Agricultural landscapes and the resilience of social-ecological systems

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Some observations from the Discussion Paper

Role of human agency in shaping landscapes
  Biocultural landscapes – where/whether to draw the line?

Locally appropriate policies (p.1), Ecosystem Approach (p.2)
  No “regulation of human activities,” but strengthening them
  Ecosystem Approach is not yet a very practical guide to action

Who validates these landscapes, is certification necessary?
  “pay due respect to unique histories, cultures”… (p.7)
  scientifically explaining rationale behind local forms of knowledge and practices (p.7)
  certification schemes for environmentally-sound agricultural methods (p.8)

The concept and ideal of “harmony”, iconic systems
  risk of disqualifying itself → harmony rarely exists, and where it does it’s under threat.
  Instead → identify aspects in human-environment interaction that contribute to landscape
  resilience, and elements that do not (can be improved).
Viewing the conservation of Satoyama-like landscapes through the prism of social-ecological resilience

The resilience of landscapes derives from ecological characteristics (biodiversity, habitat, ecosystem services) and social features (institutions, networks, education), as well as from the link between the natural and anthropogenic components.

<table>
<thead>
<tr>
<th>‘Preservation’ approach</th>
<th>‘Resilience’ approach</th>
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<tbody>
<tr>
<td>• Conserve iconic landscapes</td>
<td>• Conserve adaptation processes</td>
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<tr>
<td>• Limit human activity (disturbance)</td>
<td>• Strengthen beneficial human innovations</td>
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<tr>
<td>• Human activity must be kept within limits of ecosystem (disconnection)</td>
<td>• Promote social and ecosystem interdependence</td>
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<td>• External management</td>
<td>• Endogenous management</td>
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<tr>
<td>• Local participation</td>
<td>• Local autonomy</td>
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-Preservation-  

-Resilience-
Using indicators to measure the resilience of social-ecological systems

- Retention and acquisition of indigenous knowledge
- Use of indigenous and local languages
- Demographics
- Cultural values
- Integration of social institutions
- Food sovereignty and self-sufficiency
- Multiple uses of land and plants
- Conservation of resources
- Complexity and intensity of interactions with the ecosystem
- Degree of autonomy; indigenous rights

High resilience
Low resilience
Afghan Pamirs

Ingenuously irrigated system largely based on the cultivation of mulberry (*Morus alba* & *Morus nigra*)
Using indicators to measure the resilience of social-ecological systems

- Diversity of cultivated crops and varieties: grains, fruits, legumes, vegetables, tubers.
- Diversity of food sources gathered from the wild: roots, berries, mushrooms, fish, meat.
- Number of traditional cultivars or species preferred for distinct uses
- Multiple uses of a species (food, material, soil nutrient enrichment, shade, etc.)
- The use of traditional medicine.
- Diverse agricultural systems: intercropping, agroforestry, silvo-pastoral integrated farming and cultivation systems.

Multiple uses of land and plants
A village in the walnut-fruit forests of Kyrgyzstan

Wild apple (*Malus sieversii*)

Wild cherry plum (*Prunus cerasifera*)

Photographs: F. van Oudenhoven
Using indicators to measure the resilience of social-ecological systems

- **Availability of safe, nutritious and culturally appropriate food in sufficient quantity and quality.**
- **The abundance and use of traditional foods, seeds and medicines in the local production system.**
- **Intensity of fertilizer, insecticide and/or herbicide use on agricultural land.**
- **Contribution of traditional subsistence activities to indigenous communities’ economy (as opposed to out-migration for labor).**

Food sovereignty and self-sufficiency

- **High resilience**
- **Low resilience**
Nepali agrarian landscapes create and intensify niches to maximize use of biodiversity and maintain the resilience of mountain ecosystems.
Bio-intensive Technology for Mosaic Landscapes

The deployment of agricultural biodiversity in culturally maintained landscapes. Andean landscape mosaics (Terrazas and Valdivia 1998)
Karen rotational farming system (northern Thailand)
Homegardens in Landscape of Kadugannawa Area of Kandy District, Sri Lanka

Agroforestry make tree cover to over 50% in this landscape where natural forest cover is less than 10%.

Photo: Pushpakumara