

Introduction to Agroforestry

Introduction to Agroforestry

Key concepts, benefits, types, design principles, and practical considerations

1. What Is Agroforestry?

Aspect	Description
Definition	The intentional integration of trees, shrubs, and/or lianas with crops and/or livestock on the same land unit.
Goal	Combine the ecological functions of forests with the productivity of agriculture to create sustainable, multi-purpose land-use systems.
Scale	Ranges from smallholder home gardens to large commercial farms and landscape-level projects.

2. Core Benefits

Category	Specific Benefits
Ecological	• Soil erosion control
	• Improved water infiltration & retention
	• Enhanced biodiversity (habitat, pollinators, pest predators)
	• Carbon sequestration & climate?change mitigation
Economic	• Diversified income streams (timber, fruit, nuts, fodder, medicinal products)
	• Reduced input costs (fertilizer, feed, pesticide)
	• Increased resilience to market or climate shocks
Social	• Food security & nutrition
	• Labor diversification (seasonal work)
	• Cultural values & traditional knowledge preservation

3. Main Agroforestry Systems

[illegible]

Introduction to Agroforestry

Alley Cropping	Rows of fast-growing trees (e.g., poplar, eucalyptus) with annual crops grown in the alleys.	Soil fertility, windbreak, timber.
Silvopasture	Trees + pasture + grazing livestock.	Shade & shelter for animals, fodder, timber/fruit.
Forest Farming (Multi-Strata)	Understory crops (e.g., mushrooms, herbs) cultivated beneath a managed forest canopy.	High-value specialty products.
Windbreaks / Shelterbelts	Linear plantings of trees/shrubs along field edges.	Reduce wind speed, protect crops/livestock, conserve moisture.
Riparian Buffers	Trees/shrubs planted along waterways.	Filter runoff, protect water quality, habitat corridor.
Home Gardens / Kitchen Gardens	Mixed planting of fruit trees, vegetables, herbs, and small livestock around dwellings.	Household food supply, cultural practices.
Taungya / Integrated Forestry-Cropping	Short-rotation timber species interplanted with annual crops during early growth phases.	Early cash crops, later timber harvest.

4. Design Principles

1. Site Assessment

- Climate (temperature, rainfall, seasonality)
- Soil type, depth, fertility, drainage
- Topography (slope, aspect)
- Existing vegetation & biodiversity

2. Species Selection

- **Compatibility:** Complementary root depths, phenology, and nutrient needs.
- **Economic Value:** Market demand for timber, fruit, nuts, medicinal bark, etc.

Introduction to Agroforestry

- **Ecological Role:** Nitrogen fixers (e.g., *Leucaena*, *Acacia*), pollinator attractors, pest repellents.

3. Spatial Arrangement

- Row spacing, alley width, tree density, and canopy height are set to balance light for understory crops and tree growth.
- Use of **buffer zones** for water protection and wind reduction.

4. Temporal Planning

- Sequence planting to match growth rates (e.g., fast-growing nitrogen fixers first, followed by slower