate

DAY 4 (Date/Month, 2022): Home Sweet Home Have a Safe Trip!

MTT 2023
in NEW Provinces

ver. 1

Agenda of Mid-term Training for MoA/JICA E-COBSI
Date: From XXX to XXX, 2023
Venue: At XXXXX, XXXX Province

(Officer in Charge)

DAY 0 (Date/Month, 2023): Gathering to the Venue

DAY 1 (Date/Month, 2023): Orientation & Cultivation Technics

(Officer of the day: Mr. or Ms. XXXX)

Module 1 – Program Orientation (Mr. or Ms. XXXX)

08:00-08:30	Registration	
08:30-08:45	Prayer, welcome remarks, and program orientation (housekeeping issues)	
08:45-09:15	Opening (PACO/PAO), self-introduction, and overview of the training	

Module 2 –Purpose of MTT

09:15-09:30	Purpose and Expectation for MTT	(Mr. or Ms. XXXX)

Module 3 – Cultivation Technics for Horticulture Crops

09:30-10:00	Pre-Cultivation Activities	(Mr. or Ms. XXXX)
10:00-10:45	Horticulture Crops Cultivation (General)	(Mr. or Ms. XXXX)
10:45-11:00	**Health Break**	
11:00-11:45	Appropriate Farming Technologies	(Mr. or Ms. XXXX)
11:45-12:45	Soil Management	(Mr. or Ms. XXXX)
12:45-13:45	**Lunch**	

Module 3 – Cultivation Technics for Horticulture Crops (continued)

13:45-14:15	Popular Crop No.1: Tomato	(Mr. XXX, Ms. XXX)
14:15-14:45	Popular Crop No.2: Onion	(Mr. XXX, Ms. XXX)
14:45-15:15	Popular Crop No.3: Okra	(Mr. XXX, Ms. XXX)
15:15-15:30	**Health Break**	
15:30-16:00	Popular Crop No.4: Cabbage	(Mr. XXX, Ms. XXX)
16:00-16:30	Popular Crop No.5: Irish Potato	(Mr. XXX, Ms. XXX)
16:30-17:00	Popular Crop No.6: Watermelon	(Mr. XXX, Ms. XXX)

DAY 2 (Date/Month, 2023): Cultivation Technics & Nutrition Improvement

(Officer of the day: Mr. or Ms. XXXX)

07:45-	Registration	
08:15-	Recapitulation (review and clarification of the Day1 activities)	

Module 3 – Cultivation Technics for Horticulture Crops (continued) (Mr. or Ms. XXX)

8:30-9:00	Nursery-bed Making (Theory)	
9:00-9:30	BOKASHI Fertilizer Making (Theory)	(Mr./Ms. xxx)
9:30-10:00	Organic Pesticide Making & Disease Control (Theory)	(Mr./Ms. xxx)
10:00-10:15	**Health break**	

Module 4 – Nutrition Improvement *(Mr. or Ms. XXXX)*

10:15-11:45 Food Based Dietary Guidelines by MoA
- Lecture: 90 min

11:45-12:25 Work Plan and Operational Guidelines by MoA (Lecture)
- Lecture and Conclusion: 40 min

12:25-13:25 Lunch

Module 4 – Nutrition Improvement (continued) *(Mr. or Ms. XXXX)*

13:30-16:30 Nutrition Improvement (Presentation of Tebakari-Eiyouhou)
- The Purpose of Tebakari-Eiyouhou (Hand Scale for Nutrition)
- How to make Tebakari-Eiyouhou
- Tips for using Tebakari-Eiyouhou
- Q & A on Tebakari-Eiyouhou
- Feedback from officers on using Tebakari-Eiyouhou
- Sharing food recipe which would be introduced in Cooking Class in DAY3

16:30-17:00 Briefing of Field Visiting

DAY 3 (Date/Month, 2023): Field Visiting **(Officer of the day: Mr. or Ms. XXXX)**

※Inform the farmers what to do, and what to prepare in advance so that they can work smoothly.

07:45- Registration
08:15- Recapitulation (review and clarification of the Day 2 activities)

08:30-10:00 Moving to COBSI District Model Site (XX district, XX site)

Module 5 – Irrigation technic *(Ms. Or Ms. XXXX)*

10:00-10:30 Demonstration of Gravity irrigation

Module 4 – Nutrition Improvement *(Mr. XXXX & Ms. XXXX)*

10:30-11:30 Demonstration of Tebakari-Eiyouhou to Model Farmers

※1. Hear from farmers about their daily diet and health condition and impression on Tebakari-Eiyouhou
※2. Distribute laminated materials for each district.
- Learn how to use the Hand Scale and recommend it to farmers through demonstration

12:00-13:00 Lunch

※Because it might be difficult to order a catering service, we suppose to ask farmers to prepare the lunch in the morning beside the food of cooking class. The food materials are supplied from the JICA project team. Though the utensils are prepared by farmers.

※We will make two groups (Group A and Group B) for afternoon sessions.

Group A (FNOs only) – Nutrition Improvement *(Mr. XXXX & Ms. XXXX)*

13:30-16:00 Cooking class

※Use the PPT material of DAY2, the slide on good food combinations.

- Learn how to cook balanced food (prepare the materials for the project, use the utensil of the farmers)
- Learn good food combination
- Share what the FNOs prepared with the participants and explain how they cook them

Group B (All the participants except FNOs) – Cultivation Technics for Horticulture Crops

※Need to prepare material in advance.

13:00-14:00	Nursery-bed Making (Practice)	(Mr. XXX, Ms. XXX)
14:00-15:00	BOKASHI (Practice)	(Mr. XXX, Ms. XXX)
15:00-15:30	Compost Making (Practice)	(Mr. XXX, Ms. XXX)
15:30-16:00	Organic Pesticide (Practice)	(Mr. XXX, Ms. XXX)
16:00-17:30	Moving to the venue	

DAY 4 (Date/Month, 2023): Progress of E-COBSI Activities so far & Entry Planning and Closing (Officer of the day: Mr. or Ms. XXXX)

07:45- Registration
08:15- Recapitulation (review and clarification of the Day 3 activities)

Module 6 – Progress of E-COBSI Activities so far & Entry Planning for Remaining Period

(Mr. or Ms. XXXX)

8:30-10:30 Reviewing the progress of E-COBSI Activities and Making the target & implementation schedule for the remaining period

Activity-1) Reviewing progress: since KOT to July

Points to review the Progress since KOT

Province	Points to review the Progress since KOT
New Target Provinces	- Number of simple weir sites constructed since KOT - Number of farmers participated in simple weir construction, canal as well - Area opened to start irrigation farming - Number of E-COBSI training done - Number of farmers who participated in those training - Activities by the farmers of SHEP approach, Water management, Maintenance, and Nutrition improvement - Activities are done by the farmers of the District Model Site - Progress of Road Map in District Model Site - Activities are done by the farmers at the Demo-farm, etc.

Activity- 2) Making the target & implementation schedule taking the progress since KOT

into consideration: from August to November

※It is very important to confirm the progress of simple weir construction since KOT and to formulate the target for the remaining period (from August to November).

10:30-10:45	**Health break**	
10:45-12:00	Presentation from districts	**(SAOs)**
12:00-13:00	**Lunch**	
13:00-14:00	Presentation from districts	**(SAOs)**

Module 7 – Online Reporting and Feedback Mechanism *(Mr. or Ms. XXXXX)*

※The trainer will be the officer who is in charge of collecting reports in province. Need to confirm who is the officer.

14:00-15:00 Online Reporting Mechanism and the Reporting Form

Module 8 –Achievement Test *(Mr. or Ms. XXXX)*

※Send the sample of last year to the province and finalize the test by yourself.

15:00-15:30 Filling the Achievement Test and collection

Module 9 – Program Evaluation and Closing *(Mr. or Ms. XXXX)*

15:30-15:45	Evaluation of the training program
15:45-16:15	**Collection of the documentation (the achievement test, the training evaluation sheet, Receipt of Demo-farm inputs)**
16:15-16:30	Closing (PACO/PAO), Certificate

DAY 5 (Date/Month, 2023): Home Sweet Home Have a Safe Trip!

E-COBSI

Expansion of COmmunity-Based Smallholder Irrigation Development Project

MTT: Mid-term Training

Module 2: Purpose of MTT



Summarized Agenda

Day-1

Module 1: Program Orientation (Done already)
Module 2: Purpose of MTT (Now here)
Module 3: Nutrition Improvement

Day-2 （Field Visiting）

Module 4: Cultivation technics for Horticulture
Module 5: Nutrition Improvement

Day-3

Module 6: Progress of E-COBSI Activities so far & Entry Planning for Remaining Period
Module 7: Online Reporting and Feedback Mechanism
Module 8: Achievement Test
Module 9: Program Evaluation and Closing

Purpose of MTT

Assuming that you are familiar with the construction method of simple weirs and irrigation canals in the New Target Provinces, marketing skills as well in the Follow-up Provinces during KOT, the next step as COBSI activity are;

- Getting know-how on Nutrition Improvement

Also,

- Monitoring the progress of Simple Weir and Canal Construction to start irrigation farming since KOT,
- Progress of the Demo-plot activities at the district model sites since KOT, and
- Making the target for the remaining period (August and November)

Purpose of MTT

Others are;

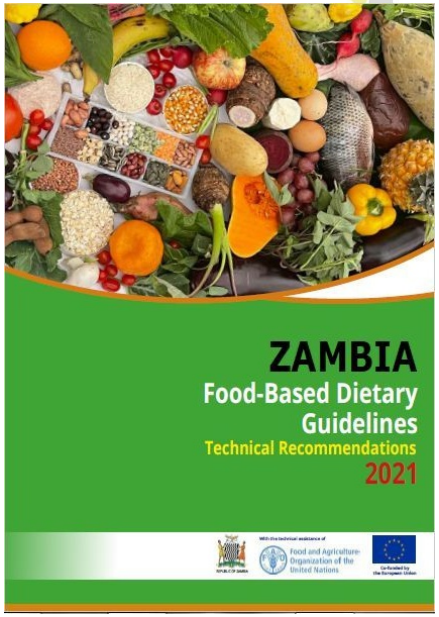
- Getting how to report the COBSI activities by using On-line system,
- Achievement Test to evaluate the understanding level

Food and Agriculture Organization of the United Nations

ZAMBIA Food Based Dietary Guidelines

Technical Recommendations

Presentation for Dissemination Workshops
2023



Food and Agriculture Organization of the United Nations

PRESENTATION OUTLINE

- Background and Context
- Methodology
- Overview of the ZFBDGs
- Recommendations 1 to 10
- Special Dietary Requirements for U5, Adolescent girls & PLW

Food and Agriculture Organization of the United Nations

Background and Context

The Zambia Food based dietary guidelines (FBDGs) were developed the Ministry of Agriculture under Technical Cooperation Agreement between Food and Agriculture Organization of the United Nations and MoA in collaboration NFNC

FBDG – purpose is to help professionals working in Health, Education, Agricultural and nutrition sector to provide them **coherent** and **harmonized** nutrition guidance to general Zambian population

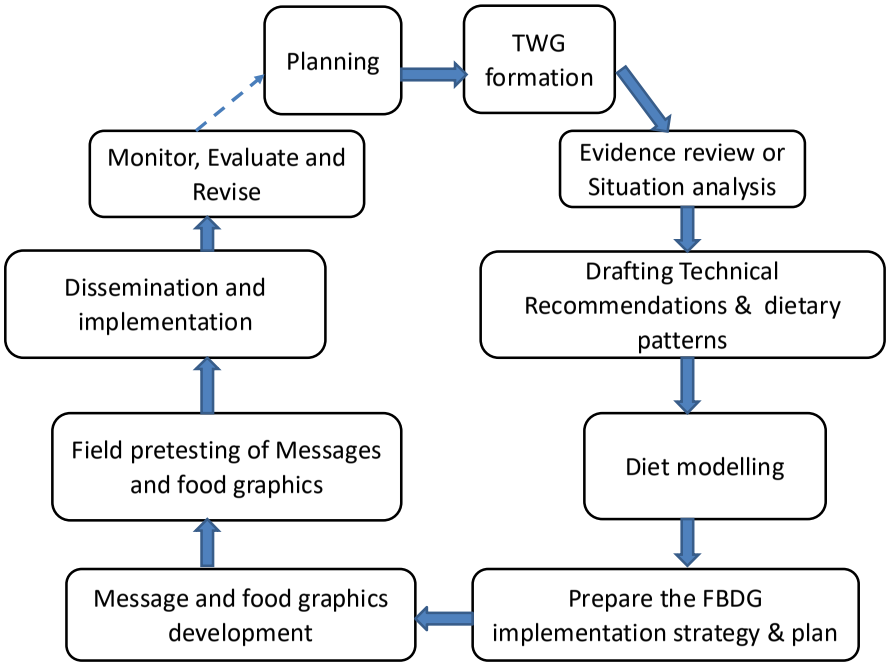
Food and Agriculture Organization of the United Nations

Background and Context

- These guidelines are meant to provide context-specific advice and principles on healthy diets and lifestyles, which are rooted on sound evidence, and respond to our country's public health and nutrition priorities, food production and consumption patterns, sociocultural influences, food composition data, and accessibility, among other factors

Food and Agriculture Organization of the United Nations

Methodology
FBDGs processes and products



FAO & WHO, 1998

Food and Agriculture Organization of the United Nations

FBDGs Products

- Situation Analysis or Evidence Review Report
- The Zambian dietary guidelines manual (Technical recommendations)
- Zambia diet models and serving sizes
- The Zambia Healthy eating consumer guide

OVERVIEW OF THE ZFBDGs

- The ZFBDGs has four sections

SECTION 1: About the Food-Based Dietary Guidelines for Zambia

- The Zambia Food-Based Dietary Guidelines at a glance
- Background and context
- Methodology/process of developing FBDGs

Food and Agriculture Organization of the United Nations

Content cont.

SECTION 2: The Food-Based Dietary Guidelines for the general population in Zambia

- Recommendation 1: Eat different types of food from each of the six food groups every day to stay strong and healthy
- Recommendation 2: Eat whole or milled whole grains (cereals), starchy roots and tubers as part of meals every day for a healthy heart and weight
- Recommendation 3: Eat plenty of different coloured vegetables every day to provide vitamins, minerals and fibre to prevent diseases
- Recommendation 4: Eat two different coloured fruits every day to provide vitamins and minerals to prevent diseases
- Recommendation 5: Eat pulses, beans, cowpeas, ground nuts or other nuts daily to maintain good health. All these foods are rich sources of protein and a good substitute for meat
- Recommendation 6: Eat fish, insects or animal source foods daily
- Recommendation 7: Take milk and dairy products for strong bones and teeth
- Recommendation 8: Limit eating ultra-processed foods and foods high in salt, sugar, and fats and oils to prevent non-communicable diseases
- Recommendation 9: Handle, prepare and store food safely
- Recommendation 10: Engage in physical activity at least 30 minutes every day

Food and Agriculture Organization of the United Nations

Content cont.

SECTION 3: Special dietary requirements for under-five children, adolescent girls, and pregnant and lactating women in Zambia

- Recommendation A: Begin breastfeeding your baby within one hour of birth
- Recommendation B: Feed your baby breastmilk only for the first six months of life and no water, herbs or porridge because mother's milk contains all the food and water your baby needs
- Recommendation C: From six months, introduce a variety of foods from the six food
- groups and continue to breastfeed up to two years and beyond
- Recommendation D: Give a variety of foods from the six food groups to children 2 to 5 years to help them grow to their full potential
- Recommendation E: Adolescents, especially girls, should eat a variety of foods
- from the six food groups for healthy weight and growth
- Recommendation F: When pregnant or breastfeeding, enjoy a variety of food
- including animal source foods, pulses, fruits and vegetables with your meals for your and your baby's health

SECTION 4: Annexes and References

- Annexes
- References

Food and Agriculture Organization of the United Nations

• SECTION 2: The Food-Based Dietary Guidelines for the general population in Zambia

Food and Agriculture Organization of the United Nations

Recommendation 1: Eat different types of food from each of the six food groups every day to stay strong

KNOWING THE SIX FOOD GROUPS

Food groups are groups of food classified according to the key and similar nutrients that they contain in large amounts

These are the six groups

- Cereals, and starchy roots and tubers
- Vegetables
- Fruits
- Pulses, legumes and nuts
- Animal sources foods such as insects, poultry, fish and meats
- Dairy

Recommendation 1: Eat different types of food from each of the six food groups every day to stay strong

Previous 3 food groups (based on functions of the nutrients provided)	Current 6 food groups (Classification of foods of similar characteristics) Easier to remember	Example of meal From 3 food groups (Less diverse)	Example of meal from 6 food groups meal (More diverse)
Protective	1. Veg	Chibwabwa	Chibwabwa
	2. Fruits		Mango
Body building	3. Legumes	Beans	Beans
	4. Chicken, fish, meat, insects		Fish
	5. Milk		Sour milk
Energy giving	6. Cereals, starchy roots & tubers	Nsima (breakfast)	Nsima (Roller meal)

Helpful Tips how to add variety to your diet

1. Choose a variety of in season local foods from all the six Zambian food groups. Fresh produce that is in season is usually of a high nutritional quality and is affordable.
2. Make a meal with different coloured foods.
3. Rotate colours of food throughout the week. Try to add as many colours of vegetables and fruits as possible.
4. Eat more mixed dishes. Add different types of pulses, vegetables and meats to stews and relishes.
5. Eat nutrient dense foods. This is one of the healthiest ways to eat because these foods give concentrated amounts of valuable nutrients such as vitamins, minerals, fibre, essential fatty acids, phytonutrients and lean protein for less calories.
6. Plan meals in advance. Practice planning meals for the week in order to incorporate different types of food into your diet.
7. Pay attention to the amount you eat per day from the different food groups.
8. Grow different types of food in a kitchen garden. Exchange vegetables with neighbours for variety.
9. Raising small animals like chicken, ducks, quills or rabbits can provide more variety and nutrients to a diet.
10. Enjoy eating homemade (cooked) meals and local dishes.
11. Eat together as a family or with friends.
12. Follow good food preparation and storage methods to maintain the best nutritional qualities. For example, vegetables should not be overcooked or cooked in too much water.
13. Choose whole foods such as whole fruit instead of industrially processed foods, like fruit juice, which are rich in sugar. Choose minimally processed[1] foods if processing cannot be avoided.

[1] *Minimally processed foods are foods that have been subjected to cleaning, removal of inedible or unwanted parts, fractioning, grinding, drying, fermentation, pasteurization, cooling, freezing or other processes that may subtract part of the food but which do not add oils, fats, sugar, salt or other substances to the original food.*

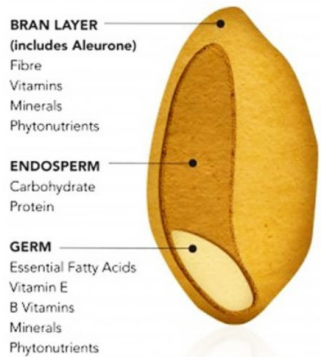
Recommendation 2: Eat whole or milled whole grains (cereals), starchy roots and tubers as part of meals every day for a healthy heart and weight cont.

Whole grains are **grains and grain products made from the entire grain seed, retaining all three parts of the grain (germ, endosperm and bran).** An example of whole grain products include roller meal, maize flour (mugaiwa), brown rice, whole wheat flour or whole meal bread.

The brain and other organs need carbohydrates to function

Recommendation 2:Eat whole or milled whole grains (cereals), starchy roots and tubers as part of meals every day for a healthy heart and weight cont.

- Whole grains, other cereals, starchy roots and tubers are an important source of carbohydrates. Carbohydrates are the body's main fuel source
- Whole grains supply the body with vitamins, minerals, fibre and some proteins
- Include traditional starchy foods and mix them or alternate them
- Inspect them for moulding, discoloured and discard



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Recommendation 2:Eat whole or milled whole grains (cereals), starchy roots and tubers as part of meals every day for a healthy heart and weight

RECOMMENDATIONS & GUIDANCE

ON EATING THE RIGHT AMOUNTS OF CEREALS, STARCHY ROOTS AND TUBERS

1. Include traditional grains like millet, sorghum and rice, and roots like potatoes, sweet potatoes, and yams as part of the diet staples.
2. Choose whole grain cereal products like roller mealie meal, mgaiwa, whole meal bread and brown rice to get the most nutrients and most health benefits.
3. Choose bio-fortified foods. Coloured grains like yellow maize, millet and sorghum contain many other good nutrients for the body. For example, orange maize contains a lot of vitamin A.
4. Choose flours fortified with vitamins and minerals.
5. Inspect grains before processing. If they look mouldy, discoloured or shrivelled, discard them as they may contain harmful toxins.

What do the participants think of this recommendation?

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RECOMMENDATION 3: Eat plenty different coloured vegetables every day to provide vitamins, minerals and fibres to prevent diseases

- Vegetables are edible parts of a plant and they include leaves, flowers, some roots, stems and fruits. Vegetables are a great source of vitamins, minerals, dietary fibre and phytochemicals
- Consume 3 servings (230g) of vegetables per day

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RECOMMENDATION 3:Eat plenty different coloured vegetables every day to provide vitamins, minerals and fibres to prevent diseases

Importance of vegetables in a diet

- Vegetables are low in calories and sodium and are nutrient dense - they provide a lot of vitamins, minerals and fibre and are mostly naturally low in fat
- Vegetables are rich in phytochemicals that boost the body's immune functions
- Vegetables are protective against non-communicable diseases such as heart disease, stroke, type 2 diabetes (sugar disease) and some types of cancers
- Eating a lot of vegetables and fruits daily helps to lower cholesterol levels and blood pressure

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Helpful Tips on easily getting your three servings (230 g) of vegetables per day

1. Select from plenty of tasty and colourful vegetables growing locally and wildly.
2. Plant vegetables around the house. A very small space can yield plenty of vegetables. Some vegetables look beautiful in flower beds.
3. Dry vegetables when they are plenty and in season. Eat them during a lean season.
4. Buy fresh vegetables in season for better value – they are cheaper and fresher.
5. Apart from being a side dish to meals, make vegetables a part of breakfast and snacks.
   - ◊ Add vegetables to other dishes. Carrots, extra onions, green peas and mushrooms make dishes colourful, tasty and nutritious.
   - ◊ Add grated carrots, mushrooms and sliced tomatoes to breakfast meals or omelets.
   - ◊ Add vegetables to smoothies and homemade juices. Carrots, beetroot, cucumber, celery or leafy vegetables are perfect ingredients for a smoothie.
6. Snack on vegetables. Carrots, cucumbers and celery make a quick and easy grab-and-go snack. They are easily carried to work or school.
7. There are many ways to prepare, cook and eat vegetables: Stir frying, steaming, boiling, grilling or baking them etc.
8. Cook different vegetables together and add herbs to make fresh vegetable stews or homemade vegetable soups.
9. Make a plate or pot colourful with vegetables. Use different coloured vegetables to decorate and add interest to meals.
10. Try something new – prepare new recipes and buy new vegetables as part of shopping each month.

RECOMMENDATION 4: Eat two different coloured fruits every day to provide vitamins and minerals to prevent diseases

- Fruits are a very good source of several vitamins, minerals, fibre, phytochemicals and antioxidants (FAO and WHO, 2004).
- Citrus fruits and other sour fruits like baobab and tamarind are rich sources of vitamin C,
- Dark yellow and orange non-citrus fruits such as mango, papaya and melons are rich in carotenoids (pro-vitamin A).

RECOMMENDATION 4 cont. Benefits of eating fruits

- Eating fruits such as oranges, tangerines, bananas and peaches which are good sources of folate, in addition to taking folate supplements a few months before and during pregnancy, is very important.
- Fruits like bananas, pomegranates, mulberries, apples and black currants are a rich source of iron
- When eaten together as part of a meal, as salads or soon after a meal, fruits, especially those rich in vitamin C which enhances the absorption of iron, contribute to the prevention of iron deficiency which is one of the public health problems in Zambia
- The potassium in fruit can reduce the risk of heart disease and stroke. Fruits rich in potassium include bananas, mango, melons, apples,
- Fruits help with reducing the risk of type 2 diabetes as they have a low glycemic index (GI) and they help with controlling blood sugar levels
- Fruits reduce the risk of some cancers
- Fruits have high quantities of water and dietary fibre which help improve the functioning of the digestive tract, thereby reducing the chances of constipation.

Guidance on eating a variety of fruits every day

- Choose a variety of and different coloured fruits.
- Eat the whole fruit including the skin (if it is edible) in order to maximise the benefits of high fibre found in skin as well. Whole fruits add fibre, water and bulk, which helps a person feel fuller on fewer calories.
- Eat raw fruits for maximum nutritional benefits. Cooked, preserved or processed fruits usually lose some important nutrients due to high heat and extended storage.
- Smoothies made of whole fruit (fruit pulp + water) are a healthier option than fruit juice. 100 percent fruit juice strips away the fibre leaving lots of natural fruit sugars.
- Whole fruit smoothies should have no added sugars, artificial flavours, colours or preservatives.

Guidance on eating a variety of fruits every day

Helpful Tips on easily eating two fruits per day

1. Eat actual fruits as snacks, instead of fruit juices, sugary, salty or fatty snacks.
2. Leave fruits in plain sight for convenient snacking.
3. Pack fruits as an office or school lunch.
4. Plant fruit trees around the house and farm to get more and diversified fruits. This will optimise the health and nutritional benefits of fruits.
5. Indigenous, naturally growing fruits (e.g. masuku, baobab, tamarind,) are healthy options with many essential nutrients.
6. Try to eat different coloured fruits every day. Different colours in foods indicate different nutrients and compounds that promote good health.
7. Choose fruits that are in season as they are fresher and cheaper.
8. When using canned or dried fruits and vegetables, avoid those with added sugar, salt or oil.

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Recommendation 5: Eat Pulses, groundnut or other nuts daily to maintain good health – they are rich sources of proteins and a good substitute for meat

- Legumes refer to any plant from the Fabaceae family that would include its leaves, stems and pods. A pulse is the edible dried seed from a legume plant, usually with seed pods that have two halves.

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Recommendation 5 cont.

Pulses are an affordable source of protein when compared to animal source foods (ASFs). Pulses can be used as alternatives to ASFs. Pulses, when eaten together with nuts or grains, provide all the essential amino acids the body needs.

Pulses, nuts and seeds are key for the prevention of micronutrient deficiencies and proper body function. Micronutrients found in pulses include iron, folate, vitamin E, zinc,selenium, copper and manganese

Generally, the production of plant-based foods results in lower greenhouse gas emissions and uses less land and water than producing animal based foods

Eat two servings of pulses, nuts and seeds every day. One serving is about 90g for pulses and about 27 to 30g (3 tablespoons) for nuts and seeds

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Helpful Tips to eating more pulses nuts or seeds daily

1. Mix pulses with whole grains, nuts or seeds to make powerful combinations of plant-based proteins.
2. Adding beans, peas and lentils to soups, stews and starchy dishes is an excellent way to add pulses to the diet.
3. Porridge goodness: Mixed whole grain, pulse, nut or seed flours make a good, healthy and whole some breakfast for the whole family.
4. Powders made from nuts and seeds can be added to foods as condiments.
5. Use pulses, nuts and seed in baked goods – either whole or as a flour.
6. Soak beans and lentils overnight and rinse with fresh water before cooking. This reduces cooking times.
7. Soak pulses before cooking to reduce stomach gas and to make iron more available for absorption.
8. Add vitamin C-rich foods to meals when eating beans, peas and lentils. Vitamin C helps the body absorb iron.
9. Use nut butters (e.g. peanut butter and almond butter) as a spread for bread rather than hard margarine and butter, which are unhealthy.
10. If possible, grow beans, nuts and seeds sustainably.

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Recommendation 6: Eat Fish, Eggs, Insects & Animal Source Foods Daily

- Eat fish, including oily and small fish eaten with bones, as often as possible per week
- Choose insects, white meat like poultry, rabbits, mice or eggs as healthier options instead of red meats
- If red meat such as beef, goat and lamb is eaten, cut consumption down to less than 160 g or the equivalent of 2 servings a week to help protect against heart diseases and some cancers
- Avoid charring meat while cooking. High-temperature cooking, like grilling, can form carcinogenic (cancer-causing) compounds in the meat.
- Avoid ultra-processed meat like polony, bacon, ham, salami, sausages and hot dog
- **Recommended daily amount of protein – 0.83g/Kilogram of body weight**

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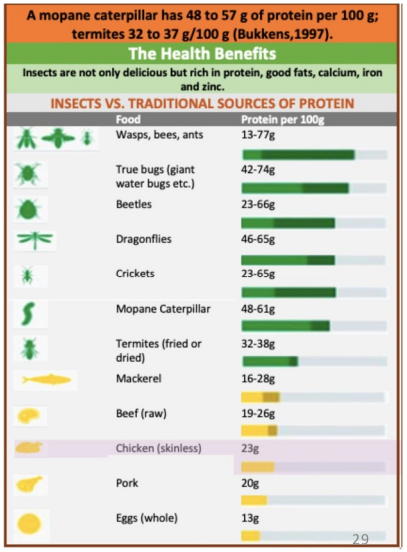
About Insects….

Edible insects: good sources proteins (12g to 70 g on same weight of 100g serving – Xiaoming el at,. 2010),

- vitB12,
- iron,
- zinc,
- fibre,
- essential amino acids,
- Antioxidant and minerals etc.

Helpful tips

- make few meals meatless per week, add pulses and legumes
- Eat fish oftenly: oily fish and also small fish eat with bones
- Choose lean meat and trim visible fats
- Remove skin from chickens or poultry before cooking
- Cook meat thoroughly to remove all risk of fooborne illnesses



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Helpful Tips on healthier consumption of fish, eggs, insects and ASF

1. Make a few meals meatless per week. An extra portion of dried beans and peas (legumes) are a good substitute for meat.
2. Eat fish as often as possible, including oily fish and small fish eaten with bones. This is because fish is possibly the healthiest form of white meat. Watch your portion sizes: a palm of your hand is about 85 to 115 grams of meat. So two palm sizes of red meat exceeds the recommended amount to eat per week.
3. Choose lean meat and trim visible fat to further reduce the amount of saturated fat.
4. Remove the skin from chicken or poultry before cooking.
5. Make sure the meat is cooked thoroughly to eliminate the risk of foodborne illnesses.

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RECOMMENDATION 7: Take milk and dairy products for strong bones and teeth

- Milk contains all nutrients required for infant growth
- Even though demand for nutrients increases as the infant grows, milk improves diet quality and nutrient dense. Mostly consumed milk – cows, goats, sheep
- Animal milk is not recommended for babies below 1 years because they are not able to digest it completely compared to breast milk or formula
- Cows milk doesn't have right amount of iron, vitamin C and other nutrients and no good fats for growing infants (WHO, 2015b, CDC, 2012)

Take milk and dairy products – For strong bones and teeth

- Cheese
- Sour milk
- Yogurt
- Other products like butter and ghee are not part of this food group because there considered as fats

Other groups

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RECOMMENDATION 7: Take milk and dairy products for strong bones and teeth.

- *Importance* : for Bone formation and teeth
  - ✓High quality protein (complete protein – contains all 9 essential Amino acids)
  - ✓Calcium, Potassium, Phosphorous, Zinc
  - ✓vitB12, vitamin A, vitamin B like thiamine (B1), riboflavin and vitB5 (pantothenic) acid, vitamin K,
  - ✓Helps to avoid a of bone disease (osteoporosis)
  - ✓Consumption helps reduce reduced risk of diabetes (good cholesterol)

Alternatives to milk

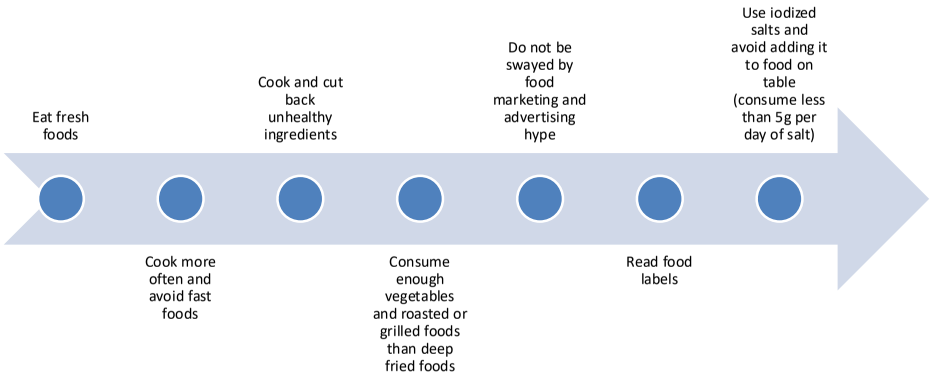
- ✓ Moringa leaves
- ✓ Baobab fruits pulp
- ✓ amaranthus
- ✓ Okra
- ✓ Cassava leaves
- ✓ Tamarind pulp
- ✓ Spinach
- ✓ Small fish e.g. kapenta, chisense, etc (50g gives four times calcium required)

RECOMMENDATION 7: Take milk and dairy products for strong bones and teeth

Helpful Tips on increasing the intake of milk and milk products

1. Add milk, yoghurt or sour milk to porridge or breakfast cereals.
2. Make soups creamy by adding milk, sour milk or plain yogurt.
3. Use milk in casseroles and omelets.
4. Add plain yogurt to fruit salads as a snack or desert.
5. Drink plain milk as a beverage during or between meals, instead of fizzy and sugary drinks.
6. Add milk to your teas, coffees and other beverages.
7. Make smoothies with milk or yoghurt.

RECOMMENATION 8: Limit eating ultra-processed foods and foods high in salt, sugar, and fats and oils to prevent non-communicable diseases



RECOMMENDATION 9: Handle, Prepare and Store Food Safely

Eating safe = eating nutritious foods

Contaminated foods will cause – diarrhea, fever, vomiting, malnutrition, death

Risk ages are:

- Children
- Pregnant mothers
- Elderly
- The sick
- Immunocompromised

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RECOMMENDATION 9: Handle, Prepare and Store Food Safety cont.

- Foods can be contaminated by microorganisms, chemicals or physical contaminants
- Wash hands with warm water and soap for at least 20 seconds before and after handling food and after using the toilet, changing nappies and handling animals and pets
- Separate raw meats, poultry and fish from fresh fruit and vegetables and other cooked foods to avoid cross contamination
- Cook raw poultry, fish and meats immediately where refrigeration is not
- available
- Cook food thoroughly to kill microorganisms
- Store foods at below 5 °C to prevent microbial growth
- Eat or refrigerate cooked foods immediately
- Discard cooked food that has stayed out of the fridge for more than two hours or more than one hour in hot weather (above 32 °C)
- Use clean and safe water for food preparation
- Clean food preparation areas with hot water and soap to remove dirt and germs before and after preparing each food item
- Wash fresh fruits and vegetables with clean water even when you plan to peel them because bacteria can spread from the outside to the inside during cutting or peeling
- Scrub firm-skinned fruits and vegetables in clean water and rinse well

Take home messages!

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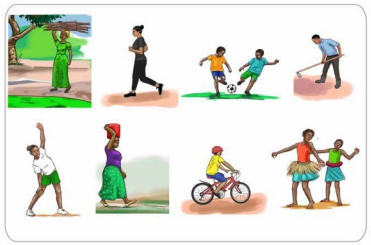
RECOMMENDATION 10: Engage in physical activity at least 30 minutes every day

- **What Is Physical Activity?** - "any bodily movement produced by skeletal muscles that results in energy expenditure" (WHO, 2020b).
- Exercise is planned, structured and repetitive, with a primary purpose of improving or maintaining physical fitness, physical performance or health (WHO, 2020b)
- Lack of activities – raise risks of NCD - Obesity can predispose and lead to:
  - diabetes,
  - high blood pressure and
  - high cholesterol, leading to heart disease; stroke; and certain cancers of the breast, colon, kidney, liver and endometrium (WHO, 2018c)



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Tips for Increased Daily Physical Exercise

- Choose activities that are enjoyable
- Be physically active with other people to make it more interesting
- Sit less, move more! Break up long periods of sitting by taking brief, active breaks.
- Move about every 30 minutes after working on a computer, studying or watching television.
- Walk or bike instead of using a vehicle whenever possible. Use the stairs instead of the elevator.
- Set time aside for structured physical activities.
- Be consistent to form a habit.
- Reduce screen time.

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Special Dietary Requirements for U5, Adolescent girls & PLW (NFNC)

- The most critical time for good nutrition is during the 1 000-day period from pregnancy until a child's second birthday. Optimal nutrition and care during this period determines whether the child will survive, thrive and reach his/her full potential.
- Children from 3 to 5 years continue to grow and develop rapidly and begin to consume food more independently. They therefore require a diversified diet to avoid growth faltering and nutrient deficiencies (UNICEF 2020a)
- Good nutrition during pregnancy and lactation is important not only for the baby but also for the mother's survival and wellbeing. Adolescent nutritionespecially foe girls in critical due to their rapid growth and development.

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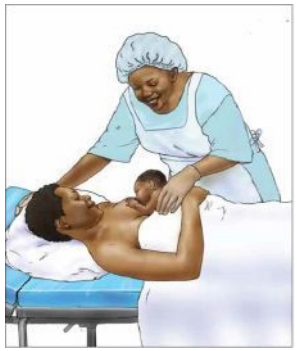
RECOMMENDATION A: Begin breastfeeding your baby within one hour of birth.

- Early initiation of breastfeeding, particularly within the first hour of birth, provides infants with colostrum; prevents infections that can lead to death in newborns; and ensures successful breastfeeding



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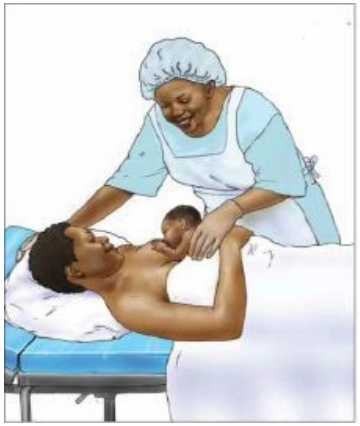
Helpful Tips on ensure successful early initiation

1. To facilitate early initiation of breastfeeding within the baby's first hour of life, place the newborn's body skin-to-skin with the mother immediately after birth.

2. Skin-to-skin contact immediately after birth until the baby's first breastfeeding is important because it increases the chances of babies being breastfed, helps to extend the length of breastfeeding, and improves rates of exclusive breastfeeding

(UNICEF, 2020).



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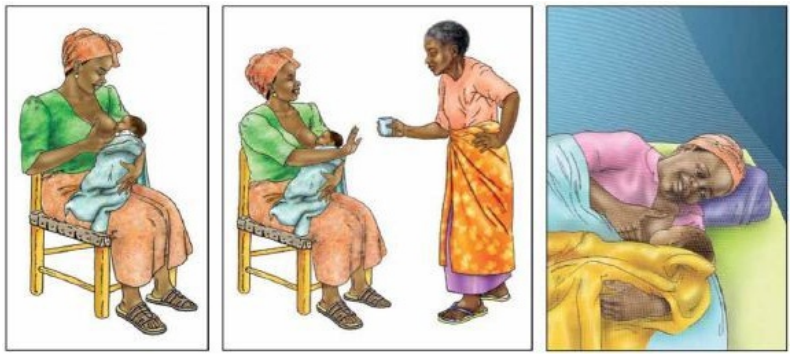
Recommendation B: Feed your baby breastmilk only for the first six months of life and no water, herbs or porridge because mother's milk contains all the food and water your baby needs.



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Recommendation B: Feed your baby only breastmilk for the first six months of life and no water, herbs or porridge because mother's milk contains all the food and water your baby needs.

- Breastmilk provides all the nutrients and energy that the infants need to grow and develop from 0 to 6 months
- Breastfeeding protects children from illness such as respiratory infections, diarrhoeal diseases and other life-threatening ailments
- Economic losses due to not breastfeeding are about US$ 70 billion annually in low- and middle-income countries . The losses are due to high maternal and child mortality, higher healthcare costs due to increased illness and disease, and loss of future wages because of reduced cognitive development in infants not breastfed
- Benefits the mother

Recommendations and guidance for exclusive breastfeeding for children aged 0 to 6 months

Breastfeed your baby within 1 hour of birth.	Give your baby only breastmilk from 0 to 6 months.	Breastfeed on demand, day and night.
Do not give any other food or liquids to your baby, not even water, during your baby's first 6 months.	Even during very hot weather, breastmilk will satisfy your baby's thirst.	Breastmilk provides all the food and water that the baby needs during this time.
Breastmilk also protects your baby against sickness and infection.	Giving your baby anything other than breastmilk will cause him or her to suckle less and will reduce the amount of breastmilk that you will produce and may make your baby sick.	

Signs to know whether the baby is getting adequate breastmilk

- The baby's urine is clear as water a few days after birth.
- Your baby has good skin colour and muscle tone.
- Your baby will be alert, responsive and contented.
- Your baby will gain weight and grow in length and head circumference starting with regaining their birth weight by 10 to 14 days old.

Recommendation C: From six months, introduce a variety of foods from the six food groups and continue to breastfeed up to two years and beyond.

- Around the age of six months, an infant's need for energy and nutrients starts to exceed what is provided by breastmilk, and complementary foods are necessary to meet those needs.
- However, breastmilk continues to be important for children between 6 to 23 months and beyond.
- Oils and fats can play a critical role in reducing the viscosity and improving the energy density of weaning foods.
- If complementary foods are not introduced at the age of six months, or if they are given inappropriately, an infant's growth may falter.
- In addition, unlike infants from 0 to 6 months, children at the age of six months are also developmentally ready for other foods besides breastmilk

Recommendation C: From six months, introduce a variety of foods from the six food groups and continue to breastfeed up to years and beyond.

- **Dietary Patterns and Nutrition Status for Children aged 6 To 2 in Zambia.**
  - On average, children aged 6 to 23 months in Zambia eat a diet composed of two to three different types of foods in a day.
  - Only 13 percent of children between the ages of 6 to 23 months were fed a minimal acceptable diet (ZamStats, MOH and ICF, 2019).
  - Less than half of children (42 percent) were given meals at the recommended minimum frequency, while 23 percent achieved minimum dietary diversity

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Recommendation C cont.

- **Guiding principles for appropriate complementary feeding for children 6 To 23 months**
  - Guiding principles for appropriate complementary are based on WHO, UNICEF and FAO guidance and these include the following:
    - Continue frequent, on-demand breastfeeding until 2 years of age or beyond.
    - After 6 months of exclusive breastfeeding, introduce safe, adequate, diversified foods from the six food groups.
    - Gradually increase food consistency, amount and variety as the child gets older
    - Give small amounts of food and increase the quantity as the child grows.

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Recommendation D: Give a variety of foods from the six food groups to children 2 to 5 years to help them grow to their full potential

- Good nutrition for children two to five years of age is important to meet the needs of rapid physical growth and development (UNICEF, 2020b).
- Inadequate nutrition at this stage is associated with high risks of illness and infections which can have lifelong consequences on education attainment and health (UNICEF, 2020b).
- Families and caregivers should continue to provide a diversified diet from all the six food groups for children in this age group.
- Children during this age need to be encouraged to eat during meal times especially during sickness

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Helpful Tips quality, frequency and amount of food to offer children aged 6 to 59 months

1. Include fish, insects, or animal source foods like eggs, poultry meat, and milk products to ensure the child gets all the nutrient he/she needs.
2. Give children orange-coloured vegetables, fruits and tubers like paw-paw, ripe mango, pumpkins, pumpkin flowers, orange-fleshed sweet potatoes, whole grain yellow maize, and dark leafy vegetables.
3. Give pulses, nuts and seeds to children. Adding pulse or nut powders is a great way to add nutrients to children meals.
4. Grow and use bio-fortified crops like orange-fleshed sweet potatoes, yellow maize and beans.
5. Add nutrient-rich food powders like insect and moringa powder to children's meals.
6. Adding Moringa is a great way to enrich child meals

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Recommendation E: Adolescents, especially girls, should eat a variety of foods from the six food groups for healthy weight and growth.

- Adolescence is the phase of life between childhood and adulthood during ages 10 to 19 years.
- During the adolescent stage, there is rapid growth physically including weight, height, neurological and psychosocial development.
- Lack of good nutrition may also lead to micronutrient deficiencies and anaemia.
- Adolescent boys have high energy needs due to physical activity, which results in them being hungry often and eating large quantities of food
- In addition to energy needs, protein needs also increase during this stage to support growth including building muscle, especially in boys

Recommendation E: Adolescents, especially girls, should eat a variety of foods from the six food groups for healthy weight and growth.

- Iron needs increase due to the increase in growth, lean body mass, blood volume and red blood cell mass
- In girls, iron needs increase and almost double during adolescence due to menstruation.
- Adolescents are at risk of overweight and obesity due to lifestyle and food habits which include consuming energy-rich foods which are high in fats, and sugary foods, and too many fizzy drinks, plus a lack of physical activity

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Recommendation F: When pregnant or breastfeeding, enjoy a variety of food including animal source foods, pulses, fruits and vegetables with your meals for your and your baby's health.

- Everybody, young and old, should enjoy eating a variety of foods from six food groups every day to stay healthy and strong
- However, three months before and during pregnancy, and after the baby is born, are the times when good nutrition is most important in pregnant and lactating women's lives.
- There is no single food source with all the nutrients necessary to meet the body's needs.
- It is important have a variety of foods from all the six food groups to ensure that both the mother and the future baby get the right types of food and amounts of nutrients they need.

JOINT SECTOR WORK PLAN FOR NUTRITION CROSSCUTTING TECHNICAL AND ADVISORY SERVICES FOR THE MINISTRIES OF AGRICULTURE AND FISHERIES AND LIVESTOCK

Mulele Sibeso

INTRODUCTION

- The development of this SWP was jointly commissioned by both the Ministry of Agriculture and the Ministry of Fisheries and Livestock in order to provide a strategic vision with a clear focus and prioritisation of interventions while promoting and facilitating coherence and complementarity of actions by the two Ministries and stakeholders.

VISION, MISSION, GOALS

The vision, mission and goal we want to achieve through the implementation of this strategy is:

- **Vision**
  - Zambian population that has access to a diversified diet that contributes to optimal nutrition and health.

STRATEGIC OBJECTIVES AND ACTIONS

- The SWP will be implemented under four strategic objectives.
- **Strategic Objective (SO) 1**: *Promote stable and sustainable availability of a variety of foods from the six food groups (cereals and starchy tubers/roots; vegetables; fruits; legumes/pulses/nuts; meats, poultry, fish; and dairy products through improved production and productivity*
- **Strategic objective (SO) 2.** *Improve access to adequate and appropriate food in terms of quality and quantity.*
- **Strategic Objective (S0) 3:** *Increase consumption of a variety of high nutrient foods from the 6 food groups.*
- ***Strategic Objective (SO) 4:*** *Creating/strengthening enabling Environment for promoting Food and Nutrition sensitive programming and implementation of this Food and Nutrition SWP.*
- *Each strategic objective has strategies and actions to linked to it. Refer to the work plan for the activities*

ROLES

- **Central Level** - Food and Nutrition Section; Focal Point Persons:
  - Dissemination of workplans
  - Mobilise resources
  - Provide guidance
  - Capacity building
  - Facilitate periodic reporting
  - Track implementation of activities; document best practices
  - Nutrition advocacy
  - Facilitate recruitment of Nutrition staff
  - Develop research agenda

ROLES CONT'D

- **Provincial Level** - PACO, PAO, SFNOs, PFLCO, SAO, subject matter specialists
  - Ensure nutrition mainstreaming in AWPs
  - Provide guidance to NGOs and other partners in the province
  - Capacity building of district implementers
  - Facilitate periodic reporting
  - Track implementation of AWP activities; document best practices
  - Submit reports
  - Collaborate with other stakeholders
  - Establishment of joint TWG

ROLES CONT'D

- **District Level** - DACO, DFLCO, subject matter specialists
  - Ensure nutrition mainstreaming in AWPs
  - Provide guidance to NGOs and other partners in the district
  - Capacity building of implementers
  - Facilitate periodic reporting
  - Track implementation of AWP activities; document best practices
  - Submit reports
  - Collaborate with other stakeholders
  - Establishment of joint TWG
  - Ensure convergence of interventions at community and household levels

ROLES CONT'D

- **Block & Camp Level**
  - Implementation of interventions
  - Nutrition mainstreaming in AWPs
  - Capacity building of farmers
  - Submission of reports
  - Facilitate access to inputs and markets
  - Link farmers to programmes, interventions and services
  - Promote positive nutrition behaviours
  - Provision of necessary extension services
  - Ensure convergence of interventions at community and household levels

LINKAGES WITH OTHER SECTORS AND STAKEHOLDERS IMPLEMENTING NUTRITION

- The JSWP promotes a multi-sectoral approach and linkages with:
  - Ministry of Community Development and Social Services (MCDSS)
  - Ministry of General Education (MoGE)
  - Zambia Statistics Agency
  - National Food and Nutrition Commission (NFNC)
  - UN Agencies - WFP, FAO, UNICEF and WHO
    - Technical Support
    - Research/Studies and dissemination
    - Documentation of best practices and innovations in implementation of high impact Food and Nutrition interventions and service delivery
  - Donors/Development partners
    - Help to mobilise and make funds to support the work plan

LINKAGES WITH OTHER SECTORS AND STAKEHOLDERS IMPLEMENTING NUTRITION

- NGO/CSO Networks
  - It is expected that all NGO and CSO Network implementing food and nutrition interventions align their activities to this SWP. The NGOs will be responsible for complementing and implementation of key interventions but will be dually reporting to the districts. The CSO advocacy work will support effective roll-out of planned activities for sustained investment in nutrition.
  - Other roles shall include:
    - Complement the work of MOA and MFL.
    - Support capacity building of the DNCC
    - Capacity building of farmer households in food and nutrition
    - Support Monitoring and evaluation activities
    - Provide funding where necessary.

MONITORING AND EVALUATION

- The Food and nutrition TWG in collaboration with the Policy and Planning Department will be responsible for development of the monitoring and evaluation systems and regular data collection, consolidation and reporting.
- Review the sector indicators and identify core indicators to be collected by the sector on a regular basis. The indicators will be mainstreamed in the M&E framework and reporting system of the Ministry
- Research and best practices will also be documented to inform programmes
- The Ministry is accountable for the implementation of the agreed actions/interventions and tracking progress at all levels of reporting.

PRIORITIES FOR 2023 AND BEYOND

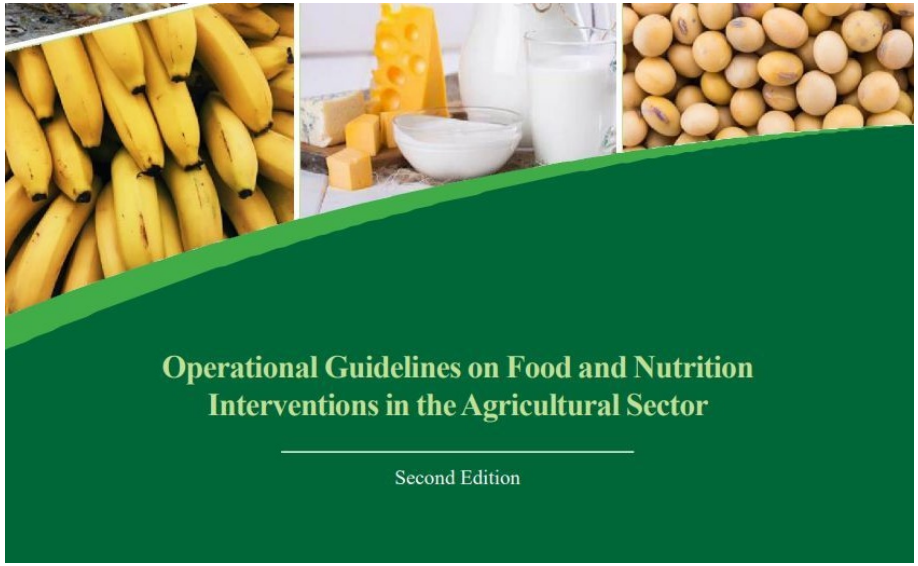
1. SO1: Promote stable and sustainable availability of a variety of foods from the six food groups
   - Organize and support farmers to engage in community-based seed multiplication of quality/improved seed/planting materials of different nutritious and bio- = fortified crops for distribution at an affordable cost within their communities Link farmers to effective local distribution/selling points of agro-supplies by
   - Supporting farmers to adopt improved technologies for processing preservation and storage as well as training them in the same ((1), strategy 4: Action one and two which talk about).
2. SO2: Improve access to adequate and appropriate food in terms of quality and quantity.
   - Promote agricultural related Income Generating Activities (IGA) such as gardening, food processing and value addition etc
3. SO3: Increase consumption of a variety of high nutrient foods from the 6food groups
   - Disseminate the ZFBDGs and Monitor their use (Under strategic objective three (3), strategy 1: Action one)
   - Facilitate research and information dissemination (Under strategic objective three (3), strategy 2: Action 2)
   - Develop and popularize recipes that deliberately promote consumption of certain foods e.g. recipes for multi-mix/blended dishes, bio-fortified nutritious/fermented = food products and fish

PRIORITIES FOR 2023 AND BEYOND

4. SO4: Creating/strengthening enabling Environment for promoting Food and Nutrition sensitive programming and implementation of this Food and Nutrition SWP

    - Reviewing sector indicators for better M&E
    - Staff trainings in nutrition sensitive programming
    - Strengthen coordination and collaboration through a TWG established at national level but will also link with the provincial and district coordination committees.
    - Training lead/senior lead farmers and field based staff on how they can disseminate developed materials to farmers

5. Crosscutting: Development of nutrition information education and communication materials (pamphlets, leaflets, fact sheets, policy briefs, radio and TV scripts) from the FBDGs



Contents

Overview of the Operational Guidelines

- CHAPTER ONE
- Introduction
- Purpose and Objectives of the Revised Operational Guidelines on Food and Nutrition Interventions in the Agricultural Sector
- Use of the Guidelines
- Areas Covered in the Operational Guidelines
- Strategic Objectives of the Joint Sector Work Plan for Nutrition Crosscutting Technical and Advisory Services for the Ministries of Agriculture and Fisheries and Livestock (JSWPNCTAS)
- The Three Agricultural Pathways of Promoting Food and Nutrition Security
- Overview of Guiding Approaches.
- The Six Food Groups

Purpose and Objectives of the Revised Operational Guidelines

- To provide standardized guidance to relevant staff in both MoA and MFL as well as partner organizations to successfully deliver nutrition sensitive programmes, interventions and services.
- To guide relevant members of staff in both MoA and MFL to effectively implement their assigned activities outlined in the JSWPNCTAS (2021-2023)

Overview of Guiding Approaches.

- Food Based Intervention Approach
- Participatory Extension Approach
- Livelihood Improvement Approach (LIA)
- Group Development (GD)

Areas Covered in the Operational Guidelines

- CHAPTER TWO : How to Plan and Mainstream Food and Nutrition Sensitive Interventions in the Various MOA and MFI Annual Work Plans and Budgets
- CHAPTER THREE : How to Promote Stable and Sustainable Availability of a Variety of Foods from the Six Food Groups
- CHAPTER FOUR CHAPTER : How to Improve Access to Adequate and Appropriate Food in Terms of Quality and Quantity
- CHAPTER FIVE: How to Increase Consumption of a Variety of High Nutrient Foods from the six (6)Food Groups
- CHAPTER SIX: How to Apply the Various Innovative Approaches to Improve Implementation, Coordination, Harmonization, Linkages and Synergies in the Joint Response to Improve Nutrition.
- CHAPTER SEVEN: Monitoring and Evaluation of Nutrition Programmes

Practical Example

Expansion of Community-based Smallholder Irrigation Development (**E-COBSI**)

Nutrition Improvement
Tebakari-Eiyouhou
(Hand Scale for nutrition to serve food daily)

Agenda of Presentation

1) Purpose of *Tebakari-Eiyouhou* (Hand Scale for Nutrition)
2) How to make *Tebakari-Eiyouhou*
3) Tips for using *Tebakari-Eiyouhou*
4) Q＆A on *Tebakari-Eiyouhou*
5) Feedback on *Tebakari-Eiyouhou* from the field
6) Exercise and Lecture of *Tebakari-Eiyouhou* in the Field
7) Cooking Demonstration

1) Purpose of *Tebakari-Eiyouhou* (Hand Scale for Nutrition)

Compare the size of your hand with your neighbor

- Compare the size of your hand with your neighbor
- Taller person has bigger hands and shorter person has a smaller hands. Body size is roughly proportional to necessary dietary allowances.

That is why we use our hand to measure amount of food to be served daily

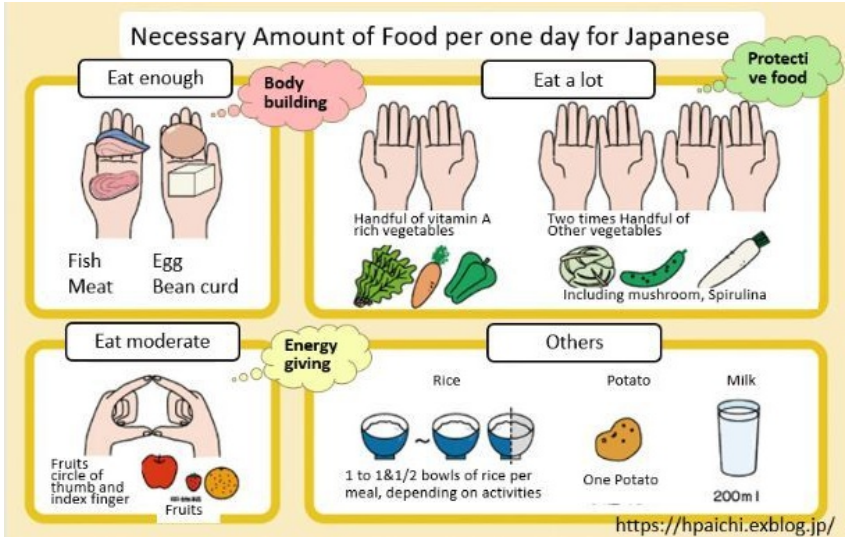
Purpose of Tebakari-Eiyouhou (Hand Scale for Nutrition)

- *Tebakari-Eiyouhou* (Hand scale for Nutrition to serve food daily) is a method of controlling calories and nutrients intake using the palm of your hand as a scale.

- You can manually measure what food you should eat and how much you should eat in a day by using *Tebakari-Eiyouhou* (Hand scale for Nutrition to serve food daily) .

Tebakari-Eiyouhou (Hand scale for Nutrition to serve food daily) in Japan

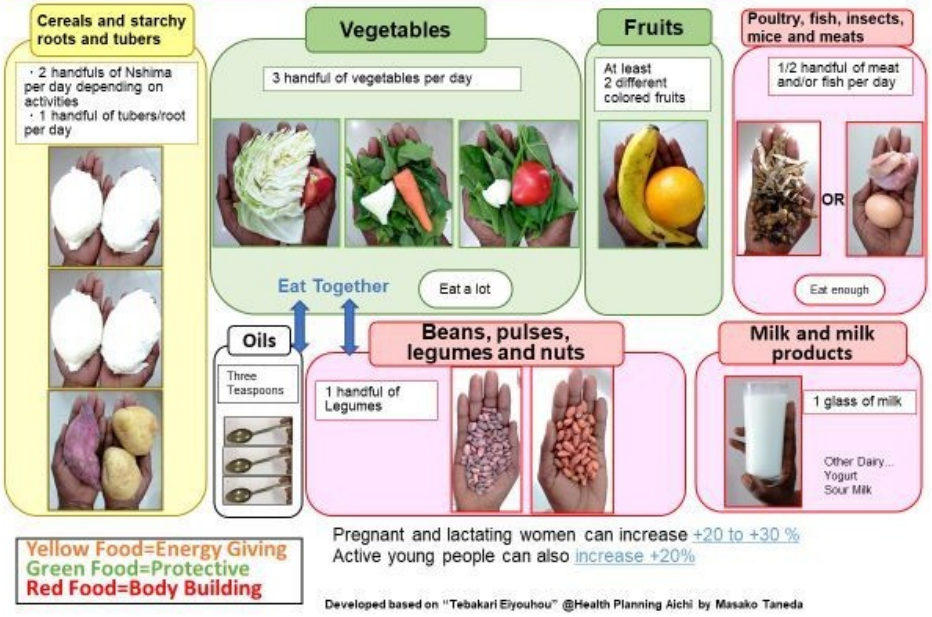
Tebakari = Hand Scale Eiyouhou = Nutrition method



Food function of Six food groups

Food Group	Main function
1. Vegetables	Protective
2. Fruits	
3. Beans, pulses, legumes and nuts	Body building
4. Poultry, fish, insects, mice and meats	
5. Milk and milk products	
6. Cereals and starchy roots and tubers	Energy giving

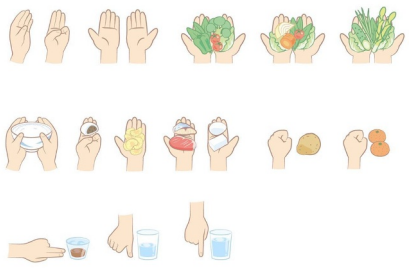
"Tebakari Eiyouhou" Hand Scale for serving food per day in Zambia



Background of *Tebakari-Eiyouhou* (Hand scale for Nutrition to serve food daily)

- From the nutrition narrative and baseline survey of E-COBSI, one of the challenges farmers face was found the limited of knowledge on nutrition and dietary diversification. Additionally, simple methods by which farmers can measure quantities of food to be consumed are not readily available.
- With support from the ECOBSI project, a simple method that farmers can use to measure quantities of foods to be consumed according to daily recommended allowances of nutrients has been developed. This method is adapted from the '' Tebakari Eiyouhou (Hand scale to serve food daily)" developed by a Japanese company called "Health Planning Aichi" (http://www.foodmodel.com/category04/f_50.html).
- The picture visually shows how much food and what varieties of food Japanese people should eat per day. As illustrated, Japanese should eat one handful of vitamin A rich vegetables and two handfuls of other vegetables such as mushrooms and seaweeds daily. This method is used in Japan as a method of dietary and nutritional guidance.
- Such food-based dietary recommendations with many pictures and simple messages enable farmers to understand what varieties of food and how much they should eat once extension workers explain. This method is so much easier to understand than if they say for example "you should eat 60 grams of protein".
- Compare your hand with your colleagues. Taller person has bigger hands and shorter person has a smaller hands. Body size is roughly proportional to necessary dietary allowances. That is why we use our hand to measure amount of food to be served daily.

Developed by Aichi Health Planning
https://hpaichi.exblog.jp/



2) How to make *Tebakari-Eiyouhou*

Usage of *Tebakari-Eiyouhou* in Japan (Example of Local municipality and Clinic)

- In Japan, *Tebakari-Eiyouhou* (Hand scale to serve food daily) is used in clinic, Local municipality and community Care as the nutrition counselling
- It is used for a wide range of age groups from infants to the elderly. It is developed for public.
- In Japan, the problem is the number of patients suffering from lifestyle-related diseases is increasing. The Japan needs prevention of them in terms of nutrition.
- It can be used for dietary guidance and nutritional guidance for lifestyle-related diseases such diabetes, metabolic syndrome and obesity.
- Also, it can be used for dietary guidance and nutritional guidance for undernutrition

How to make *Tebakari-Eiyouhou* (Hand scale for nutrition to serve food daily)

No	Activity
1	Make the food list that available most of seasons in Zambia
2	Divide local Food (ingredients) into 6 food groups
3	Select which Foods to be included to Tebakari-Eiyouhou (Please select non-seasonal foods)
4	Purchase selected foods in the local market
5	・Measuring the food weight to meet total energy, protein amount and fat amount of recommended Daily Dietary referring to Zambia Food-Based Dietary Guideline. When you measure the required dietary intake, please refer to "Recommended amount"(toral food weight) of the Zambia Food-Based Dietary Guideline ・Refer to Food composition table for the energy and nutritional value of each ingredient.
6	・Making adjustments to meet enough energy and nutrients ・Considering the environmental conditions of the area ・In the case of the E-COBSI site, since many vegetables are cultivated, the intake length of vegetables was adjusted to a large extent. ・When creating a hand scale method, if the total calories are less than the recommended calories, adjust with a sima (car gasoline) that does not contain much other nutrients. If the amount of protein is large, correct it to an appropriate amount.

How to make *Tebakari-Eiyouhou*

1. Make the food lists available in the area

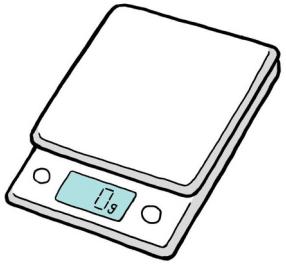
2. Divide Foods list into 6 food groups

3. Select which Foods to be included to Tebakari-Eiyouhou (Please select non-seasonal foods)

	Major function in the body	Colour clarification	Food group based on Zambian food category	Food Group	Food	The food available most of seasons in Zambia
Staple food	Energy	Yellow	①Cereals and starchy tubers/Roots	1-1. A group of grains, potatoes and root vegetables	Maize	○
					Samp(Crushed corn)	○
					Sweet potato	○
					Cassava	○
			⑤Legumes/pulses/nuts	1-2. Group of legumes and nuts	Palm oil	
					Red beans	
					White beans	
					Common Bean	○
					Ground nuts	○
					Soyabean	○
					Cowpea	○
fruits are side menu			③Fruits	4. Fruits	Amabuyu	
					Amakole(jakjak fruit)	
					Apple	○
					Banana	
					Ifidungusa (Amankolobwe)	
					Mandaline Orange	○
					masawa(indigenous fruit)	
					Orange	○
					Lemon	○
					Avocado	○
					Guava	○
					Mango	
Side dish (relish)	Protective food	Green	②Vegetables	2. Vegetable	Avocado	○
					Chinese cabbage	○
					Okra	○
					Onion	○
					Pumpkin	○
					Tomato	○
					Amaranthus Leave	○
					Cassava Leave	○
					Pumpkin Leave	○
					Rape	○
					Impwa	○
					Cabbage	○
Main dish	Body buildin	Red	④Meats, Poultry, Fish	3. Meat and fish	caterpillar	
					Chicken	○
					Egg	○
					Small fish	○
					Dry fish	○
			④Dairy	5. Dairy products	goat milk	
					cow milk	△
					sour milk	△

How to make *Tebakari-Eiyouhou*

5. Measuring food weight to meet total energy, protein amount and fat amount



Criteria of food selection for *Tebakari-Eiyouhou*

- Measured energy and nutrition based on recommended food intake of Zambia Food-Based Dietary Guidelines.(2021)
- The highest priority was measured to meet total energy, protein amount, fat amount of Recommended Daily Dietary, then minerals and micronutrient amount.
- In order to measure the required dietary intake, we first measured referring to Food weight.
- However, the intake of Nshima (Cereals and starchy tubers/Roots group) and vegetables was not a realistic intake amount for farmers. So, according to the situation of the farmers at the E-COBSI site, the amount of Nshima and vegetables was increased more than the recommended amount, and the intake of meat/fish were reduced.
- For Legumes/Pulses/Nuts Group, we added Groundnut to adjust total calories, iron and fat, and reduced intake aomoun than recommended.

※Increased intake of foods that can be produced on their own or that can be purchased cheaply, and reduced intake of expensive foods (meat and fish) than recommended

Recommended serving size amount, energy and nutrient contribution per food group Health general population based on a 2,100kcal diet

Table 3: Recommended serving size amounts and energy and nutrient contribution per food group for a healthy general population based on a 2 100 Kcal diet

Food group	Recommended amounts		Energy and nutrient values per serving^ ① ② ③										
	Number of servings	Total food weight (g)	Energy† (Kcal)	Protein (g)	Fat (g)	Carbohydrates (g)	Ca (mg)	Fe (mg)	Zn (mg)	Vit A* (mcg RAE)	Retinol (mcg)	Folate (mcg)	Fibre (g)
IN TOTAL	-	1558	2094	79	56	301	945	21	10	2364	966	518	32
Cereals and tubers	3.75**	559	781	17	2	168	65	2	2	317	0	57	9
Dairy products	1	248	124	7	7	8	230	0	1	63	60	19	0
Fats and oil	1	14	126	0	14	0	0	0	0	0	0	0	0
Fruits	2	291	189	2	3	36	52	2	0	283	0	74	6
Meat, fish and eggs	1	99	149	20	7	1	45	4	2	957	907	89	1
Pulses, nuts and seeds	2	181	425	21	22	32	53	5	3	4	0	151	10
Vegetables	3	222	131	12	1	15	496	8	1	739	0	126	5
The minimum cost of this food combination is approximately K14.95 (Kwacha)													

^Provided by the diet model food combinations
*Measured in micrograms of retinol of activity equivalents (mcg RAE)
**Rounded to 4 servings
†Protein accounts for 15%, fat accounts for 24 % and carbohydrates account for 58% of the total energy amount

How to make Tebakari-Eiyouhou

Based on the following value from **the Zambia Food-Based Dietary Guideline**

Recommended Daily Dietary Allowances

Recommended Daily Dietary Allowances	Energy	Protein	Vitamin A	Iron	Fat	Calcium
	(Kcal)	(g)	(ug retinol)	(mg)	(g)	(mg)
Adult Woman	2,200	79	2364	21	56	945

Recommended Amount for Each Food Group

Recommended Daily Dietary Allowances	Staples	Meet production	Legumes	Fruits	Vegetable	Dairy products
	(g)	(g)	(g)	(g)	(g)	(g)
Adult Woman	559	99	181	291	222	248

We created the Tebakari-Eiyouhou based on the following result

Calculated Daily Dietary Amount

Actual Daily Dietary Allowances	Energy	Protein	Vitamin A	Iron	Fat	Calcium
	(Kcal)	(g)	(ug retinol)	(mg)	(g)	(mg)
Adult Woman	2,211	81	7,810	33	55	1,639

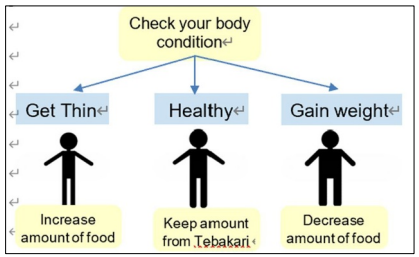
Calculated Amount for Each Food Group

Food weight	Staples	Meet production	Legumes	Fruits	Vegetable	Dairy products	Oil
	(g)	(g)	(g)	(g)	(g)	(g)	(g)
Adult Woman	440	77	95	283	349	248	16

3) Tips for using *Tebakari-Eiyouhou* (Hand scale)

Tips for using *Tebakari-Eiyouhou* (Hand scale)

- First, exactly try Tebakari-Eiyouhou (Hand scale to serve food daily) and check your body condition. If you feel healthy, keep the amount from Tebkari-Eiyouhou. If you feel you get thin and want to increase more weight, please increase amount of hand you serve. If you feel you gain weight too much, please decrease amount of hand you serve.



- Look at your body and adjust amount of food to be served depending on your volume of activities. Check yourself whether you maintain, gain or lose your weight. Tebakari-Eiyouhou can be adjusted depends on people.
- Community workers (like CEOs and health workers) should continue checking farmers health and nutritional status.
- And check your body condition (whether you get tired easily or not)

Tips for using *Tebakari-Eiyouhou* (Hand scale)

- **Pregnant women** can increase +15%~20% (Based on calorie in FBDG) of food to be served from the standard.
- On average, pregnant women take an additional 360 Kcal on a daily basis in the second semester and 475 Kcal in the third (FAO, 2004b).
- **Lactating women** are nutritionally vulnerable because of the physiological demands of breastfeeding (FAO, 2021b). Breastfeeding mothers require additional calories +25%~30% (Based on FBDG) for producing breastmilk to feed their infants.
- While some of the energy will come from the fat that was stored during pregnancy, well-nourished women need an extra 505 Kcal per day from the diet (FAO, WHO and UNU, 2004; CDC, 20201b).
- Undernourished women, including those who do not gain adequate weight during pregnancy, should add 675 Kcal per day during the first six months post-delivery (FAO, WHO and UNU,2004)

Tips for using *Tebakari-Eiyouhou* (Hand scale)

- **Pregnant women** are at risk of micronutrient deficiencies especially iron, iodine, calcium, folic acid, and vitamin A.

Recommendation:
・Eat a variety of foods from all the six food groups as stated in the dietary guidelines
・Eat one additional serving of fish and animal source foods or two servings of pulses, nuts and seeds in order to get the additional 14 g of protein needed during pregnancy.
・Take daily oral iron and folic acid supplementation with 30 mg to 60 mg of elemental iron and 400 g (0.4 mg) of folic acid provided from the clinic or as prescribed by the doctor to prevent maternal anemia, puerperal sepsis, low birth weight, and pre- term birth (WHO 2016).

- **Breastfeeding mothers** also need an extra 20 g of protein and micronutrients. Lactating women need additional vitamin A to replace the lactation losses and to prevent night blindness. (FAO and WHO, 2004). Other nutrients of importance to lactating women are vitamins like B3, B6, B12 and C, folate, and minerals like selenium, calcium and zinc as per Table 29 (FAO, 2004; FAO, WHO and UNU1981).

Recommendation:
・Eat an extra meal to get the additional energy (505 Kcal) and requirements as well as the additional 20 g protein.
・Lactating women should take iron and folic acid supplementation for at least three months after delivery (WHO, 2014b).

Tips for using *Tebakari-Eiyouhou* (Hand scale)

- Active young people can also increase +20% of food to be served from the standard. They should eat enough protein and work well and then the muscle is maintained.

- Since elderly people decrease amount of works, they can reduce 20% of "yellow" food from the standard. But they should eat the other well-balanced food. Elderly people should maintain amount of protein and calcium.

Tips for using *Tebakari-Eiyouhou* (Hand scale)

- Eat different types of food from each of the six food groups every day to stay strong.
- Eat well-balanced three meals (breakfast, lunch and dinner). Ideally, the Recommended Daily Dietary Allowances should be spilt into three meals
- Taking too much protein damages your kidney and liver and extra protein convert to fat. Therefore, maintain proper recommended amount of protein
- If farmers cannot buy meat and chicken, they should eat fish enough. If you eat whole fish including fish skin and bones, you can take calcium and Vitamin D. Since meat and fish is high quality protein, eating only beans as protein source is not recommended. CEOs can instruct farmers to buy fish and meat from earned money, not beans only.

Tips for using *Tebakari-Eiyouhou* (Hand scale)

- If you eat vegetable with oils, more nutrition can be absorbed to the body.
- Mix in groundnuts with your vegetables for extra flavor, increasing protein and lipid.
- If people do not eat protein sources in the morning, body temperature does not increase. So, they should take like tea with milk or sour milk for work.
- Without Vitamins, protein sources are not absorbed very well. Therefore well-balanced meal based on *Tebakari-Eiyouhou* is most important.
- If calorie is not enough, people should eat more Cereals and starchy tubers/Roots Group's food which contains energy sources and less other nutrients. If protein sources is too much, they should adjust and not eat too much protein sources.

Points to concern

- Please Instruct the subject to immediately remember what they ate and how much they ate by looking at the palm of their hand.
- By looking at your palm and remembering what you ate today, you can be careful not to eat the same foods more than once.
- If farmers cannot buy some foods, they should eat other foods in the same group instead.
- In addition to explaining the foods, at the same time, we will introduce simple dishes that can be done without hassle

4) Q & A on *Tebakari-Eiyouhou*

Q&A on *Tebakari Eiyouhou* ①

1. How can you measure the amount of food for children?

2. Whose palm to use when measuring food?

A: Please use your hand to measure your own food amount. But if you cook for family members, please imagine and estimate others' hand size for others' food.

3. Why should we use the hand scale?

A. To promote adequate intake of nutrients e.g. amount and variety, it also shows the recommended amounts on a varieties of foods to eat.

4.When do you use hand scale? Is it before or after food preparation?

A. Except Nshima, foods shown on Tebakari-Eiyouhou are raw (fresh), so please refer it before food preparation.

5. At what meal should the hand scale be used?

A. Tebakari-Eiyouhou shows amount of food per day and person. So the amount should be split into three meals and at every meal a person should use it.

Q&A on *Tebakari Eiyouhou* ②

6. Who should use the hand scale?

A. Anyone above 2 years.

7. What should I do if not full after using hand scale?

A. Consider activity and your situation. Adjust the amounts of food based on your situation. And encourage to eat food at least 3 meals per day. Habit of food taking only once a day is not recommended and should be changed.

8. Is the food on the hand scale enough to satisfy me?

A. Basically it satisfies you. But requirement of food depends on personality.

First, try Tebakari-Eiyouhou (Hand scale to serve food daily) and check your body condition. If you feel healthy, keep the amount from Tebkari-Eiyouhou. If you feel you get thin and want to increase more weight, please increase amount of hand you serve. If you feel you gain weight too much, please decrease amount of hand you serve.

Look at your body and adjust amount of food to be served depending on your volume of activities. Check yourself whether you maintain, gain or lose your weight. Tebakari-Eiyouhou can be adjusted depends on people.

Calorie of food should be adjusted by "Cereals and starchy roots and tubers" group.

Q&A on *Tebakari Eiyouhou* ③

9.How long should the hand scale be used?

A. Daily on all the meals

10.We don't have some of these foods what should we do?

A. Diversified production, increased productivity (income pathway). Purchase what you don't have. Food preservation processing and storage.

11. How does hand scale takes care of people with special diets e.g. vegetarians or allergies?

A. Tebakari-Eiyouhou is for public. Those have disease, special consideration needs specific diets like hospital.

12. Culture don't allow to measure food?

A. To reduce food wastage and to reduce the risks of NCDs, measuring food is necessary.

5) Feedback on *Tebakari-Eiyouhou* from the field

* From this presentation, you can practice Tebakari-Eiyouhou and cooking class during the field trip

Discuss with farmers and get feedback on *Tebakari-Eiyouhou* from the field

1. Some feedback from farmers

2. Some challenges for the extension of *Tebakari Eiyouhou*

6) Exercise and Lecture of Tebakari-Eiyouhou in the Field

Exercises: Teach Tebakari-Eiyouhou to farmers How to use Tebakari-Eiyouhou and recommend it to farmers

Describe the 6 food groups

↓

The instructor listens to and understands the life background and work history of the farmers and grasps the nutritional status and health condition.

↓

Guide dietary recommendations (guidance on excess and deficiency of diet and nutrition) by using Tebakari-Eiyouhou

- Please adapt your guidance according to the situation on the site

7) Cooking Demonstration