Permaculture

A SCIENCE AND AN ART OF SUSTAINABLE SYSTEMS DESIGN

permaculturist.org

28/08/2016

PERMACULTURE

a definition

Permaculture is a global design tool to create sustainable systems that answer humans needs while benefiting the environment

PERMACULTURE

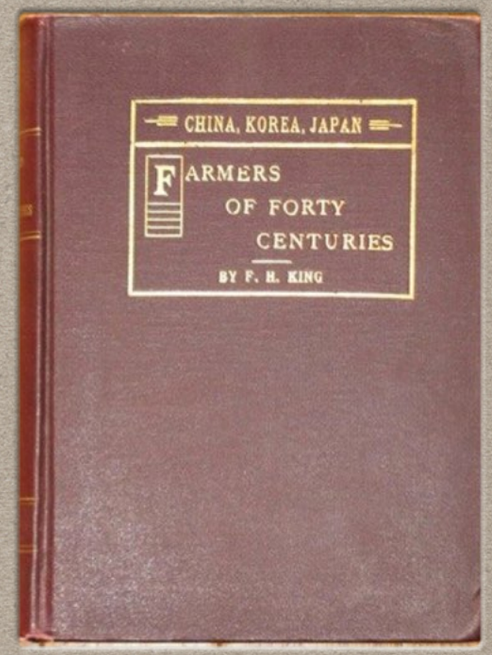
general framework

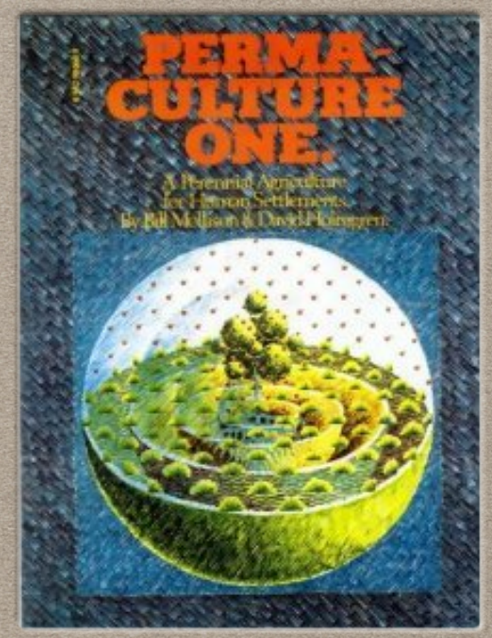
- Work with not against nature
- A systemic approach that combines the observation of nature, traditional knowledge, results from science and results from experimental approaches
- The means to satisfy all of our needs –food, energy, social … while growing the natural capital for generations to come

PERMACULTURE

origin of the name

- The “Permanent Agriculture” concept
  - F. H. King, *Farmers of Forty Centuries*
  - Bill Mollison & David Holmgren, *Permaculture 1*
- The “Permanent Culture” concept
  - Works by David Holmgren





PERMACULTURE

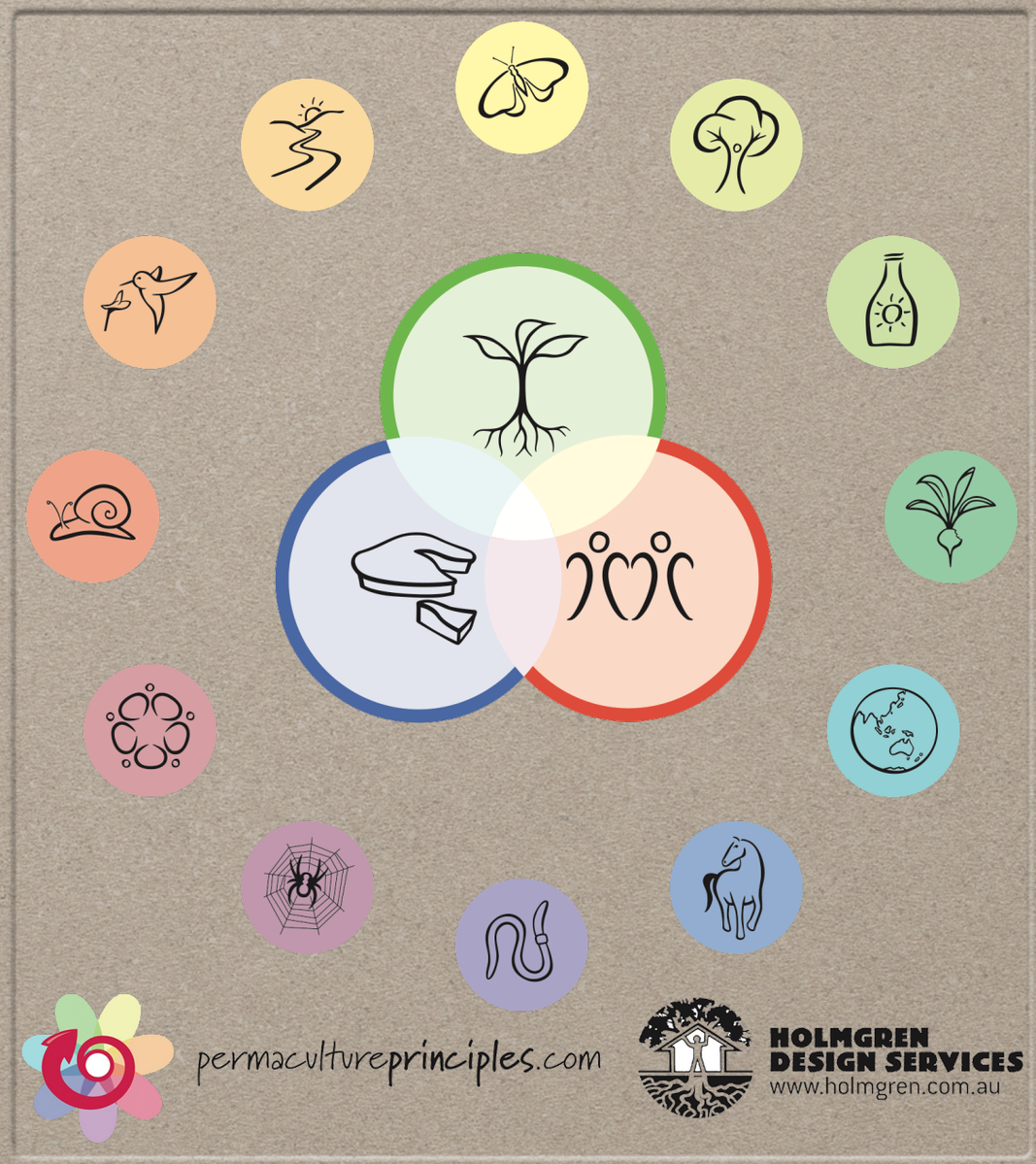
3 principles for an ethic

- **Care for earth**
  - soils, forests, water
- **Care for people**
  - self, relatives, community
- **Fair share**
  - resources and yields

PERMACULTURE

12 design principles

- A conceptual toolbox
- An analytical grid to evaluate solutions
- An invitation to use “system” and “process” thinking

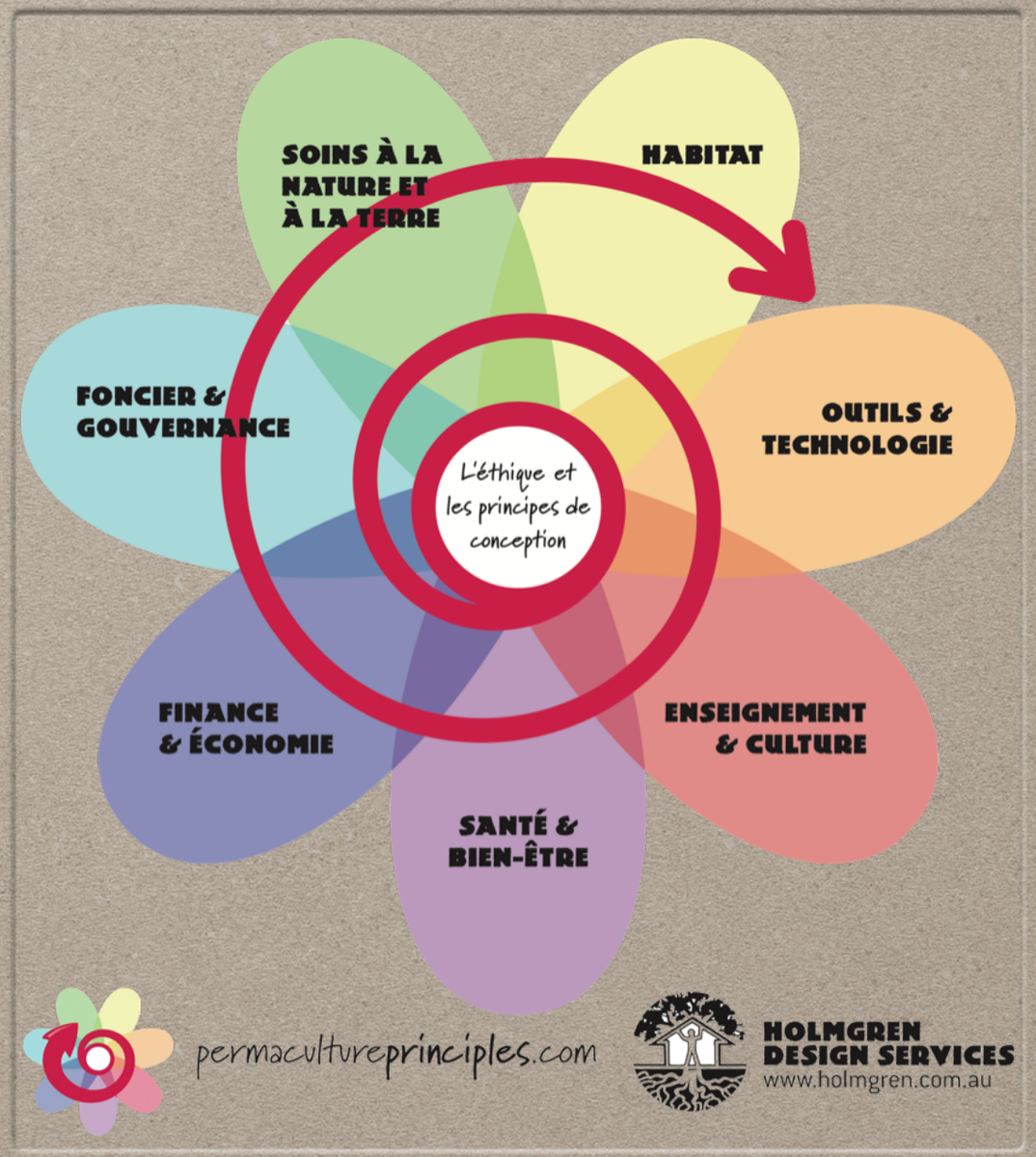


permaculturist.org

PERMACULTURE

use of the principles

- Principles are rooted in nature and soils, which are their first area of use
- Principles operate in all fields of human activity
- The use of principles ensures consistency and effectiveness of actions



DESIGN

a definition

The concept of design is central in permaculture and means simultaneously the design, the establishment and the management of a system that is, it refers both the "form and substance"

DESIGN

general framework

- Permaculture design is an approach to system design that allows us to:
  - better understand a system, or a problem, as a whole
  - observe how the parts of the system are linked
  - restore failing systems
  - learn from functional natural systems to plan the integration of human beings into ecosystems
  - include the people who have never heard about permaculture

DESIGN

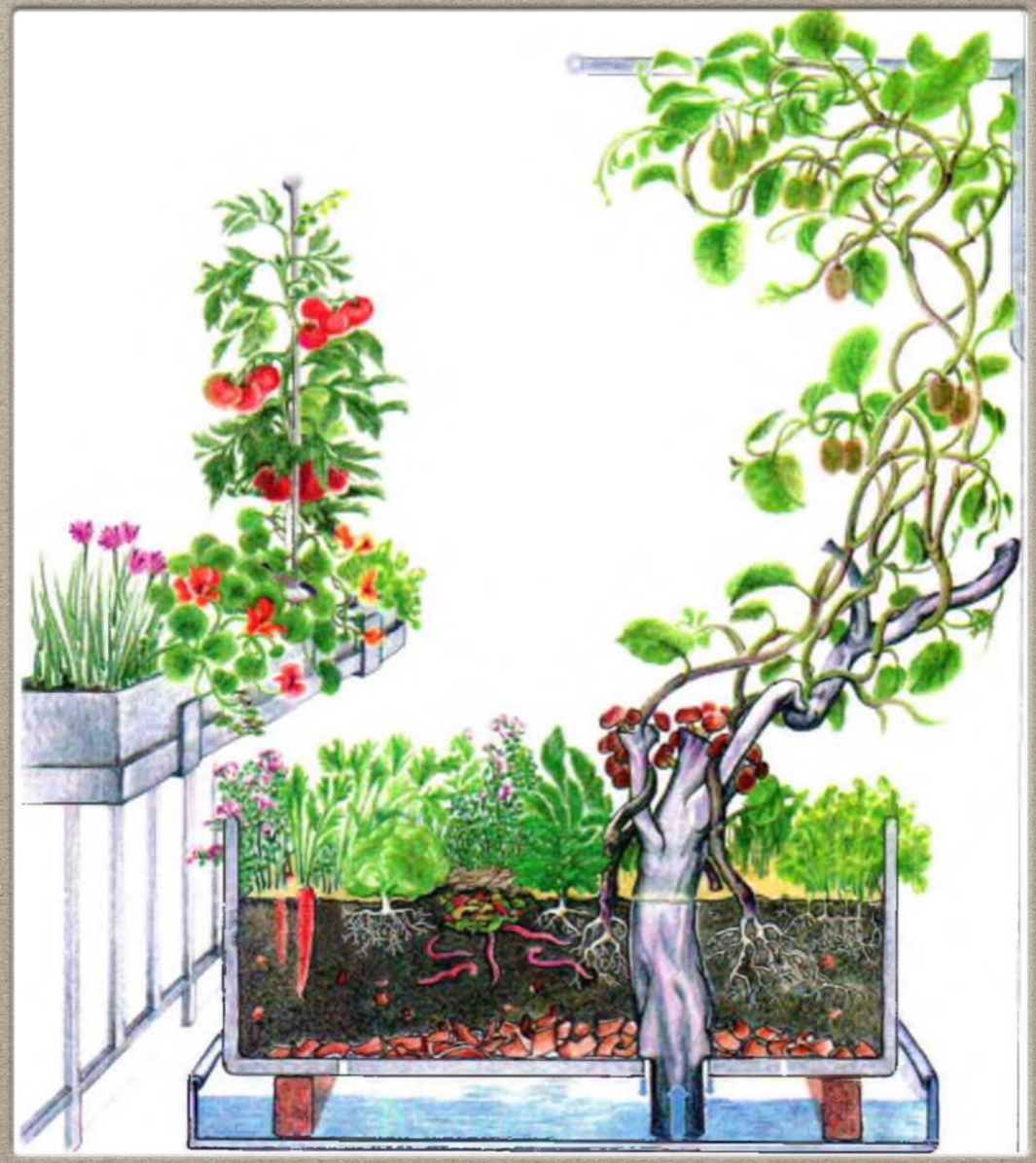
primary goals

- Answering the needs of the occupants of a place
- Benefiting the environment
- Possibly producing surplus ...
- By planning the execution of the design, whatever its scale

DESIGN

balcony scale

- 3 square meters are enough to start a working ecosystem
- The benefits are not only food: climate regulation, scents, territory of experimentation for children ...



DESIGN

garden scale

Picture by Claire Gregory [CC BY-SA 3.0]

- A permaculture suburban garden in Sheffield

DESIGN

farm scale

- Zaytuna Farm, in Australia: A reference for permaculture, headquarters of the Permaculture Research Institute

Geoff Lawton, Permaculture Research Institute

DESIGN

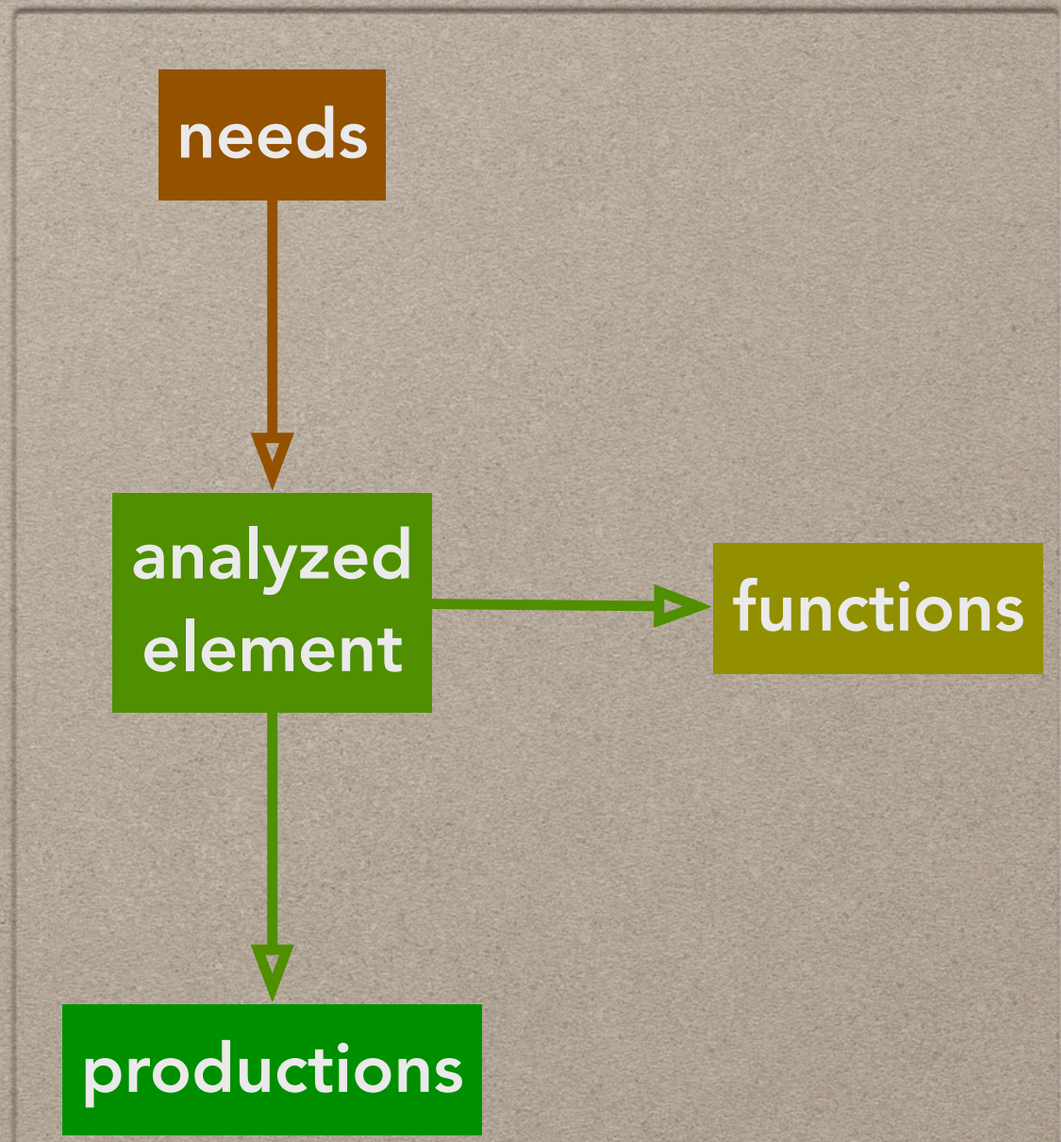
landscape scale

- A desert created by man in 10,000 years of agriculture and breeding
- 900,000 ha restored over a period of 10 years
- Improvement of living conditions and drastic reduction of soil losses

DESIGN

method of analysis

- The "needs-functions-production" analysis is an important step in the construction of perennial systems
- It can be applied at different scales: from an element in a micro system to a resource in the complete system



DESIGN

an exemplary element

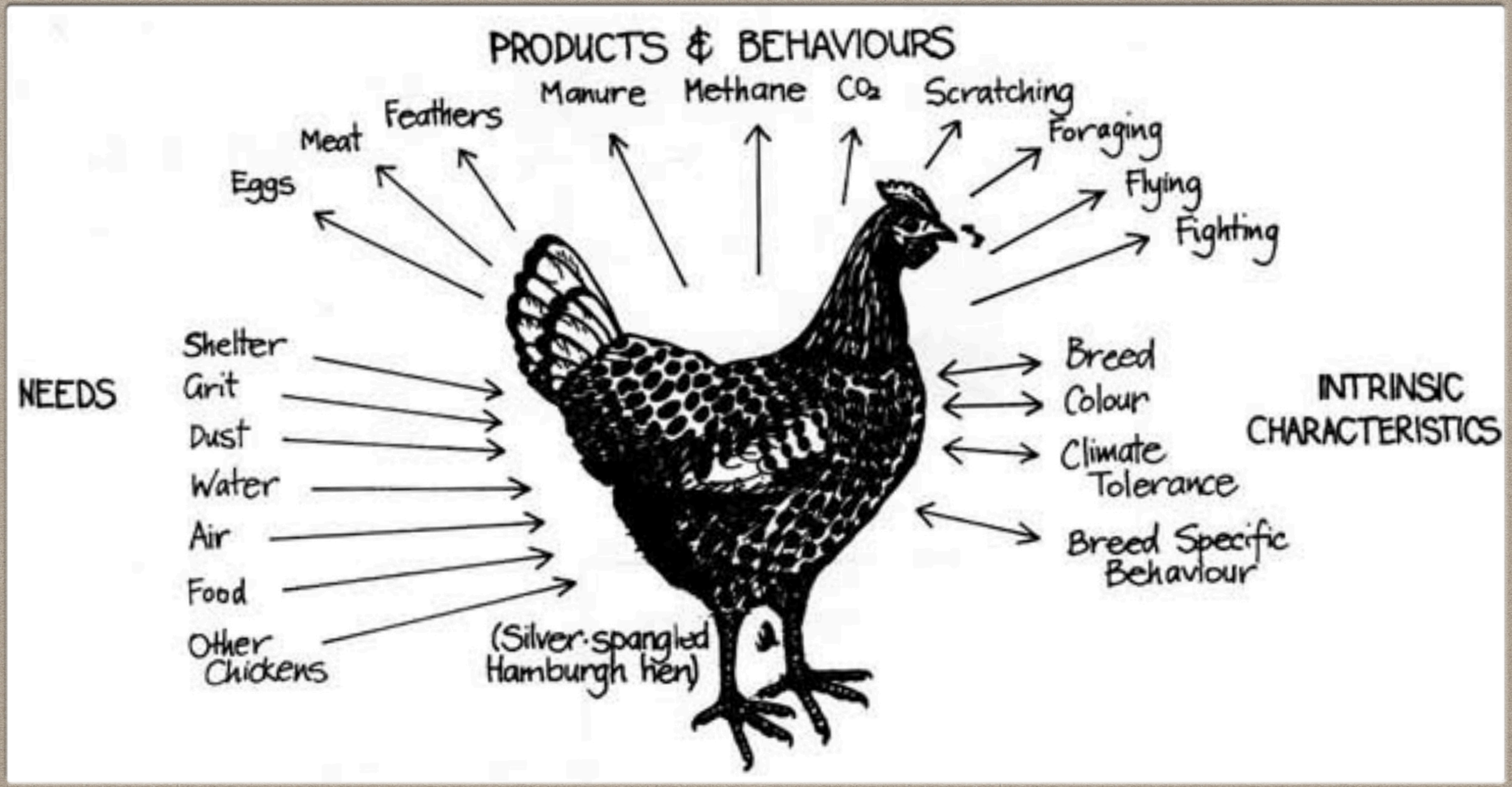


Illustration from Permaculture, A Designer's Manual, by Bill Mollison

DESIGN

an exemplary resource

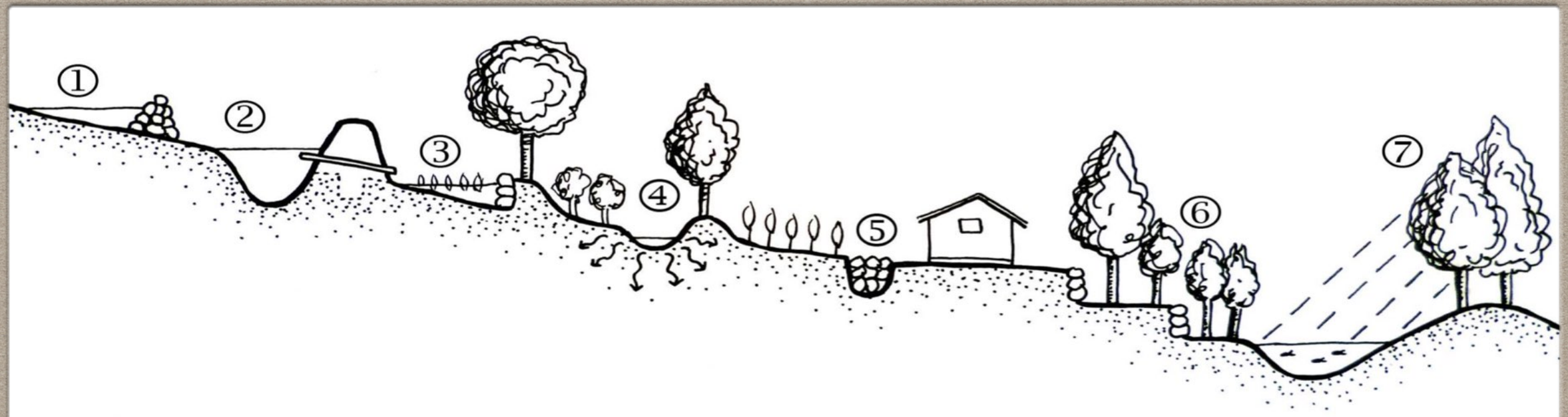


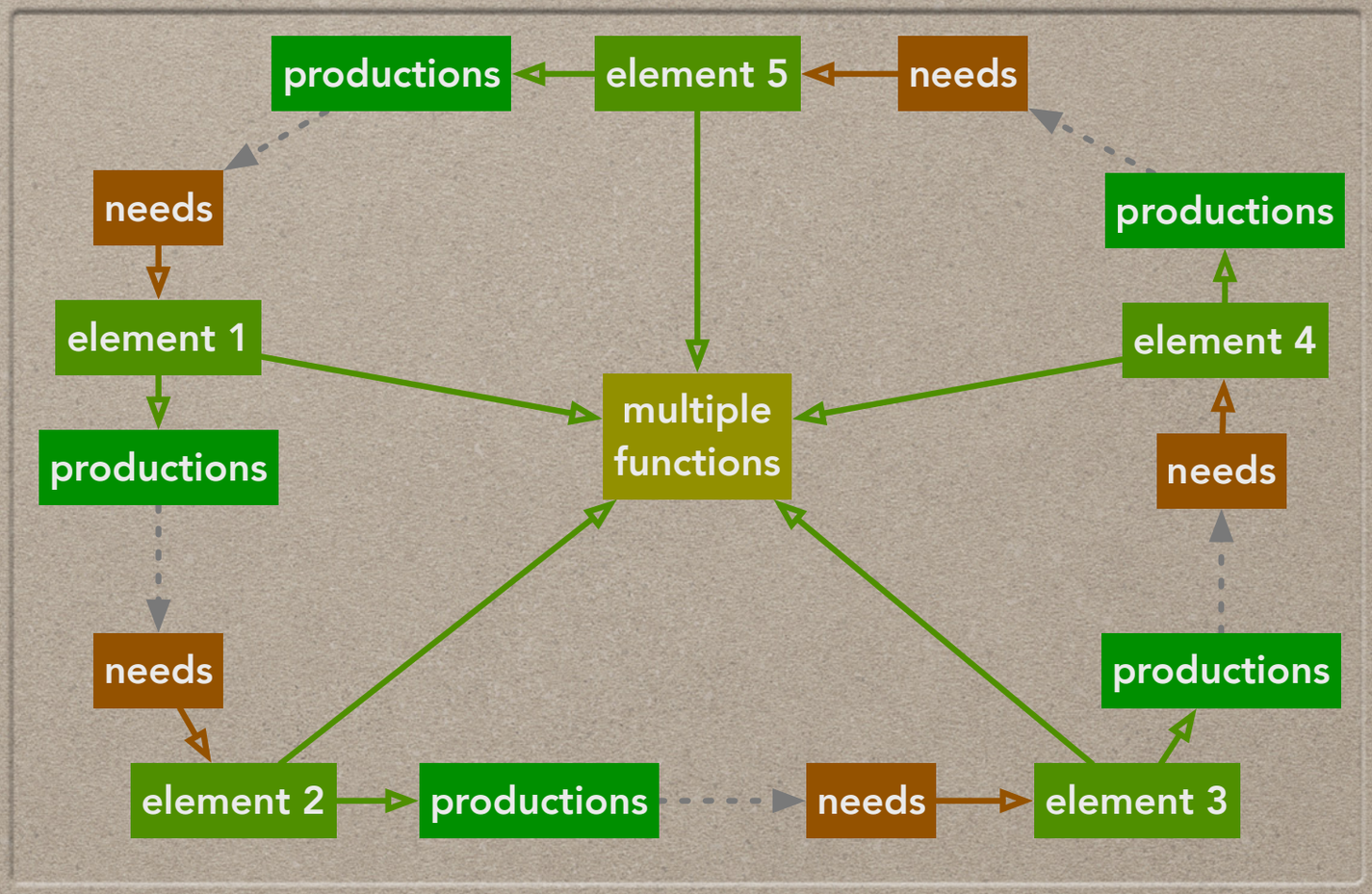
Illustration from Guide du permaculteur débutant, by Benjamin Broustey

- Water, considered as an energy flow, is collected and stored to maximize its use and limit its negative effects
- 1 gabion, 2 dam, 3 rice paddy, 4 swale, 5 drain, 6 aquaculture, 7 shadow to slow evaporation

DESIGN

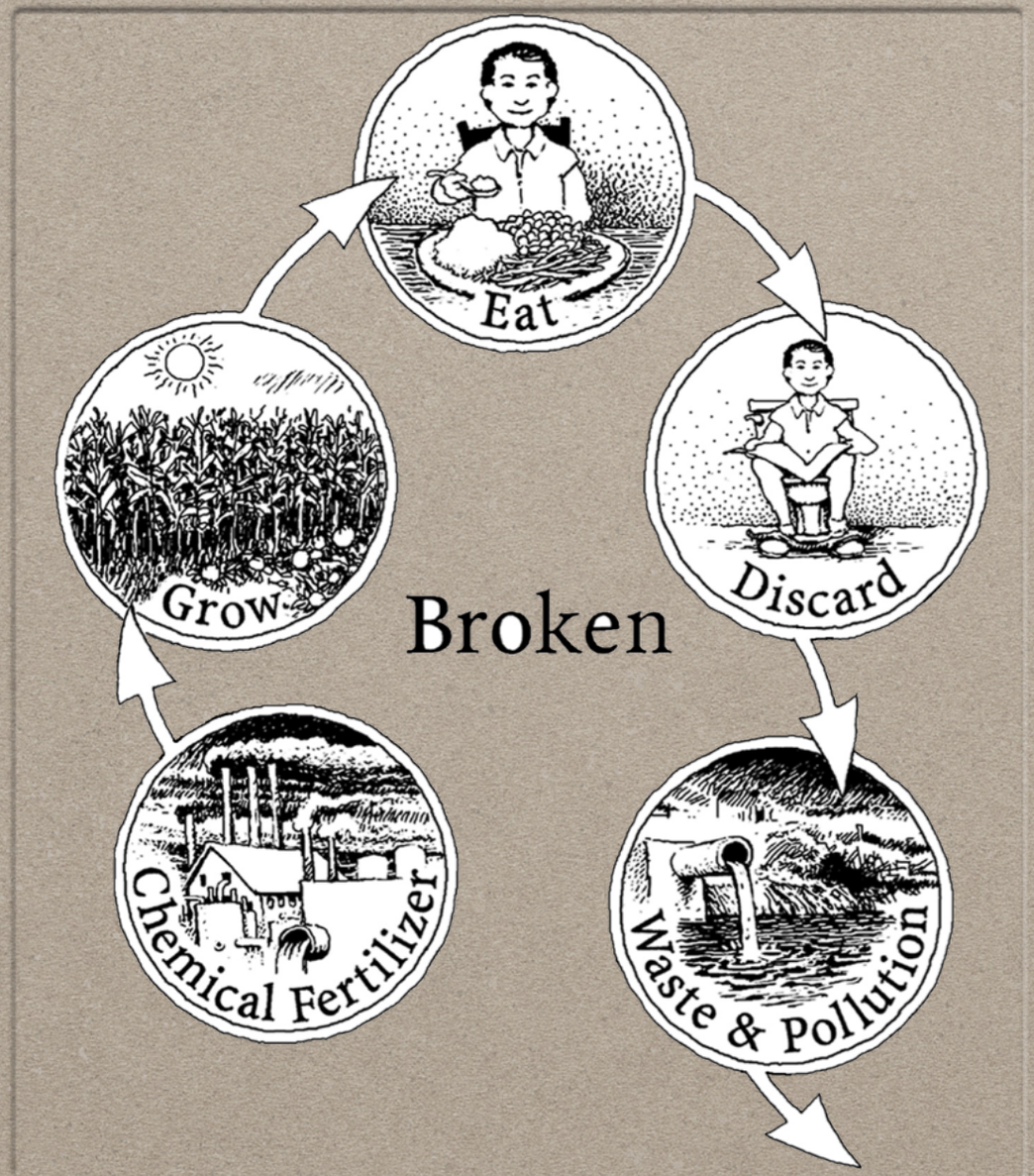
use of analysis results

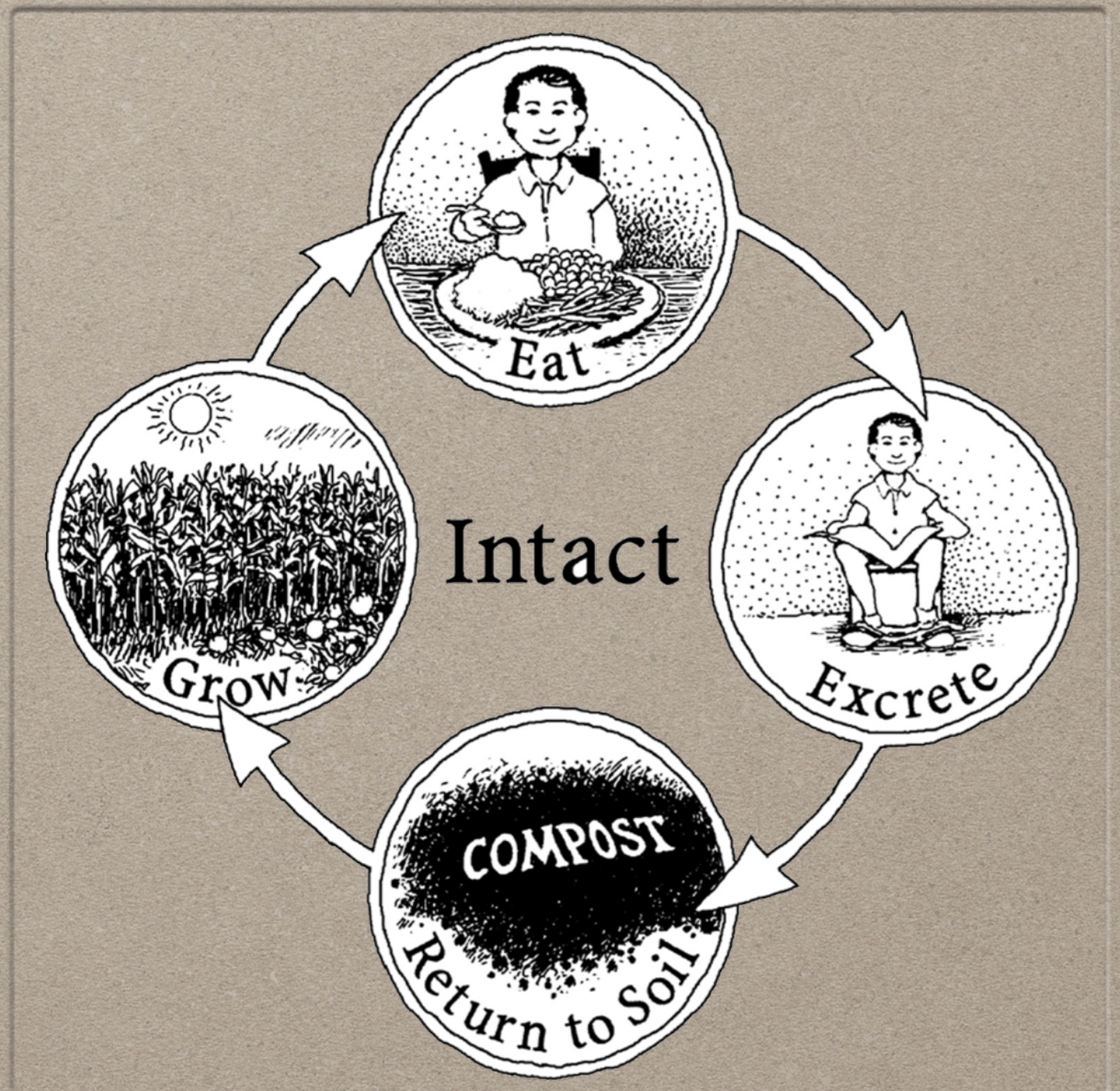
- When the elements are analyzed, it's easier to connect them
- When a loop is closed, a self-sufficient system is generated



DESIGN

the example of dry toilets

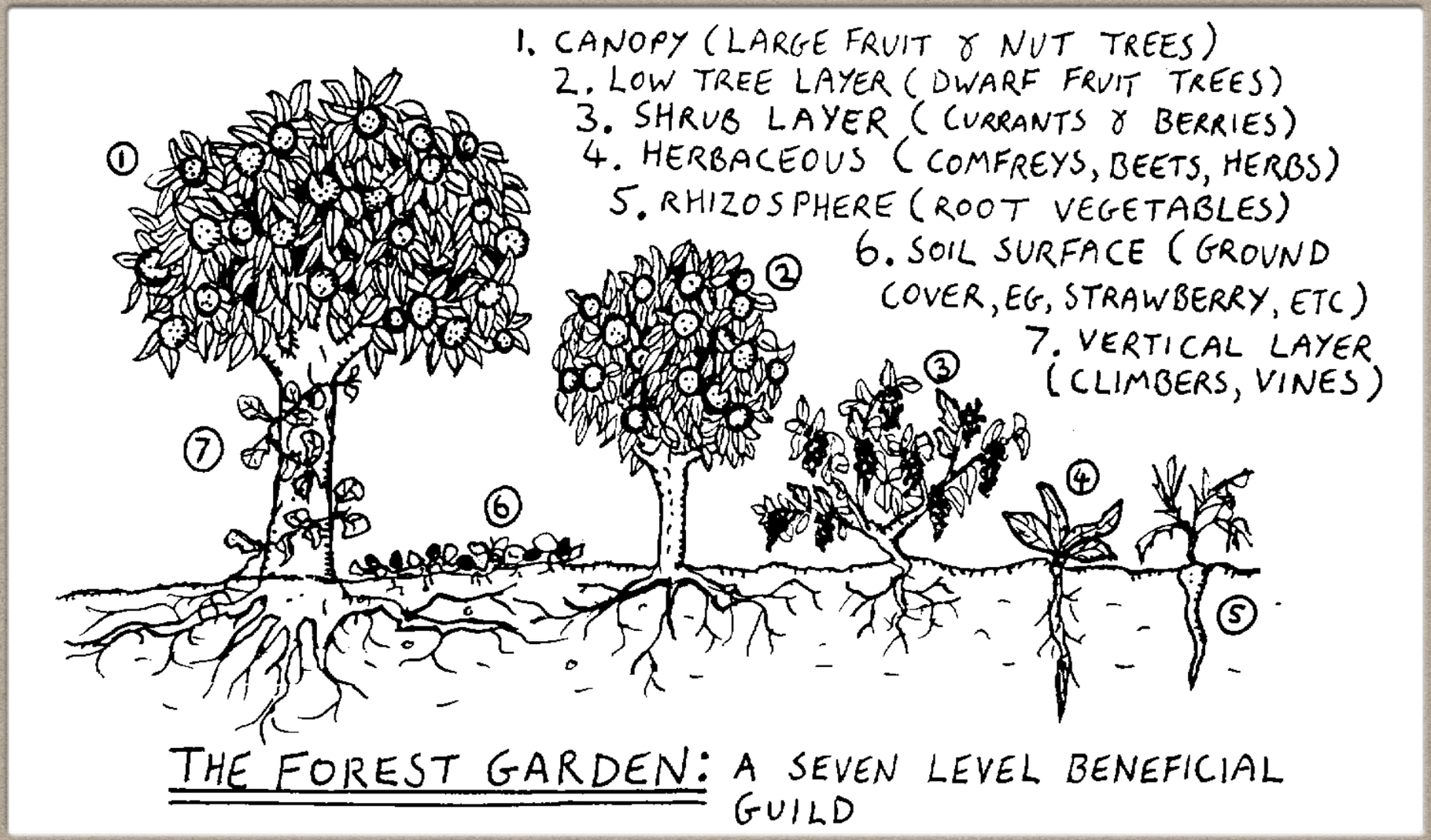




Illustrations from The Humanure Handbook by Joe Jenkins

DESIGN

spatial intensification



- The seven layers of the forest garden, according to Graham Burnett

DESIGN

temporal intensification

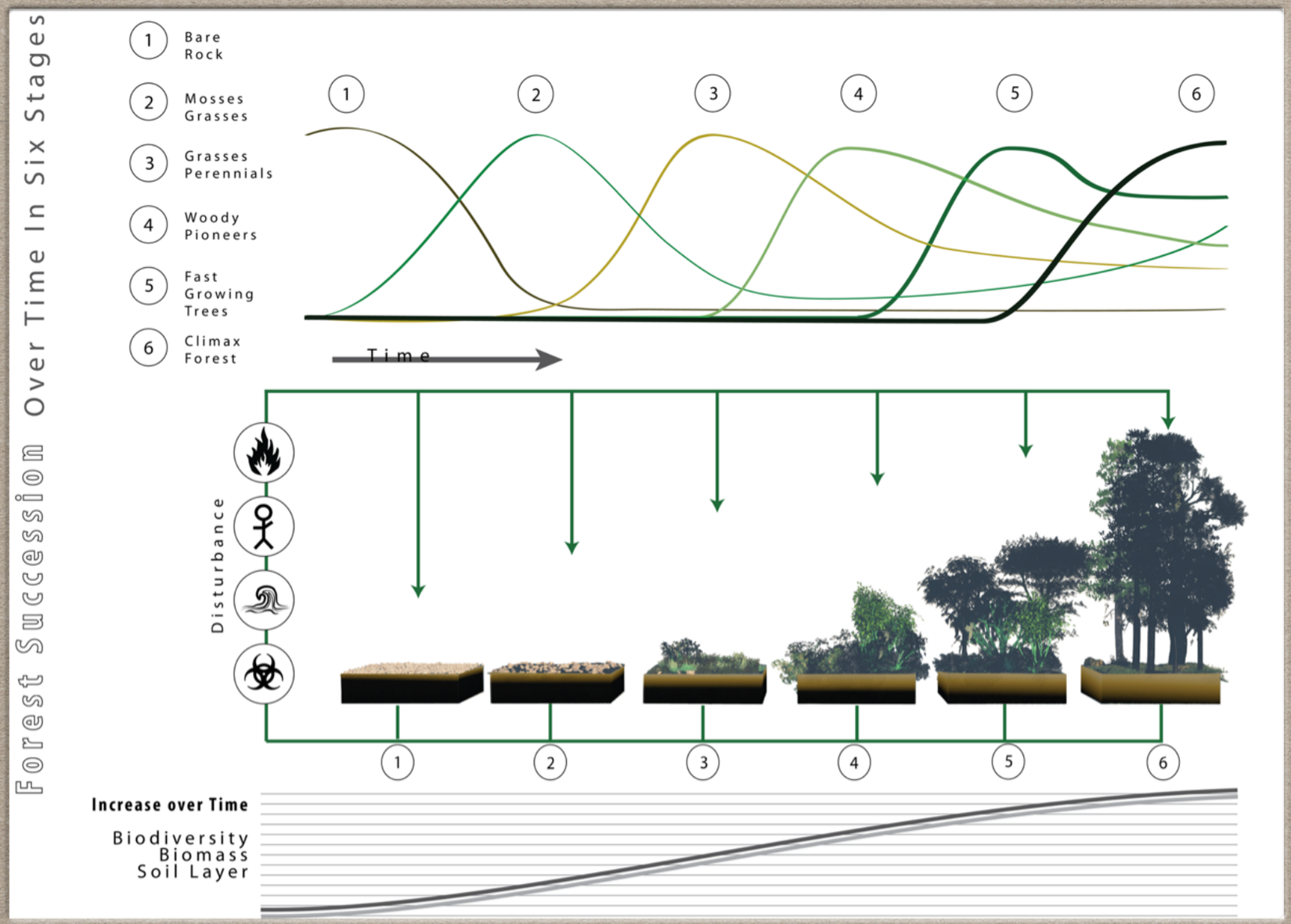


Illustration from Lucas Martin Frey [CC BY-SA 3.0]

- Ecological succession can be accelerated to maximize the yields of each stage

DESIGN

the resilience of the system

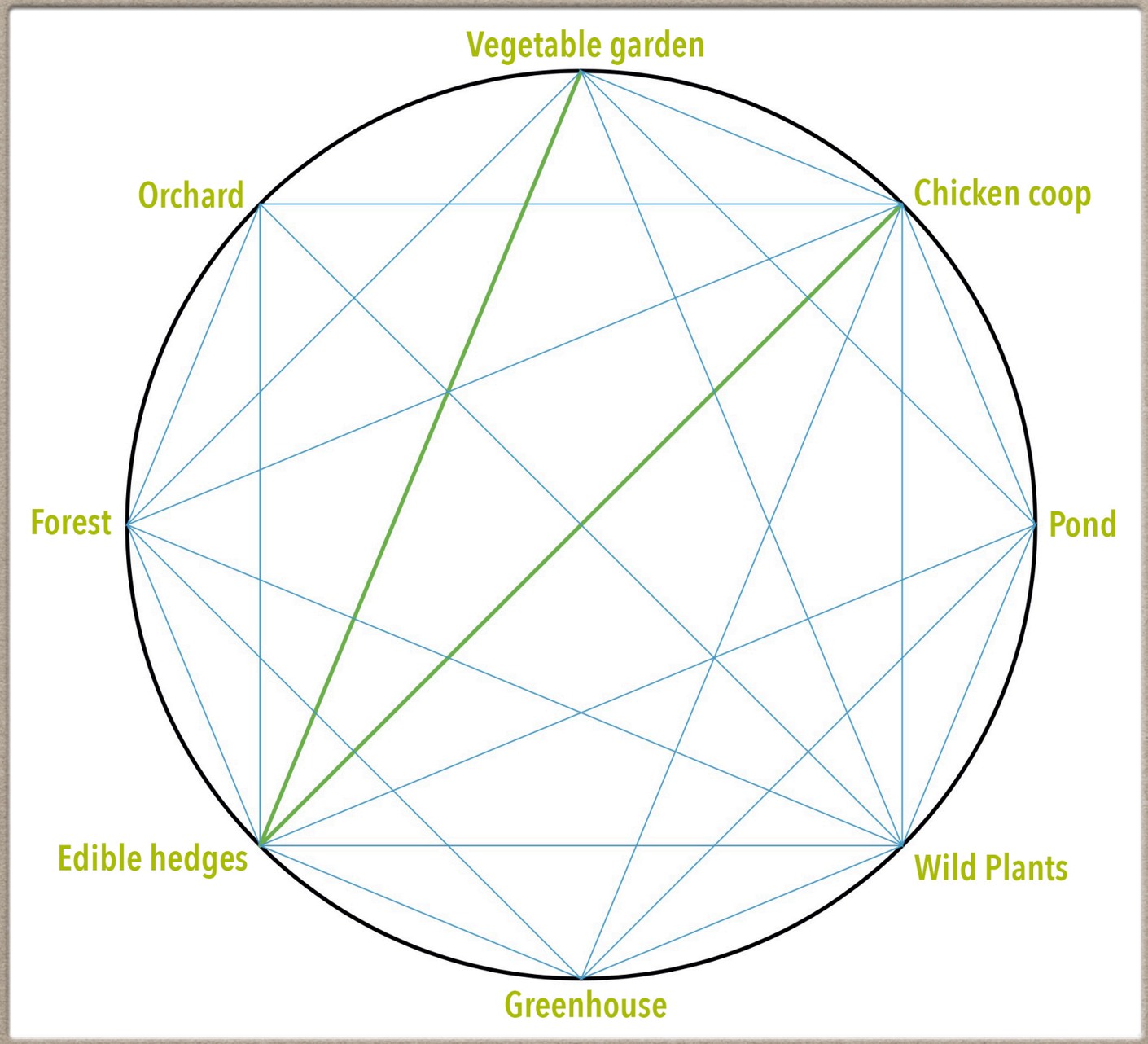


Illustration from the training Invitez la permaculture dans votre jardin

- The diversification of elements and the multiplication of relations increases the resilience of the system
- At the same time, its productivity grows in time and space

DESIGN

energy management: zones

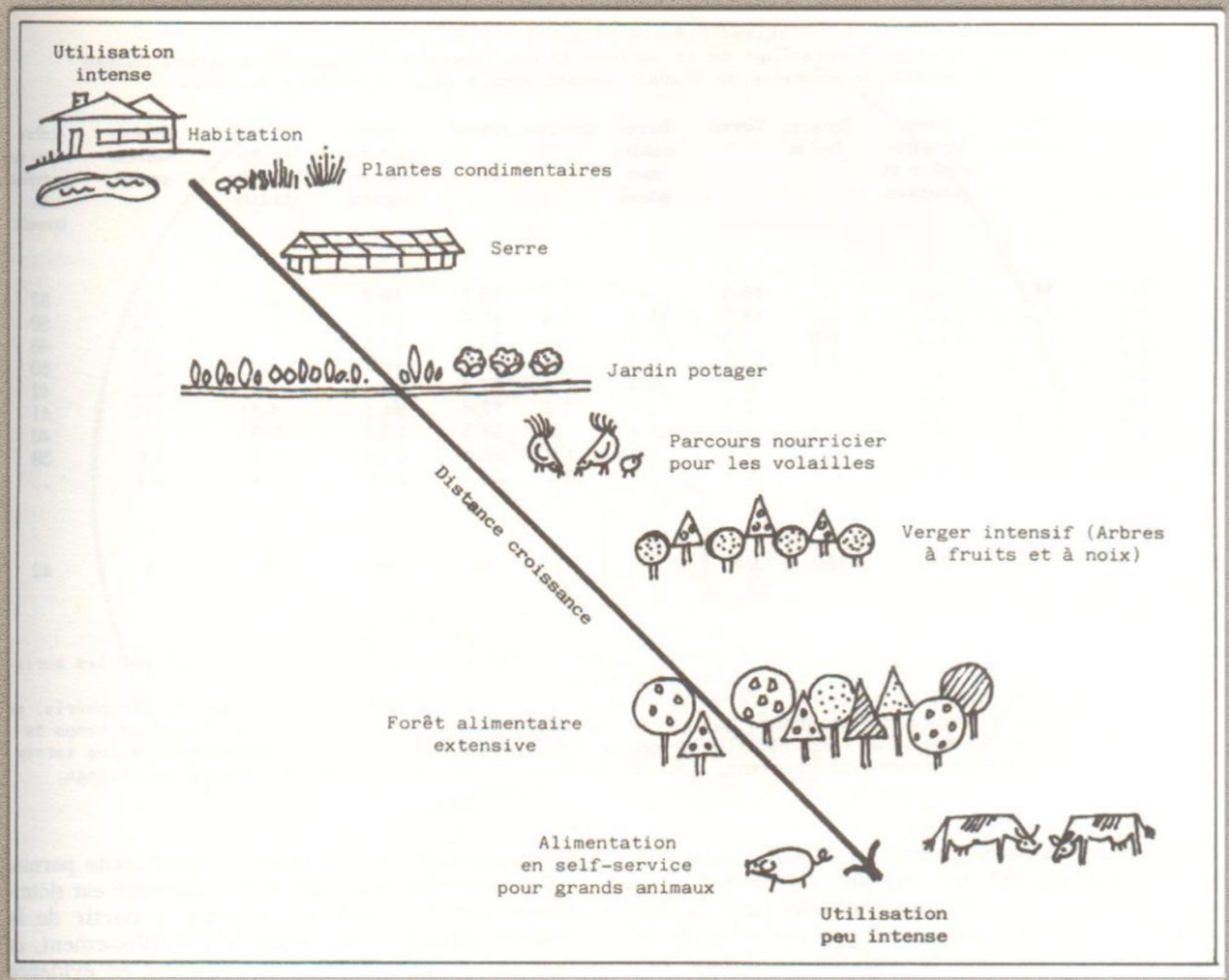


Illustration from Permaculture 1, by Bill Mollison & David Holmgren

- By dividing all species and structures into zones, human work within the system is used very efficiently

DESIGN

energy management: sectors

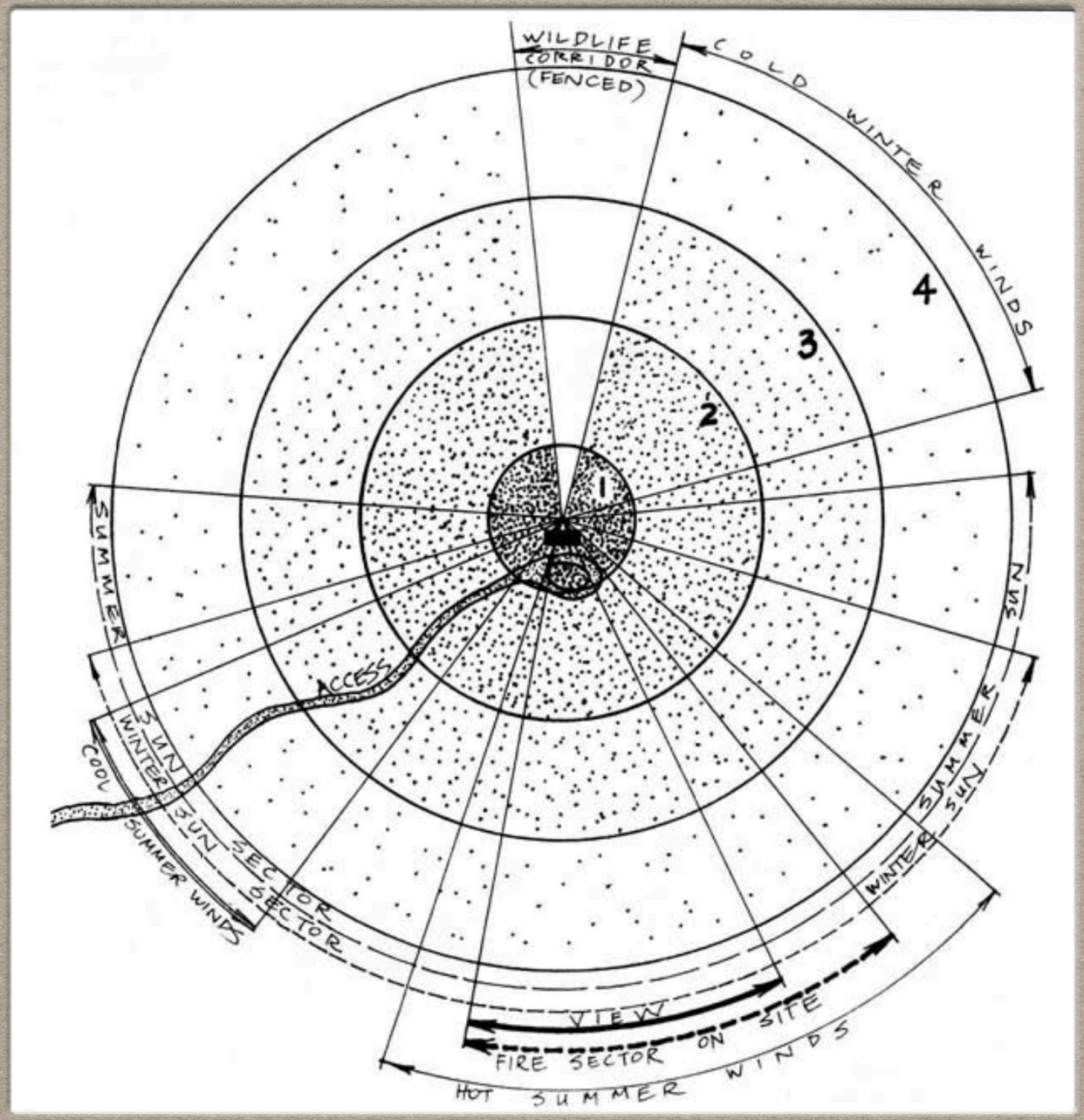


Illustration from Permaculture, A Designer's Manual, by Bill Mollison

- The sector division aims at the efficient control of energy coming from the outside of the system: sun, wind, fire

- These energies can be blocked, channeled or augmented at will

DESIGN

a cultivated ecosystem

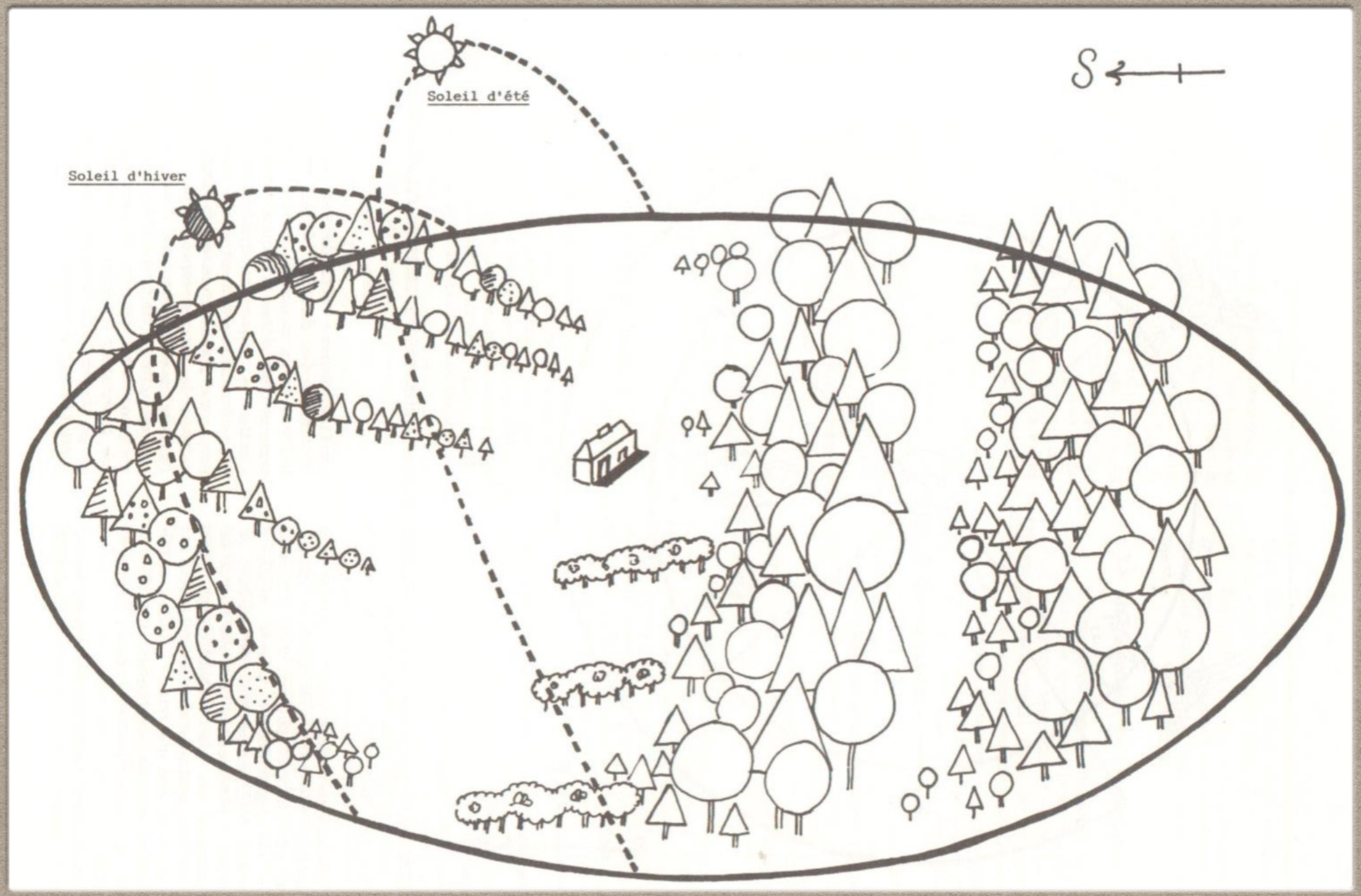
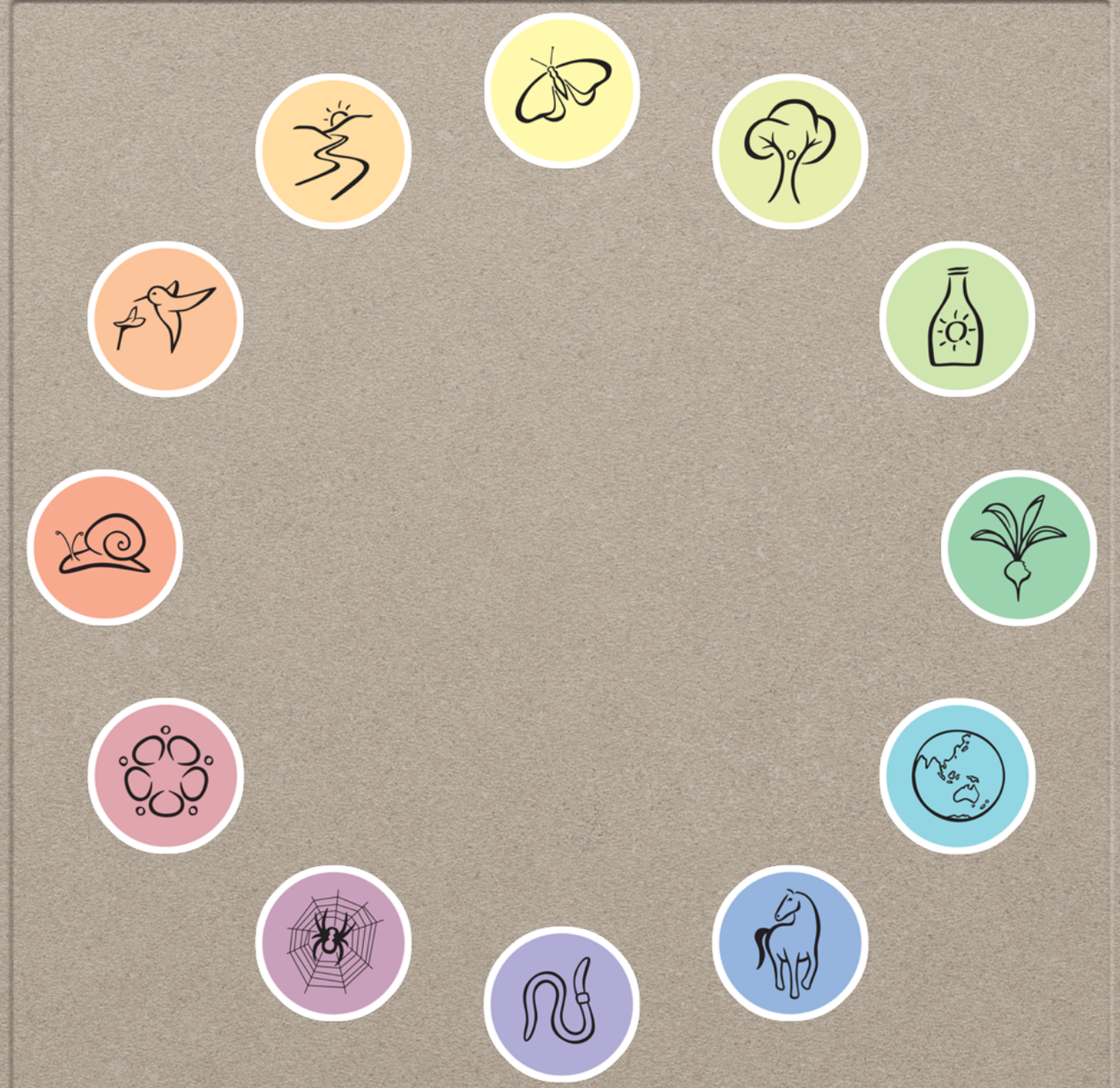


Illustration from Permaculture 1, by Bill Mollison & David Holmgren

PERMACULTURE

principles in detail



permaculturist.org

PERMACULTURE

principle 1

Observe and interact

- A good design depends on a free and harmonious relationship between nature and people
- Careful observation and careful interaction provide inspiration, and a repertoire of solutions and design motifs
- The main aim of this principle is to facilitate the emergence of a long-term way of thinking which is indispensable for devising new solutions

PERMACULTURE

principle 2

Catch and store energy

- Exploit the opportunities of collecting the energies available locally: sun, wind, water, waste ...
- Store energy in humus-rich soils, perennial vegetation systems, water bodies and cisterns, passive solar buildings ...

PERMACULTURE

principle 3

Obtain a yield

- Any system should be designed to ensure autonomy at all levels, effectively using the collected and stored energy to maintain the system and also to collect even more energy

- Flexibility and creativity are essential qualities for finding new ways to create a production

PERMACULTURE

principle 4

Apply self-regulation and accept feedback

- With a better understanding of how positive and negative feedbacks work in nature, we can design systems that are better self-regulated
- This reduces work by limiting corrective actions

PERMACULTURE

principle 5

Use and value renewable resources and services

- Seek the best possible use of renewable natural resources to create and maintain production
- Renewable services are those provided by plants, animals, soil life and water without being consumed

PERMACULTURE

principle 6

Produce no waste

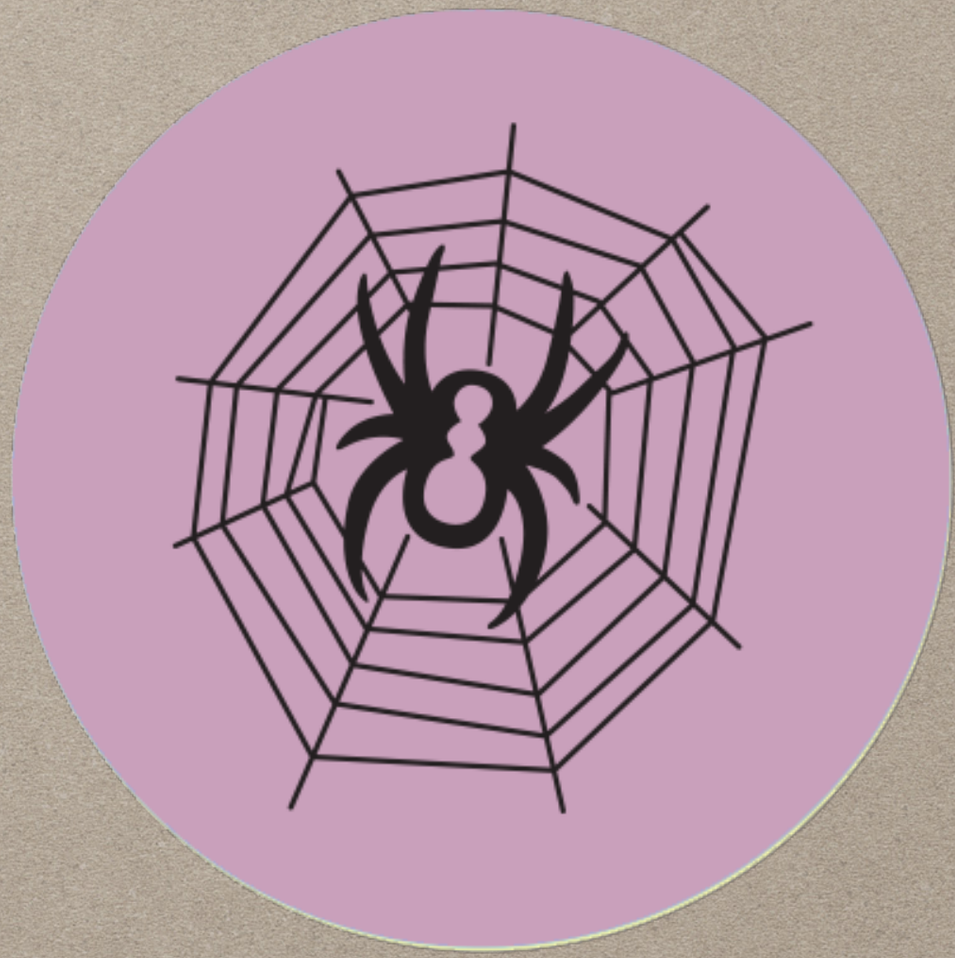
- Considering waste as resources and potentialities
- To perceive that all living beings are part of networks where the productions of some are the resources of others

PERMACULTURE

principle 7

Design from patterns to details

- To design a system, it is more important to find an appropriate overall scheme than to understand all the details of the system elements
- The recognition of forms is the result of the application of the principle Observe and interact; it is also the prerequisite for the permaculture design process



PERMACULTURE

principle 8

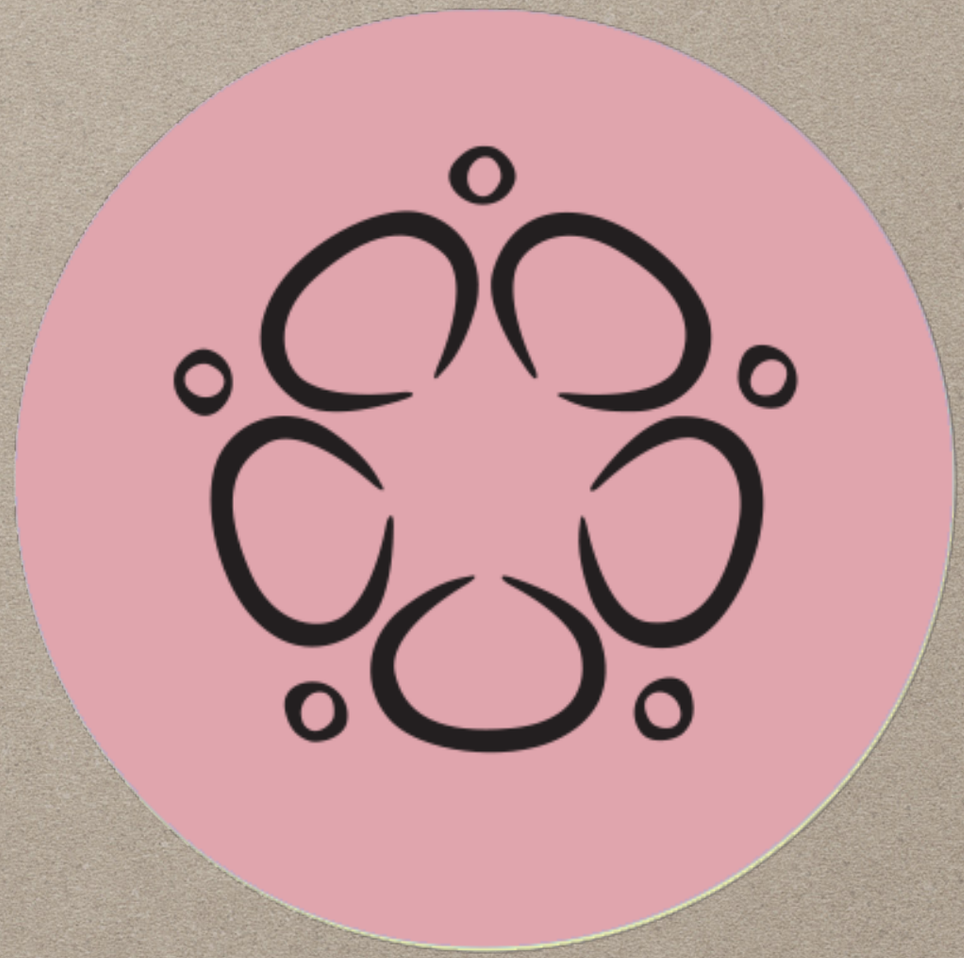
Integrate rather than segregate

- In all aspects of nature, the connections between the elements are as important as the elements themselves

- In the design of self-sufficient systems:

  - Each element fulfills several functions

  - Each important function is assumed by several elements



PERMACULTURE

principle 9

Use small and slow solutions

- For each function, systems should be designed on the smallest scale that fulfills the function while being achievable and energy efficient

- For a society to be human, democratic and sustainable, it is the human scale and the capacities of the individual that should be the main standard of measurement

PERMACULTURE

principle 10

Use and value diversity

- It is the great diversity of forms, functions and interactions within nature and humanity that give rise to the complexity of evolutionary systems

- Diversity must be seen as the result of a balance or tension in nature between, on the one hand, variety and possibility and, on the other, productivity and power

PERMACULTURE

principle 11

Use edges and value the marginal

- In each terrestrial ecosystem, the living part of the soil is both an interface or an edge between the inert mineral layers and the atmosphere
- The value and contribution of edges as well as the marginal and invisible aspects of any system must be recognized and preserved
- Extending edges can increase productivity and system stability

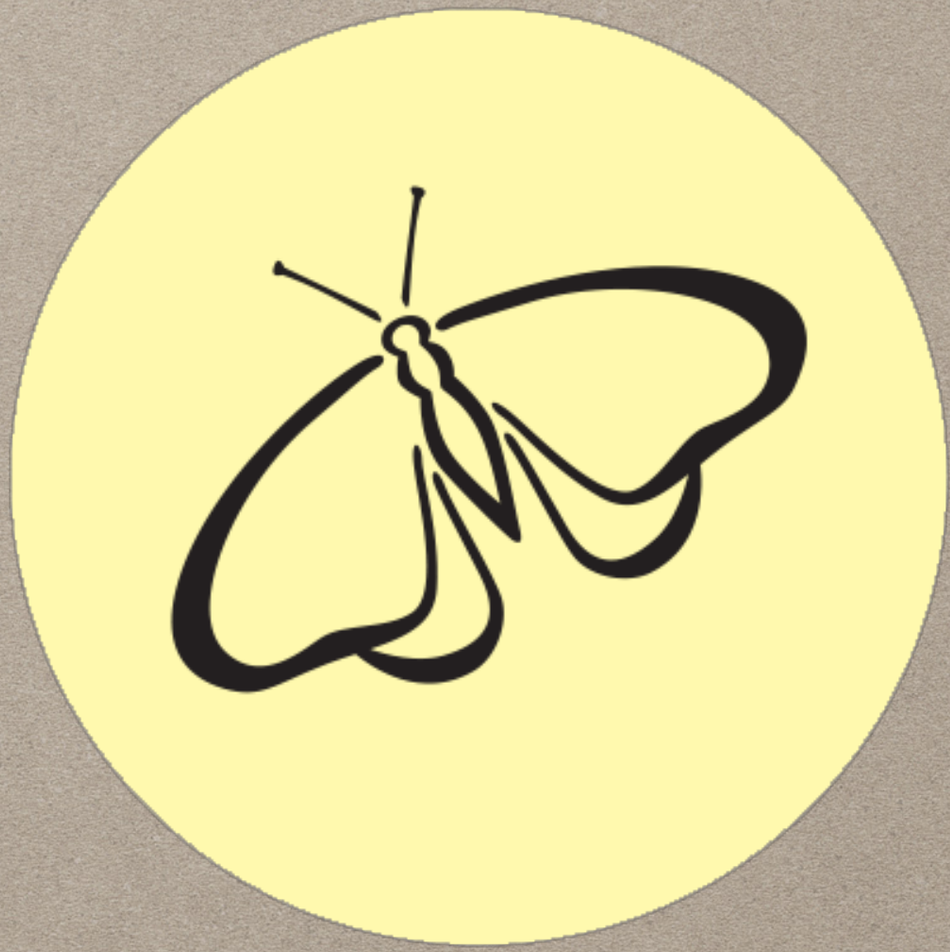
PERMACULTURE

principle 12

Creatively use and respond to change

- This principle has two aspects: on the one hand, to conceive using change in a voluntary and cooperative way; on the other, to react or adapt creatively to large-scale changes that cannot be controlled or influenced

- Permaculture is about the permanence of natural living systems and human culture, which depends to a large extent on flexibility and change



terms of use

Permaculture

THANK YOU FOR YOUR ATTENTION!

MICHAEL@PERMACULTURIST.ORG

permaculturist.org