WORKSHOP MODULE No 6.

Home & Community Gardens

Permaculture Facilitator's Handbook Module 6. Home & Community Gardens

Notes...

Presentation : Home Gardens

Method : **Presentation and discussion**

Tools : **Garden images, black / white board, markers**

References : **PC Book CH 6 – Home and community gardens**

Objective : **Participants learn and discuss ideas for sustainable & productive gardens**

The home garden plots and market garden plots are the basis for good health and self-sufficiency. Gardens can provide vegetables, and also fruit, spices and medicines for very small cost. By using simple organic methods the garden can be highly productive while the soil's fertility will improve every year.

It is good to start small and make a garden that works well and is protected from animals. Then expand your garden as you need. A lot of food can be grown in a very small garden.

Note: The facilitator can use the images to show good design ideas, integrated techniques and sustainable methods for productive home gardens.

The facilitator can use some of the permaculture principles and home garden examples of principles in action to help explain sustainable home garden concepts. Discuss with the participants and see how many examples they can think of as well.

The following are a few examples to get started, the facilitator can encourage the participants to think about and contribute other ideas.

Diversity	Grow flowers, small medicinal plants and herbs among the vegetables
Energy planning	Make swaled/terraced gardens on sloped land to catch, store and direct water to where it is needed.
Energy cycling	Composting all garden waste
Scale	Start with a few small garden beds and make more over time
Biological resources	Use duck or chicken tractors for pest control and fertilizing
Multiple functions	Living legume fences that provide nitrogen, mulch, animal food and structure for vines
See solutions, not problems	Run excess and stagnant water into ponds that provide food, pest predator habitats and compost materials
Observation	Watch for pests and for predators that eat the pests

Presentation : Good Nutrition

Method : **Facilitator presentation**

Tools : **Photocopies Food nutrition circle PC Book CH 6 – Home & Community gardens,**

References : **PC Book CH 6 – Home and community gardens**

Objective : **Participants understand about good nutrition and home gardens**

Growing a wide range of vegetables, grains, fruit and nuts provides important nutritional needs for families, especially for children. The most important time period for good nutrition is when mothers are pregnant and for babies. Other family members need to help to make sure that they are eating as well as possible. This will reduce the chances of babies becoming sick and dying and will lead to a much healthier life later on.

Note: The facilitator can explain what good nutrition is and the connections between home gardens, good soil, good nutrition and good health. They can encourage a discussion on the topics by first asking the participants' opinions. Reference the "Good nutrition section" at the start of PC Book CH 6 – Home and community gardens for more detailed information.

Good nutrition leads to:

- Fewer health problems
- Faster recovery after sickness
- Children grow up stronger and healthier and they have fewer health problems later in life
- Longer lives
- More energy for work and for play. Therefore more can be achieved in a day
- The ability to learn and concentrate increases. This is very important for children at school. Better food leads to smarter people

What is good nutrition?

People need to eat a wide variety of foods to be healthy. This means every day eating vegetables, fruit, eggs and meat as well as beans and grains. A wide range of healthy organic vegetables grown at home will provide many vitamins, minerals, proteins, energy and oils.

Healthy soils are needed for the vegetables, fruit, grains and even animals to provide food that is full of vitamins, minerals and protein needed for healthy bodies. If the soils are poor then the produce will also be low quality.

Note: The facilitator can hand out photocopies of the food nutrition circle and encourage a discussion about what it means and how it can be achieved with local produce.

Creative Thinking : Good Nutrition from a Garden

Method : **Group and workgroup brainstorms**

Tools : **Black / white board or large paper, markers**

References : **PC Book CH 6 – Home and community gardens**

Objective : **Participants create a nutritional sources from garden produce table**

Step 1

Using something like the table below, the facilitator can ask the participants to identify different nutritional needs and why each nutritional need is important. (Table 1.)

Step 2

Ask the participants to split up into smaller work groups and have each workgroup come up with sources of nutritional needs, first from home gardens and then from other local sources.

The answers listed below are only supplied as guidelines for the facilitator should the participants need help or prompting to develop ideas and discussions.

- **Vitamin A (Good for eyes)** - Taro leaves, sweet potato leaves, cassava leaves, pumpkin leaves, cabbage, green leaf vegetables, carrot, mango, banana, papaya, moringa, sesbania.
- **Vitamin C (Healthy body)** - Green papaya, lemons, oranges, manderins, pomelo, sweet peppers, tomato, pineapple, guava, mango, cashew fruit, tamarind.
- **Protein (Strong bones and muscles)** - Peanut, beans, peas, yam beans, pigeon peas, watermelon seeds, banana tubers, cashew nuts, candle nuts, moringa seed pods, sesbania seed pods. Energy (Fuel for people) - Corn, sweet potato, cassava, taro, yam, potato, rice, pumpkin, avocado, ripe coconut, jackfruit, breadfruit, bananas, sugarcane.
- **Fats and Oils (keeps your insides healthy)** - Avocado, coconut, peanuts, candle nuts, cashew nuts, soybeans.
- **Iron (strength and stamina)** - Mustard, amaranth, green leaf vegetables, banana heart, cassava leaves, sweet potato leaves, dried beans.
- **Vitamins and minerals (good health, good body function and vitality)** – The foods listed for Vitamin A & C provide other vitamins and minerals, as well as eggplant, choko, spinach, okra, pumpkins, cucumbers, watercress, bitter gourd, onions and radishes and fruit such as watermelon, custard apple and passion fruit
- **Some trees, like Sesbania and Moringa, also provide very nutritional leaves and pods.** Their leaves can be dried, ground and added to rice, soup, rice porridge and more. If they are mixed with small amounts of coconut oil, sea salt and sugar they will provide good basic nutrition
- **Meat, fish and eggs provide lots of protein, iron and some oils** and they are important to eat most days if possible
- **Dry beans, tempe and tofu also provide protein**

- **Bamboo shoots provide many different vitamins and minerals**
- **Mushrooms provide protein and many vitamins and minerals**
- **Traditional medicines, especially small medicine plants like aloe vera and mint** can be grown close to the house with flowers and vegetables.
- **Spices and herbs like chilli, ginger, garlic, pepper, coriander and basil are also important to eat for healthy bodies,** and are good to use to help fight some sicknesses.

Step 3

After each workgroup has created their lists ask them to write the lists on the board (Table 2.) while presenting the results to the entire group for feedback and other suggestions. The facilitator can use the information provided above to add to the tables if necessary. This will add to the participants' knowledge base.

Nutritional Need	Why it is needed
Vitamin A	Good for eyes
Vitamin C	Healthy body. Needed every day
Other vitamins and minerals	Good health, good body function and vitality
Iron	Strength and stamina
Protein	Strong bones and muscles
Fats and oils	Keep your insides healthy
Energy (carbohydrates)	Fuel for people
Medicines	Heal our body

Table 1. Nutritional need & why it's needed

Home Garden Source	Other local source
Taro leaves, sweet potato leaves, cassava leaves, pumpkin leaves, cabbage, green leaf vegetables, carrot, mango, banana, papaya, moringa, sesbania.	Juicy tubers, radishes
Green papaya, lemons, oranges, mandarins, pomegranate, sweet peppers, tomato, pineapple, guava, mango, cashew fruit, tamarind.	Tangerines, Bali oranges, snake skin fruit, mangosteen, star fruit, mahkota dewa
Eggplant, chokos, spinach (kangkung), okra, pumpkins, cucumbers, watercress, bitter gourd, onions and radishes, custard apple, passion fruit.	Watermelon, melon
Mustard, amaranth, green leaf vegetables, banana heart, cassava leaves, sweet potato leaves, dried beans.	Spinach (Kangkung), sago.
Peanuts, beans, peas, yam beans, pigeon peas, watermelon seeds, banana tubers, cashew nuts, candle nuts, moringa seed pods, sesbania seed pods.	Avocado, coconut
Avocado, coconut, peanuts, candle nuts, cashew nuts, soybeans.	
Corn, sweet potato, cassava, taro, yam, potato, rice, pumpkin, avocado, ripe coconut, jackfruit, breadfruit, bananas, sugarcane.	
Chilli, ginger, garlic, pepper, coriander and basil.	Sambi roto, sirih leaf, sembung leaf, katu leaf, turmeric, kencur (greater galinger)

Table 2. Where they can be found

Creative Thinking : Design a Food Calendar

Method : **Presentation and workgroup brainstorms**

Tools : **Black / white board, markers, large paper**

References : **PC Book CH 6 – Home and community gardens**

Objective : **Participants create their own food calendars**

The goal of this exercise is to link good nutrition and food availability with what is locally grown and develop a food calendar, which will show how good nutrition and food availability can be better achieved all year round.

Note: In the "Succession plantings" section of the PC Book CH 6 – Home and community gardens there is a detailed description of how to make local food calendars, with examples.

Step 1

The facilitator can explain the process of making a food calendar including:

- How it works
- The connection with good nutrition
- The connection with food availability all year
- How it can be used for garden planning

Use visual examples to help explain this.

Step 2

Ask the participants to divide into smaller work groups (see Resource Book) and have each workgroup make their own food calendars - one for when to plant and one to when to harvest.

Hints

- It may be easier for the participants to develop a harvest calendar first to create year round harvests for a range of foods, and then create the planting calendar from the harvest calendar
- This exercise may create planting times and harvest times that conflict with traditional times. This will result in some interesting discussion. It is important to preserve local traditions but also important to make positive change when it improves health and nutrition

Step 3

After each workgroup has created their calendars, they can present them to the entire group for feedback and other suggestions. The facilitator can also make the link to how good food storage will improve year-round food availability.

Presentation : Food Storage & Preservation

Method : Facilitator presentation

Tools : Images, markers, black / white board

References : PC Book CH 6 – Home and community gardens,
PC Book CH 12 – Appropriate Technology

Objective : Participants learn about storage and preservation techniques

This presentation introduces techniques and simple technologies for improving food storage and preserving excess food for later use.

The technologies are sustainable and able to be used in poor rural areas. The facilitator can focus on the most appropriate ideas for the participants, but it is also good to introduce new ideas for future use. See PC Book CH 12 – Appropriate Technology for detailed description and illustrations.

Storing and using the vegetables properly is very important. Good storage means that vegetables last much longer and keep more vitamins. Fewer vegetables will go rotten and there is more chance of selling them. For most root vegetables the best option is to store them in the ground until needed. But for other vegetables a good storage method is essential.

After harvest, clean and remove any rotten leaves. Store the vegetables in a cool place that is out of the sun and protected from insects and animals.

Three good types of containers are:

- **Clay pots are excellent for small vegetables and green leaf vegetables.** Cover the top with a damp cloth and use string or rubber bands to tie it on. Keep away from the sun. The vegetables will stay fresh for many days longer.
- **In Africa some people use two clay pots, a smaller pot within a larger pot.** A 2cm layer of wet sand is placed between the 2 pots. Cover and keep out of the sun. This technique works even better than 1 clay pot.
- **A Coolgardie Safe.** The Coolgardie safe is a simple way to keep food colder as well as stopping animals from eating it and insects from touching it. The Coolgardie safe can be hung from a roof or placed on a legs or a stand. It is important to put it outside in a place that gets wind.

If many vegetables are picked at once or can't be sold or eaten there are methods to use and store the vegetables for later. A **Solar Drier** can be used to dry vegetables. There are many different types. The type that is made and used depends on the materials, time and money available. They can also be used for drying fish, meat and fruit.

Solar driers are good because:

- They stop insects and animals from eating the food.
- They stop insects and animals from touch the food and spreading disease to people.
- The food dries much faster. Fish that takes 1 week to dry normally takes 2 days in a solar drier. Much more produce can be dried in the same amount of time.
- Less food goes rotten. Any food that can't be sold or eaten can be dried and saved for later use.
- The nutrients in the food stay in the food.

Vegetables and fruit can be preserved as sauces, pastes, pickles and jams. Some examples:

- Sauces: tomato, chilli, tamarind.
- Paste: peanut, candlenut, cashew.
- Pickles: cucumber, onions, capsicum, cabbage, mango, limes, bamboo.
- Jams: All fruit except watermelon

Some vegetables can be dried and stored in oil for later use: for example eggplant, capsicum, chilli and tomato.

Creative Thinking : Food Storage & Preservation Ideas

Method : **Participatory brainstorm, group discussion**

Tools : **Paper, markers, black / white board**

References : **PC Book CH 6 – Home and community gardens**

Objective : **Participants create a list of storage and preservation techniques**

Step 1

With the entire group, conduct a brainstorm to create a list of the food that is grown in home gardens. (Table 1.) **Note**: Write the participant's answers on large pieces of paper or white / black board so that everyone can see and comment.

Step 2

Once the list of home grown foods is done, ask the participants to divide into smaller work groups. The groups can then work out:

- How the fresh food is normally stored
- If the storage could be improved
- How the fresh food is or could be preserved – dried, pickled, sauce, paste etc
- What simple technologies could be used to achieve better storage or preservation – solar drier, Coolgardie safe, pedal powered grinder (table 2.)

The answers listed below are only supplied as guidelines for the facilitator should the participants need help or prompting to develop ideas and discussions. The facilitator may need to help with some of the simple technological information.

Type of food
Snake Beans
Corn
Tomatoes
Cucumbers
Capsicums
Eggplant
Ginger
Coriander
Soya beans

Table 1.

How is it stored?	Can it be improved?	How is or could the food be preserved?	What simple technologies could help with storage or preservation?
Keep in cold place	yes	Drying the seed	Every morning put outside to remove dew
Keep in cold place	yes	Drying	Put above the stove
Keep in cold place	yes	Make it dry	Food dryer
Keep in cold place	yes	Make it dry	Food dryer
Keep in cold place	yes	Make it dry / powder	Food dryer and grinding
Keep in cold place	yes	Make it dry	Food dryer
Keep in dry place	yes	Make it dry / powder	Food dryer and grinding
Keep in dry place	yes	Make it dry / powder	Food dryer and grinding
Keep in dry place	yes	Make it dry, milk powder, tofu, tempe	Food dryer and grinding

Table 2.

Step 3

After each workgroup has created their lists, they can present the results to the entire group for feedback and other suggestions.

Creative Thinking : Garden Location & Design

Method : **Participatory brainstorm, group discussion**

Tools : **Paper, markers, black / white board**

References : **PC Book CH 6 – Home and community gardens**

Objective : **Participants create a checklist and response list for location factors**

Note: The purpose of this exercise is for participants to consider different factors that affect the location and design of garden beds and find techniques for positive responses to the factors.

Step 1

With the entire group conduct a brainstorm to create a checklist of location and design considerations. (Table 1.) Write the participant's answers on large pieces of paper or white / black board so that everyone can see and comment.

Step 2

Once the list is done, ask the participants to split up into smaller work groups. The groups can then come up with solutions and good design ideas to deal with the different considerations (Table 2.).

The answers listed below are only supplied as guidelines for the facilitator should the participants need help or prompting to develop ideas and discussions. The facilitator may need to help with some of the simple technological information.

Considerations
Sunlight
Water supply
Soil
Wind
Slope
Tree root competition
Proximity to house
Animals
Insect problems
Excess water on ground
Protection for seedlings

Table 1.

Location & Design Solutions
Choose or create area of full sun to part shade
Close to water supply or bring water supply to garden
Test soil type, apply appropriate improvement techniques, use natural fertilizers and mulch
Living fences, windbreaks, legume rows
Swales, terraces
Choose treeless site if possible, or remove big trees if necessary. Only plant small productive trees close to garden
As close as possible
Strong fence, living fence, make chicken house to stop them entering garden areas
Create Pest predator habitats – flowers, perennial plants ponds, rotting logs, rocks
Raised garden beds, run water into trenches, ponds or pits and grow water loving plants
Small nursery

Table 2.

Presentation : Garden Maintenance

Method	**: Facilitator presentation**
Tools	**: Images, photocopies of weed control / water saving techniques from: PC Book CH 6 – Home & community gardens**
References	**: PC Book CH 6 – Home & community gardens; PC Book CH 4 – Soils; PC Book CH 9 – Integrated Pest Management**
Objective	**: Participants learn sustainable, organic garden maintenance methods**

Preparation

Photocopy enough of the adding plant food, pest control and weed control sections from **PC Book CH 6 – Home & community gardens** so that each participant can take one set of references home.

Adding plant food is explained in more detail in **PC Book CH 4 – Soils**, and pest control is explained in more detail in **PC Book CH 9 – Integrated Pest Management**

Notes:

- The facilitator can use images such as photos or illustrations to help explain the following topics. Local examples for each topic will also help to make the clear. Allow as much discussion time as is needed.
- If making plant food and integrated pest management are also part of the workshop, then only discuss these in relation to home gardens and leave the specific details for the other parts of the workshop.
- Hand out the photocopies at the end of the exercise.

Adding Plant Food

- Compost
- Liquid compost
- Mulch
- Use EM – Effective Microorganisms
- Integrating composts with garden design

Water Saving Techniques

- Always water very early in the morning or late afternoon.
- Garden borders
- Mulching
- Windbreaks
- Bamboo or plastic water bottle watering pipes.
- Bamboo irrigation

Weed Control

- Mulching
- Plant ground covering vegetables
- Make a "weed barrier" around the outside of the vegetable plots
- If you turn over the soil less, then fewer weeds will grow.
- Animal tractors.
- Any weeds that do grow should be removed before they produce seeds.
- Grow productive weeds.

Pest Control

- Pest control in the garden is not just about removing pests.
- To control pests sustainably involves using many different techniques that result in rarely having to use pesticides at all - techniques like improving soil quality, encouraging pest predators and preventing pests.
- If pesticides are needed, natural pesticides should be used, not chemical pesticides.

Note: If the garden is changing from using chemical sprays to organic methods, then pesticides will need to be used as often as chemical pesticides until other pest control methods such as soil quality, encouraging pest predators and preventing pests restore a better balance. Then even natural pesticides only need to be used rarely.

Field Activity : Creative Gardens use Natural Patterns

Method	**: Design and make natural shaped garden beds**
Tools	**: Photos or illustrations of different shaped garden beds, pens, paper, tools for making garden bed, garden border materials, mulch**
References	**: PC Book CH 6 – Home and community gardens**
Objective	**: Participants use their creativity and natural patterns in design**

Garden beds don't have to be made in straight lines. The beds can be any shape that the designer decides. The shape and slope of the land always varies and if the designer works with it then the land will help to show the shape of the beds. Working with natural patterns and edges will increase the potential productivity of the land. It will also help to increase diversity and reduce the severity of pest problems.

- On sloped land swales and terraces are shaped with the land to catch and store water and mulch.
- On gently sloped land, different patterns can make use of wet season rains.
- Edges occur naturally on the land but may also occur due to human development. All edges can be used and all usage of edges will increase production and diversity. All paths have edges on both sides that are not often used for production - planting path edges with fruit and flowers is beneficial

Preparation

The facilitator will need to identify a site to make the garden beds. Garden borders such as rock, bamboo, wood etc will be needed and it is good to have mulch, and even compost if possible ready before running the exercise, to be applied straight away.

Running this exercise

Step 1

Ask the participants to draw some different shapes to make garden beds. The shape can be anything they want but the width of the bed should be around 1 – 1 ½ m at any point. This is wide enough to hold the water and soil but thin enough to prevent the need to step on the beds. When complete, put the designs into a hat and have a participant randomly choose 1 design to make per 5 students. More can be chosen if time permits.

Step 2

Create the garden beds. Each bed should be raised to allow drainage and bordered with the materials provided. Apply the compost and mulch at the end to complete the process.

Step 3

Review the process with the participants and discuss how they think natural patterns can be used on a larger scale. Write the participant's answers on large pieces of paper or white / black board so that everyone can see and comment / input.

Presentation : Making Use of Space & Time

Method : **Presentation, visual examples, field walk**

Tools : **Visual displays, field walk, black / white board, markers**

References : **PC Book CH 6 – Home and community gardens**

Objective : **Participants learn concepts that can improve garden productivity**

By making more efficient use of space and time gardens will become more intensive, meaning that they will be able to produce more in a smaller space.

Preparation

- Read the 'planting methods' and 'planting times' section of **PC Book CH 6 – Home and community gardens** in order to be familiar with the concepts. Some practical experience is also important.
- The facilitator can walk around the community and identify different examples to demonstrate the topics in the exercise.

Running the exercise

The facilitator can use visual displays such as photos or illustrations to help explain the following topics. Local examples for each topic will also help to make them clear.

The facilitator can introduce each of the following concepts and then ask the participants to give local examples. Allow as much discussion time as is needed.

Making use of space

- Use different plant heights
- Changing garden plot heights
- Integrating crops together
- Vegetable combinations
- Vegetable plot and paddy integration

Making use of time

- Succession plantings
- Use different plant growth lengths
- Crop rotation
- Integration with animals

When the discussion is completed, take the participants on a field walk to show them different examples in action. Ask the participants to find more for themselves and explain them to the other participants.

Presentation : Designing & Building a Garden System

Method : **Facilitator Presentation and group discussion**

Tools : **Images of fully developed integrated garden systems**

References : **PC Book CH 6 – Home and community gardens**

Objective : **Participants learn the components of a sustainable home garden**

Ideally, if time during the workshop allows, the sixteen (16) remaining activities in this module will ALL BE CONDUCTED during the workshop as an integrated exercise. If time does not allow for this, then the facilitator should choose the most relevant components to deliver. Note: It is important for the participants to be part of creating integrated systems, not just individual garden beds. The Garden Exercises include:

- Ex. 1 : Design the Garden
- Ex. 2 : Make Raised Garden Beds
- Ex. 3 : Mulch the Garden Beds
- Ex. 4 : Construct & Plant a Living Fence
- Ex. 5 : Plant Seedlings
- Ex. 6 : Create a Small Nursery
- Ex. 7 : Create Compost & Mulch Area
- Ex. 8 : Use Compost, Mulch & Liquid Compost
- Ex. 9 : Use Water Saving Devices
- Ex. 10 : Make Trellising
- Ex. 11 : Construct Ponds
- Ex. 12 : Make Swales / Terraces
- Ex. 13 : Construct Banana Pits
- Ex. 14 : Make & Use a Chicken Tractor
- Ex. 15 : Weed control for the Garden
- Ex. 16 : Pest control for the Garden

Develop a different aspect of the garden project on different days so that over the duration of the course the garden will be added to step-by-step and the participants will gain a full understanding of the process of how to design, implement and maintain a healthy garden.

Preparation

- **Identify land to use** – The components developed during these activities should be able to be maintained as an ongoing demonstration site, not just for the time of the workshop, therefore the land that is used needs to be available long-term. It will take around 2 years to show the real results of soil improvement and clearly demonstrate improved productivity.
- **Identify the water source for the gardens and other components** – The garden will need a regular and easy to access water source.
- **Prepare other materials and tools needed** – There should be enough materials and tools for all of the workshop participants to be actively involved in all of the hands-on activities chosen for this series of exercises. If needed, participants can be asked to bring their own tools to use for various exercises.
- **The importance of the design step** – The following exercise 'Designing the Garden' is essential no matter how many of the other exercises are used.

Running this exercise

Introduce to the participants each of the activities that will be part of the 'Garden Design and Building' process over the duration of the workshop. Answer any questions they may have about the process that will be undertaken. Encourage them to participate by preparing seeds, cuttings, composting and mulching materials that can be used later as the process unfolds.

Field Activity : Design a Garden System (Garden Ex. 1)

Method : **Participatory Field Activity**

Tools : **Pens, paper and clip board and / or 3-D modeling materials**

References : **PC Book CH 6 – Home and community gardens**

Objective : **Participants develop the Garden System to be implemented**

Note: This exercise is essential no matter how many other exercises in this series follow.

Participatory site survey

Take the participants to the site that has been chosen for the demonstration gardens to survey the land and other resources that can be used such as water source, mulch materials etc.

Groups design the garden project

Divide the participants into groups and ask each group to create their garden designs. Note: these designs should include all the elements of a sustainable and productive garden (as follows), even if only some of those aspects are put into practice at the demonstration.

Components include:

- Garden Beds & Pathways
- Small Nursery
- Trellising
- Swales / Terraces
- Living Fences
- Banana Pits
- Ponds
- Compost, Liquid Compost & Mulch Storage

Considerations include:

- Access to water
- Sunlight
- Access to the house
- Access to mulching materials
- Wind
- Distance from tree roots

The designs can be on paper or a simple 3-D model, but they do not need to be too detailed as the details of the designs will become clear as they are implemented in the development of the garden and related components. **Note:** The designs will need to last the duration of the workshop so 3-D models will need to be protected from the rain.

Choose the design to implement

- Each group presents their design to the whole group and explains their ideas
- Then the whole group can choose the final design. Each participant can vote for their favorite design other than their own group's design.
- The chosen design is used as the template for the garden practical exercises.

See PC Book CH 6 – Home & Community Gardens and other exercises in this book for reference and ideas.

Field Activity : Make Raised Garden Beds (Garden Ex. 2)

Method : **Participatory Field Activity**

Tools : **See description below & PC Reference Manual**

References : **PC Book CH 6 – Home & community gardens**

Objective : **Participants learn about & practice making creative raised garden beds**

Running this exercise

- From the chosen design, copy and mark out the garden beds to make. Make sure that the garden beds are 1 – 1 ½ m wide at any point. This is wide enough to hold the water and soil but thin enough to prevent the need to step on the beds. Paths are also important and should be wide enough for easy access.
- Create the garden beds. Each bed should be raised to allow drainage and bordered with the materials provided.
- If necessary, dig some soil from the paths to raise the height of the garden beds. But make sure that the paths will drain easily after heavy rains.

See PC Book CH 6 – Home & Community Gardens for reference and ideas.

Field Activity : Mulch the Garden Beds (Garden Ex. 3)

Method : **Participatory Field Activity**

Tools : **See description below & PC Reference Manual**

References : **PC Book CH 6 – Home & community gardens**
PC Book CH 4 - Healthy Soil

Objective : **Participants practice mulching garden beds**

Running this exercise

- Divide the participants into workgroups, and have each group choose a target area for their mulching exercise (i.e. trees, beds, paths, seedlings).
- Ask the participants to identify and collect various local mulching materials.
- Prepare the mulching materials – bulkier materials should be chopped up
- Have the groups apply the mulch at the various locations

See PC Book CH 6 – Home & Community Gardens & PC Book CH 4 - Healthy Soil and other exercises in this book for reference and ideas.

Field Activity : Construct & Plant a Living Fence (Garden Ex. 4)

Method : **Participatory Field Activity**

Tools : **See description below & PC Reference Manual**

References : **PC Book CH 6 – Home & Community Gardens**
PC Book CH 10 - Animal Systems

Objective : **Participants learn about & practice making a living fence**

Preparation

- Prior to running this exercise the facilitator should either identify and prepare and / or ask the participants to identify and prepare cuttings that can be used for creating the living fence.
- **Appropriate plants for living fences include:**
  - Moringa
  - Cactus
  - Tall grass
  - Flamboyan
  - Lamtoro
- **Other materials that can be used for creating the fences include:**
  - Stones
  - Bamboo
  - Old roofing materials
  - Wood
  - Old fishing nets

Running this exercise

- Ask the participants to identify, gather and use local materials to build a strong fence around the garden.
- On the inside of the fence (approximately 10 cm from the fence line) the participants can plant legume tree cuttings or seeds - very close together, 5 – 10 cm apart, so that they will become a strong living fence within 1 to 2 years.
- The fence can be used to grow vines on as well.
- Thought should also be given to stopping chickens that may fly over the fence. A chicken house and yard is a good solution, clipping chicken wings is another.

Note: This should be one of the first exercises as it provides protection for future work.

See PC Book CH 6 – Home & Community Gardens, PC Book CH 5 - Seed Saving & Nurseries & PC Book CH 10 - Animal Systems and other exercises in this book for reference and ideas.

Field Activity : Plant Seedlings (Garden Ex. 5)

Method : **Participatory Field Activity**

Tools : **See description below & PC Reference Manual**

References : **PC Book CH 5 – Seed Saving & Nurseries**

Objective : **Participants learn about & practice planting seedlings**

Most or all of the participants will have planted seedlings at some stage in their lives but following the instruction in the PC Reference Book, and conducting this exercise as a participatory activity is still important because:

- There may be a step that they hadn't thought of before
- There may be something that they could improve
- From the participants sharing their own knowledge everyone, including the facilitators, will learn more

Preparation

- Prior to running this exercise the facilitator should either identify and prepare and / or ask the participants to identify and prepare the seedlings that will be used in the demonstration gardens.
- Vegetables that grow better when the seeds are planted in a nursery are cabbage, tomatoes, green-leaf vegetables, spinach, eggplants, capsicum, onions, chilli, cucumbers, peas, okra, lettuce and mustard.
- Vegetables that grow better if the seeds are planted straight into the ground are pumpkins, corn, beans, peanuts, radish, sunflowers, luffa, squash, gourds and melons.

Running this exercise

- With all the participants as a group review the planting plan for the garden that they have chosen.
- Then divide the participants into smaller work groups who can focus on planting different parts of the garden.
    - Small seeds should be planted about one finger knuckle deep in the soil
    - Large seeds should be planted about two finger knuckles deep
- When they are done, the whole group can work together to water the seedlings in the new nursery and plant some more seedlings in the demonstration garden.

See PC Book CH 5 – Seed Saving & Nurseries and other exercises in this book for reference and ideas.

Field Activity : Create a Small Nursery (Garden Ex. 6)

Method : **Participatory Field Activity**

Tools : **See description below & PC Reference Manual**

References : **PC Book CH 5 – Seed Saving & Nurseries**
PC Book CH 6 – Home & Community Gardens

Objective : **Participants learn about & practice making a small nursery**

If there is a large nursery near the garden site then it can be used for growing the vegetable seedlings for the garden. If not then a small nursery can be made.

- It needs to be inside the garden fence and have easy access to water.
- It can be located close to the compost and liquid compost areas.

Preparation

- Collect construction materials and shade materials for the nursery roof. E.g. bamboo, wood poles, coconut leaves etc.
- Collect the tools needed for making the construction
- Collect the materials needed for the potting soil mixture
- Prepare plant containers
- Prepare seeds and propagates for planting

See the "Small nurseries" section in PC Book CH 6 – Home & Community Gardens for detailed information.

Running this exercise

With all the participants as a group decide on the location, size and design of the nursery.

Then divide the participants into 2 groups.

- **Group 1**: Focuses on the nursery construction
- **Group 2**: Prepares soil mixtures, containers, seeds and seedlings

Ask each group to plan and implement their tasks. When they are done, the whole group can work together to water the seedlings in the new nursery and plant some more seedlings in the demonstration garden.

See PC Book CH 5 – Seed Saving & Nurseries & PC Book CH 6 – Home & Community Gardens and other exercises in this book for reference and ideas.

Field Activity : Create Compost & Mulch Area (Garden Ex. 7)

Method : **Participatory Field Activity**

Tools : **See description below & PC Reference Manual**

References : **PC Book CH 6 – Home & Community gardens**
PC Book CH 4 - Healthy Soil

Objective : **Participants learn about & create a storage area close to the garden**

The size of the storage area needed for the ongoing compost, liquid compost and mulching materials will depend on the size of the garden.

Preparation

- Prepare all the materials and storage bins as described below.

Running this exercise

As mentioned earlier the size of this storage area will depend on the size of the garden.

A minimum should include the following:

- **3 compost bays, 1 m x 1 m size for each bay**
  - Construct 3 sides – use a fence as the back side for all the bays if possible, and leave the front open.
  - A removable front will help but is not essential.
  - Use whatever local materials are available for construction – bamboo, wood, stone, large planting cuttings like cassava or gamal etc.
- **3 mulch and compost material collection bays**
  - The size will vary depending on the space available, but they should be a minimum of 1 m x 1 m.
  - Construct in the same method as the compost bays.
- **1 liquid fertilizer drum**
  - 200 liters or the equivalent amount using other containers.
  - A liquid compost container can easily be made out of ferro cement if drums or large containers are not available.

If there is time in the workshop the next step is to collect the materials and use them to make the compost and liquid compost.

See **PC Book CH 4 - Soil Improvement** and other exercises in this book for detailed instructions on how to do this.

Field Activity : Use Compost, Mulch & Liquid Compost (Garden Ex. 8)

Method : **Participatory Field Activity**

Tools : **See description below & PC Reference Manual**

References : **PC Book CH 6 – Home & Community gardens**
PC Book CH 4 - Healthy Soil

Objective : **Participants practice composting, using liquid compost & mulching**

Preparation

- Depending on the objectives and other components of the lesson plan for the workshop, the facilitator should review the relevant sections of this book and the PC Reference Manual to decide which of the Composting, Mulching and Liquid Compost exercises are most applicable to run at this time.
- The lists of materials and tools to be prepared are provided in the individual exercise descriptions.

- Follow the instructions in any of these exercises from Module 4. Healthy Soil:
    - Mulching a Garden Bed
    - Make a Quick Compost Heap
    - Make Liquid Fertilizer
    - Use Liquid Fertilizer

Running this exercise

- With all the participants as a group discuss the plan for using the compost, liquid compost and mulching materials in the demonstration garden.
- Then divide the participants into 2 groups
    - **Group 1**: Focuses on applying the compost
    - **Group 2**: Focuses on gathering and applying the mulch materials
- Ask each group to plan and implement their tasks.
- When they are done, the whole group can work together to apply the liquid compost throughout the demonstration garden.

See PC Book CH 4 - Healthy Soil & PC Book CH 6 – Home & Community Garden and other exercises in this book for reference and ideas.

Field Activity : Use Water Saving Devices (Garden Ex. 9)

Method : **Participatory Field Activity**

Tools : **See description below & PC Reference Manual**

References : **PC Book CH 6 – Home & Community gardens**

Objective : **Participants learn about & create water saving devices**

Preparation

Prepare the following materials:

- Bamboo poles at least 10 cm wide.
- Plastic 1.5 liter water bottles
- Hammer and nails, knife and machete
- Tool for poking small holes through the nodes of the bamboo

Running this exercise

With all the participants as a group discuss the benefits and techniques for using water saving devises in the demonstration garden. The pictures in the "Water saving techniques" section of PC Book CH 6 – **Home & Community Garden** provide simple explanations for how to make the watering pipes.

Divide the participants into 2 groups

- **Group 1**: Focuses on creating a bamboo water saving device system
- **Group 2**: Focuses on creating a plastic bottle water saving device system

Ask each group to plan and implement their tasks. **Remind them to install the systems 40 – 50 cm apart and at least 15 cm deep in the soil.**

When they are done, each of the work groups can explain to the others the techniques that they used to implement their water saving device systems.

The facilitator should take this opportunity to also explain to the participants that some watering onto the soil will still be required, especially for seedlings before their roots are established and deep - however over time a lot of water will be saved by using these techniques.

See **PC Book CH 6 – Home & Community Garden** and other exercises in this book for reference and ideas.

Field Activity : Make Trellising (Garden Ex. 10)

Method : **Participatory Field Activity**

Tools : **See description below & PC Reference Manual**

References : **PC Book CH 6 – Home & Community gardens**

Objective : **Participants learn about & create shade trellises**

Preparation

Identify and prepare and / or ask the participants to identify and prepare the tools and materials to build the trellises and cuttings that can be used for planting on the trellises.

- **Appropriate plants for trellises include:**
  - Moringa
  - Cactus
  - Tall grass
  - Flamboyan
  - Lamtoro

- **Materials that can be used for creating the trellises include:**
  - Wood
  - Old fishing nets
  - Bamboo
  - Old roofing materials

Running this exercise

With all the participants as a group discuss the benefits and techniques for using trellising in the demonstration garden.

- The design and shape of the trellises will depend on the garden size and shape and the creativity and needs of the people making them
- Trellises can be permanent, temporary or moveable
- Fences can be adapted to make trellises

Ask the participants to plan the trellises for the garden system. Remind them to beware of creating too much shade in the garden - some shade is good for plants like lettuce and green leaf vegetables but not total shade. Pictures in the PC Book CH 6 – Home & Community Garden provide examples of various trellis techniques if needed.

Then divide the participants into 2 groups

- **Group 1**: Focuses on applying building the trellises
- **Group 2**: Focuses on preparing the plants to be planted on the trellises

Ask each group to plan and implement their tasks.

When they are done, the whole group can work together to plant the various plants that have been prepared for the trellises.

See **PC Book CH 6 – Home and community gardens** for reference and ideas.

Field Activity : Construct Ponds (Garden Ex. 11)

Method : **Participatory Field Activity**

Tools : **See description below & PC Reference Manual**

References : **PC Book CH 6 – Home & Community Gardens**
PC Book CH 11 - Aquaculture

Objective : **Participants learn about & create ponds in a garden system**

Preparation

- The facilitator should test the soil in the planned location for the pond to see if it will hold water or not. If not, then ideally water holding clay, or otherwise cement making materials can be prepared.
- A water source for filling the pond will be needed. The pond can be filled using a hose, buckets or from digging a trench from another water source to the pond.

Tools and materials to prepare include:

- Tools for making the pond
- Water loving plants to plant in, and around the edge of the pond
- Mosquito eating fish
- Rocks to control the water inflow and outflow

Running this exercise

With all the participants as a group :

- Choose the location and design the shape and size of the pond
- More than 1 pond could be made if space and time permits

Then divide the participants into 2 groups

- **Group 1**: Focuses on digging and lining the pond, and later as Group 2 plants the plants, Group 1 can collect and apply mulch around the plants on the edge of the pond.
- **Group 2**: Focuses on preparing the water, inflow / outflow controls, plants and fish

Ask each group to plan and implement their tasks.

When they are done, review the process with the participants and discuss the functions and benefits of the pond. Write the participant's answers on large pieces of paper or white / black board so that everyone can see and comment / input.

See **PC Book CH 6 – Home & Community Garden** & **PC Book CH 11 - Aquaculture** and other exercises in this book for reference and ideas.

Field Activity : Make Swales / Terraces (Garden Ex. 12)

Method : **Participatory Field Activity**

Tools : **See description below & PC Reference Manual**

References : **PC Book CH 6 – Home & Community Gardens**
PC Book CH 8 - Forests, Tree Crops & Bamboo
PC Book CH 7 - Farming

Objective : **Participants learn about & create swales & terraces**

Preparation

- Materials for making and using A-Frames
- Tools for digging the swales and / or terraces
- Rocks, clay or wood for holding the terraces and / or swales in place
- Seeds, seedlings or propagates to plant in the finished terraces and / or swales
- Mulch materials

Running this exercise

This exercise is divided up into the following steps:

1. Making the A-Frame and using it to mark out the swales and / or terraces
2. Digging the swales and / or terraces
3. Using the rocks, clay or wood to support the swales and / or terraces
4. Planting the seeds, seedlings or propagates
    - Create legume tree rows, if space provides, use legume propagates on the edge of every 2nd swale and / or terrace
5. Mulching the swales and / or terraces

Notes:

- It is beneficial for all the participants to practice each of the steps in this exercise.
- For successful implementation of this exercise you can use the information and pictures in the reference chapters for advice, but some direct field experience with designing and making swales and terraces is important.

See PC Book CH 6 – Home & Community Gardens, PC Book CH 8 - Forests, Tree Crops & Bamboo and PC Book CH 7 - Farming and other exercises in this book for reference and other ideas.

Field Activity : Construct Banana Pits (Garden Ex. 13)

Method : **Participatory Field Activity**

Tools : **See description below & PC Reference Manual**

References : **PC Book CH 6 – Home & Community Gardens**
PC Book CH 4 - Healthy Soil

Objective : **Participants learn about & practice making banana pits**

Preparation

- Tools for digging the banana pits and planting the plants around the pit
- Banana planting stock and other seeds, seedlings and propagates ready to plant
  Note : it is not essential to use bananas. If the participants prefer, vegetables can just as easily be planted around the outside of the pit
- Rocks - to support the edge around the pits
- Mulch materials
- Water for the plants

Running this exercise

With the whole group, identify good locations for the banana pits. The locations should:

- Allow for space for the bananas to grow and multiply without shading or crowding any vegetable beds
- Make use of banana pits' ability to collect and absorb stagnant water

Divide the participants into groups using a creative group creation technique (see appendix). The number of groups will be determined by (a) the space available for the banana pits and (b) the time available for the exercise - at least 2 hours is needed for completing a pit.

- **Each group will be responsible for developing one banana pit:**
  - Creating the pit
  - Planting the pit and borders
  - Mulching after planting
  - Watering
- Have each group present their pit to the rest of the participants
- Review the results and the processes used with all the participants

See PC Book CH 6 – Home & Community Gardens & PC Book CH 4 - Healthy Soil and other exercises in this book for reference and ideas.

Field Activity : Make & Use a Chicken Tractor (Garden Ex. 14)

Method : **Participatory Field Activity**

Tools : **See description below & PC Reference Manual**

References : **PC Book CH 6 – Home & Community Gardens**
PC Book CH 10 - Animal Systems

Objective : **Participants learn about & practice making & using a chicken tractor**

Making a chicken tractor can be a fairly long a process, especially as more than 1 tractor will have to be made if it is a large group of participants and every participant is to be included in the process.

If time and materials are available, this is an excellent activity that demonstrates an integrated approach.

Preparation

- Collect enough materials for making 1 chicken tractor per 10 students
- For a chicken tractor of 3 m x 4 m collect 4 large bamboo poles
- **Other materials needed will include:**
    - Grasses, rattan, hammer, nails, string, wire etc - for binding the bamboo together
    - Grass, coconut leaves and / or plastic sheeting to attach as a roof for shade and protection from rain
    - Old fishing nets to cover the tractor to prevent escapes or intrusions
- Chicken to put in the tractors

Running this exercise

- **With the whole group:** Discuss the basic principles and techniques of chicken tractor design including best size and shapes
- Decide where the chicken tractors will be used
- **Then ask the participants to divide into smaller work groups** - each group can then construct their own chicken tractor
- Once the tractors are completed, the groups can put chickens into the tractors to trial and test the results
- Suggest that the participants monitor and even document the effects of using the tractors during the remainder of the workshop

See **PC Book CH 6 – Home and community gardens** and **PC Book CH 10 - Animal Systems** and other exercises in this book for reference and ideas.

Field Activity : Weed control for the Garden (Garden Ex. 15)

Method : **Participatory Field Activity**

Tools : **See description below & PC Reference Manual**

References : **PC Book CH 6 – Home & Community Gardens**
PC Book CH 7 – Farming
PC Book CH 9 - Integrated Pest Management (IPM)

Objective : **Participants learn about & practice ways to control weeds in the garden**

Following are some of the key systems for weed control in the garden:

- **Remove weeds -** Most weeds can be added to composts or mulch material bays. However, weeds like running grasses or weeds that have already seeded need to be separated to stop them from creating more weeds and should not be used for compost or mulch. Put these weeds in banana pits, into liquid compost or into a chicken house.
- **Plant ground covering vegetables -** like pumpkin, beans, luffa, sweet potato and yam under cassava, corn and other large crops to reduce weeds in the future.
- **Mulch the garden**
- **Make a "weed barrier" -** around the outside of the vegetable plots to stop running grasses from growing into the garden plots. **The weed barrier can be:**
    - A path around the edge that is kept free of weeds.
    - Plant a small but thick living barrier that will prevent running grasses from entering the garden. Lemon grass, vetiver grass, comfrey etc. Plant them close together so that the roots create the barrier.
- **Use an animal tractor -** This is a good way to remove weeds and weed seeds and fertilize the ground at the same time.
- **Grow productive weeds -** Spread seeds and cuttings of useful plants that grow easily. This will create a new weed problem. The difference is that it is useful plants that become weeds!

Preparation

- Discuss with the participants the weed control methods outlined above, if images and or hand outs have been prepared they can be used as well
- Choose the weed control techniques to be implemented that are most suitable for the workshop and area
- If some of the recommended techniques are not chosen for implementation, they should still be explained to the participants for future reference.

Running this exercise

- Divide the participants into groups
- Write down the different techniques chosen to be implemented - each technique on a different piece of paper. Fold up the papers and let a representative from each group choose a technique or techniques

- The weed control technique chosen by the each group is implemented at the demonstration garden
- After each group has finished, they can present the results to the entire group for feedback and other suggestions

See PC Book CH 6 – Home & Community Gardens, PC Book CH 7 - Farming and PC PC Book CH 9 - Integrated pest management and other exercises in this book for reference and ideas.

Field Activity : Pest control for the Garden (Garden Ex. 16)

Method : **Participatory Field Activity**

Tools : **See description below & PC Reference Manual**

References : **PC Book CH 6 – Home & Community Gardens**
PC Book CH 9 - Integrated Pest Management (IPM)

Objective : **Participants learn about & practice different types of garden pest control**

In Module 9 - Integrated Pest Management includes several practical exercises which can be used for pest prevention and control. Some of the practical exercises from the module that are important for a sustainable home garden include:

- Observation and hand control
- Integrating flowers
- Making a pond
- Crop rotation
- Vegetables and herbs
- Making and using natural organic pesticides
- Setting baits and trap

Preparation

- Use the same method for exercise preparation as outlined in the previous exercise "Weed Control for the Garden".

Running this exercise

- Use the same method for running this exercise as outlined in the previous exercise "Weed Control for the Garden".

See PC Book CH 6 – Home and community gardens and PC Book CH 9 - Integrated pest management and other exercises in this book for reference and ideas.

Notes...