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For a world without hunger

NUTRITION SENSITIVE INTEGRATED FARMING

AN AGRO-ECOLOGICAL APPROACH

Flip chart for Farmer Field School

Nutrition Smart Village

IMPRINT

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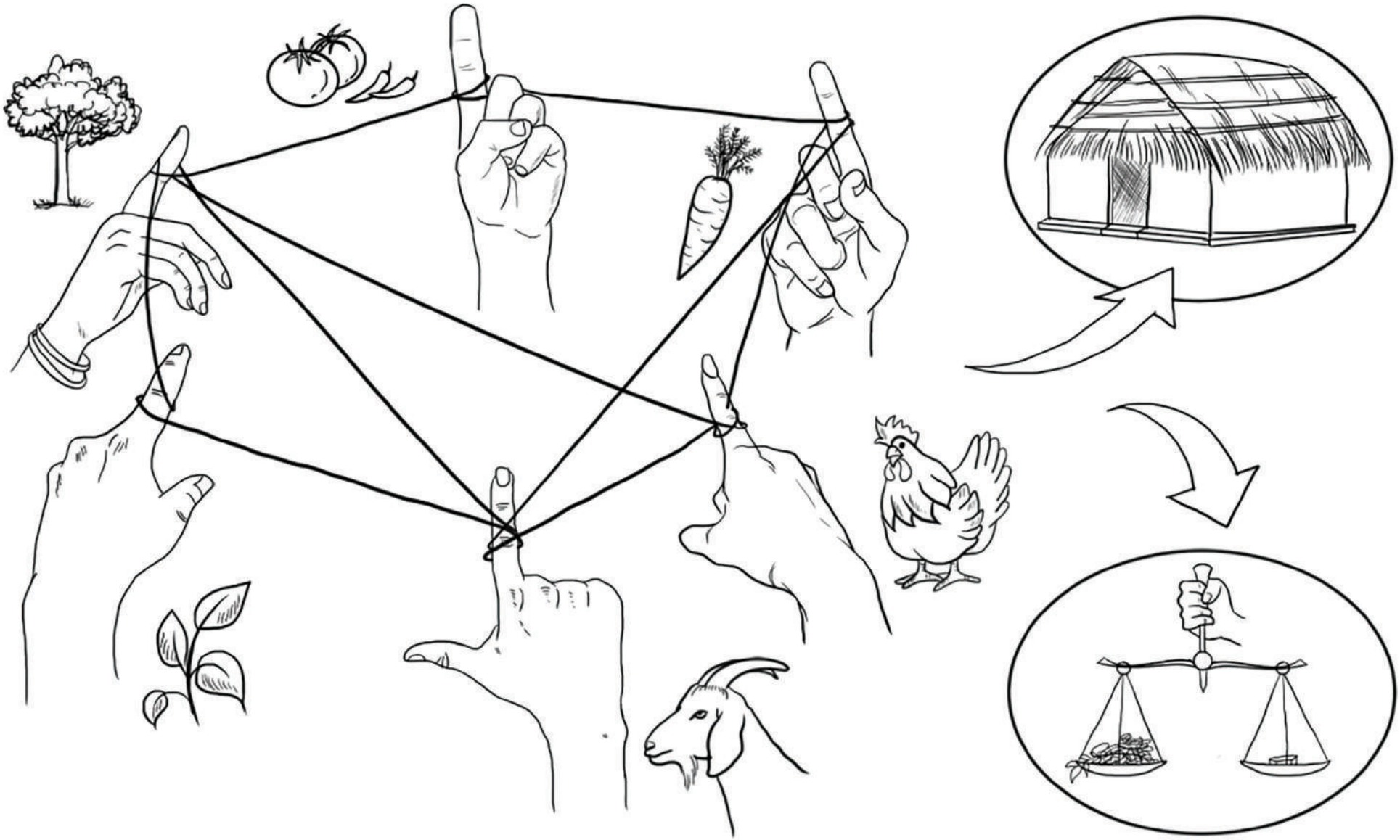
INTRODUCING THE IDEA OF AN INTEGRATED NUTRITION GARDEN



SESSION

01

INTRODUCING THE IDEA OF AN INTEGRATED NUTRITION GARDEN

1.5 HRS

PROCESS

- Make participants stand in circle, look around the garden and think of anything in the garden. That, now, becomes the assumed name for each participant in this session. Each participant is supposed to remember her/his assumed name.

- Participants name themselves and the facilitator must see if most of the food groups are covered. Then, assign participants to two groups – these groups can be namedKitchen and Marketor any other set of names that suit the participants).

- Take a string and tie it to the finger of any one participant (say,Moringa). Ask her/him, to name another participant whom s/he canoffersomething (say leaves as fodder for goats) – connect the string to this second person, who, in turn, is asked to name yet another participant whom s/he can offer something (for example, spinach for food) and, once again, tie the string to a finger of this participant. Continue till the group becomes a network.There might be more than two networks in each group. This should spur the discussion. The facilitator will steer the discussion to emphasise how all the things in the garden are inter-dependent.

DISCUSSION POINTS

- How our kitchen is dependent on thefarming;
- Whether every food type iscovered from our kitchen garden;
- Whether our kitchen garden is producing all the food that we need for consumption;
- If not, how can we improve our garden so that it produces all the food.
- What are the things that we are selling.

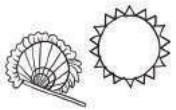
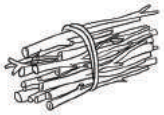
KEY MESSAGES

- Production, if planned properly, can be the main source of nutrition for our families. We will learn about this in coming sessions.
- Everything in the garden is inter-connected and works as part of a system.

TASK AHEAD

Check your own garden, think whether your garden is like what has been discussed during the course of this session.Return to the training with an analysis of what are the gap areas inyour gardens.

PLANNING OF YOUR PRODUCTION - ASSESSING STRESS

SESSION

02A

PLANNING OF YOUR PRODUCTION

ASSESSING STRESS

30 MINS

PROCESS

- Draw this table in ground or chartpaper
- The symbols in the firstrow signifysummer/pre-kharif, rainy/ kharif,winter/ravi
- The symbols in the first column signify food, fodder, fire wood, drinking water, irrigation water, cash orwork
- The discussion will be to understand the scarcity/gap/stress of each component throughout the three different seasons. You can denote the gap by - - - (very high), - - (moderate), and - (low).

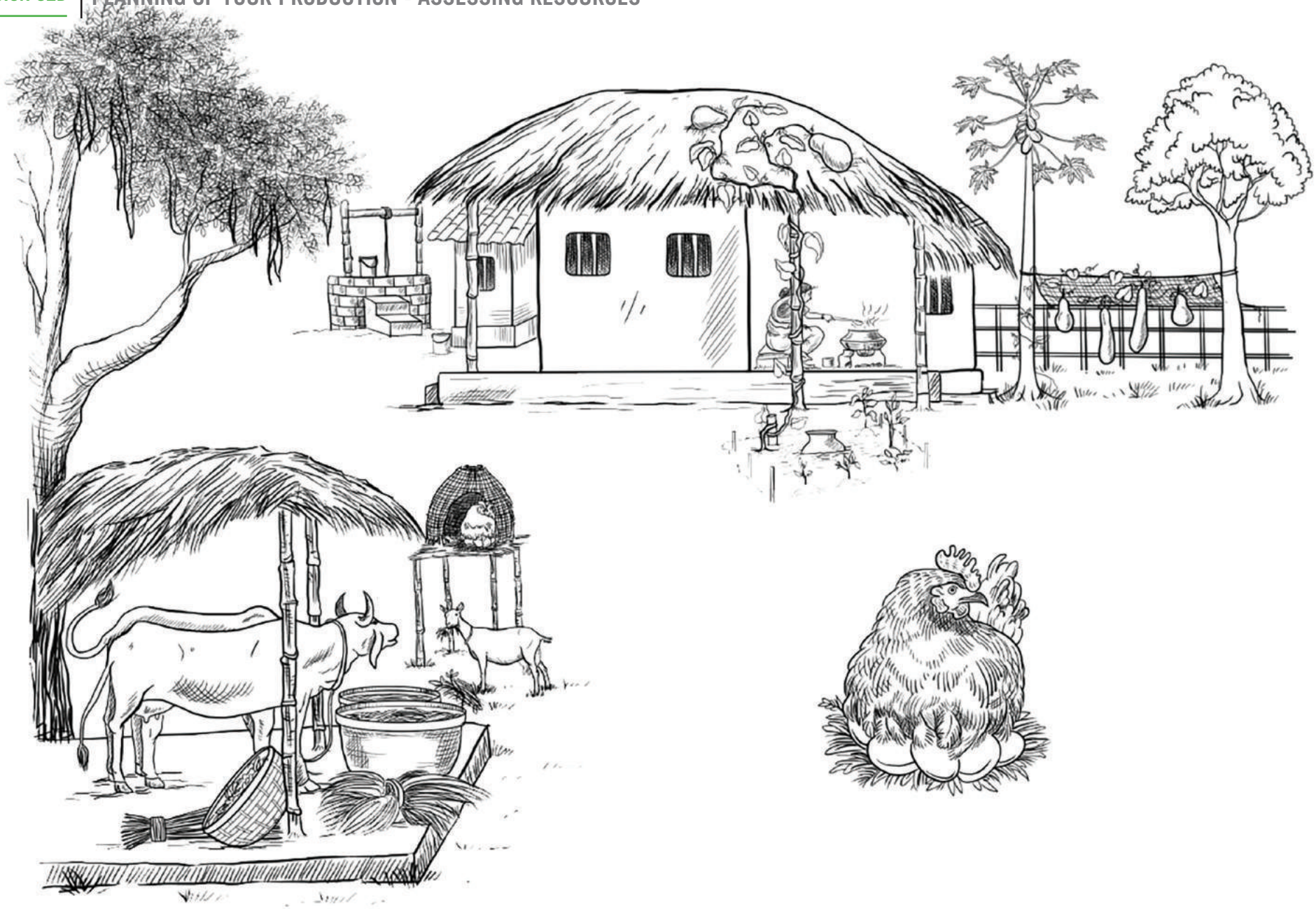
DISCUSSION POINTS

- What happens to the products in the first column as the seasons progress? Discuss howthe families cope with scarcity
- Which are the most difficult months/season? Discuss why the participants associate the levels of stress with these months/ seasons.
- As the group if they see any positives inthese?

KEY MESSAGES

You have ups and down, so families need to plan carefully so that they can address gaps and improve on their strengths and make their families more resilient to the changing weather patterns denoted in the first row of the chart.

PLANNING OF YOUR PRODUCTION - ASSESSING RESOURCES



SESSION

02B

PLANNING OF YOUR PRODUCTION

ASSESSING RESOURCES

30 MINS

PROCESS

Show the picture anddiscuss (in the first person):

- What do you see?
- Do you have all these in yourhouse?

After this, each individual farmer must be asked to draw/write a similar diagram for his/her own farm. S/he will also be required to denote the quantity of each (for example, two cows, nine country/ free range poultry birds, etc)

DISCUSSION POINTS

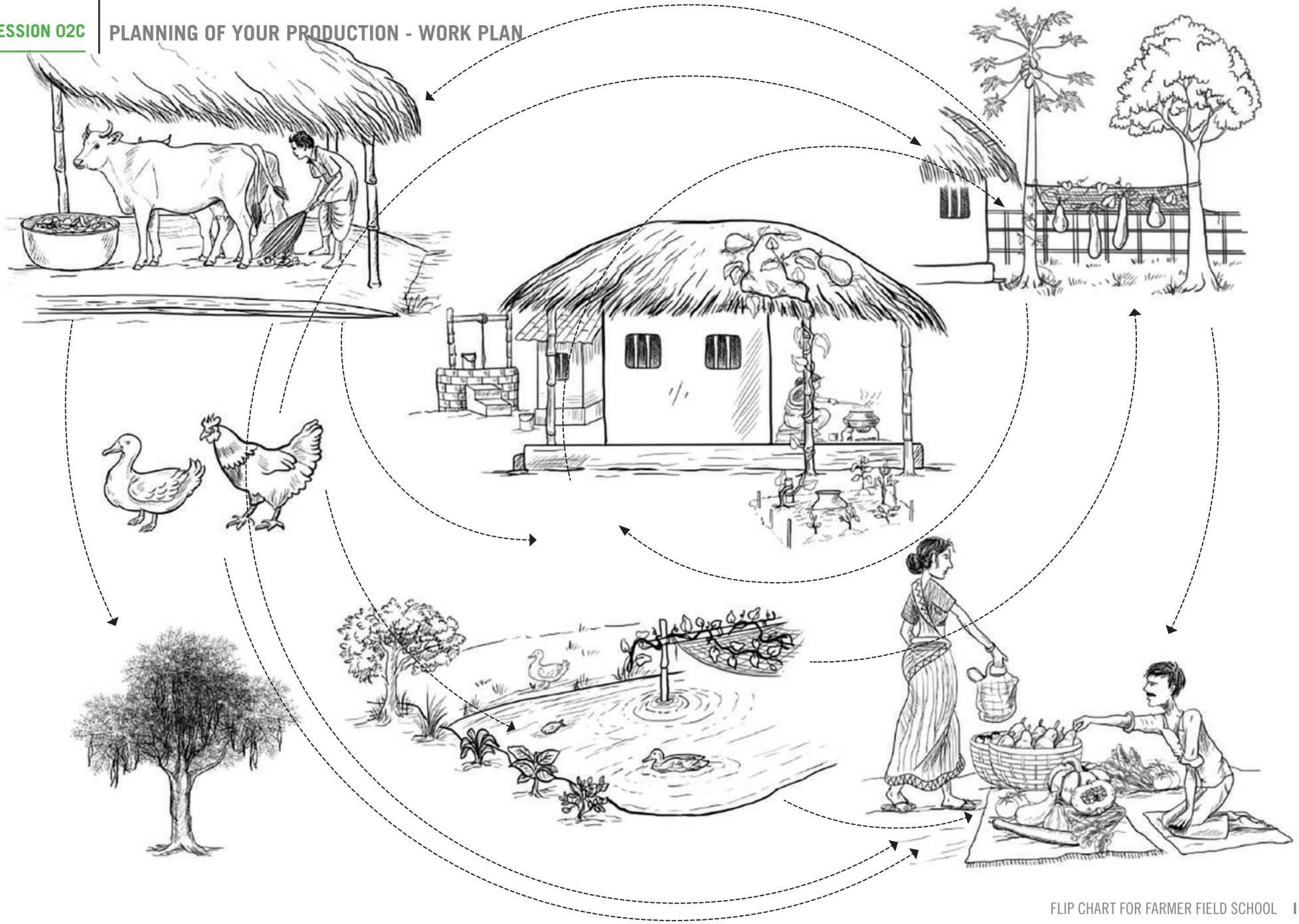
The discussion the participants will engage in will be around the following points:

- How do you use these resources? Can these be put to better use?
- What are your needs? Are these resources enough to fulfill yourneeds?
- How can the output from these resources be maximized, especially in seasons of scarcity?
- What is your type of soil?

KEY MESSAGES

We often do not utilize our resources optimally.

PLANNING OF YOUR PRODUCTION - WORK PLAN



SESSION

02C

PLANNING OF YOUR PRODUCTION

WORK PLAN

30 MINS

PROCESS

- Discuss what the participants see in the picture above.
- After the discussion, each one has to draw connecting lines on how one component is helping the other.
- They can mark the links or add new things with a new colour to show what their futureplanning is like.

DISCUSSION POINTS

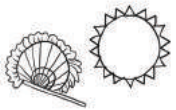
- Can you dream of a farm for yourself where you will have cereals, pulses, oilseeds, egg, meat/fish, milk, leafy vegetables, vegetables, fruits for your kitchen - all through the year? What should you add here now?
- Does each component depicted in the graphic above help the others?
  - What are thelinks?
- Can we plan our garden and homestead like this?
  - What are the problems in doing so?

KEY MESSAGES

- If waste of one is used as input for others, fertilizer input costsarereduced
- A family also will get various types of nutrition and income throughout the year if the diversity of systems, components and species are increased.

SESSION 02D

PLANNING OF YOUR PRODUCTION - WORK PLAN



SESSION

02D

PLANNING OF YOUR PRODUCTION

WORK PLAN

30 MINS

PROCESS

Write down each component you had planned on the previous session 2c. Write down, what you will do as the seasons progress. Mention about soil and water management, crops – thinking on consumption/nutrition. While planning, keep in mind your period of scarcity (Session 2a) in mind.

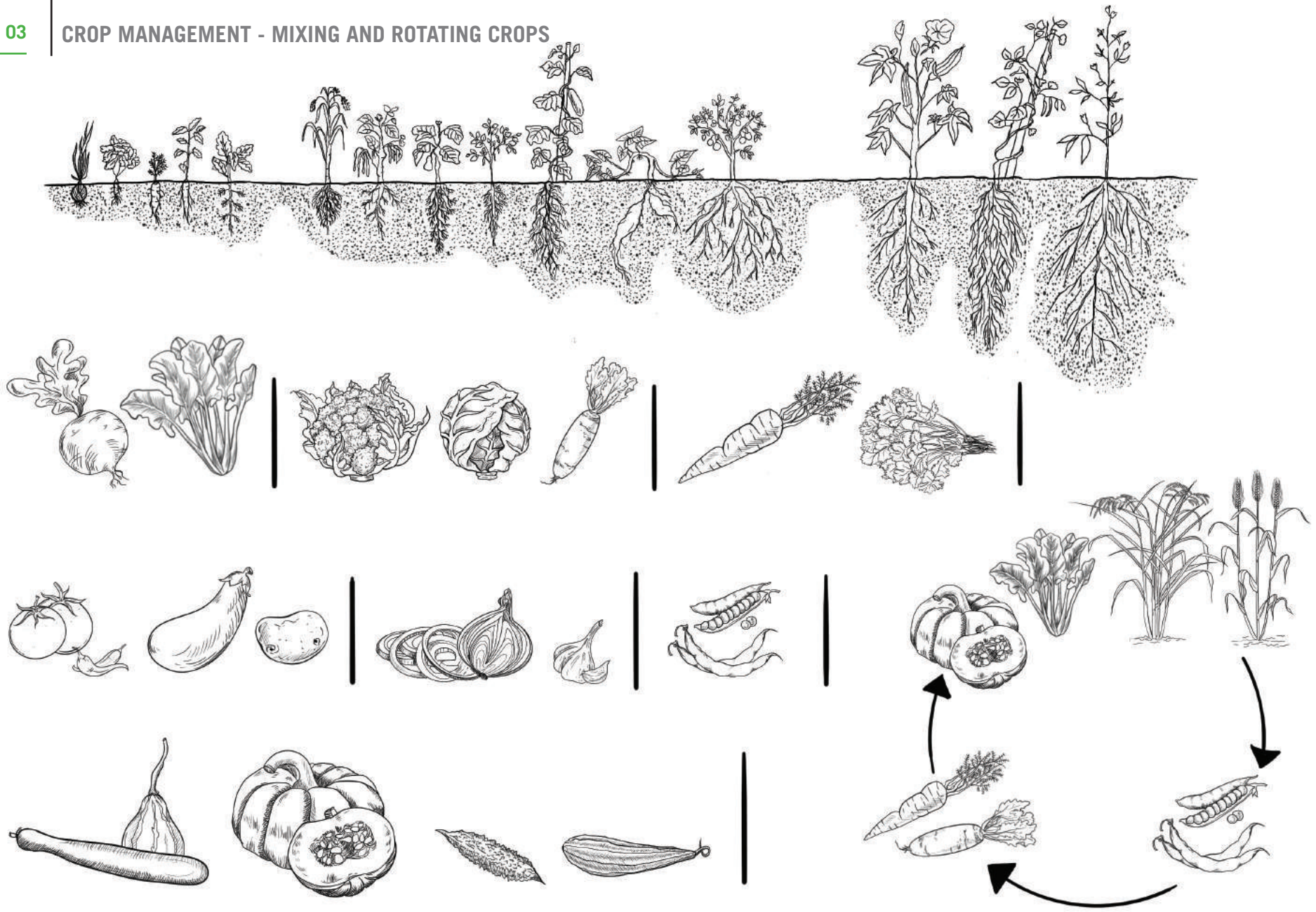
DISCUSSION POINTS

- Do you want to start everything at one go?
- What is your priority?
- What capacities do you need to build?

TASK AHEAD

Complete this entire exercise for each farmer's farm. If required, facilitators will support them and note down all the input and capacity need for the entire group.

CROP MANAGEMENT - MIXING AND ROTATING CROPS



SESSION

03

CROP MANAGEMENT

MIXING AND ROTATING CROPS

1.5 HOURS

PROCESS

- Go to a nutrition garden. Ask each farmer to fetch leaves of the crop they have in their garden.
- Ask them to display the leaves according to the height of the plant, and discuss.
- After that, ask them to keep the leaves family(similarity)-wise, and discuss.

DISCUSSION POINTS

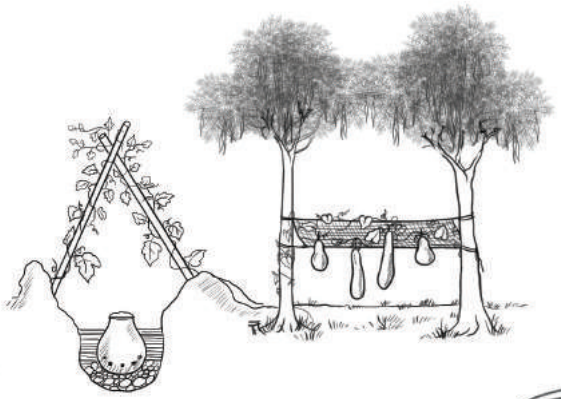
- What are the common practice of mixing crops in this area?
- What can be mixed with your current monocrop?
- Food requirement of leafy/fruit vegetables and grains are very high (+++), tubers/oilseeds/millets are medium (++) and legumes are low (+). So crops should be rotated accordingly in an individual plot of land.

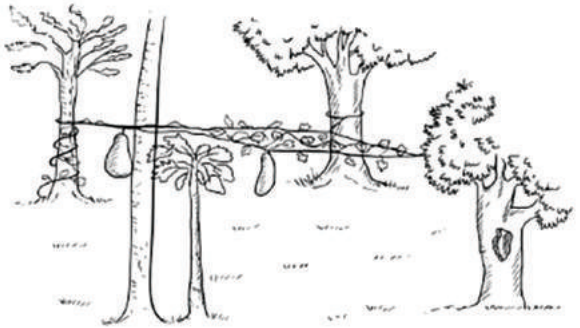
KEY MESSAGES

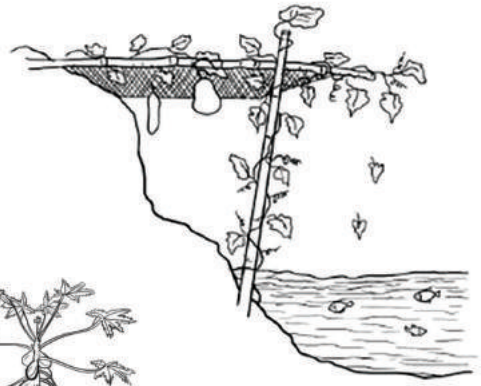
- The tolerance limit of water scarcity increases with a plant's root length – the longer (and deeper) the root, the more water the plant needs.
- Crops from the same family should not be mixed together or repeated in consecutive seasons.
- Crops of differing root depths can be mixed together.
- Rotate crops according to food requirement, it is always better to have one legume in a year.
- While selecting a crop, we should have few crops from at least 6 groups 1) Leafy vegetables; 2) Fruit vegetables; 3) Tubers; 4)Legumes; 5) Spices; and 6) Medicinal plants. All nutrition gardens should have moringa, papaya and lemon.

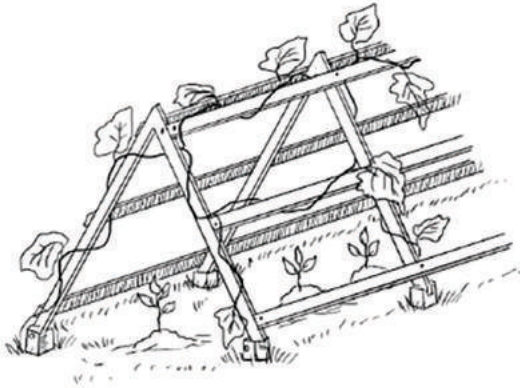
TASK AHEAD

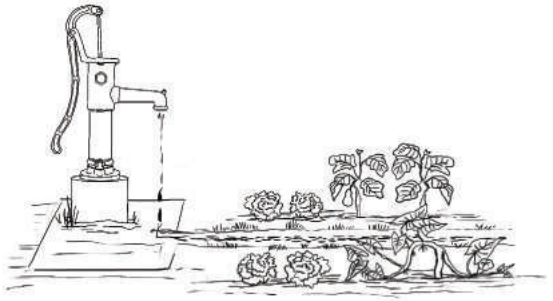
Develop a cropping pattern for your own garden.

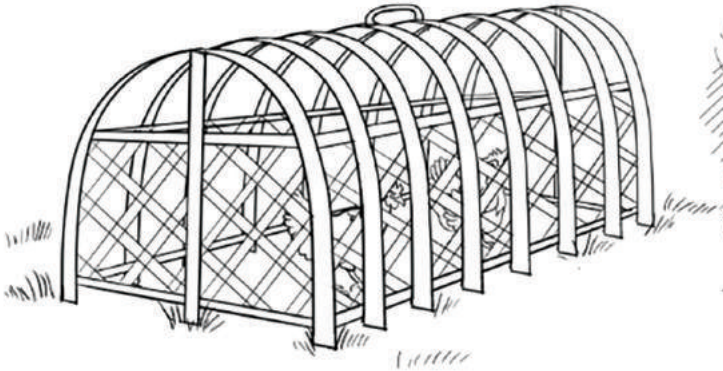












SESSION

04

SPACE MANAGEMENT

1 HOUR

PROCESS

- Do this session in a garden.
- Show the picture and discuss.
- Show what can be improved in the garden (where this session is being conducted).

DISCUSSION POINTS

- Fence of a nutrition garden can be living with non brows-able plants. Use pole like straight plants (Glyricidia,
- Subabul, Neem) + thorny bushy plants (Lemon) + smaller plants (aloe Vera) + climbers (bitter gourd)
- Moringas are good to be planted in the trellis, instead of bamboo poles.
- Trellis can be created over a small pond, where falling leaves from a creeper can generate food for fish.
- Waste water from a tube-well can be used for irrigation. Water-tolerant and water-resistant Plants like Ipomoea Acquatica (Kangkon or Kalmi), Cantella (a medicinal herb) and Aurum can be planted besides the drain.
- Papayas can be planted where water from roof is falling.
- Set a light-trap in your crop field/garden – and raise local carnivores fish below that.
- Allowing you chicken in the field after harvest has a dual advantage: The chicken can eat up pests and the seeds of weeds while also fertilising the field.

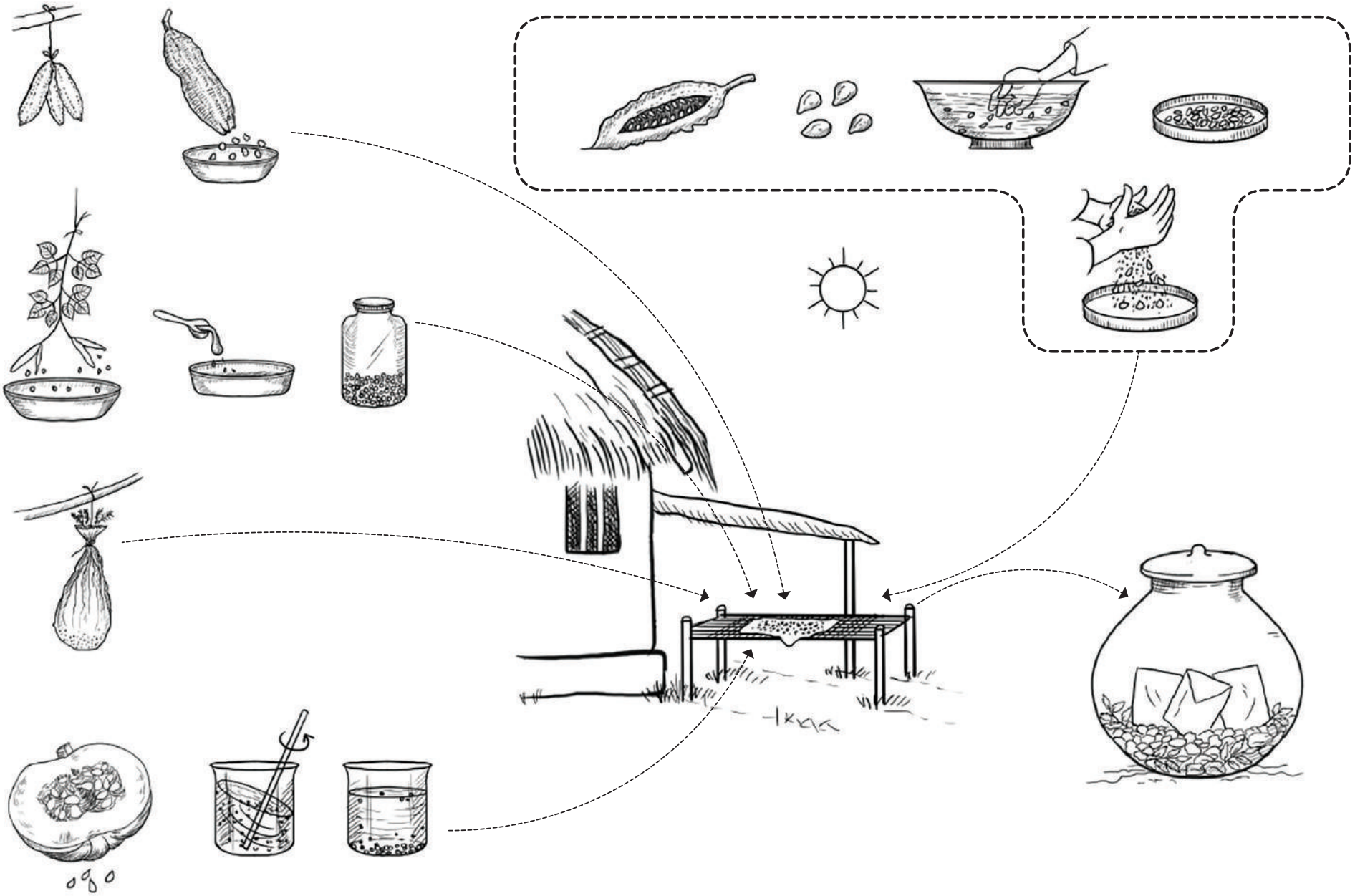
KEY MESSAGES

- As we have small space, we can increase space vertically through trellis and other multi-layered structure.
- Even within one system many other things can be introduced for better space utilization.

TASK AHEAD

Start at least on multilayer design in each garden.

SEED MANAGEMENT - COLLECTION, TREATMENT & STORAGE



SESSION

05

SEED MANAGEMENT
COLLECTION, TREATMENT & STORAGE

1.5 HOURS

PROCESS
Discuss, showing the picture.

- Bring example of each type of seed, example of seed packet, storage unit.

- Mix cow dung (100 grams), cow urine (1.5 litres) and vermi-compost (50 grams). Mix all this with 3 litres of water. Soak the seed, and dry it in shade before planting.

DISCUSSION POINTS
- Are you keeping all the seed that is required? What are others methods for seed preservation?

- Before planting the seeds, treat them in Trichoderma or Rhizobium cultures (for pulses). Trichoderma is a fungi that works as a biocontrol agent and is used against soil-born diseases. Rhizobium is a bacteria that take in nitrogen from the atmosphere and pass it on to the root nodules of plant, allowing it to grow in soil low in nitrogen.

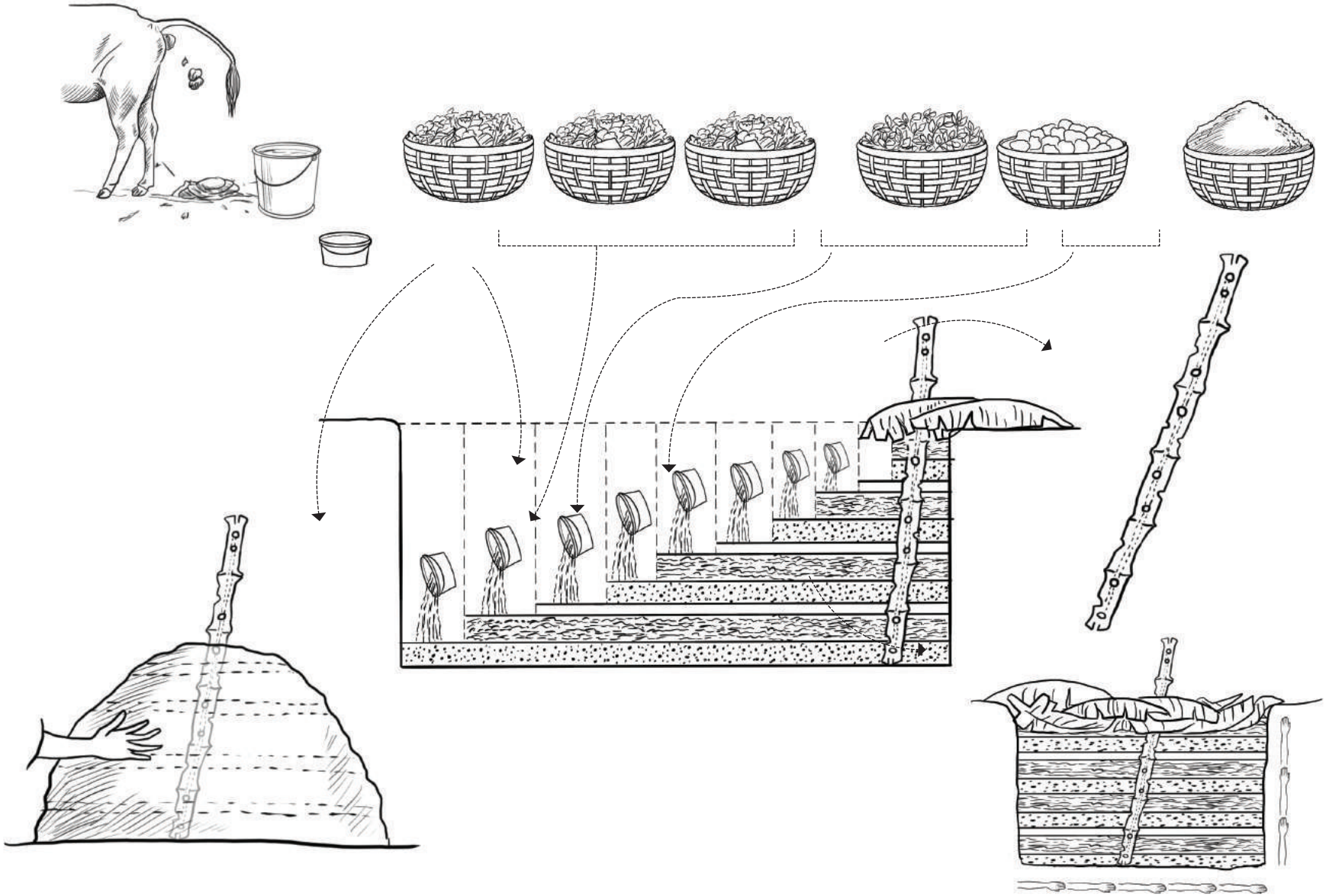
KEY MESSAGES
- Keep the seed dry. Always dry seeds in shade. Keep some charcoal in the seed storage because it absorbs moisture.

- -Neem oil, dry neem leaves can be mixed with seed to avoid pest attack.

- While collecting, take seeds from fruits which are of medium size, keep seeds from fruits from the mid portion of the plant, and middle of the season.

TASK AHEAD
Make a seed storing unit in each house.

SOIL AND WATER MANAGEMENT - HEAP/PIT COMPOSTING



SESSION

06A

SOIL AND WATER MANAGEMENT

HEAP/PIT COMPOSTING

1 HOUR

PROCESS

- Collect green leaves and dry matter (can be also from weeds, agri-waste). Chop them into smaller pieces.
- Make a thick liquid mixture with cow-dung and water.
- Dig a pit of 3' wide X 3' deep X 5' long.
- Make a 6~8" layer of dry materials and sprinkle cow-dung mixture. Add another 6~8' layer of green matter sprinkle cow-dung mixture again. Repeat the process till it comes 1~1.5' above the ground.
- Cover it with broad leaves, or plaster it with mud.
- Before plastering, insert a bamboo with holes through and on the surface, to give scope for gas (methane) to emerge through this.
- The similar method can be followed as heap.
- If you have excess cow-dung, a layer of cow-dung and soil can be included.

DISCUSSION POINTS

- Do you use all cow-dung and agriculture-waste?
- The farm-yard manure is a poor compost, as it remains open in the sun. This is a better method.
- You can generate good amount of fertilizer from a lesser amount of cow-dung.

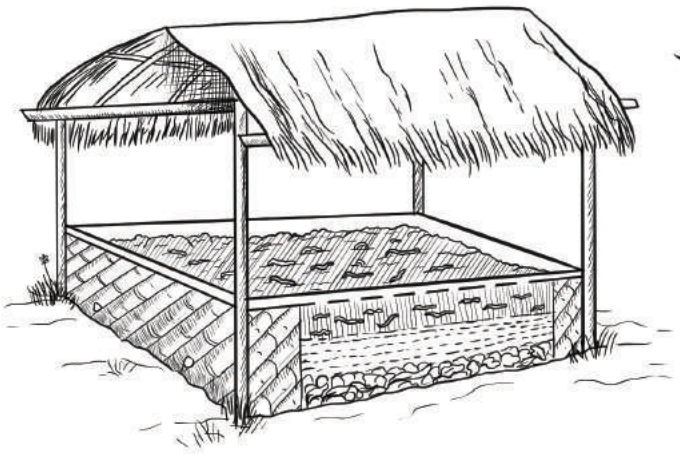
KEY MESSAGES

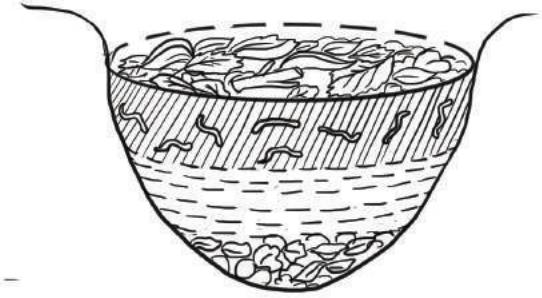
It has to be turned over after 30 days, the moist condition has to be retained. The compost will be ready in 90 days.

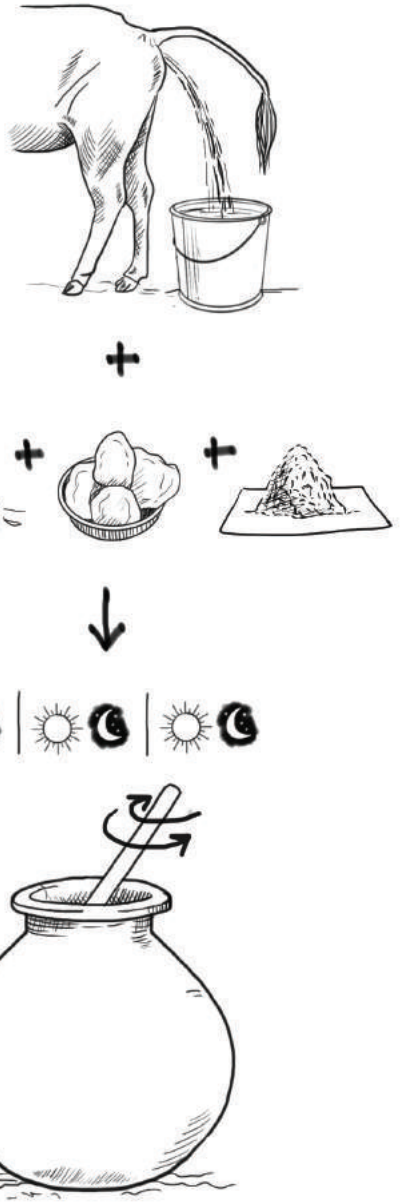
TASK AHEAD

Do it in every family's garden.

SOIL AND WATER MANAGEMENT - VERMICOMPOSTING AND LIQUID MANURE







SESSION

06B

SOIL AND WATER MANAGEMENT

VERMICOMPOSTING AND LIQUID MANURE

1.5 HOURS

PROCESS

Vermicompost

- Mix green leaves/vegetable peels, cow dung and dry leaved/ straw. Moist it and let them decompose for 15~20 days.
- Introduce 100 earthworm/kg, this will prepare vermicompost by 30 days.
- When prepared, Vermicompost looks like tea dust and without smell.
- It is important to keep the mixture in the vermicompost in moist condition, can cover with moist gunny bag.

Liquid Manure

- Mix 1 kg of cow dung, 1 litre of cow urine, 200 gms of jaggery, 200 gms of wasted pulse powder with 18~20 litres of water.
- Keep it for 3 days.

DISCUSSION POINTS

What are the other methods of preparing manure? What is the pros and cons of all these methods?

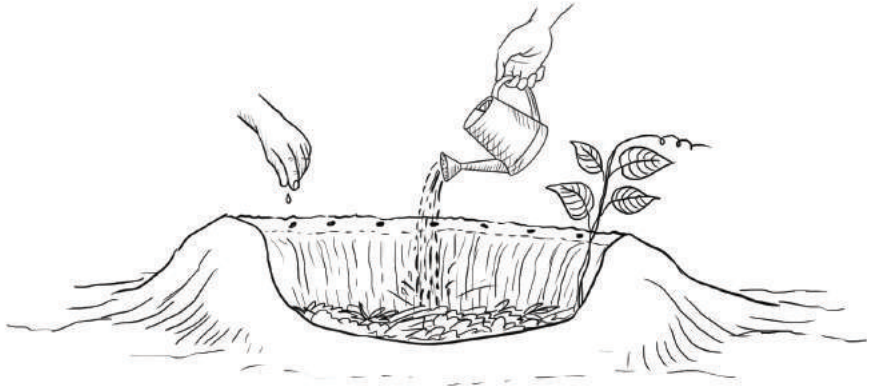
KEY MESSAGES

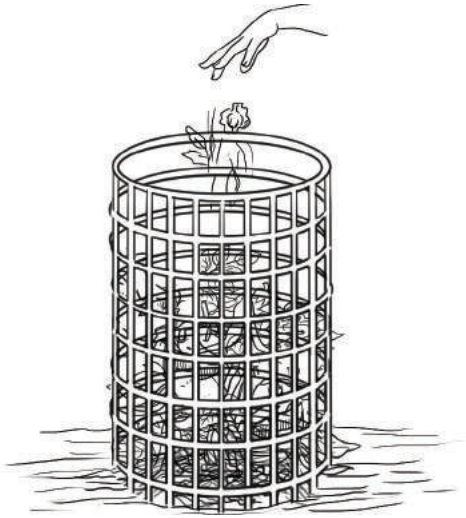
- 5~6 ton/ha vermicompostis required for field crops.
- Mix the liquid manure with 5~10 litresof water and sprinkle/ spray.

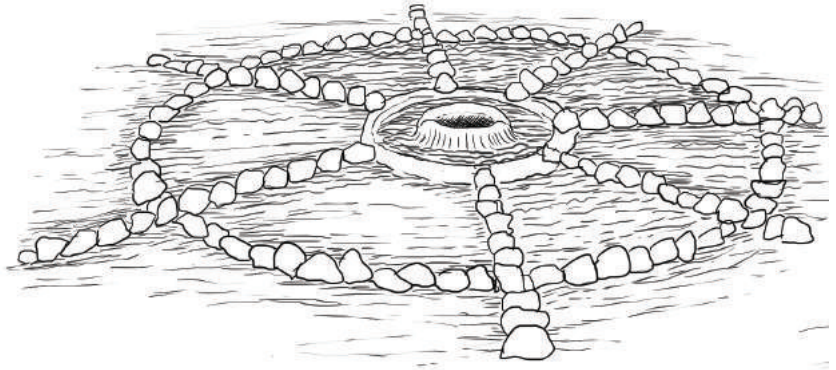
TASK AHEAD

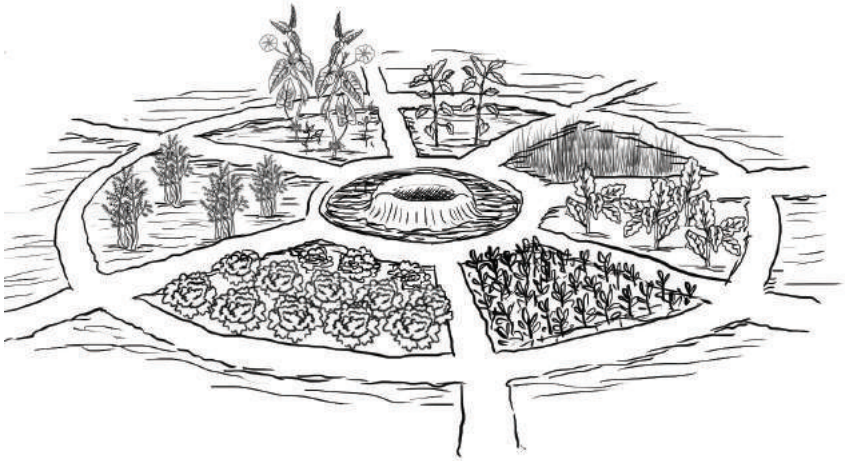
Do it in each garden

SOIL AND WATER MANAGEMENT - KEYHOLE AND CIRCLE GARDEN









SESSION

07

SOIL AND WATER MANAGEMENT

KEYHOLE AND CIRCLE GARDEN

2 HOURS

PROCESS

Circle Garden

- Go to a garden and do the process step by step as shown in the picture.
- Dig the pit with 1' radius, pile up the soil around it with vermi-compost mixed with the soil. Sow seeds on that bund. The creepers should be outside of the circle – so that it goes outward.
- The pit can be treated with waste water, vegetable peel, compost and water.

Keyhole Garden

- Make a round cage with sticks. Encircle this with a spread of a layer of dry/green agriculture-waste matter. The inner side will be at a height. Radius of the garden (outer circle) – 21/2 to 3 feet.
- Surround it with stone/brick. Keep space so that you can reach the cage in the centre.
- Waste water, vegetable peel, compost and water can be given on the cage, so that the nutrient flows out due to gravity. You can plant leafy vegetables for your consumption.

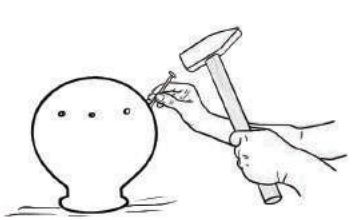
DISCUSSION POINTS

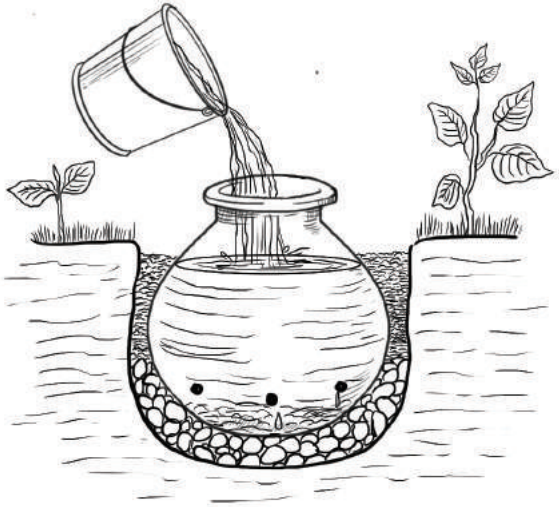
- This needs less amount of water.
- We are living in a water scarce place. Waste water must be used in judicious way.
- You can plan the crops according your consumption pattern of a week.

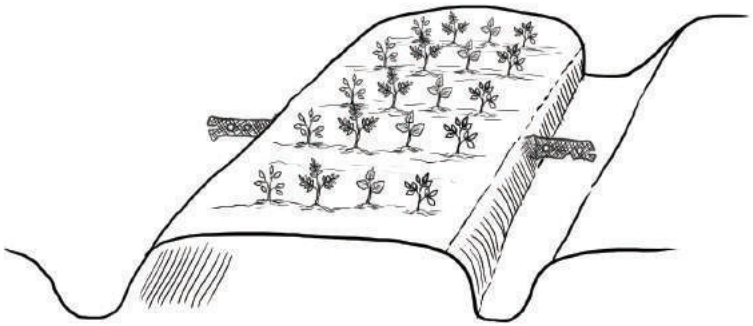
TASK AHEAD

Develop these models in your garden.

SOIL AND WATER MANAGEMENT - MULCHING, PITCHER AND DRIP IRRIGATION







SESSION

08

SOIL AND WATER MANAGEMENT

MULCHING, PITCHER AND DRIP IRRIGATION

1.5 HOURS

PROCESS

Pitcher Irrigation

- Carefully, make (drill) holes in a mud pitcher. Cover it with a thin cotton cloth.
- Dig a hole in the ground and install the pitcher in this. Ensure that there are little stones between soil and the pitcher so that the soil does not clog the holes in the pitcher.
- You can give water/manure in the pitcher and close it. Water consumption will be much lower.
- One can also make holes on bamboo and install it inside the vegetable bed to release water drip by drip.

Mulching

- Try dry mulching with straw, dry leaves and green mulching with green leaves.
- Live mulching is done with creepers like sweet potato.

DISCUSSION POINTS

- Irrigation water should be targeted and not exposed much.
- Are we using water cautiously?

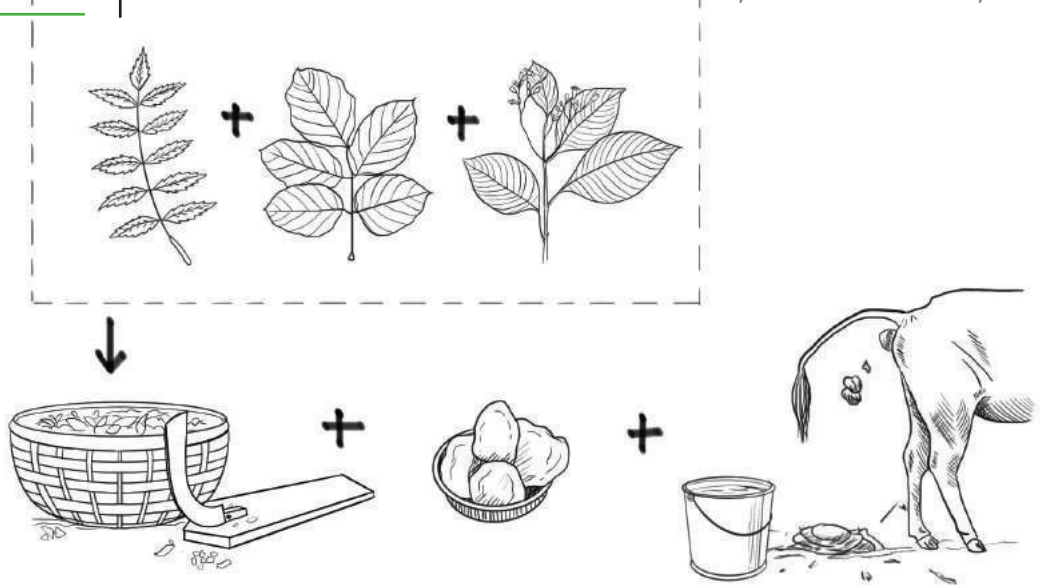
KEY MESSAGES

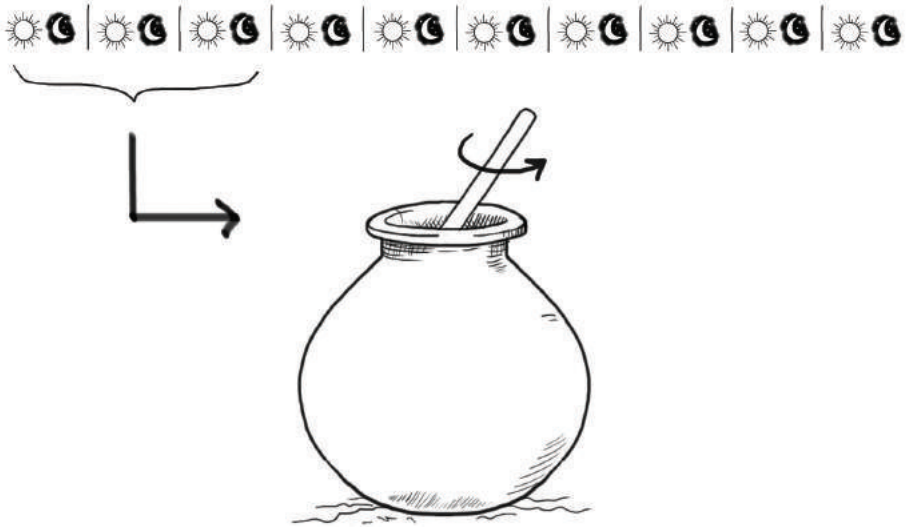
- Mulching protects the soil from soil erosion. Mulching decreases the rate of evaporation from the upper soil and helps
- maintaining the soil humidity.
- Mulching provides a heat insulating layer above the soil. So, the soil never becomes too hot or too cold. This helps
- soil microbes, earthworm to reside comfortably in soil and maintain soil fertility and aeration.
- Mulching prevents the growth of weeds. The weeds that are able to penetrate the mulch can easily be uprooted.

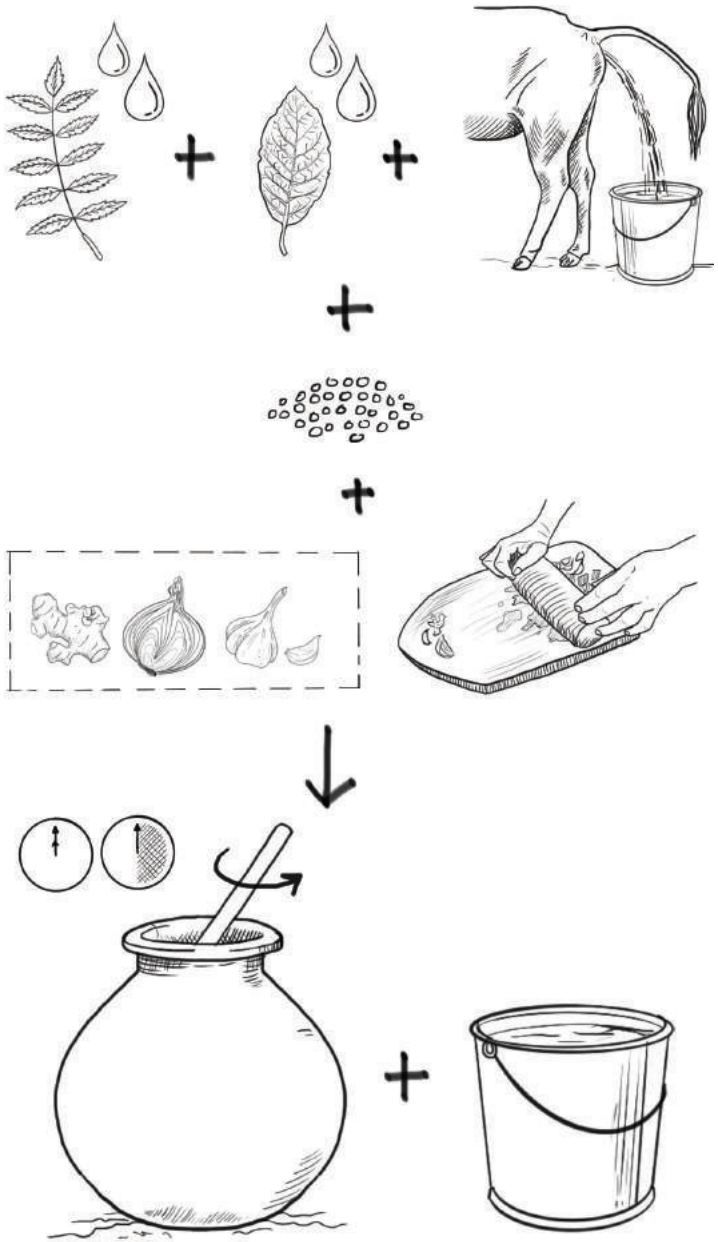
TASK AHEAD

Try these in all the vegetable gardens.

PEST MANAGEMENT - YELLOW STICKY PAPER, PEST REPELLENT, *BRAHMASTRA*







SESSION

09

PEST MANAGEMENT

YELLOW STICKY PAPER, PEST REPELLENT, *BRAHMASTRA*

1.5 HOURS

PROCESS

Yellow sticky paper

- Take a hard paper, colour it yellow. Let it dry.
- Apply grease or glue on the painted board. Hang it or install it on the vegetable field. This is a trap for flying insects.

Pest Repellent

- Cut a kilo each of Neem leaves, Karanj leaves and Akawand leaves into smaller pieces.
- Add these to a mixture of four litres of cow urine, two kilos of cow-dung and 50 grams of jaggery.
- Seal this air-tight for 10 days, stirring once every three days. Add one litre of this final solution to 100 litres of water (for every 1ha) and spray.

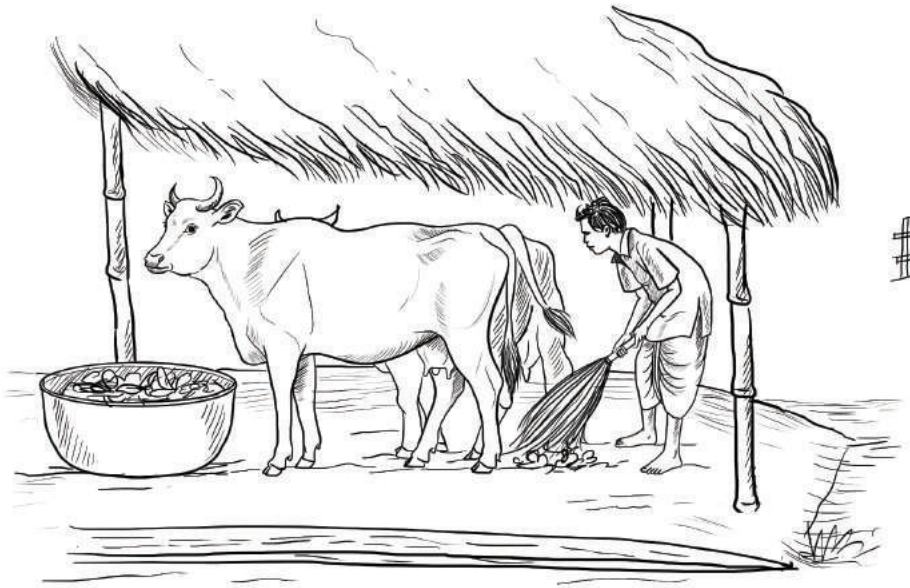
Brahmastra

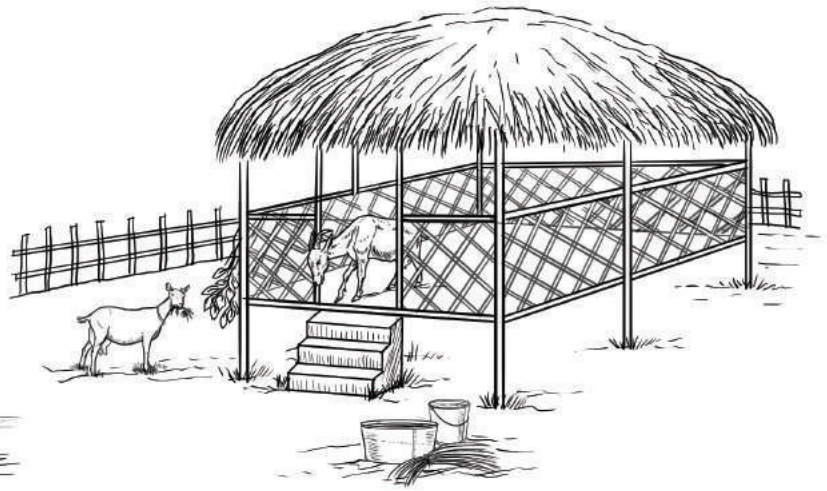
- Mix together in a pot: 500 ml of neem oil, extract of tobacco leaves (100 grams), 100 grams asafoetida, six litre of cow urine, paste of 500 grams garlic and 250 grams ginger and 250 grams of chilly.
- Leave this mixture it for 6 hours.
- Once diluted with at least with 10 times water, this is a strong pest replant.

DISCUSSION POINTS

What are the other methods of bio-pest repellents you know?

LIVESTOCK MANAGEMENT - ANIMAL SHELTER AND FODDER





			6% 	
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			5-8% 	
			5-8% 	

SESSION

10A

LIVESTOCK MANAGEMENT

ANIMAL SHELTER AND FODDER

1 HOUR

PROCESS

- Take the participants to an animal shelter and discuss.
- Prepare the livestock feed by mixing Rice/Wheat/Sorghums/ Millets (40%), Bran/husk (32%), Oilcake (25%), Black salt/ eggshells (3%) – grind it well.

DISCUSSION POINTS

- 1.5 kg of the livestock feed per day (as prepared along instructions stated above) should be given to a cow.
- Additional 1 kg to be given against every 2.25 litre of milk a lactating cow produces. A lactating cow should also be given two litres of extra water per litre of milk in addition to a minimum of two buckets of water.
- Are we giving enough thrust on our livestock? Are we growing fodder for them?
- Each branch of green leaves in the picture denotes 5 kg of green leaves. Each bucket of water is 10~12 litre.
- The requirement of dry fodder per day is mentioned in the table, as per % of the body weight.

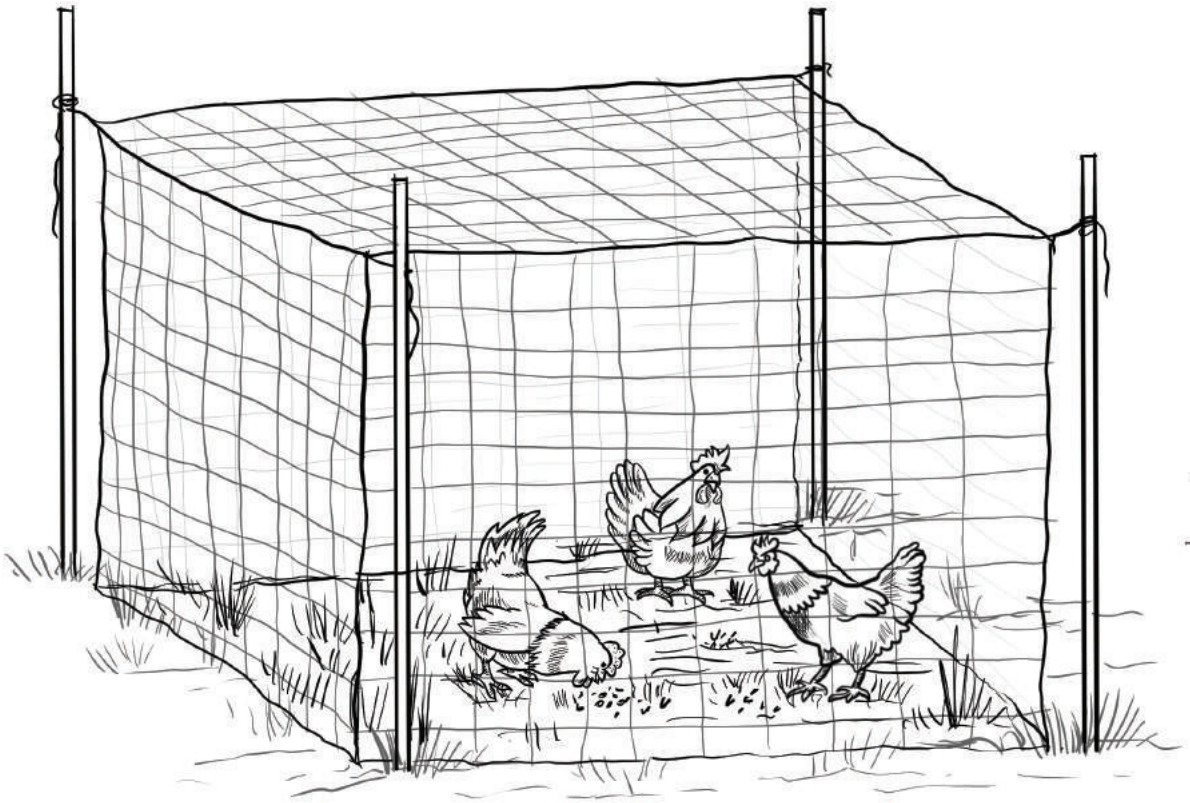
KEY MESSAGES

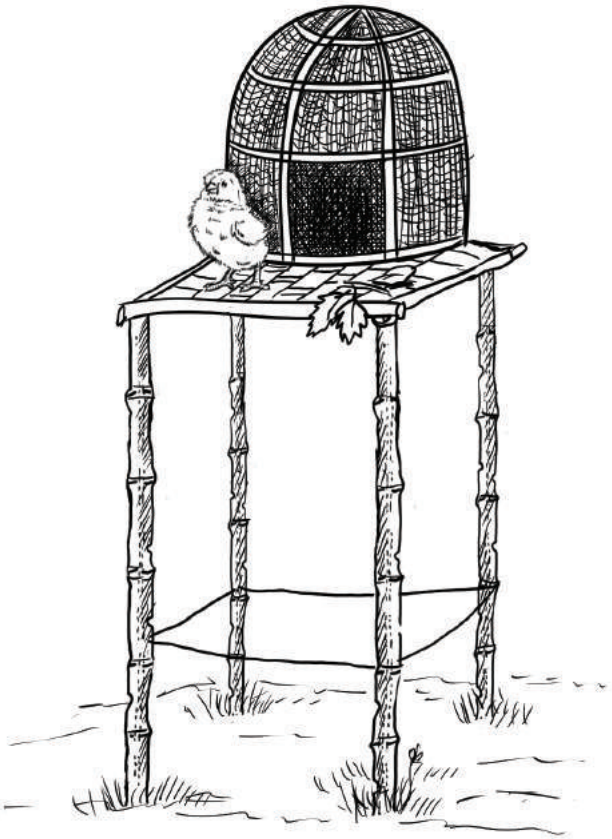
- Water store in the route of the livestock should be there especially for summer season.
- Animals can be fed any dry stem (hay) of rice/millets etc.– provided this is kept in without moisture safely
- The floor should be dry sloppy but not uneven. The urine and dung to be collected regularly for agricultural purpose.
- The shed to be cleaned and disinfect with sprinkling a dilute solution of lime/turmeric water and fumigate with neem, karanj or eucalyptus leaf. To fumigate, the leaves need to be burnt around the cowsheds – the smoke is a disinfectant.

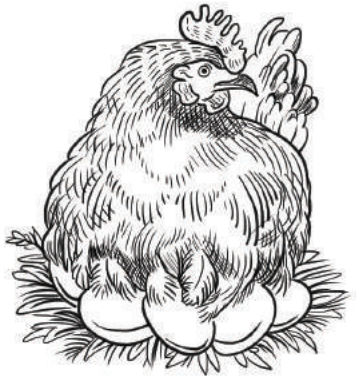
TASK AHEAD

Do a health check of your animal and shelter and make a to do list to share in the next meeting.

LIVESTOCK MANAGEMENT - FREE-RANGE/COUNTRY/DESI/DESHI CHICKEN







SESSION

10B

LIVESTOCK MANAGEMENT

FREE-RANGE/COUNTRY/DESI/DESHI CHICKEN

1 HOUR

PROCESS

Discussion with the flipchart and installing free range/country/desi/deshi chicken unit.

DISCUSSION POINTS

- Initial care of the chicks can be on nursery, later on it can be raised free or in aside a net with grass and seeds grown for them inside the net.
- They can be kept under the net, or away from dogs and cat.
- Chickens should have deworming medicine and vaccine regularly.
- They should be given adequate calcium.
- Roosters can be raised for meat.

KEY MESSAGES

The desi/deshi chicken is of medium weight, high price as met and they produce good amount of egg. They also have a high resistance against diseases. Little care can yield better result.

TASK AHEAD

Conduct a health check-up of chicken and their shelter and make a to-do list to improve practices.

03

This is manual number 3 in a series of 5 manuals

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