

# How Agroforestry Can Serve Communities

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Economy ?



Society ?



Environment ?

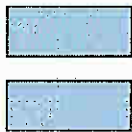
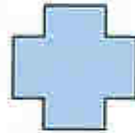


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Communities ?

# What is Agroforestry?

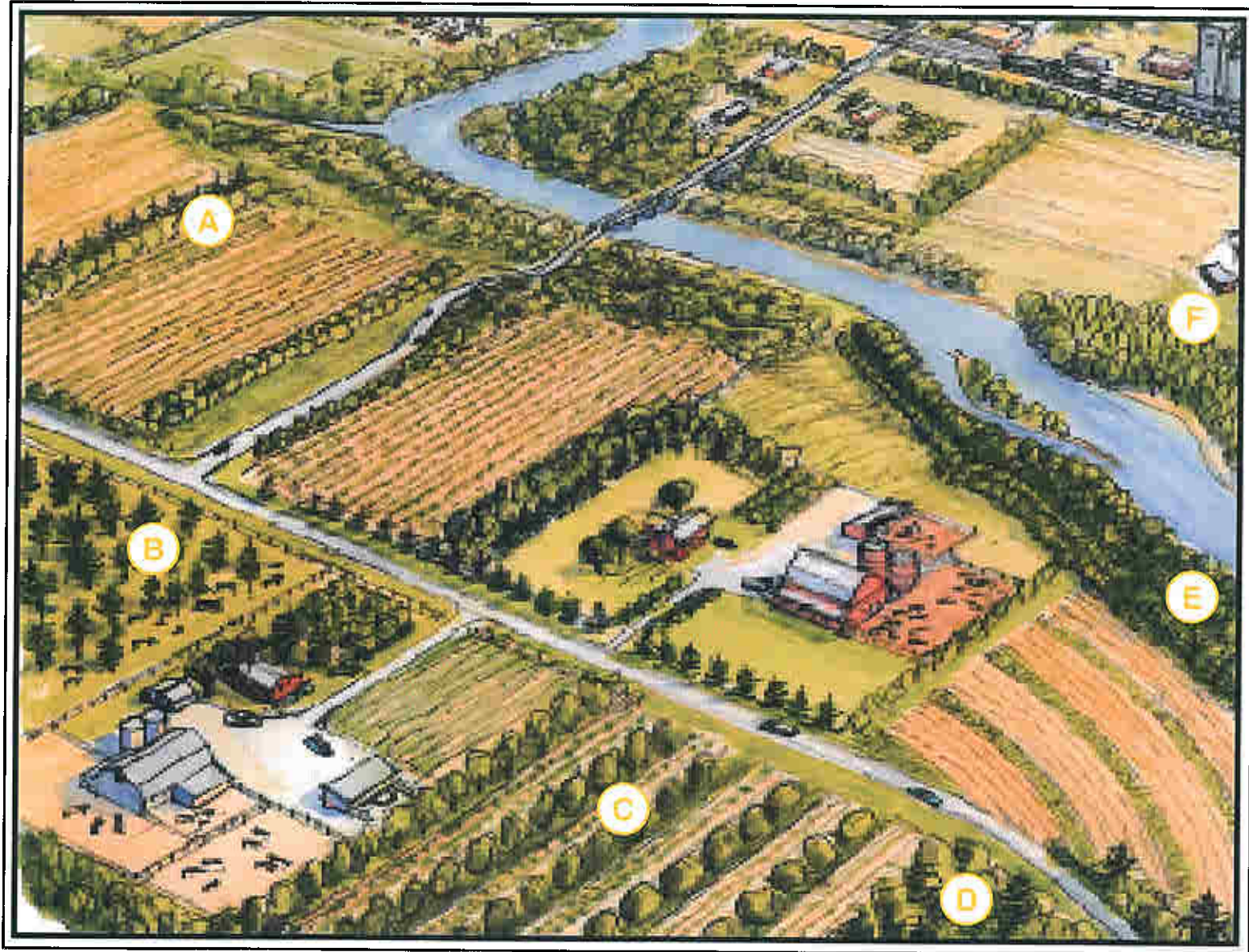


★ Agroforestry will support the emerging *bioeconomy*

# What is Agroforestry?

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- An deliberate integration of agriculture and forestry practices – trees into farming systems and cultivation into forested areas
- Developed in tropical countries and driven by increasing population density, deforestation and extensive cattle farming
- Involves the manipulation of natural ecosystems to promote or increase bioproducts species “in the wild”



# Criteria For Agroforests

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- 1) ***Intentional***: trees, crops and/or animals must be managed as a whole unit
  - 2) ***Intensive***: recurring practices that maintain productivity and ecosystem health
  - 3) ***Interactive***: ecosystem is manipulated to produce harvestable commodity and conservation benefit
  - 4) ***Integrated***: trees, crops and/or animals must be integrated into a single unit
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# Agroforestry Systems

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- 1) Forest Farming Agroforestry – Sun Systems
- 2) Forest Farming Agroforestry – Shade Systems
- 3) Silvopasture Agroforestry
- 4) Timberbelt Agroforestry
- 5) Integrated Riparian Agroforests

# FFA – Sun Systems

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- 1) **Natural** - small, immature or widely-spaced trees in a random pattern that give full sunlight
- 2) **Alleycropping** – the cultivation of food, forage or specialty crops between rows of trees

## Benefits:

- Use standard farm equipment
  - Transition to shade-tolerant crops as trees mature
  - Bioenergy and bioproducts opportunities
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# FFA – Shade Systems

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- High-value understory crops are grown under forest canopies that have been modified to provide the correct shade level (e.g. ginseng, pine mushrooms)
- Extensive – large area, low labour cost, low ROI
- Intensive – small area, high labour cost, higher-value crops



# Forest Farming Agriculture

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## *Sun Systems*



## *Shade Systems*



# Silvopasture Agroforestry

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- The intentional combination of trees, forage plants and livestock:
  - 1) **Forest Grazing:** livestock in the forest
  - 2) **Tree Pastures:** trees in a pasture

## Benefits:

- Reduced weather-related stress on animals
- Higher forage quality
- Increased tree crop yields

# Silvopasture Agroforestry

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## *Forest Grazing*



## *Tree Pastures*



# Timberbelt Agroforestry

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- Windbreak and fenceline planting of trees and shrubs to provide environmental and economic benefits

## Benefits:

- Wind protection
- Soil conservation
- Wildlife habitat
- Additional revenue streams



# Integrated Riparian Agroforests

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- Management of riparian zones to improve and protect aquatic resources and provide economic benefits

## Benefits:

- Improved water quality
- Bank stability, erosion and flood control
- Enhanced wildlife habitat and biodiversity



# Special Applications

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- 1) **Wastewater Management:** use hybrid poplar or willow to absorb wastewater and produce short rotation wood fibre
  - 2) **Waterbreaks:** plant trees on floodplains to reduce flooding impacts
  - 3) **Streambank Protection:** use plants to reinforce soil, stabilize slopes and reduce erosion
  - 4) **Trees for Communities:** improve soil, water and air quality; provide wildlife habitat; recreational opportunities; visual and noise screens
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# Benefits of Agroforestry

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- Soil and water quality and conservation
- Reduced use of pesticides
- Protection of natural stocks
- Preservation of old growth forests
- Provide supplementary income to producers and managers
- Create new avenues for bioproducts

# Challenges Facing Agroforestry

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- High labour and equipment requirements
- Further research is needed to optimize production in agroforests
- Markets for bioproducts are not fully-developed
- Competing with forestry and agriculture for land-base



# Agroforestry in Canada

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- Canadian agroforestry sector is a minor contributor to the economy
- Output is perceived mostly in terms of environmental benefits, not economic impact
- Need successful demonstrations that integrate economic, social, and ecological issues into new resource management paradigms that promote the welfare of communities

# Increasing the Economic Impact of Agroforestry in Canada

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- 1) Establish a foothold on a land base that is non-competitive with the current forest and agriculture industries
- 2) Create products that are cost-competitive with the commodities that agroforestry wishes to displace
- 3) Create value-added opportunities for which markets must be developed
- 4) Create proof-of-concept research that will support the needs of the investors and entrepreneurs

# The 'Old' Research Model

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★ The *agenda* is driven by *science*

# The 'New' Research Model

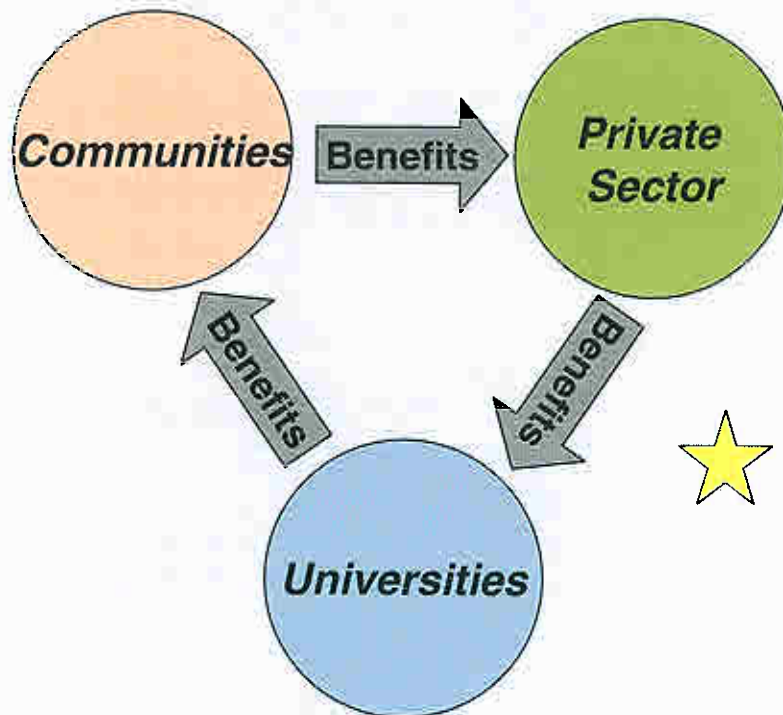
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★ The *agenda* is driven by *private sector*

# The 'Outstanding' Research Model

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★ The *agenda* is driven by *communities* and *private sector*

# Conclusions

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- Agroforestry shifting toward providing goods for the bioeconomy
- Agroforestry can assist communities in developing new business opportunities for landowners
- Agroforestry can support biodiversity conservation
- New Brunswick is well positioned to access new markets
- Demonstrations are needed