



Peltometsäviljely agroekologin silmin 11.3.2026

Tiiti Kämäri



TRANSFORMATIONAL

LEVEL 5
Build a new global food system based on participation, localness, fairness and justice

LEVEL 4
Reconnect consumers and producers through the development of alternative food networks

LEVEL 3
Redesign agroecosystems

FOOD SYSTEM

- 13 PARTICIPATION**
Encourage social organization and greater participation in decision-making by food producers and consumers to support decentralized governance and local adaptive management of agricultural and food systems.
- 12 LAND AND NATURAL RESOURCE GOVERNANCE**
Recognize and support the needs and interests of family farmers, smallholders and peasant food producers as sustainable managers and guardians of natural and genetic resources.
- 11 CONNECTIVITY**
Ensure proximity and confidence between producers and consumers through promotion of fair and short distribution networks and by re-embedding food systems into local economies.
- 10 FAIRNESS**
Support dignified and robust livelihoods for all actors engaged in food systems, especially small-scale food producers, based on fair trade, fair employment and fair treatment of intellectual property rights.
- 9 SOCIAL VALUES AND DIETS**
Build food systems based on the culture, identity, tradition, social and gender equity of local communities that provide healthy, diversified, seasonally and culturally appropriate diets.

INCREMENTAL

LEVEL 2
Substitute conventional inputs and practices with agroecological alternatives

LEVEL 1
Increase efficiency of input use and reduce use of costly, scarce or environmentally damaging inputs

AGROECOSYSTEM

- 8 CO-CREATION OF KNOWLEDGE**
Enhance co-creation and horizontal sharing of knowledge including local and scientific innovation, especially through farmer-to-farmer exchange.
- 7 ECONOMIC DIVERSIFICATION**
Diversify on-farm incomes by ensuring small-scale farmers have greater financial independence and value addition opportunities while enabling them to respond to demand from consumers.
- 6 SYNERGY**
Enhance positive ecological interaction, synergy, integration, and complementarity amongst the elements of agroecosystems (plants, animals, trees, soil, water)
- 5 BIODIVERSITY**
Maintain and enhance diversity of species, functional diversity and genetic resources and maintain biodiversity in the agroecosystem over time and space at field, farm and landscape scales.
- 4 ANIMAL HEALTH**
Ensure animal health and welfare.
- 3 SOIL HEALTH**
Secure and enhance soil health and functioning for improved plant growth, particularly by managing organic matter and by enhancing soil biological activity.
- 2 INPUT REDUCTION**
Reduce or eliminate dependency on purchased inputs.
- 1 RECYCLING**
Preferentially use local renewable resources and close as far as possible resource cycles of nutrients and biomass.

ILLUSTRATIONS: DOROTTYA POÓR

THE FIVE LEVELS OF TRANSITION TOWARDS SUSTAINABLE FOOD SYSTEMS AND THE RELATED 13 PRINCIPLES OF AGROECOLOGY

SOURCE: GLIESSMAN (2007) AND HLPE (2019)

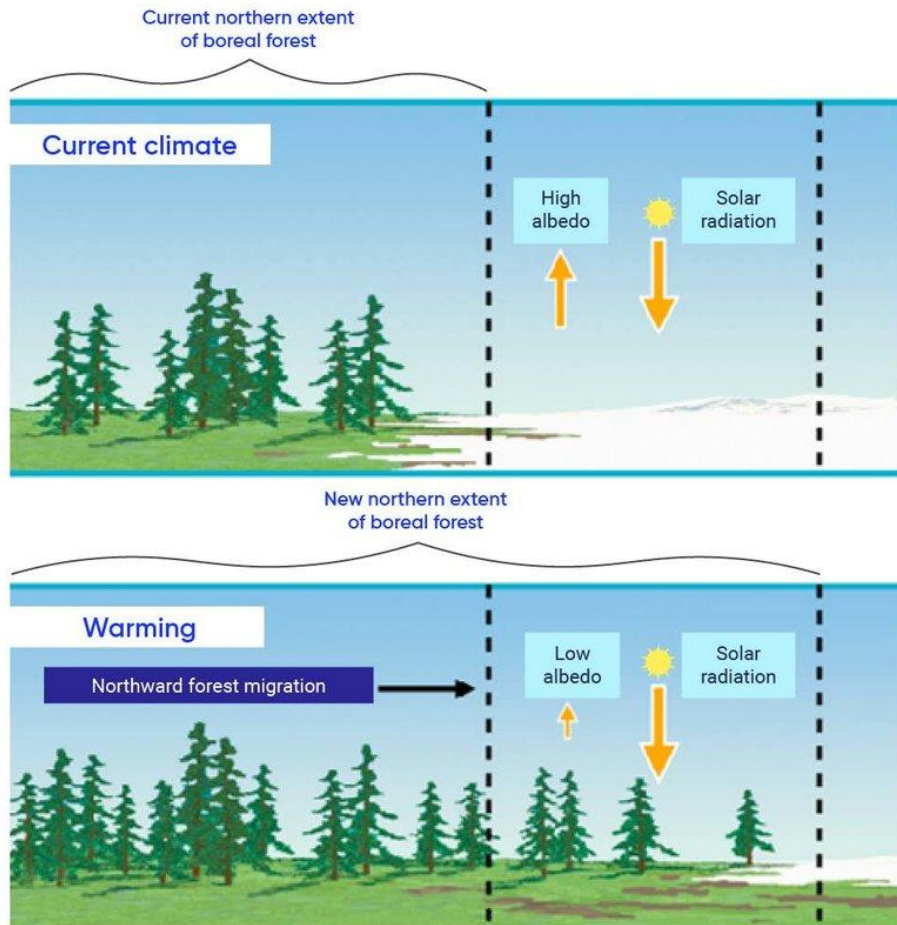
Ekosysteemin funktiot

- Abioottiset ja bioottiset tekijät
- Energian virta
- Ravinteiden kierto
- Populaatiot ja vuorovaikutussuhteet
 - Monimuotoisuus & keskinäiset riippuvuudet
 - Kilpailu ja kantokyvyn rajoitteet
 - Symbioosit ja lajien yhteistyö
- Ekosysteemiset muutokset
 - Takaisinkytkennät ja itsesäätely
 - Kasvu ja uusiutuminen

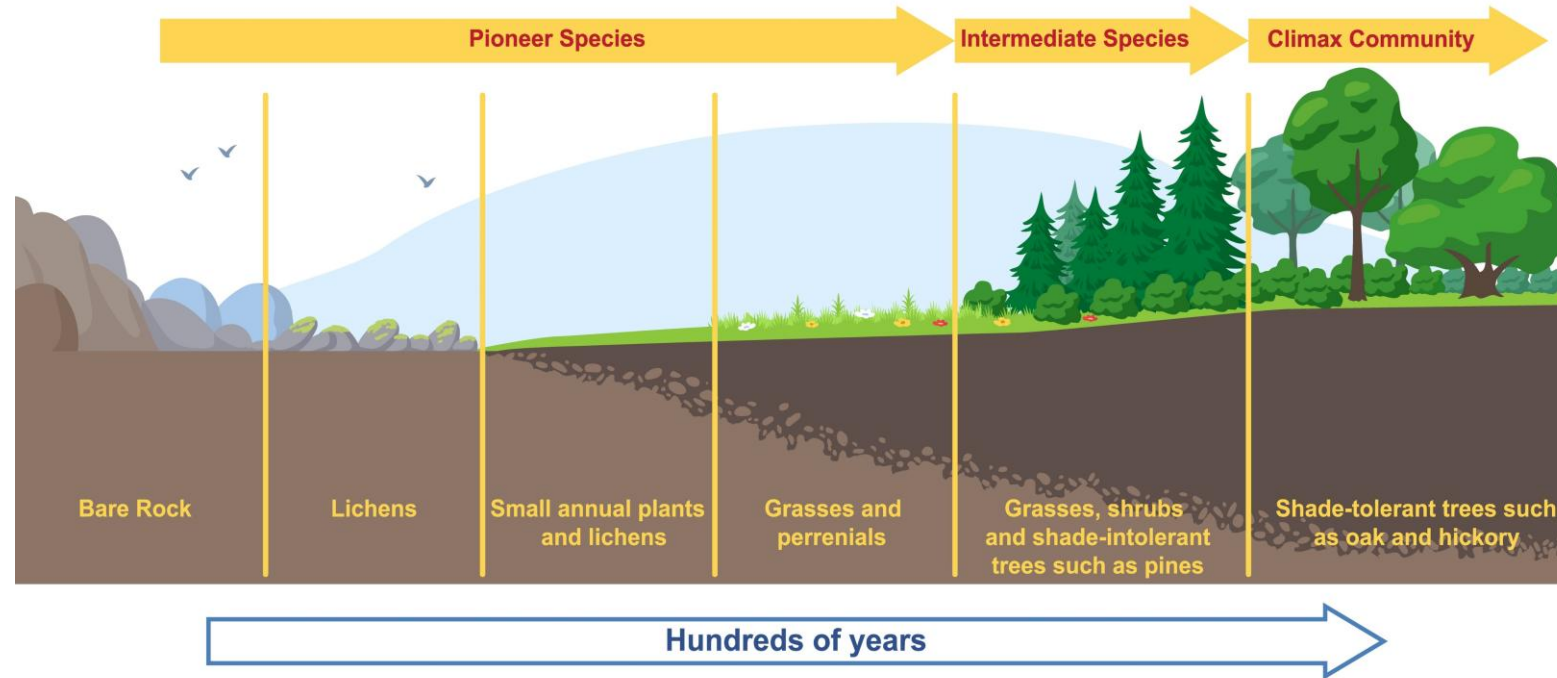
The ecosystem functions

- Abiotic and biotic factors
- Flow of energy
- Nutrient cycling
- Populations and interactions
 - Diversity & communities
 - Competition and carrying capacity constraints
 - Symbioses and cooperation between species
- Ecosystem changes
 - Feedback and self-regulation
 - Growth and regeneration

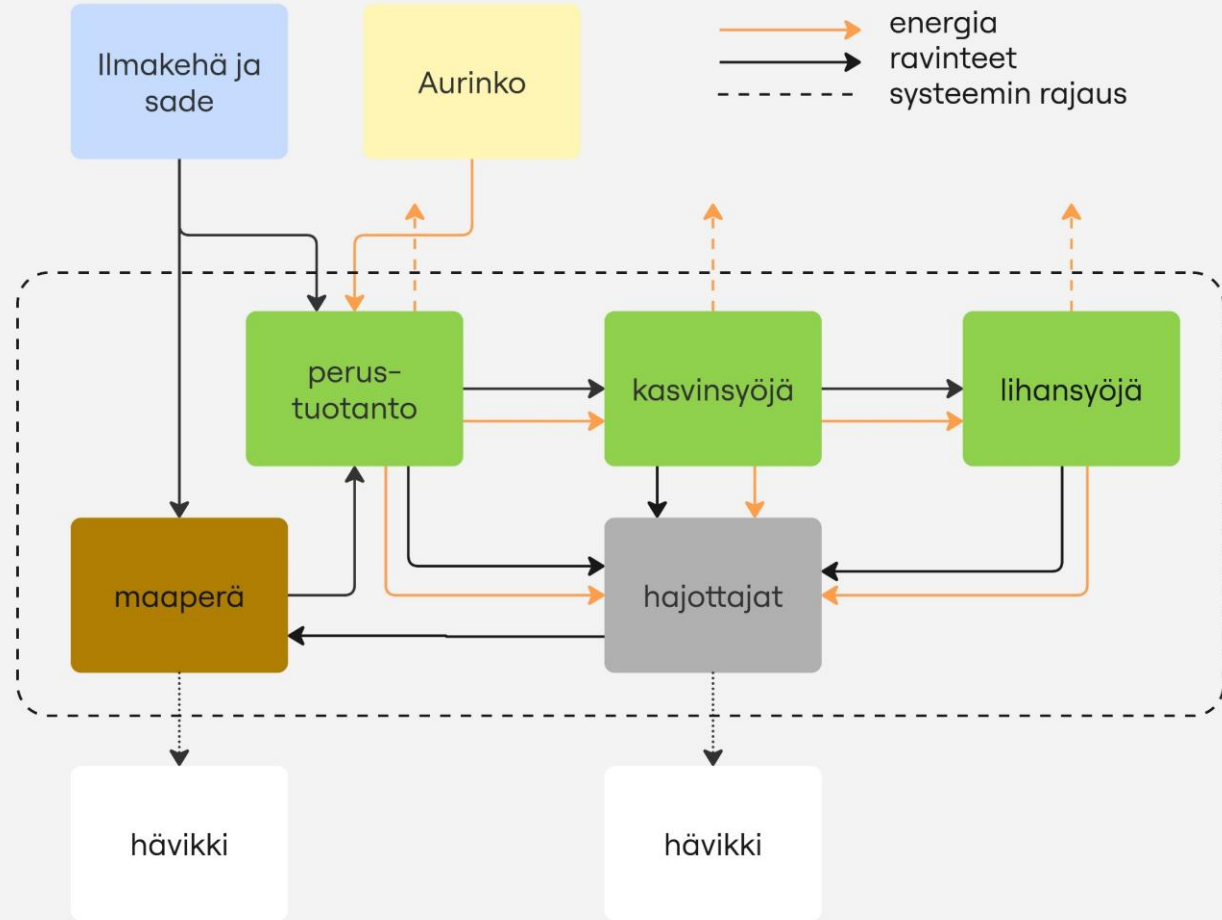
Ekosysteemiset muutokset/ Ecosystems change



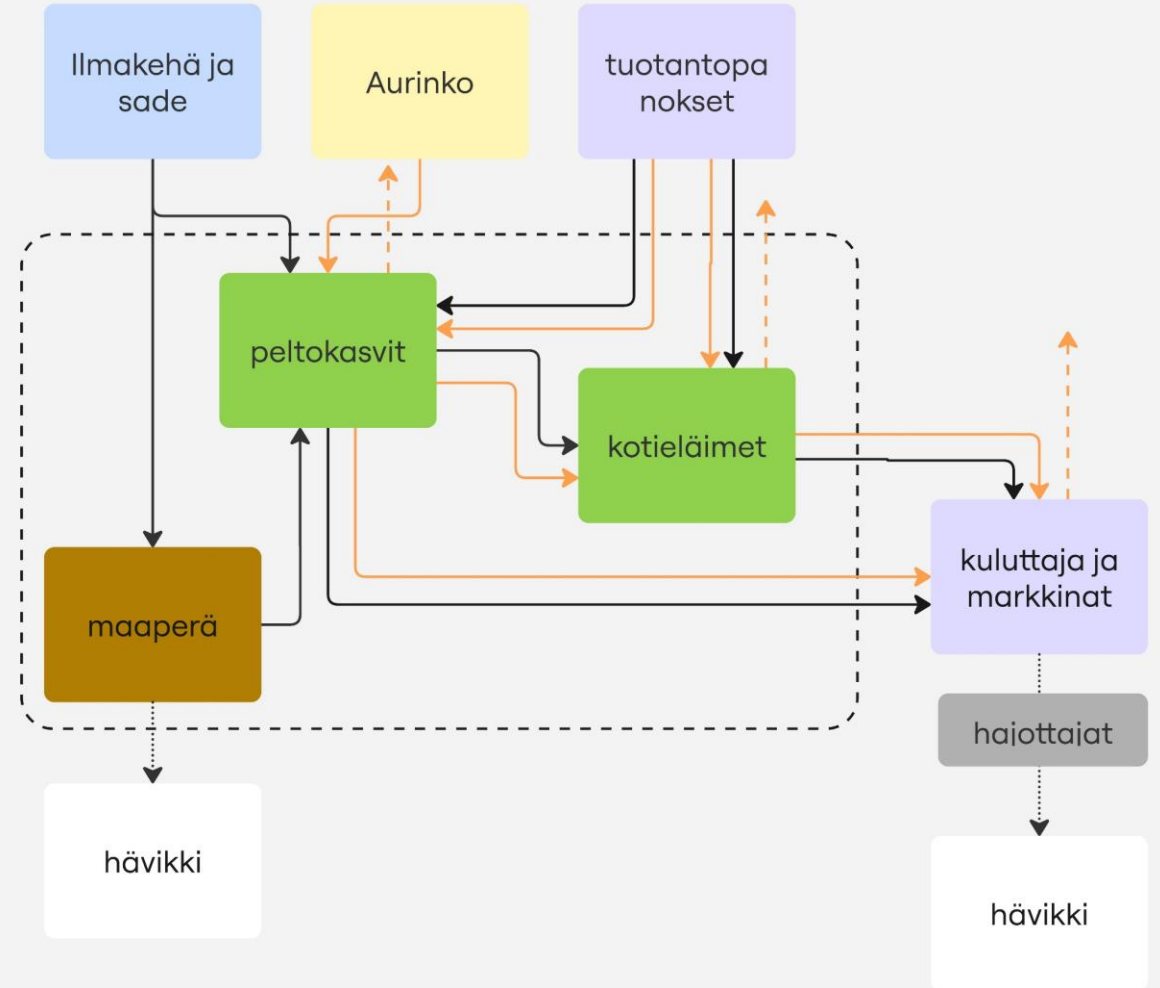
PRIMARY SUCCESSION



EKOSYSTEEMI



AGROEKOSYSTEEMI



Agroekosysteemin vs. ekosysteemi

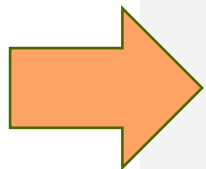
- Merkittävimmät eroavaisuudet
 - Energian virta
 - Ravinteiden kierto
 - Populaatiot
 - Resilienssi

Agroecosystem vs. ecosystem

- The most significant differences
 - Flow of energy
 - Nutrient cycling
 - Populations
 - Resilience

Agroekosysteemin komponentit ja populaatiot

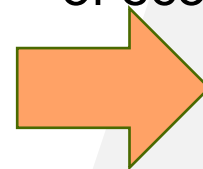
- Troofisten tasojen ja vuorovaikutusten vähyyys
- Suppea ja valikoiva geenimonimuotoisuus
- Populaation koko ihmisen säätelemää
 - Minkä seurauksena ekosysteemeille tyypillinen itsesäätely ja takaisinkytkennät puuttuu



Resilienssi on ekosysteemiin verrattuna heikko ja edellyttää ulkoisten panosten lisäämistä

Agroecosystem components and populations

- Lack of trophic levels and interactions
- Limited and selective genetic diversity
- The entire population is regulated by humans
- As a result, the self-regulation and feedbacks typical of ecosystems are lacking



Resilience is weak compared to the ecosystem and requires increased external inputs





Agroekosysteemiä arvioidessa tulee huomioida

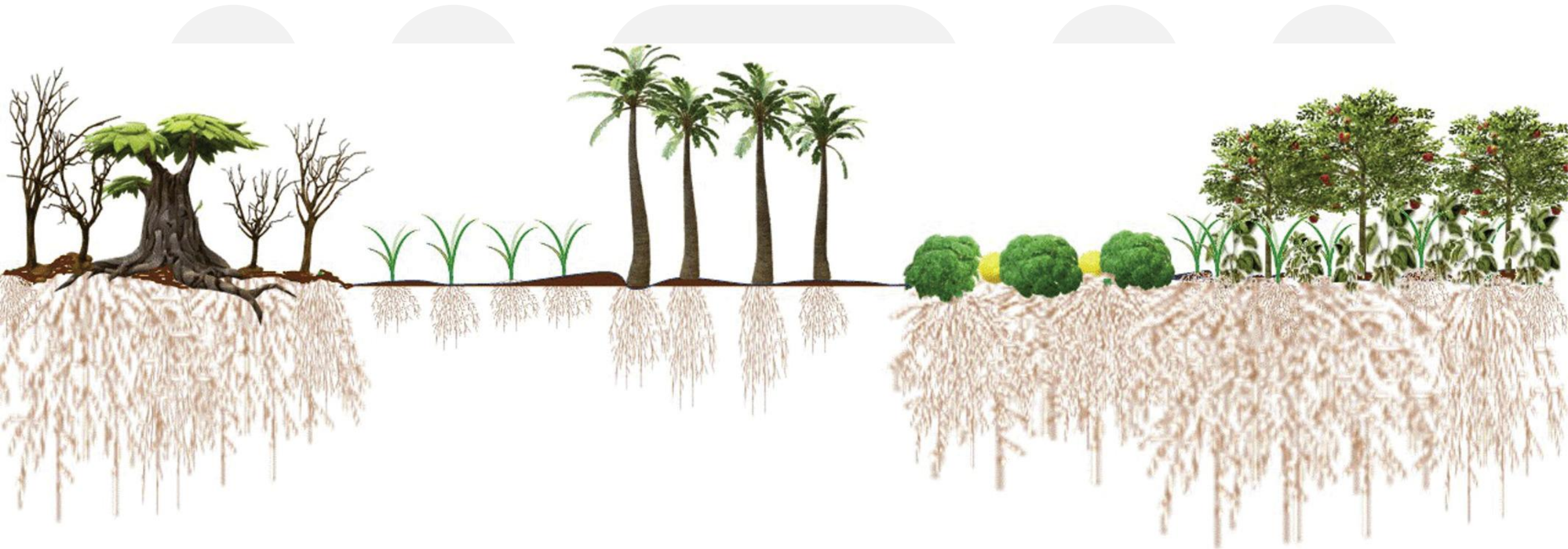
- **Systemin rajaus**
 - Abstrakti ja konkreettinen ulottuvuus
- **Systemin ulkoiset ja sisäiset panokset, toimijat**
 - Panoksien alkuperä ja merkitys
- **Maisemaulottuvuus**
 - Monitoiminnallisuus huomioi muutkin kuin vain tuotantoon liittyvät ekosysteemipalvelut
 - Korostaa ekosysteemien välisiä yhteyksiä – mosaiikki, joka luo kokonaisuuksia

When assessing an agroecosystem, the following must be taken into account:

- System Limitation
- Abstract and concrete dimension
- External and internal inputs of the system, actors
- Origin and Significance of Stakes
- Landscape dimension
- Multifunctionality takes into account more than just production-related ecosystem services
- Emphasizes the connections between ecosystems – a mosaic that creates wholes

Esimerkki monitoiminnallisuudesta ja maisematason toteuttamisesta

Example of multifunctionality and implementation of the landscape plane



	Native vegetation	Annual Crop and Date Palm	Multifunctional Agroecosystems
Life time:	1972	1977 2009	2017 2069 (Model)
SOC (Mg ha ⁻¹):	21.3	16.9 8.9	~15.3 ~30.0

Peltometsäviljely

- Ei perustu ulkoisiin panoksiin
- Lisää lajien ja populaatioiden välisiä vuorovaikutussuhteita, jotka
 - Parantaa ekosysteemistä toiminnallisuutta (kilpailu, symbioosi, resurssien jakautuminen)
- **Hyödyt eivät ole vain ekologisia:**
 - riskienhallinta (mm. useita tulovirtoja, resilienssi)
 - panoskustannusten väheneminen pitkällä aikavälillä

Agroforestry

- Not based on external inputs
- Increases the interactions between species and populations that
 - Improves ecosystem functionality (competition, symbiosis, resource allocation)
- **The benefits are not only ecological:**
 - risk management (e.g. multiple income streams, resilience)
 - reduction of input costs in the long term