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

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Ecosystem Services in the Asia-Pacific Region
Penang, 2 October 2009
Cultivated Systems:
Areas in which at least 30% of the landscape is cultivated

Source: Millennium Ecosystem Assessment
<table>
<thead>
<tr>
<th>Ecosystem Type</th>
<th>Habitat Change</th>
<th>Climate Change</th>
<th>Invasive Species</th>
<th>Over-exploitation</th>
<th>Pollution (nitrogen, phosphorus)</th>
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</thead>
<tbody>
<tr>
<td>Forest</td>
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<td>Boreal</td>
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<td>Tropical</td>
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<td>Dryland</td>
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<td>Temperate grassland</td>
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<td>Mediterranean</td>
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<td>Tropical grassland and savanna</td>
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<td>Desert</td>
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<td>Inland water</td>
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<td>Coastal</td>
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<td>Marine</td>
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<td>Island</td>
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<td>Mountain</td>
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<td>Polar</td>
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</table>
Percent Increase in Nitrogen Flows in Rivers

Source: Millennium Ecosystem Assessment
But nitrogen fertilizer has also made modern industrial agriculture possible.
Index 100 in 1961

Undernourished in developing countries

Total food production

Food production per capita

Food price

Sources: FAOSTATS, SOFI, Millennium Ecosystem Assessment
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

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

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

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

<table>
<thead>
<tr>
<th>Requirements</th>
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<tbody>
<tr>
<td>Undisturbed nesting sites</td>
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<tr>
<td>Protective cover: perennial and native</td>
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<tr>
<td>Adequate source of clean water, available year-round</td>
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<tr>
<td>Territory access with functional corridors</td>
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<tr>
<td>Access to food from diverse sources</td>
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<tr>
<td>Predator balance: diversity with protection</td>
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<tr>
<td>Interdependent species: patches of natural vegetation</td>
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</tbody>
</table>
Some forms of ecoagriculture are ancient
Omen birds of the Kelabits (Borneo)

Yellow wagtail

Brown shrike

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

<table>
<thead>
<tr>
<th>Habitat</th>
<th>Watershed</th>
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</thead>
<tbody>
<tr>
<td><strong>Critical breeding areas?</strong></td>
<td><strong>Key sources of pollution controlled?</strong></td>
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<tr>
<td><strong>Continuous corridors?</strong></td>
<td><strong>Water flow managed across the watershed?</strong></td>
</tr>
<tr>
<td><strong>Adequate territory for species?</strong></td>
<td><strong>Major tributaries included?</strong></td>
</tr>
<tr>
<td><strong>Water and food for wildlife available year-round?</strong></td>
<td><strong>Key wetlands included?</strong></td>
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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.
Please visit our website at...

www.ecoagriculturepartners.org