



Sustainable Food Production Toolkit



CCIVS
70 YEARS
Coordinating Committee for
International Voluntary Service
1948-2018



IVS for **Climate
Justice**

Co-funded by the
Erasmus+ Programme
of the European Union



Sustainable Food Production Toolkit

Kate Curtis
Kate Curtis
Julia Perez Lema

Author
Original illustrations
Layout and Design

This project has been funded with support from the European Commission.
This publication reflects the views only of the author, and the European Commission cannot be held responsible for any use which may be made of the information contained therein.

Project coordinator



CCIVS
70 YEARS
Coordinating Committee for
International Voluntary Service
1948-2018

Co-funded by the
Erasmus+ Programme
of the European Union



Partners



TABLE OF CONTENTS

SOIL 11

WATER 18

SEEDS 21

STRATEGIES 23

FOOD FORESTS 29

WELL BEING AND INTEGRATION OF ANIMALS 31

INTEGRATING PEOPLE, COMMUNITY AND ECONOMY 33

ACKNOWLEDGEMENTS 34

Why Sustainable Food Production?

It is time to rethink how we grow, share and consume our food. If done right, agriculture, forestry and fisheries can provide nutritious food for all and generate decent incomes, while supporting people-centered rural development and protecting the environment.



Right now, our soils, freshwater, oceans, forests and biodiversity are being rapidly degraded. Climate change is putting even more pressure on the resources we depend on, increasing risks associated with disasters, such as droughts and floods. Many rural women and men can no longer make ends meet on their land, forcing them to migrate to cities in search of opportunities. Poor food security is also causing millions of children to be stunted, or too short for the ages, due to severe malnutrition.

A profound change of the global food and agriculture system is needed if we are to nourish the 821 million people who are hungry today and the additional 2 billion people expected to be undernourished by 2050. Investments in agriculture are crucial to increasing the capacity for agricultural productivity and sustainable food production systems are necessary to help alleviate the perils of hunger.

SDG <https://www.un.org/sustainabledevelopment/hunger/>

Sustainable Food Production can empower people through improved nutrition and skills, and can potentially create a income, when surplus foods can be taken to market or traded.

What is Sustainable Food Production?

Producing food sustainably means we use methods that are natural, low-cost, energy efficient and respect the biodiversity and natural environment that supports us.

For food to be truly sustainable we need to maintain the fertility of the soil and the purity of the water without creating rubbish or toxins for future generations to deal with. It cannot be considered sustainable if it causes harm to the environment in any way.

In order for food to be produced sustainably we need to choose climate appropriate strategies and crops, suitable to the water availability and seasonal conditions. In a changing climate, this may mean diversifying from traditional crops.

Sustainable systems are created by planning for long term and short term yields, we plan and design with this in mind, for example. it is essential to maintain soil fertility by giving back to the soils after every harvest.



Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification and halt and reverse land degradation and halt biodiversity loss



Ensure sustainable consumption and production patterns

In this toolkit we will explore different principles and methods to grow sustainable food crops. This can be implemented on a small or larger scale-from a balcony or school garden, to a community plot or small farm.

Permaculture

‘Consciously designed landscapes which mimic the patterns and relationships found in nature, while yielding an abundance of food, fibre and energy for provision of local needs.’

David Holmgren

Permaculture is a design tool that can help us when creating sustainable food production systems. It is based on 3 ethics:

- 1) **Earth Care**
- 2) **People Care**
- 3) **Fair Share (or Future Care)**

It is important to consider all three ethics when making a decision about your food production. If we are caring for the earth, the earth will care for us. We must take care of the people who work and care for gardens and animals, this includes taking care of ourselves. Fair share or future care was originally described as

“Re-investment of surplus and self regulation” - is very important to ensure that the future generations will also be able to eat, we can do this by taking care of the fertility of our soils through composts and cover crops, ensuring better water usage and infiltration. Saving good, healthy, diverse seeds is another way to contribute positively to food security for future generations.

Permaculture uses different principles that can help us to create more resilient, holistic, interconnected food system:



Permaculture Design Principles

- 1 Observe and Interact**
Beauty is in the eye of the beholder



- 2 Catch and Store Energy**
Make hay while the sun shines



- 3 Obtain a Yield**
You can't work on an empty stomach



- 4 Apply Self-regulation and Accept Feedback**
The sins of the fathers are visited on the children unto the seventh generation



- 5 Use and Value Renewable Resources and Services**
Let nature take its course



- 6 Produce No Waste**
A stitch in time saves nine
Waste not, want not



- 7 Design from Patterns to Details**
Can't see the wood for the trees



- 8 Integrate Rather than Segregate**
Many hands make light work



- 9 Use Small and Slow Solutions**
The bigger they are, the harder they fall
Slow and steady wins the race



- 10 Use and Value Diversity**
Don't put all your eggs in one basket



- 11 Use Edges and Value the Marginal**
Don't think you are on the right track just because it is a well-beaten path



- 12 Creatively Use and Respond to Change**
Vision is not seeing things as they are but as they will be



Permaculture design principles of Bill Mollison

(from Introduction to Permaculture by Bill Mollison)

1) Approaches:

Observe:

Use protracted and thoughtful observation rather than thoughtless action. Observe the site and its elements in all seasons. Design for specific site, client and climate.

Connect:

Use relative location. Place elements in ways that create useful relationships and time saving connections among all parts. The number of connections among elements in a system creates healthy diverse ecosystems, not the number of elements.

Diversify:

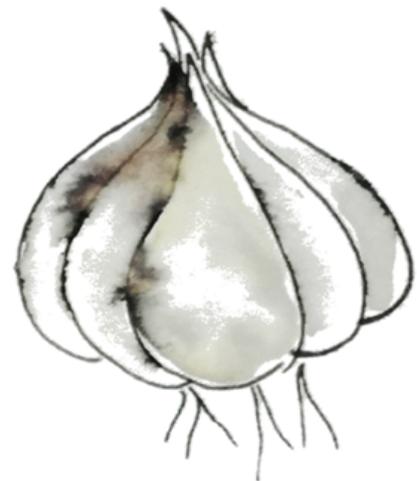
Diversity Increases resiliency. A web is stronger than any single strand. The greater the number of connections (relationships) between elements, the more resilient and stable the system is.

Mimic Nature:

Nature has been designing for millions of years. She is the ultimate designer. Look for patterns and relationships found in nature to inform design.

Optimize opportunities:

What opportunities are created or lost by a particular choice? The choice or option that creates and or maintains the most opportunities is often (not always!) the “best” choice.



2) Actions

Catch and store energy and materials as high in the landscape as possible

Identify, collect and hold the useful flows moving through the site.

By saving and re-investing resources, we maintain the system and capture still more resources. Close the cycles. Maintain resources as high in the system for as long as possible. By slowing the erosion of resources from the system and recycling them; we conserve energy, soil, and nutrients. (It's takes less energy to hold water high in the system than it takes to pump it back up.)

Make the least change for the greatest effect

Find the “leverage points” in the system and intervene there, where the least work accomplishes the most change. Well placed simple interventions lead to complex solutions and diverse impacts.

Use small-scale intensive systems

Start at your doorstep with the smallest systems that will do the job, and build on your successes, with variations.

Stacking

Choose and place each element in a system to perform as many functions as possible. Increasing beneficial connections between diverse elements creates a stable whole. Stack elements in both time and space.

(A tree as windbreak, baskets, green manure, shade, fuel, fodder, and food.)

Redundancy

Use multiple methods to achieve important functions and to create synergies. Redundancy protects when one or more elements fails.

For any given need, if obtained from multiple sources resilience in the system is built.

Optimize Edge

The edge – the intersection of any 2 or more environments- is the most diverse and productive place in a system, and is where energies and materials accumulate. Optimize, not maximize, the amount of edge. The greatest learning is at the intersection of two different elements.

Use local and renewable resources

This supports other local systems and elements. Resources found locally are cheaper and have less “embodied energy. “ Embodied energy is the sum of all the energy required for a product or resource to be available for use. This includes extraction, production, transportation and storage. Renewable resources (usually plants and animals) reproduce and build overtime, store energy, and interact with other elements. (Instead of importing costly cement to construct gully plugs you can use locally found bamboo, stones, saplings, etc.)

Recycle energy and resources

Supply local and on-site needs with energy from the system, and reuse this energy as many times as possible. Every cycle is an opportunity for yield.



3) Attitudes

Everything gardens

When we examine how plants and animals interact and change their environment we may find allies in our effort to sustain other species and ourselves.

The Problem is the Solution

A problem is just the system giving you information. Look to the problems to develop creative solutions. How can the problem be a benefit? What does it offer or provide? Is the outcome of the problem something another element or system can use? Can you use it to create a linkage? Change your perception or understanding, not the system.

Get a Yield

Get both immediate and long-term returns from your efforts: "You can't work on an empty stomach." Set up positive feedback loops to build the system and repay your investment.

Yields are unlimited.

The biggest limit to a system's total yield is the designer's imagination. We are faced with insurmountable opportunities.



Soil

Soil is alive!

Almost all the food we eat comes from the soil. It is essential to care for and nourish our soils to continue to produce healthy food.

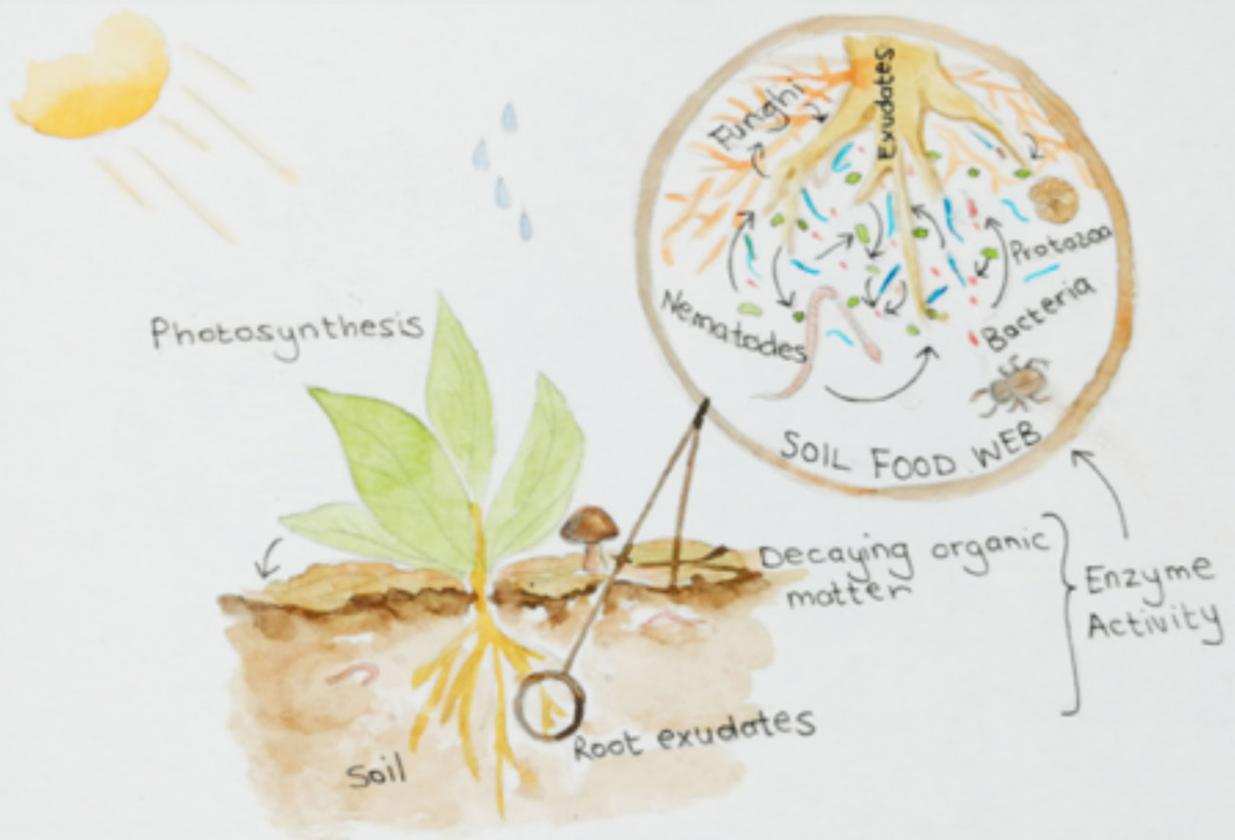
What is soil?

Soil is made up of a complicated, interconnected web of bacteria, fungi, plants, organic matter, water, air and macro- and micro-organisms.

A healthy soil food web depends on root exudates from plants, and healthy plants depend on a healthy, diverse soil web.

A healthy soil has a balance of air, water, organic and inorganic matter.

The Soil Food Web



Basic Soil Care:

- Minimum till and no plowing: each time we open and disturb the soil, we damage the web of bacteria and funghi beneath the surface. It also leads to compaction and decreases air and water retention.

- Avoid compaction:

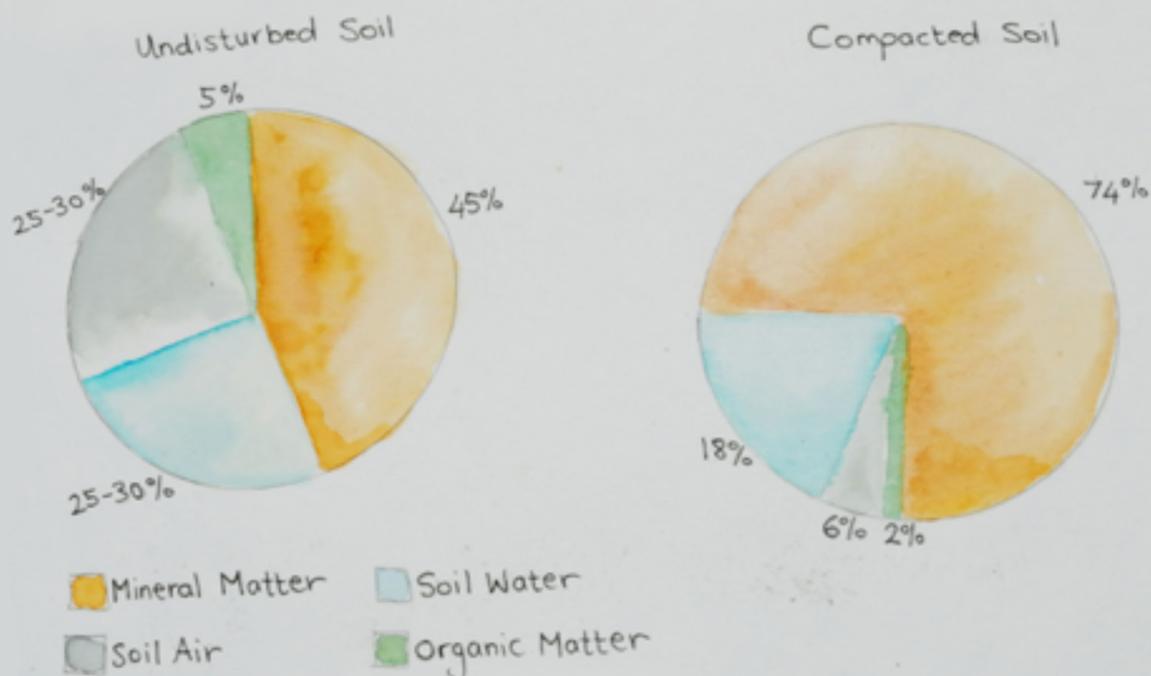
It is best to create paths for your food production area, refrain from walking or leaning on the soil as this compacts and degrades it.

- Always keep the soil covered (see mulch) and, if possible, have something living in it at all times (cover crops, support species and food crops)

- Soil loves diversity (different plants with different root depths, leaves and nutrients)

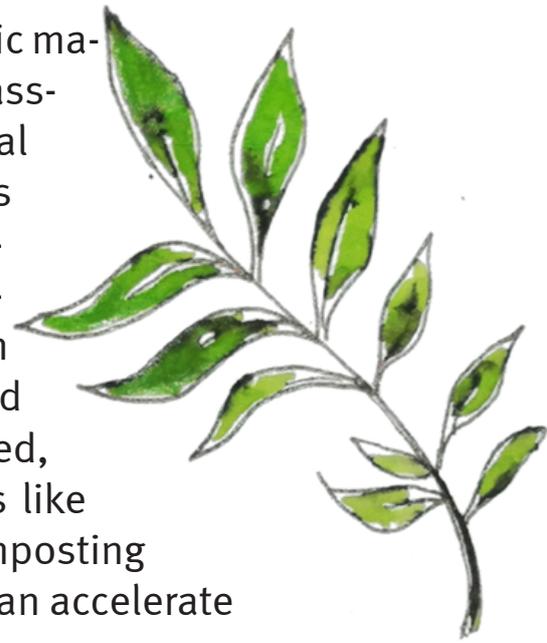
- Replace nutrients that you remove when harvesting with organic matter, compost, manure, etc. Close the loop!

There are many creative ways to shape paths and growing beds for easy access without walking on the growing areas.



Compost

We can create a simple compost by layering: Organic material high in Carbon (brown: straw, dry leaves & grasses, woodchips, even cardboard) with organic material high in Nitrogen (green: chopped leaves, fresh grass clippings, cow/horse manure, fresh kitchen vegetable scraps (uncooked, like vegetable and fruit peels)) Layer the Nitrogen (1 part) layer with Carbon layer (2 parts) 1 parts Green to 2 part Brown is a good general rule to follow It needs to stay moist, aerated, and at an even temperature You can add catalysts like urine, cow milk, molasses, etc. to accelerate the composting process By turning the compost every 3-7 days, we can accelerate the decomposition through improved aeration.



Kitchen Waste and Food Scraps:

Raw kitchen scraps (such as peels, egg shells, stems, etc) are a good addition to compost.

It is important to protect your compost from rats, and other pests. There are different containers or simple structures you can create to minimize pests access.

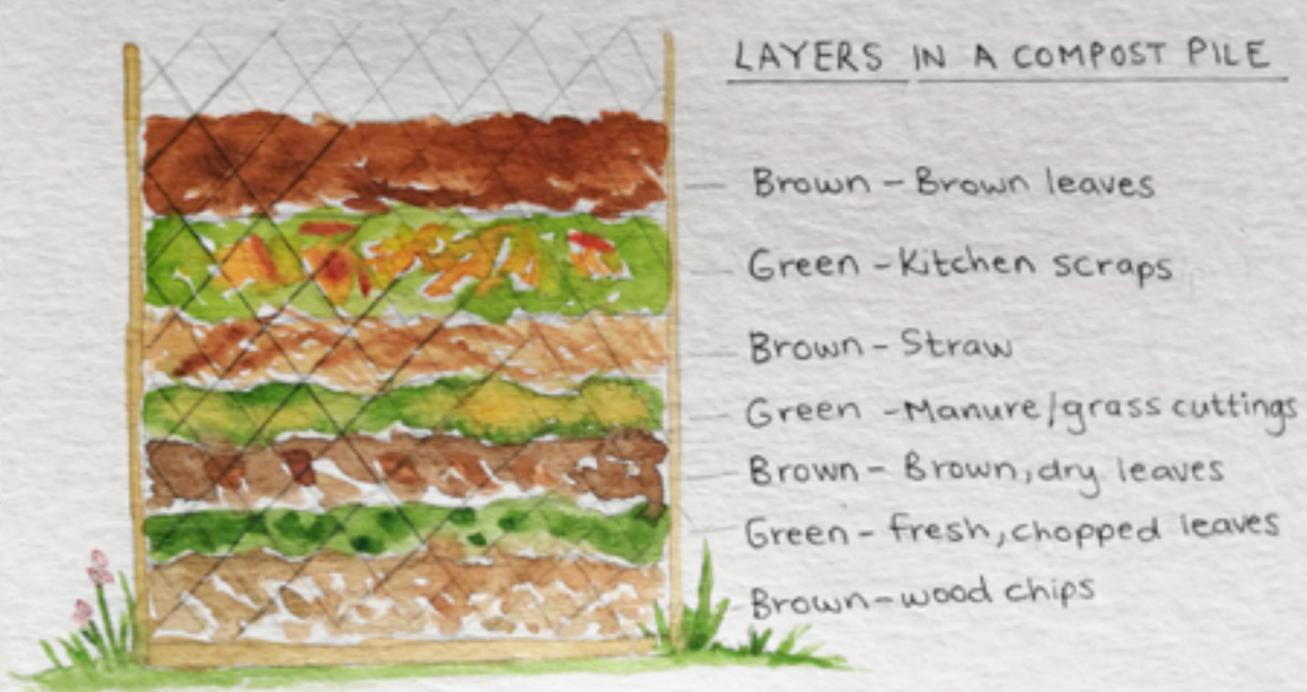


Usually it is preferable to put cooked food waste in a worm-composting system- to avoid rotting and bad smells.

Notes: It is not recommended to add too much citrus to a compost bin (it can become quite acidic and affect useful bacterias populations and the decomposition process) It is also advisable to avoid adding too much onion or garlic as this can also have a anti-bacterial effect on the compost and slow down the decomposition process.

Compost piles should be kept moist and aerated.

Do not compact it!



Add water at each layer and keep it covered and in the shade

Vermicompost

Another useful and interesting way to create compost from organic waste, animal manure and/or kitchen scraps is with vermicompost.

We can create a “worm farm” in many different sizes and contexts. There are a lot of DIY ideas online from small urban setups to larger bathtub systems. It is recommended to research and find one that suits you and your situation.

Worm castings are a great fertilizer, as well as the liquid runoff (worm “tea”) can be used diluted to improve soil. They are both full of useful bacteria and nutrients for the soil.



Mulch

When we look at nature, we can learn a lot! In nature it is very rare to see soil uncovered or exposed to direct sunlight.

Dead material (leaf litter, branches, dry grasses, etc) fall on the surface and so-called weeds will quickly occupy the space when soil is exposed.

Mulch is a covering for the soil of organic matter (straw, dead leaves, woodchips, nutshells, etc) It improves the soils water holding capacity and prevents rapid evaporation.

It also adds essential organic matter to feed the soil food web, which helps to keep plants healthy.

Mulch helps to hinder wind and water erosion.

Mulch helps to avoid compaction too.

Mulch protects the sensitive funghi and bacteria in the foodweb from exposure to the harsh UV rays and high temperatures of direct sunlight.

Living Mulch

We can also plant a green, living mulch (clover, legumes, nasturtiums, alfalfa, peanuts, pumpkins, etc). Living ground cover/

cover cropping has the same function as mulch. Protecting the soil and nourishing the foodweb. It can be “chopped and dropped”

onto the soil surface to feed carbon and other nutrients back into the soil. Living mulch can double-up as food production!



Organic Fertilizers and Compost Teas

There are many ways to make simple organic fertilizers depending on the ingredients you have available to you: Plant ferments: cumfrey, nettle, horsetail, dandelion, and other mineral rich plants.

Cut into small pieces until 1/3 of large bucket is full, fill bucket with water, then add small amount of molasses to feed bacteria. Stir daily to aerate.

It will start to smell like “earth” and perhaps you will see bubbles and foam when stirring. Depending on the outside temperature, it will be ready to apply diluted in 3-5 days.

It is recommended to research your local areas available plants and experiment to find what will work best in your areas climate.

Compost Tea:

Requires: a bucket, some fresh compost, a bag or old cotton tea-shirt to use as the “teabag”, simple aquarium pump, some molasses.



See above diagram.

Leave the “tea” brewing for 3 days in the shade, at an even temperature.

Apply diluted as foliage spray or direct to the root zone or soil



Regeneration of Degraded Soils

There are different ways we can regenerate/create and grow soils.

- Shaping: creating edge by digging shallow furrows or trenches on contour to catch run-off water and organic matter, also creates shade and microclimate for seeds to grow
 - bringing in compost and/or organic matter from another place (grass cuttings, prunings from trees, restaurant and kitchen waste, manure etc.)
 - we can grow appropriate hardy, fast-growing, pioneer species plants on the site.
 - We can seed and establish cover crops. A recommended mixture of:
 - grasses: for carbon and deep roots
 - legumes: support Nitrogen fixation
 - brassic: deep rooting, hardy and produce organic matterThese should always be planted at the correct time of year, with the rains.
- These can then be chopped and dropped to create mulch, and as soil conditions improve, other species can slowly be introduced.
- soils can be inoculated with compost teas, organic fertilizers, and EMs (Effective Microorganisms)



WATER

Water is life!

Water is a scarce and vital resource. Without it we cannot survive nor grow food.

When we design for water we talk about the 4 S -

SLOW: prevent evaporation, stop runoff and erosion

SPREAD: over the landscape through mulch and plants and swales

SINK: create a landscape that can absorb water and replenish water tables and wells

STORE: save water in dams, ponds and rain tanks for dry periods and even distribution



Working on contour:

Using contours for planting or creating infiltration ditches or swales, is very important for water to spread and infiltrate evenly (to replenish ground water)

Planting on contour stabilises slopes and helps to prevent water runoff and erosion

Finding contour lines- simple A-frame tool:

To build this simple A-frame tool you will need: 2 x 1.5 meter sticks

1 x 45 cm stick

1 x 60 cm of twine

1x stone/rock to use as a weight nails or twine to join wooden pieces

The A shape should have 1m distance between the 2 “feet” of 1 meter

Calibrate on 2 horizontal points



Irrigation and climate specific strategies

The shape and position of the growing beds will influence its water holding capacity.

Raised beds are good for wetter and/or cooler conditions (as the sides “breathe” and create drainage and evaporation.

Sunken beds are good for drier, hotter areas. As they are better insulated and can retain more moisture.

In a wet-dry seasonal climate it may be a good idea to have different style beds for different seasons.

Wicking beds are one good solution for extremely dry region solution.

Clay pot irrigation and drip irrigation systems are also recommended.

It is best to irrigate early in the morning or after sunset to avoid waste and damaging plants. It maximises the plants ability to use the water available when we water at cooler times of the day.

Water wise Gardens:

It is essential to design your food production according to your water availability.

If you don't have enough water to sustain animals or plants, you need to address this FIRST- through rainwater harvesting tanks, dams, wells, etc. Always plant in the correct season.

Use climate appropriate species that can grow with the water available. Water is also in the atmosphere! Using plants (like cactii) together with mulch, micro-climates (shadows, walls, hedges, edges) you can minimise evaporation and catch and store dew and precipitation from the air.

Introducing a (small) pond or water body can attract many beneficial predators and create a microclimate that may open the possibility to diversify your harvests.



SEEDS:

Humans have been selecting, saving and breeding edible varieties of plants for generations! Seeds and Human civilizations have evolved side-by-side: they are a vital part in our food, health, livelihoods and culture.

- Know where your seed comes from.
- Find local seed producers and suppliers
- Use Heirloom seeds that can be saved
- Use Climate adapted seed
- Use Organic seed
- Seeds are becoming a controlled resource so, fight for seed freedom: save, distribute and promote variety

Some seeds are easy and others can be more difficult to germinate. Some seeds may require soaking or scaring first.

Some have a short-life viability of a few days, others may last from a few months to a few years.

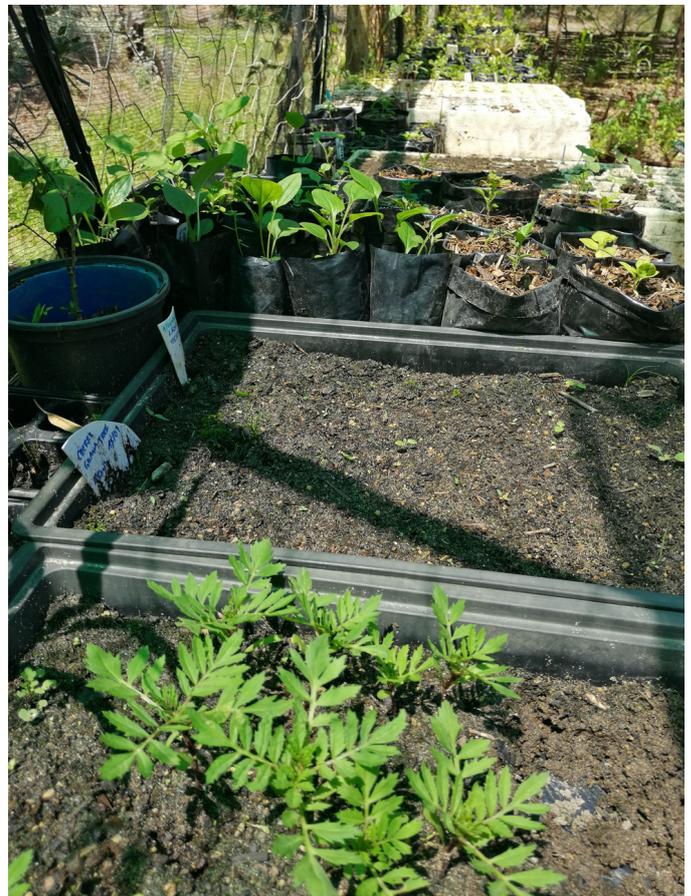
If in doubt, do a seed germination test with a small quantity to start.

Label seed trays: germination date and species. Use a pencil on re-usable plastic (cut up yoghurt containers work well)

Save, bank and share your seeds.

Everyone can save seed – it's a learning curve, start with one type.

The best place to save seed is by growing them!



Seed Storage:

Storage effects viability!

Seeds should be kept dry, cool and in the shade Refrigeration is a handy option for longer storage.

Adding ash or chalk can minimise damp and deter pests.

Small is beautiful!

Your garden offers more than just available flat square meters. Be creative with space!

Layers: Root, Ground Cover, High, Emergent, etc Use Climbing frames and structures to take advantage of vertical space

Stacking in time: Seasonality, Deciduous trees, shade created by mature forests.

By planting intensively and close together, we save resources like soil and water, as plants fill all available space Read more about bio-intensive gardening in “How to Grow More Vegetables” by John

Jeavons.

Smaller gardens require more pruning- harvest regularly to make space for new plants-

Diversity helps to prevent risk of losing harvest to pests and diseases



STRATEGIES:

Microclimates:

“A microclimate is a local set of atmospheric conditions that differ from those in the surrounding areas, often with a slight difference but sometimes with a substantial one. The term may refer to areas as small as a few square meters or square feet or as large as many square kilometers or square miles.” Wikipedia

What influences the microclimates in an area?

- Physical features: trees can provide shade, slope, hills, etc.
- Water: can provide a cooling effect or reflect sunlight
- Shelter: trees, hedges, walls and buildings can provide shelter, which means they will be warmer.
- Buildings/Large Rocks/walls: give off heat that has been stored during the day, they also break up any wind.
- Surface: the colour of the ground affects warming (dark colours absorb heat and stay warm for longer)
- Aspect: the direction that you/a building is facing is called aspect, facing the south will be sunnier (and warmer) in the northern hemisphere and shadier (and colder) in the southern hemisphere.
- Soil Quality: different types of plants prefer different soil types (Typically soil on a slope is poorer, while soil at the bottom of a slope or near a water body is richer)

How can we use microclimates to our benefit?

When we identify (or create) microclimates, we can plant the right plant in the right place and have healthy thriving production.



Planting Patterns

Many plants thrive in each other's company!

Some plants grow better together and have mutually beneficial properties, so we can benefit from growing them together- we call this companion planting.

Examples:

Tomatoes & Basil / Cilantro Lettuce with Aubergine Cabbage and Chamomile Nasturtium and Squash Carrot and Raddish Some plants don't grow well together, for example :

garlics, onions (aliums) with beans

Crop Rotation helps to nourish soil and avoid depletion of the same nutrients each year.

Supportive plants can help with pests, fertility, shade etc



Guilds:

A Guild is a consortium of 3 or more plants around a central element that are working in harmony together performing diverse, interconnected functions.

We usually favour mostly perennial plants, or self seeding varieties, for low maintenance and longevity.

A Guild usually contains:

- 1) 1 central element (a fruit, nut or timber tree)
- 2) Support species (Nitrogen fixing or fast growing tutor trees or shrubs, or dynamic accumulators like cumfrey, dandelion- deep rooting plants that bring minerals to other plants)
- 3) Pollinator attractors (flowers- can be medicinal or edible)
- 4) Ground cover (edible is always great! Nitrogen fixing is great too- most legumes do this)
- 5) Pest deterrents (aromatics, garlics, onions- check that they won't disturb the other plants though!)
- 6) A creeper or a vine (grapes up an olive tree, pepper in the mangoes, etc)

but the number of elements is unlimited!

When we plant a guild, we try to plant all the plants at the same time, with a good covering of mulch and ground cover, so that the plants grow together and benefit each other during the seasons.

(We can chop and drop the leaves of the support species and other plants to feed the main tree)



IPM Integrated Pest Management

Integrated Pest Management is a strategy that will improve your land and crop productivity, especially for the long term. These techniques naturally combine with Permaculture techniques to help create a strong and resilient agriculture system.

Prevention:

The easiest way to prevent insect damage in your garden is to discourage them from coming in the first place. A healthy garden is the best defense.

- Pull out any weak plants. They may already be infected. If not, they will attract predators. Pull the plant and dispose of it away from the garden area.
- Build healthy, organic soil. Natural composting methods, mulching and top-dressing your soil with compost or natural fertilizer are the best way to develop strong, vigorous plants.
- Seaweed mulch or spray. Seaweed contains trace elements such as iron, zinc, barium, calcium, sulfur and magnesium, which promote healthy development in plants. Seaweed fertilizer in mulch or spray form will enhance growth and give plants the strength to withstand disease. Seaweed mulch also repels slugs.
- Minimize insect habitat. Clear garden area of debris and weeds which are breeding places for insects. Use clean mulch.
- Interplant and rotate crops. Insect pests are often plant specific.

When plantings are mixed, pests are less likely to spread throughout a crop. Rotating crops each year is a common method to avoid re-infestation of pests that have over-wintered in the bed.

- Keep foliage dry. Water early so foliage will be dry for most of the day. Wet foliage encourages insect and fungal damage to your plants. See our page on drip-irrigation for methods of delivering water to the root systems without wetting the foliage.

- Disinfect. If you've been working with infested plants, clean your tools before moving on to other garden areas. This will reduce the speed of invading insects.

Remember! Most insects are not harmful to your crops. All insects play specific roles in nature and are needed to keep a balanced ecosystem. In fact, small numbers of pests are also needed to supply food for pest predators. Removing all pests can cause imbalance in the ecosystem and cause you to become dependant on pesticides.



Inter-plant insect attractor plants and flowers in your vegetables.

Building a small pond will attract insect-predators like frogs, toads, dragonfly and more!

Natural pesticides are a short-term solution for handling immediate pest problems quickly. Natural pesticides should be a part of pest management, but should only be used when necessary. Do not use natural pesticides if there are no pests or crops are not damaged. In fact, they should not even be used if only small amount of crops are damaged. Take time to observe if pest predators are eating the pests and if those pests are spreading quickly or slowly, if there are still pest predators, it is best to let them do the work. Some natural insecticides are very strong and will kill all insects, both damaging and beneficial insects. Be careful, because most insects are not harmful to your crops and killing them can even cause more problems in the future.

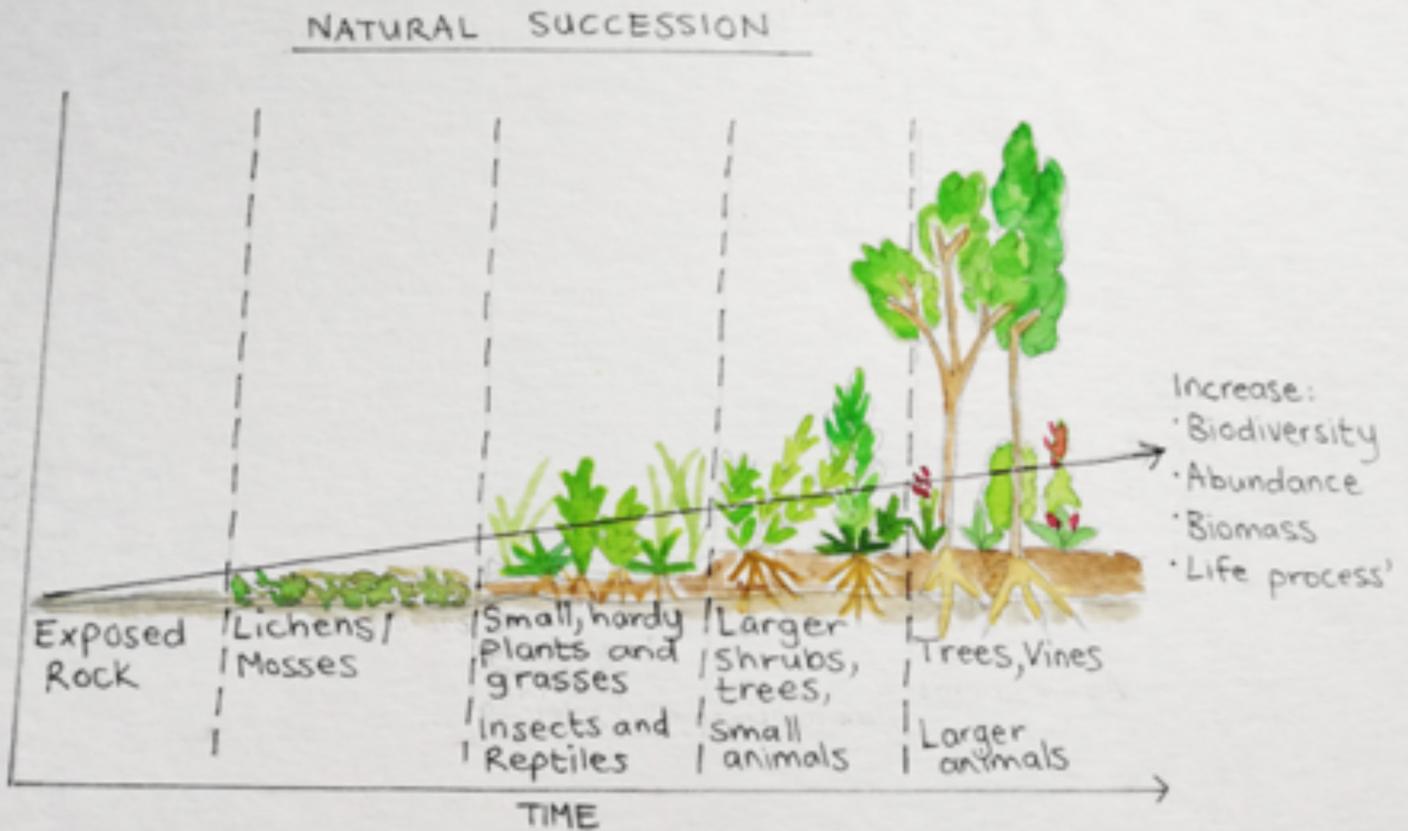
There are numerous recipes for natural pesticides and fungicides online, depending on what is available to you and which imbalance you are facing. Always start with a test area before applying to an entire crop.



FOOD FORESTS/ AGROFORESTRY:

Natural Succession

We can imitate natural succession by introducing the correct species for the conditions available, then we accelerate succession, by creating clearings and introducing the next species along the evolutionary path



Food Forests

Food Forests or Forest Gardens are a good way to create food security, as they consist of perennials which give a long term harvest for every year.

Design your food forest to contain a good diversity of trees and shrubs, that give fruits at different times of the year, and provide a variety of products (nuts, fruits, berries, leaves, timber, medicine, honey, fibers, spices, etc)

Follow the natural succession, in the beginning, as trees are growing and establishing- take advantage of the space and light in between young trees to grow annuals and other crops there.

It is a good idea to use edges areas to grow mulch producing plants/shrubs for chop and drop

A living fence or hedge can become a food forest if you choose edible varieties!

Introducing the right animals at the right time, can benefit the fertility and yield of your food forest



Alley cropping

Alley cropping is a good way to use horizontal and vertical growing space.

Trees are grown in rows (on contour if on slope) and grains or pasture is grown between,

Rows are left large enough for machinery to pass by if needed. Animals can also be integrated to graze below.

Other agroforestry models

There are many ways to multi-crop and include animals under trees.

A traditional technique from the Iberian Peninsula known as Dehesa, has pigs grazing acorns under cork and oak trees.

Lavender and Olive or Citrus grow well together and are both used to produce oils.

Syntropic Agriculture and Analog Forestry are other models to create dynamic, diverse, productive, economically viable forestry systems.



WELL BEING AND INTEGRATION OF ANIMALS

Livestock

Livestock can be an integral part of a sustainable farming system.

Role of Livestock on a Permaculture farm:

Animals and birds are important elements of an integrated farming system. They provide the following services which increase the over-all sustainability of a farm:

- Good source of food (such as milk and eggs)
- They can use and eat farm by-products (like kitchen scraps), thereby reducing pollution
- The micro-organisms in their manure and urine quicken the decomposition of biomass and improve soils when managed correctly.
- Animals require farmers to be on the land which prevents “absent farming” and encourages more observation & care around the farm
- Amusement and joy during farm activities
- Easier management of pests and diseases
- Income Generation potential
- Energy for transportation and drafts Livestock serve more functions than we can see!

Points to be considered while selecting the types and number of animals:

- Property size
- Needs of the family /farmer
- Special needs of the livestock in concern
- Breeding behaviour
- Suitability for local conditions
- Climate, landscape and society
- Time and resource availability
- Skill, interests and technical facilities
- Availability of space, feed, forage and fodder
- Ability to provide ethical, clean, warm, conditions for animals to have good health and well being

It is a big responsibility to bring an animal into your system Make sure you can take care of their needs for food, water, shelter, sunlight, exercise, companionship, etc.

Think to start from small to big: Earthworms, bees, butterflies, to birds (chickens, ducks) up to cows and horses.

Animal “waste” and manures can be very beneficial to the nutrient cycles and the soil.

Compost manure and bedding (straw) to integrate it into vegetable production beds

Certain animal behaviours can be used to benefit your system: ducks eat snails and slugs, chickens like to scratch and can be used to prepare the soil, bees are pollinators for most fruit trees.



Always research and prepare thoroughly before bringing an animal into your system!

INTEGRATING PEOPLE, COMMUNITY AND ECONOMY CSA

Community-supported agriculture (CSA model) is a system that connects the producer and consumers within the food system more closely by allowing the consumer to subscribe to the harvest of a certain farm or group of farms.

Also known as the “box system”

It has many benefits to the farmer and consumer. Consumers know where their food comes from and how it is grown- often they are offered the chance to come and harvest their own veg.

The farmer is guaranteed a price and customer for his produce, thereby cutting out the middle-man and unfair market-determined prices influenced by subsidies.

PGS (Participatory Guarantee System)

“Participatory Guarantee Systems (PGS) are locally focused quality assurance systems. They certify producers based on active participation of stakeholders and are built on a foundation of trust, social networks and knowledge exchange.” IFOAM (Organics International)

PGS initiatives are serving thousands of small organic farmers and their consumers all over the world, and the numbers are increasing every year. IFOAM - Organics International supports the development of PGS as an alternative and complementary tool to third-party certification within the organic sector and advocates for the recognition of PGS by governments.



Acknowledgements

I would like to acknowledge and thank the trainers who participated and contributed to the content in this document.

Especially, Govinda Sharma from Hasera Organics, Nepal ; Deepika Kundaji from Pebble Garden, Auroville, Rosie and Peter from their Kitchen Garden, Goa; FSL India hosting team, and all the participants who attended the training in Kundapur, India, 2018.

May we grow many resilient, abundant food gardens and recover our food sovereignty, together with our connection to the soil and the cycles of nature-of which we are an intrinsic part.



A watercolor illustration of a plant. It features a single, vibrant orange flower with five petals and a dark center, positioned at the top right. Below the flower are two large, green, heart-shaped leaves with prominent veins. The entire illustration is set against a light, textured background.

Published in November 2018 by the
Coordinating Committee for International
Voluntary Service (CCIVS) - UNESCO House
1 Rue Miollis, 75015, Paris, France

Want to support the CCIVS?

CCIVS relies on the kind support of its donors, if you wish to support
CCIVS please consider making a donation through our website