



# **Satoyama and Ecoagriculture: Building links among international programs for sustainable agriculture**

By

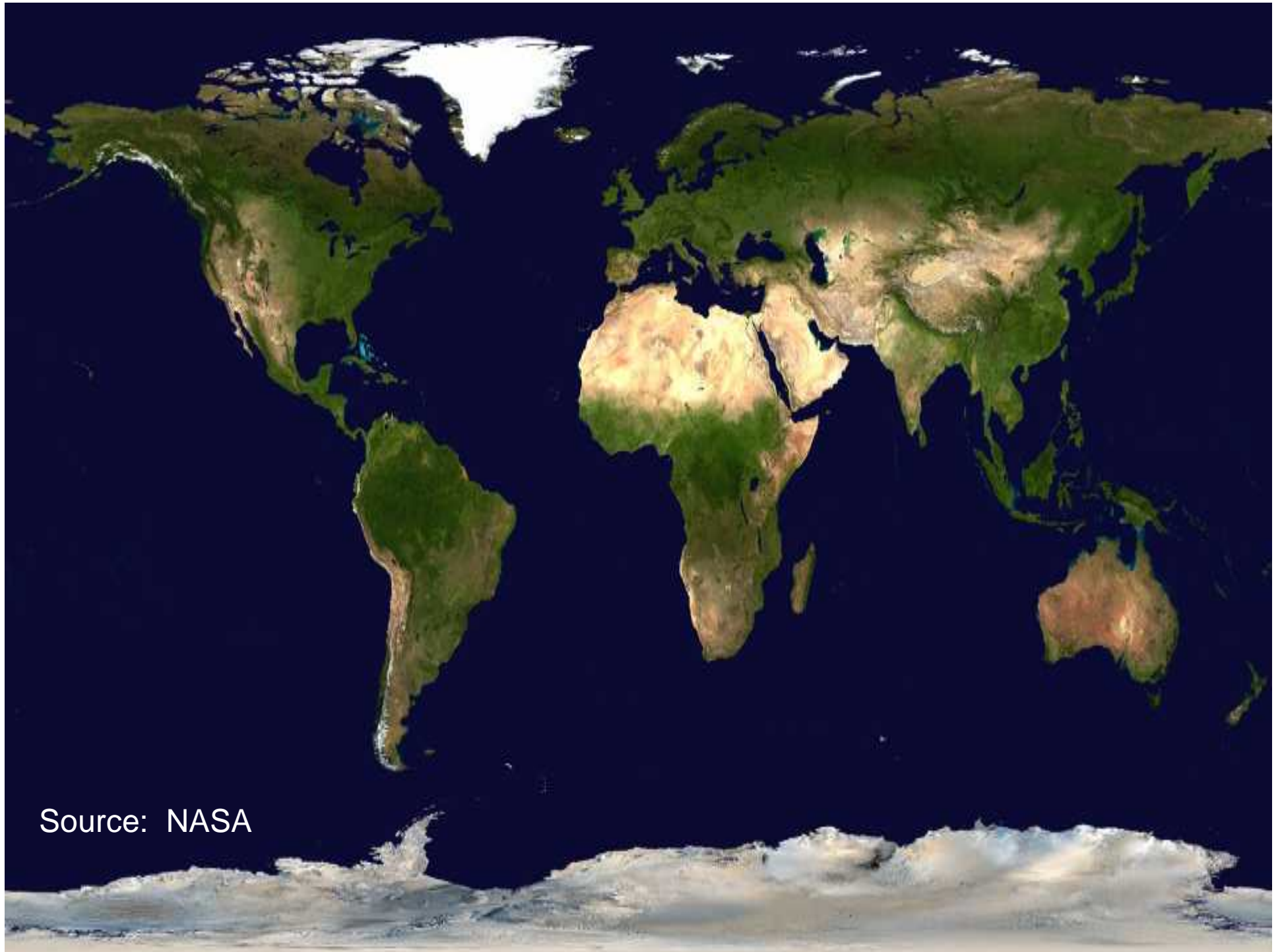
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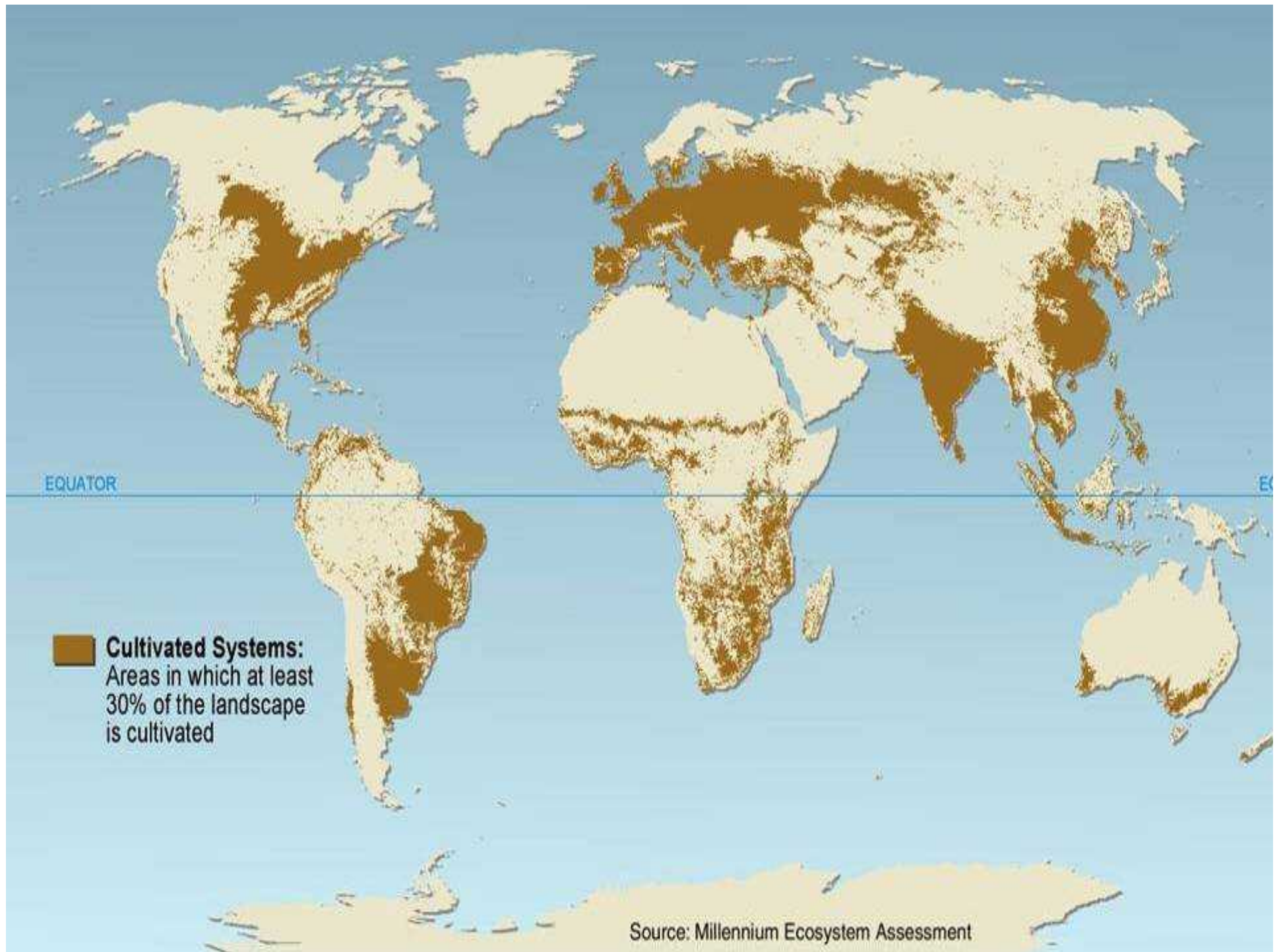
International Union for Conservation of Nature

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**Ecosystem Services in the Asia-Pacific Region  
Penang, 2 October 2009**



Source: NASA



EQUATOR

EQUATOR

**Cultivated Systems:**  
Areas in which at least  
30% of the landscape  
is cultivated

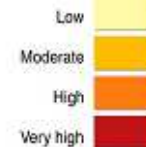
Source: Millennium Ecosystem Assessment



		Habitat change	Climate change	Invasive species	Over-exploitation	Pollution (nitrogen, phosphorus)
Forest	Boreal	Low, Increasing	Low, Increasing	Low, Increasing	Low, Continuing	Moderate, Increasing
	Temperate	Moderate, Decreasing	Low, Increasing	Low, Increasing	Moderate, Continuing	Moderate, Increasing
	Tropical	High, Increasing	Low, Increasing	Low, Increasing	Moderate, Increasing	Low, Increasing
Dryland	Temperate grassland	High, Increasing	Low, Increasing	Moderate, Continuing	Low, Continuing	High, Increasing
	Mediterranean	Moderate, Increasing	Low, Increasing	Moderate, Increasing	Moderate, Continuing	Low, Increasing
	Tropical grassland and savanna	Moderate, Increasing	Moderate, Increasing	Low, Increasing	High, Continuing	Moderate, Increasing
	Desert	Low, Continuing	Moderate, Increasing	Moderate, Continuing	Low, Continuing	Low, Increasing
Inland water		High, Increasing	Low, Increasing	Moderate, Increasing	Moderate, Continuing	High, Increasing
Coastal		High, Increasing	Moderate, Increasing	Moderate, Increasing	Moderate, Increasing	High, Increasing
Marine		Moderate, Increasing	Low, Increasing	Low, Continuing	High, Increasing	Low, Increasing
Island		Moderate, Continuing	Low, Increasing	High, Continuing	Moderate, Continuing	Low, Increasing
Mountain		Moderate, Continuing	Moderate, Increasing	Low, Continuing	Low, Continuing	Low, Increasing
Polar		Low, Increasing	Moderate, Increasing	Low, Continuing	Moderate, Increasing	Moderate, Increasing

# Trends in Drivers of Ecosystem Degradation

Driver's impact on biodiversity over the last century

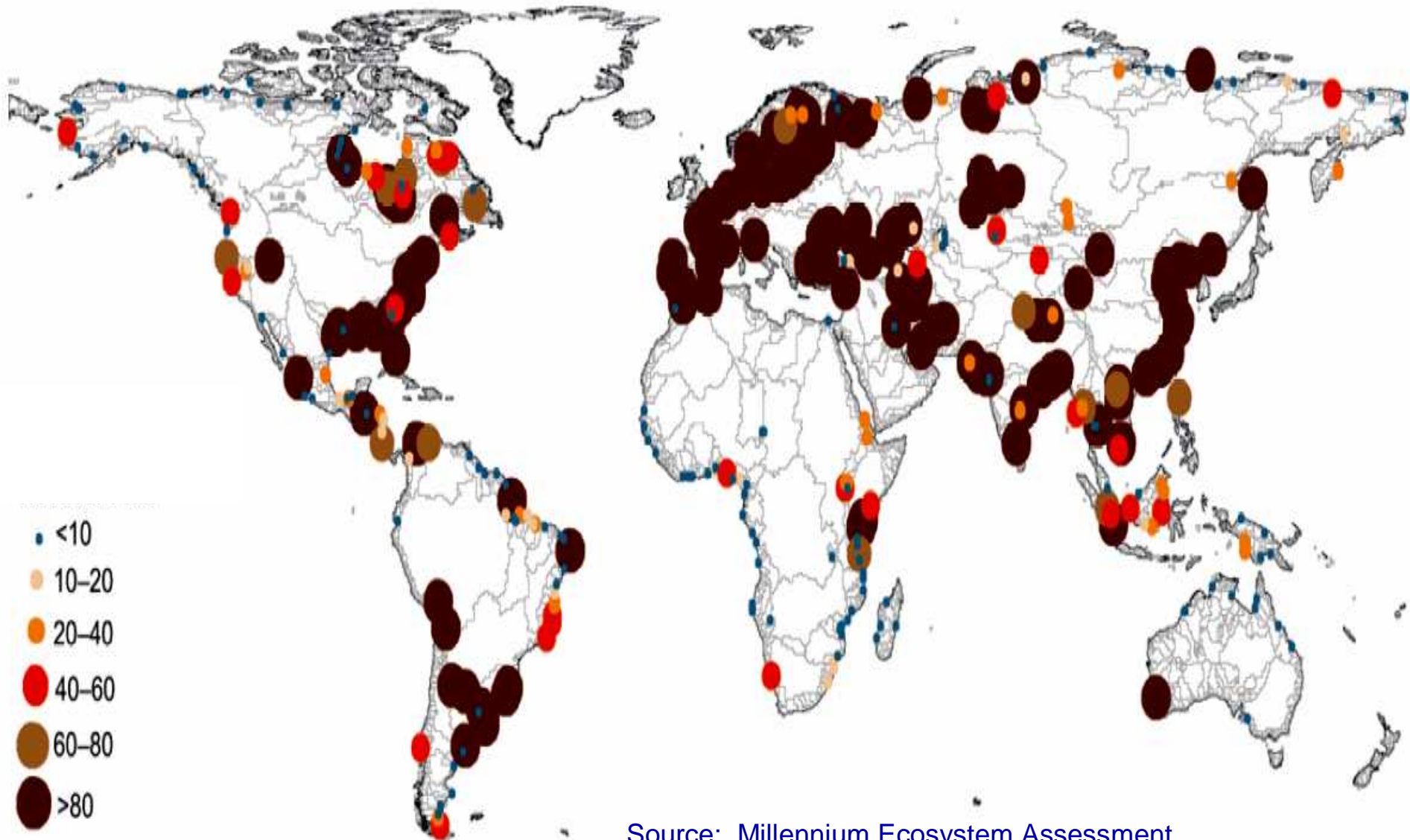


Driver's current trends



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# Percent Increase in Nitrogen Flows in Rivers

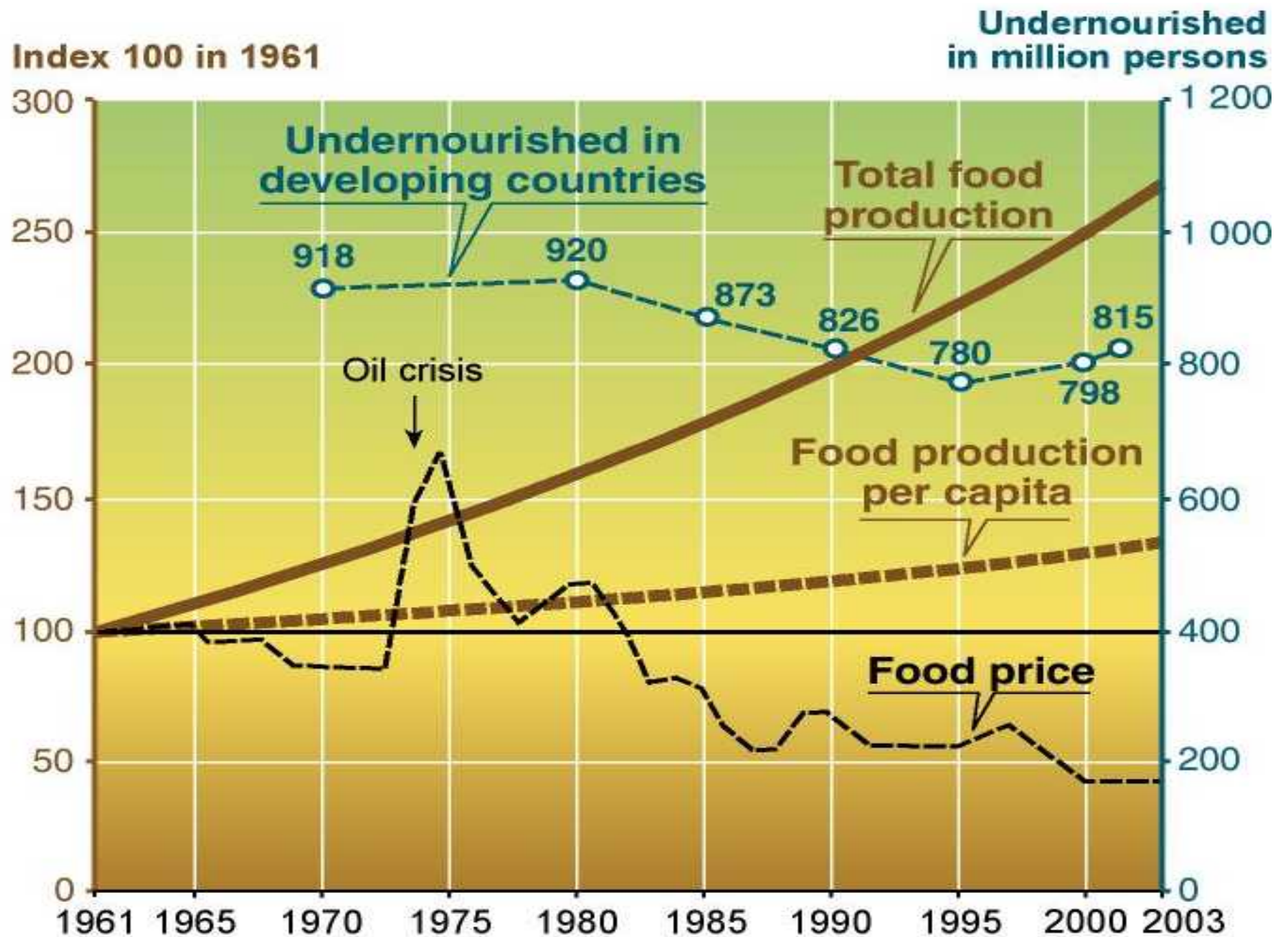


Source: Millennium Ecosystem Assessment

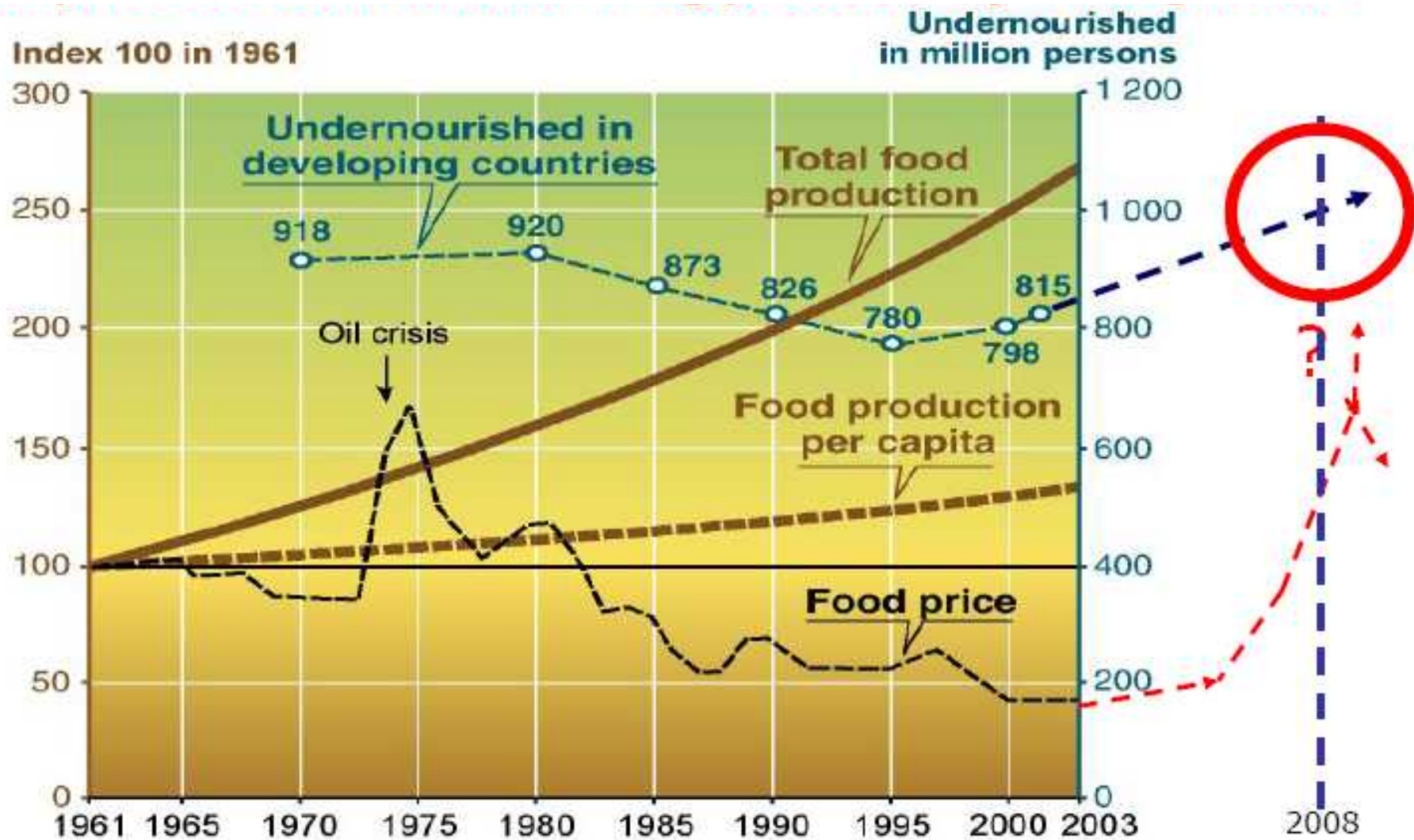
**But nitrogen fertilizer has also made modern industrial agriculture possible.**







Sources: FAOSTATS, SOFI, Millennium Ecosystem Assessment



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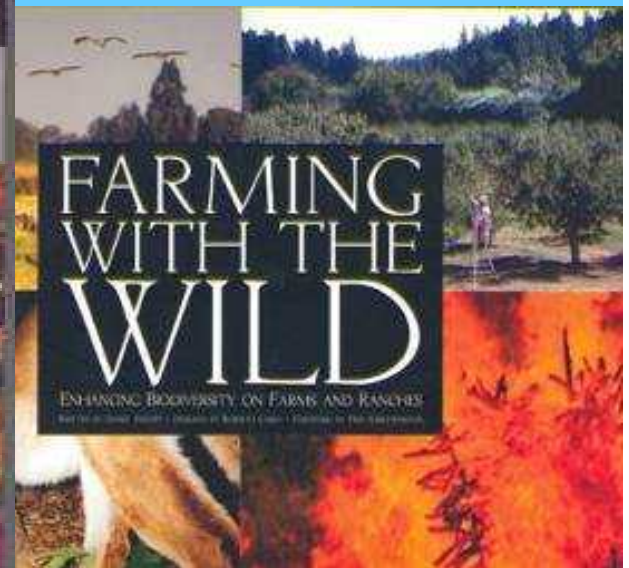
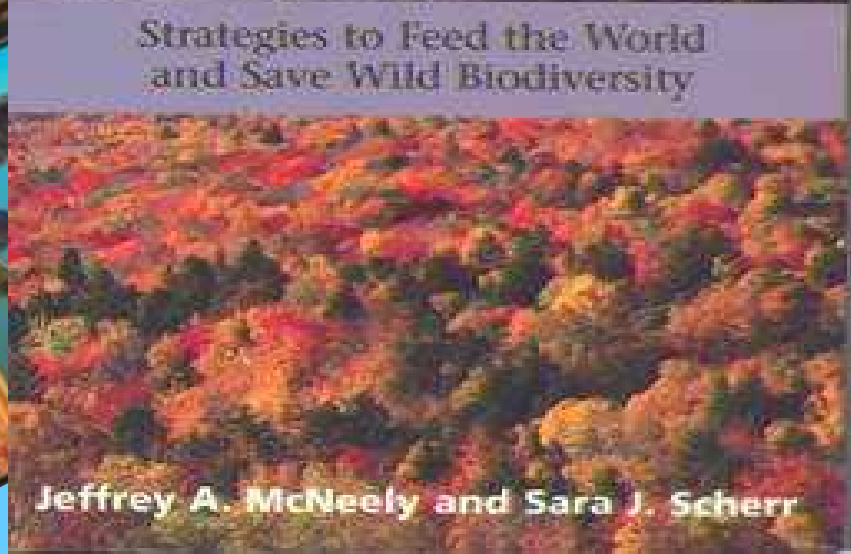
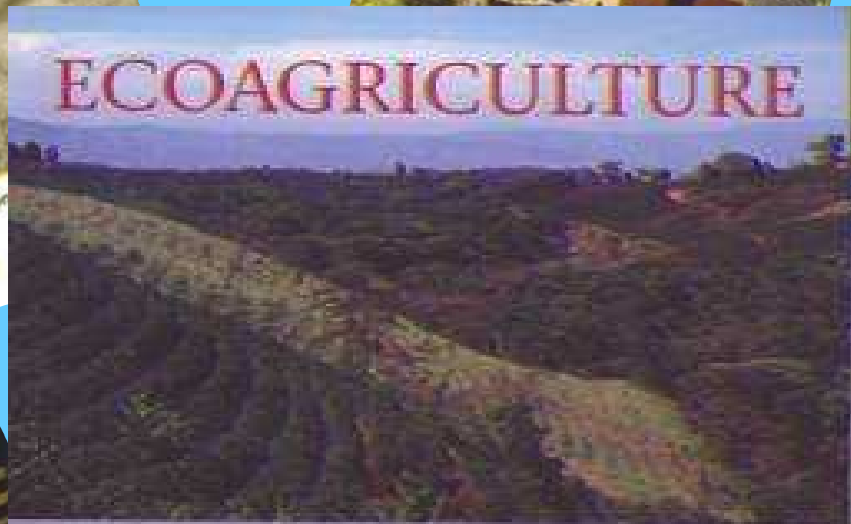
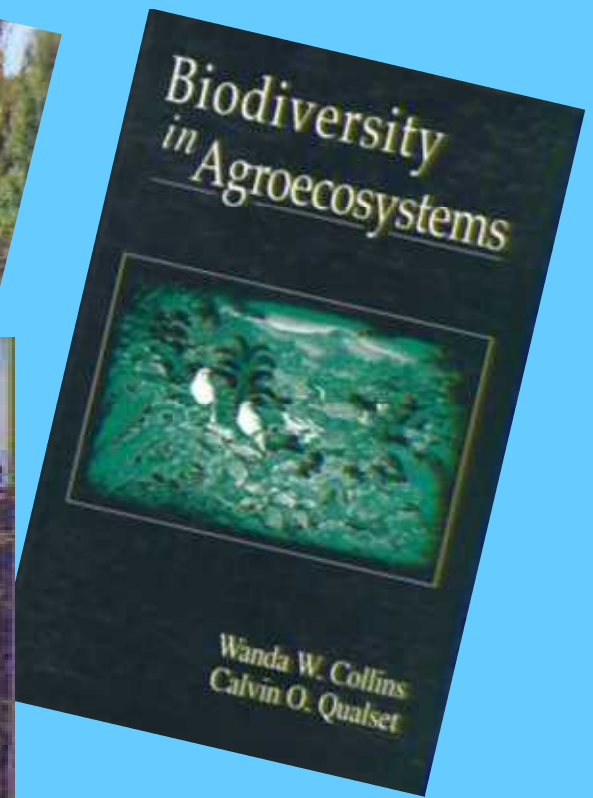
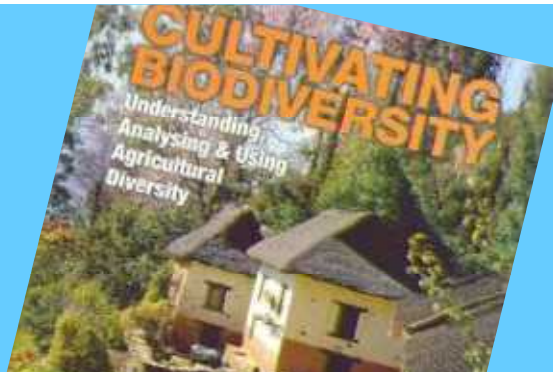
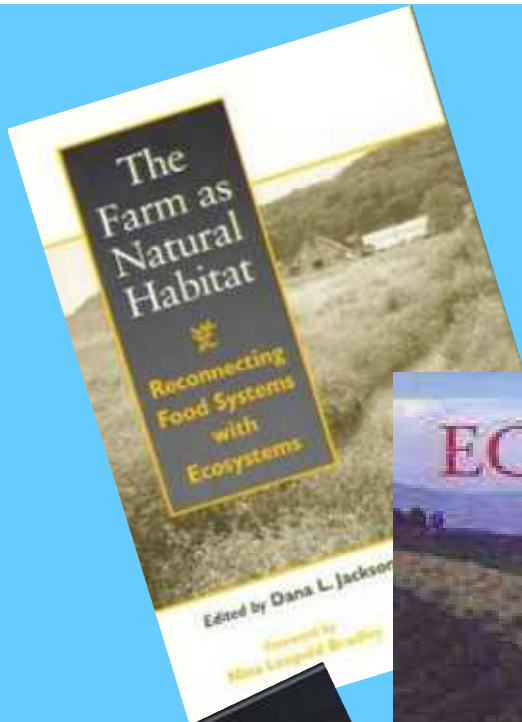
**How can we maintain productive ,  
socially responsible, and sustainable  
agriculture in times of rapid change?**











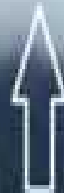


# Ecoagriculture

Agricultural landscapes managed to enhance rural livelihoods and sustainable agricultural production (of crops, livestock, fish and forest), while conserving or restoring ecosystem services and biodiversity.



# Some Elements in an Ecoagriculture Landscape



Path to waterfall on Private property brings income to locals in form of Ecotourism

Monteverde Cloudforest Reserve provides important source of water in landscape and downstream

Shaded coffee extends wildlife habitat from reserve and reduces erosion

Windbreaks provide habitat and corridors for wildlife, control erosion, and protect livestock from wind

Coffee, Corn, Sugar Cane and other products are sold at local Cooperative

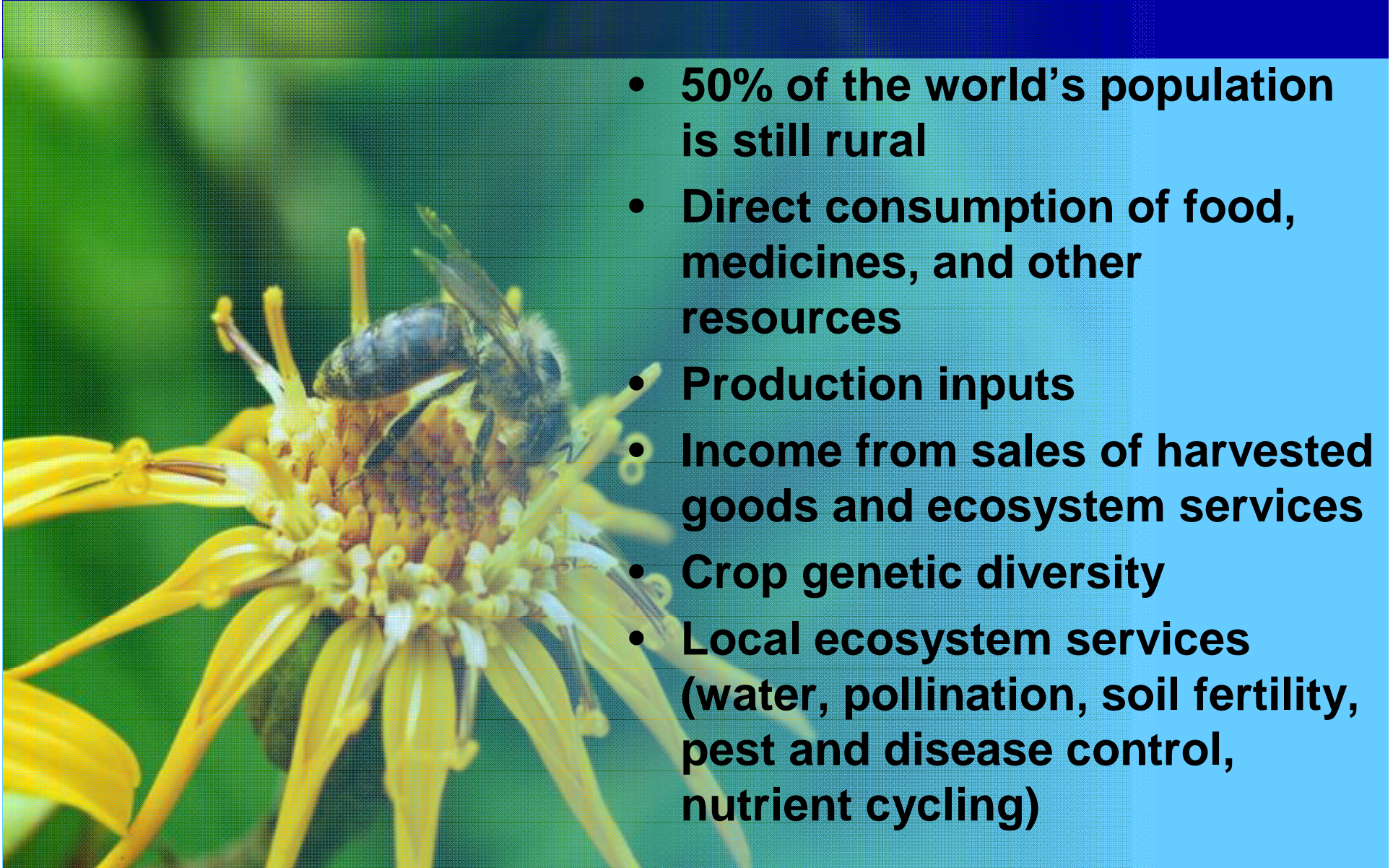
All fences are live rows of trees

San Luis Valley, Costa Rica



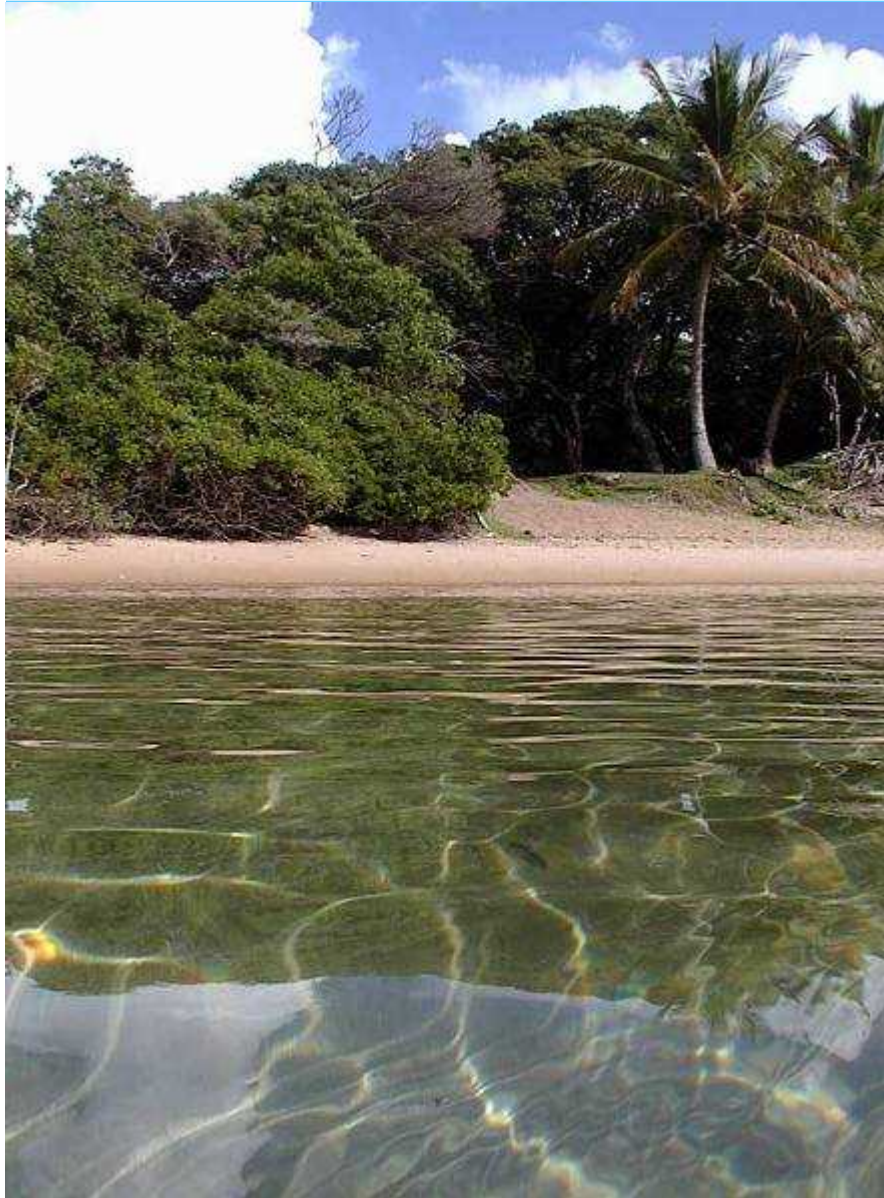
# Meeting the biodiversity needs of human populations

- 50% of the world's population is still rural
- Direct consumption of food, medicines, and other resources
- Production inputs
- Income from sales of harvested goods and ecosystem services
- Crop genetic diversity
- Local ecosystem services (water, pollination, soil fertility, pest and disease control, nutrient cycling)





# Meeting the habitat requirements of wild species



- **Undisturbed nesting sites**
- **Protective cover: perennial and native**
- **Adequate source of clean water, available year-round**
- **Territory access with functional corridors**
- **Access to food from diverse sources**
- **Predator balance: diversity with protection**
- **Interdependent species: patches of natural vegetation**





**Some forms of ecoagriculture are ancient**



**Yellow wagtail**



**Brown shrike**



**Omen birds of the Kelabits (Borneo)**

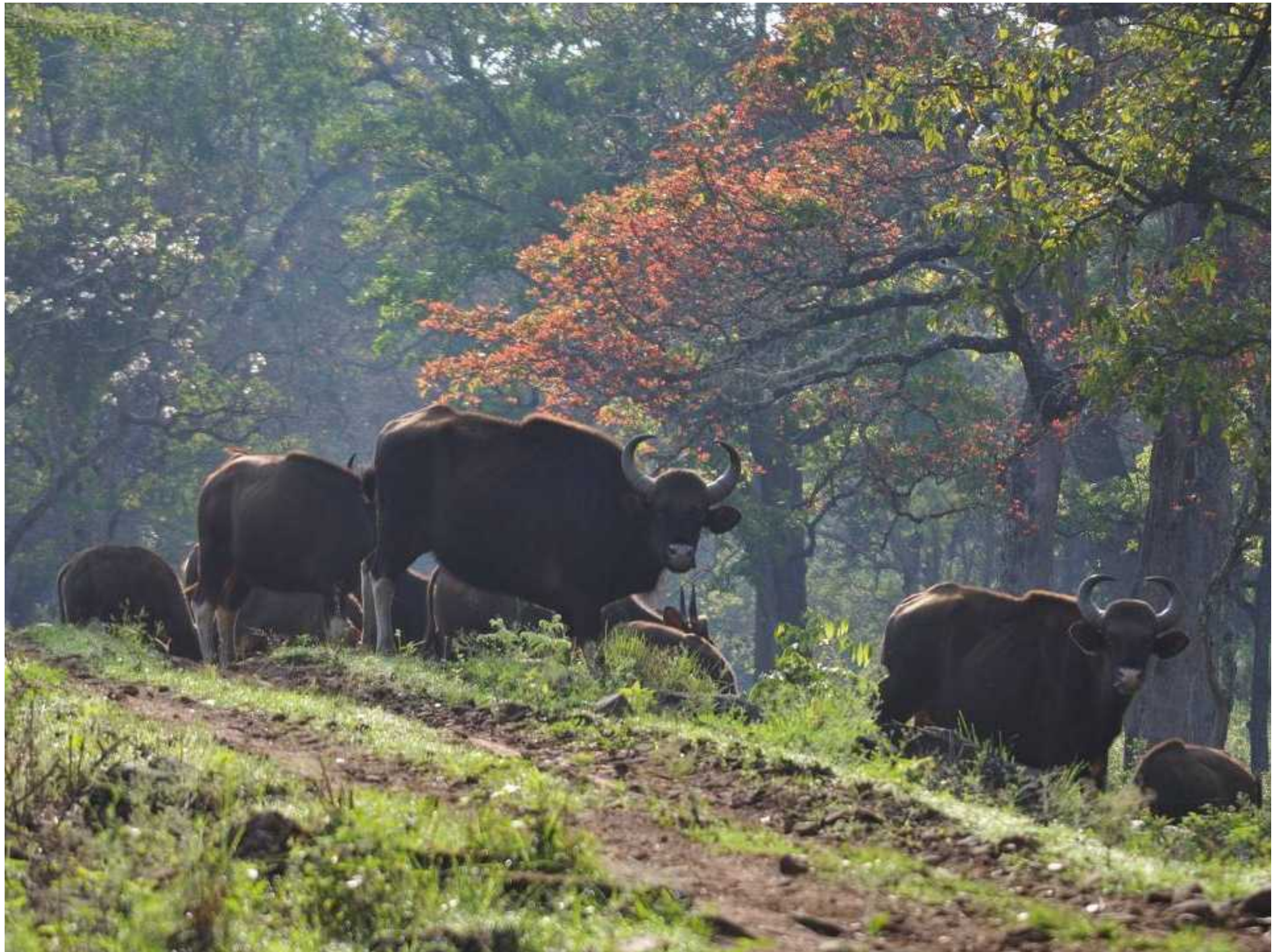
**Sparrow hawk**



**Dusky thrush**









# DESIGN CHALLENGES FOR ECOAGRICULTURE





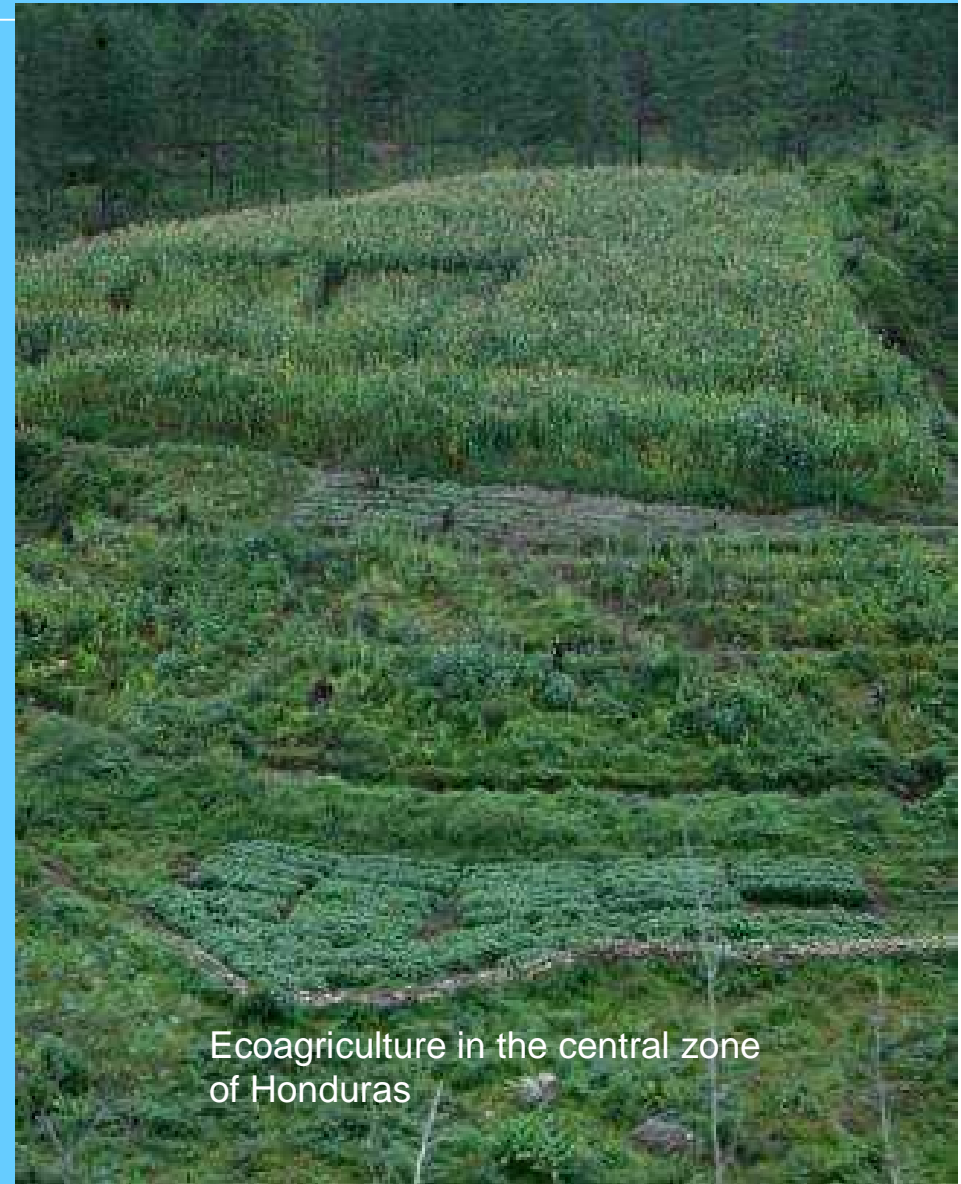
# 1) Production systems for ecoagriculture landscapes



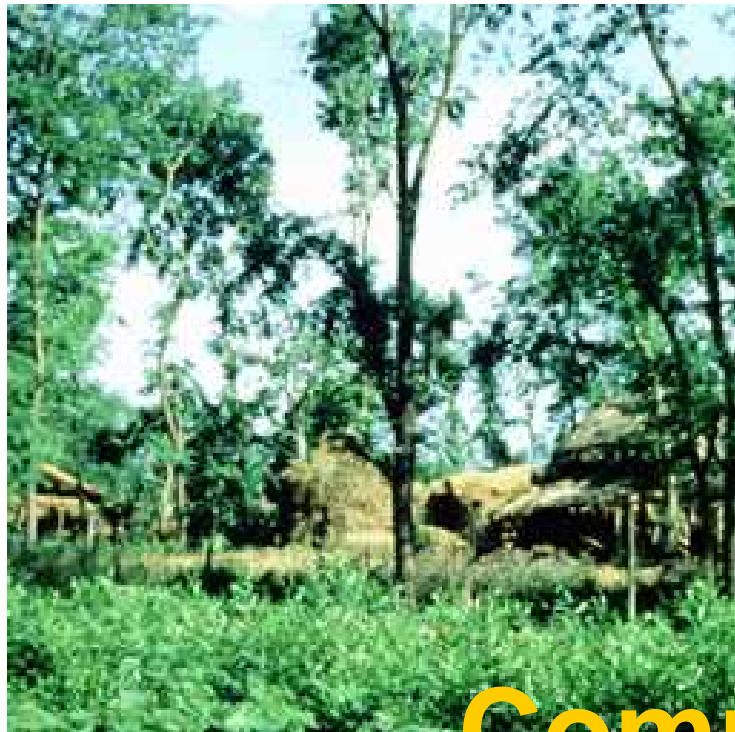


# Agricultural systems compatible with nature

- Live fences, wind barriers
- Agroforestry
- Organic agriculture
- Shaded crops (cacao, coffee)
- Agroecological practices
- Better management practices for industrial crops



Ecoagriculture in the central zone of Honduras



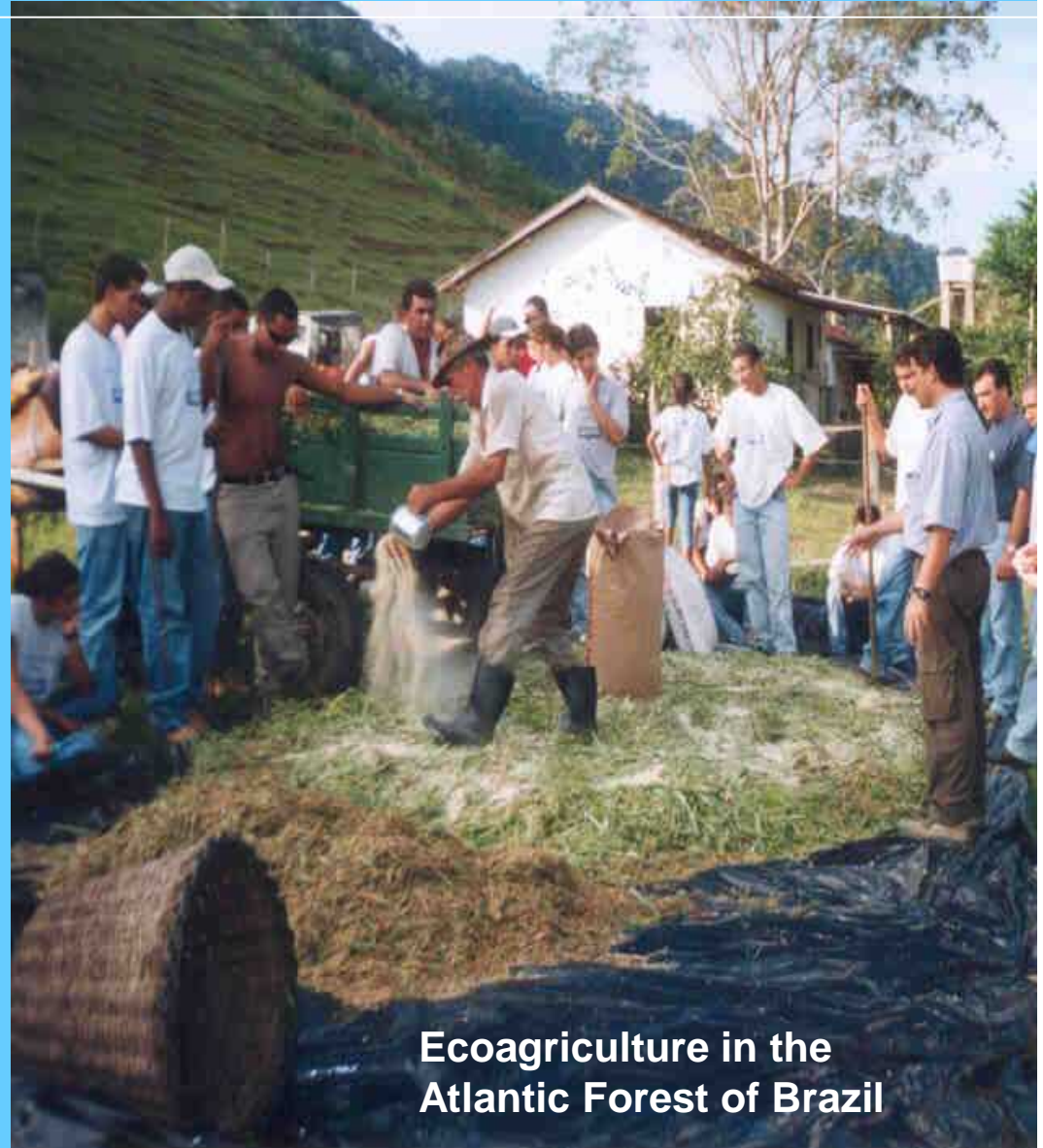
# Community forestry





# Farm systems compatible with nature

- Silvopastoral systems
- Cooperative corridors
- Adapted pastoralism
- Co-management of farms and wild species
- Permeable borders and forage banks
- Rotational cropping
- Perennial crop cultivation



Ecoagriculture in the  
Atlantic Forest of Brazil

# Achieving positive synergies for agricultural production and ecosystems

- Increase input efficiency
- Enhance biological and ecological synergies
- Improve spatial organization of land use
- Manage wild species to benefit farming
- Economies of scale through collective action
- Substitute natural capital for financial capital
- Improve the flow of information







*"I'll call you back. I'm harvesting rice."*

## 2) Managing ecoagriculture landscapes for production, conservation and livelihoods





# Delivering ecosystem services at requisite habitat or watershed scale

## Habitat

- *Critical breeding areas?*
- *Continuous corridors?*
- *Adequate territory for species?*
- *Water and food for wildlife available year-round?*

• .....

## Watershed

- *Key sources of pollution controlled?*
- *Water flow managed across the watershed?*
- *Major tributaries included?*
- *Key wetlands included?*



# Conserving biodiversity in agricultural landscapes

1. Maintain (or reestablish) cover & connectivity between native habitats within agricultural landscapes
2. Conserve areas of native habitat within the agricultural landscape, giving priority to large, intact and ecologically important patches
3. Implement conservation plans for species and ecological communities of high value
4. Convert marginal productive lands to natural vegetation
5. Re-establish hydrological connectivity & natural patterns of aquatic ecosystems (incl. flooding)
6. Manage the matrix of agricultural lands to be more compatible with biodiversity conservation





### 3) Building institutions for landscape coordination & management





# Multi-stakeholder platforms for landscape planning





# Policies and markets that support ecoagriculture

- International and national policies incorporate ecoagriculture (including MDGs, MEAs)
- Product market innovations
- Payments for ecosystem services in ecoagriculture landscapes



# Human infrastructure





# Nature's infrastructure





**Like *Satoyama*, Ecoagriculture is seeking ways for these infrastructures to be mutually supportive.**





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[www.ecoagriculturepartners.org](http://www.ecoagriculturepartners.org)