

# INTRODUCTION TO AGROFORESTRY

## DEFINITION AND CONCEPT, BASIC TERMINOLOGY, PROS AND CONS

AUTHOR:  
BOHDAN LOJKA

MODULE 1



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## AIM OF THE MODULE



- Define agroforestry (AF) – what and why?
- Explain the basic concept of AF
- Shortly have a look on the history of AF
- Review the role of trees in AF
- Clarify the pros and cons of AF
- How to implement AF





What is agroforestry?



# DEFINITION OF AGROFORESTRY - WORLD



## BASIC DEFINITIONS

*Agroforestry is a collective name for land-use systems in which woody perennials (trees, shrubs, etc.) are grown in association with herbaceous plants (crops, pastures) or/and livestock, in a spatial arrangement, a rotation, or both; there are both ecological and economic interaction between the trees and other components of the system.*

Lundgren, ICRAF (1982)

*Agroforestry is a dynamic, ecologically based, natural resource management system that, through the integration of trees in farmland and rangeland, diversifies and sustains production for increased social, economic and environmental benefits.*

Leaky (1997)

**Agroforestry = growing trees on farm**





# DEFINITION OF AGROFORESTRY IN EUROPE



## EU CAP REGULATION 1325/2013

*Agroforestry system means land use system in which **trees are grown in combination with agriculture** on the same land.*

## EURAF (EUROPEAN AGROFORESTRY FEDERATION)

*Agroforestry is the **integration of woody vegetation, crops and/or livestock on the same area of land**. Trees can be inside parcels or on the boundaries (hedges).*

## ČSAL (CZECH ASSOCIATION FOR AGROFORESTRY)

*Agroforestry is management of agricultural or forest land that **combines growing woody perennials with some form of agricultural production**. The components of agroforestry system (trees, crops, animals, or others) have to be cultivated with productive and/or environmental goals.*

**Agroforestry = growing trees by farmers on agricultural land**

**Agroforestry is not reforestation of agricultural land!!!**

**Definition is very broad and we need to define different agroforestry practices (see Module 2)**



## CONCEPT OF AGROFORESTRY



- AF normally involves **two or more species** of plants (or plants and animals), at least one of which is a woody perennial
- AF system always **two or more outputs**
- The cycle of an AF system is always **more than one year**
- Even the simplest agroforestry system is **more complex**, ecologically (structurally and functionally) and economically, than a monocropping system



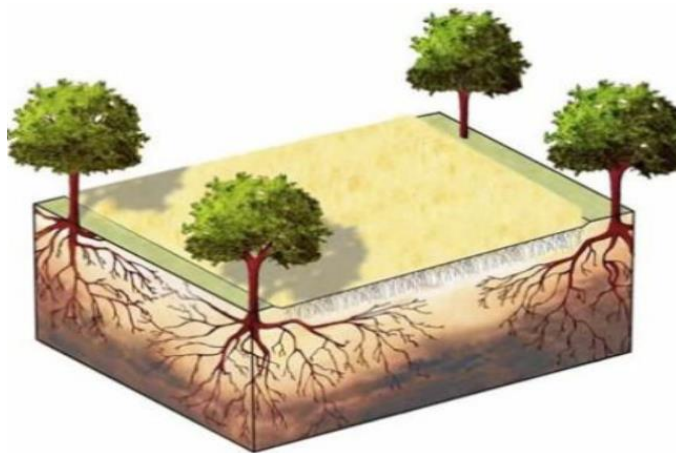




## WHY AGROFORESTRY?



- AF is currently seen as one of the **sustainable agricultural system**
- AF could be **highly productive while conserving natural resources**
- AF could be **compatible with modern agriculture**
- AF in Europe can bring lots of **environmental services** that we value: biodiversity, soil and water conservation, carbon sequestration etc.
- **Trees are beautiful** – European cultural landscape





**Agroforestry ... a traditional technique in most parts of Europe ....**

**But forgotten with industrialization of our agriculture**

**Can it be brought back?**







# HISTORY OF AGFOFORESTRY



- **New name for set of old practices**
- Shifting cultivation is a form of agroforestry according to the definition used
  - Practiced in Europe until Middle-ages and still a mainstream in the tropics
- **Many traditional farming systems used throughout the tropics but also in Europe are a kind of agroforestry**
- Most of the traditional AF practices in Europe **disappeared through the agricultural intensification** in the last century – **elimination of trees from agricultural land**
- In the 1970s agroforestry has been brought as a scientific way of improvement of agricultural systems in the tropics and in the last decades interest in AF also grown in Europe
- **Growing interest in temperate countries as environmental friendly land-use system**
- **EURAF** – European Agroforestry Federation (lobbying for AF), established in 2012
  - See EURAF [AF map of Europe](#)
- Implementation in **EU CAP** legislation in 2013 – general support for establishment of AF systems
- AF is implemented into **new EU CAP strategic plan (2021-27)**, but implementation depends on each member state
  - See Map of [AF Policy Measures](#)









## ROLE OF AGROFORESTRY AND TREES



**Productivity:** intensification of agricultural as well as tree/forest production

**Sustainability:** conserving the production potential of the resource base

**Adaptability:** improved or new agroforestry technologies should conform to local farming practices





## MULTIPURPOSE TREES (MPT'S) – ROLE IN AF



Trees which make more than one substantial contribution, as products or service functions, to the land-use systems in which they are grown

Productive role	Service role
<p>Timber</p> <p>Fuelwood</p> <p>Building materials</p> <p>Poles and stakes</p> <p>Fodder</p> <p>Fruits</p> <p>Medicines</p> <p>Resins and gums</p> <p>Mulch and green manure</p>	<p><i>At the farm level:</i></p> <p>Control of runoff and erosion</p> <p>Maintenance of soil organic matter and physical properties</p> <p>Promote nutrient cycling and efficient nutrient use</p> <p>Control of weeds, pest and diseases</p> <p>Shade (for human and livestock)</p> <p>Reduction in wind speed</p> <p>Fencing and demarcation of boundaries</p> <p>Microclimate improvements</p> <p><i>On a large scale:</i></p> <p>Improvement of the hydrological cycle</p> <p>Maintenance of biodiversity</p> <p>Carbon sequestration</p>





# PROS AND CONS OF AGROFORESTRY



## ADVANTAGES OF AGROFORESTRY

- **Productivity and sustainability** of farming systems on marginal land
- But also important in **maximizing and diversifying productivity** on highly fertile land
- **Reduction of risks** – diversity of products
- Building on **farmers knowledge**
- Improved **soil and water management**
- Number of **environmental services**





# PROS AND CONS OF AGROFORESTRY



## DISADVANTAGES OF AGROFORESTRY

- **Profitable in longer time** – relatively high investment for establishment
- Could be **intensive for labour, management and skills**
- **Legislation barriers** in many European countries
- **Tree compete with crops** for water, light and nutrients
- **Trees can become like weeds** (invasive tree species)







# HOW TO IMPLEMENT AGROFORESTRY



## TWO FUNDAMENTAL WAYS OF ARRIVING AT AF

- Integrating trees into farming system
- Integrating farmers or agricultural production into forest (from alley cropping to forest farming)







# SUMMARY OF THE MODULE



## LESSON LEARNED

- Agroforestry is **association of trees with agricultural production** on the same piece of land
- Agroforestry is a **complex and long-term** land-use system
- Agroforestry is **not new in Europe** – many traditional agricultural systems are agroforestry
- Trees can have very important **productive role**
- Growing trees on agricultural land brings lots of **environmental services** mainly connected with soil and water management
- However, there are also **disadvantages** that prevents farmers of implementing AF
  - **Legislative barriers, long-term investment and competition** between trees and crops
- How to arrive to AF – either **implement trees into agriculture** or implement agricultural production into forest







➤ Will be added

## REFERENCES



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