Conserving Biodiversity in Agrarian and Natural Landscapes:
Developing and applying global indicators of social and ecological integrity and well-being of mosaic landscapes rich in biodiversity.

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Overview

• Brief introduction/revision of analytical framework
• Proposed organization. Platform of research on topic
• Possible sites: Cuba, Tajik Pamirs, Sri Lanka, Eastern Kenya, Sahelian and possibly coastal zones in the Upper Guinea Coast, Potato Park-Peru.
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 ones (institutions, networks, education), as well as from the link between these natural and human components.

<table>
<thead>
<tr>
<th>‘Preservation’ approach</th>
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<tbody>
<tr>
<td>• Conserve iconic landscapes</td>
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<tr>
<td>• Limit harmful human activity</td>
</tr>
<tr>
<td>• Human activity must be kept within limits of ecosystem (disconnection)</td>
</tr>
<tr>
<td>• External management</td>
</tr>
<tr>
<td>• Local participation</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>‘Resilience’ approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Conserve process of creation</td>
</tr>
<tr>
<td>• Strengthen beneficial human activity</td>
</tr>
<tr>
<td>• Human activity is determined by ecosystem (interdependence)</td>
</tr>
<tr>
<td>• Endogenous management</td>
</tr>
<tr>
<td>• Local autonomy</td>
</tr>
</tbody>
</table>
Purpose of indicators

1. Measure the impact of agricultural and other land management practices on ecosystem integrity and community wellbeing
2. Measure the benefits that wild landscapes and niches provide to livelihoods in managed ecosystems
3. Measure interactions between people and the various components of mosaic landscapes and biodiversity rich production systems
4. Assess community ability to adapt, innovate and maintain resilience in “Satoyama” landscapes
5. Establish a common understanding between conservation and development agencies and communities to establish an alternative global paradigm for conservation and development
Why develop indicators?

Indicators establish a set of agreed points in a process:

• Indicators of ecological processes that are being maintained or changing.
  – Ecosystem integrity, richness, distribution of biodiversity and bio-resources
  – Flows across components of a landscape and across ecosystems, and their impacts

• Indicators of progress towards common goals MDGs, conservation targets, community cohesion and reduced marginalisation.

• Indicators can be applied to several concomitant processes
  – to manage tradeoffs or prioritise actions in the case of conservation and community development
  – To manage different land use practices in mosaic landscapes for ecosystem integrity, long term productivity. E.g interface between cultivated and wild landscapes, or pastoralism, forests uses, farming and conservation rules.
Why measure and who decides what units to use

Measurement includes the different perspectives as seen by those living on the landscape and the perspectives of outsiders.

What to measure and the units of measurement depends on what one is able to perceive, how biodiversity is being used, and the quality of life that communities define as key to well being.
• Measurement can change perceptions and processes for the better or undermine traditional measures that emphasised relationships and interactions, between wild and cultivated, or spiritual and socio-economic.
• Outsiders (scientists) can apply units of measurement that smaller and more precise, and generic than what communities may perceive
• Communities perceive relationships among components of landscapes and ecosystems and long term cycles that are imperceptible to or ignored by outsiders.
Indicators to measure the resilience of social-ecological systems

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

High resilience
Low resilience
Agricultural Biodiversity Conservation and Cuban Man and Biosphere Reserves: Bridging managed and natural landscapes
• Restoring diversity and health to Cuban agrarian landscapes and food systems.
• Supporting protected area management and conservation of agricultural biodiversity
Tajik Pamirs – reviving cultural knowledge and wild and cultivated landscape management
<table>
<thead>
<tr>
<th>Landrace</th>
<th>Meaning of local name</th>
<th>Products made (e.g. jam, compote, juice)</th>
<th>Medicinal qualities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asli</td>
<td>local</td>
<td>coarse pikht, jam, special juice (called bekmez)</td>
<td>kidney diseases, anemia, vit. A deficiency, low blood pressure</td>
</tr>
<tr>
<td>Bedona</td>
<td>without seeds</td>
<td>better pikht (dried mulberry flour), jam, special juice (called bekmez)</td>
<td>kidney diseases, anemia, vit. A deficiency, low blood pressure</td>
</tr>
<tr>
<td>Chavtut</td>
<td>multi-coloured</td>
<td>pikth, jam, special juice (called bekmez)</td>
<td>kidney diseases, anemia, vit. A deficiency, low blood pressure</td>
</tr>
<tr>
<td>Khasak</td>
<td>not useful</td>
<td>used only for rootstock</td>
<td>kidney diseases, anemia, vit. A deficiency, low blood pressure</td>
</tr>
<tr>
<td>Khirdkhog</td>
<td>like walnut (big fruits)</td>
<td>pikht, jam, special juice (called bekmez)</td>
<td>kidney diseases, anemia, vit. A deficiency, low blood pressure</td>
</tr>
<tr>
<td>Malbeb</td>
<td>small sort</td>
<td>pikht</td>
<td>kidney diseases, anemia, vit. A deficiency, low blood pressure</td>
</tr>
<tr>
<td>Muzafari</td>
<td>name of the person who brought it here from Afghanistan</td>
<td>pikht (but difficult to make, because sticky), jam, special juice (called bekmez)</td>
<td>especially good for kidney stones, anemia and low blood pressure</td>
</tr>
<tr>
<td>Revichtut</td>
<td>Многоплодная</td>
<td>pikht, jam, special juice (called bekmez)</td>
<td>tonsilitis, high blood pressure</td>
</tr>
<tr>
<td>Shafin</td>
<td>slimy</td>
<td></td>
<td>kidney stones</td>
</tr>
<tr>
<td>Shaikhi</td>
<td>brought from place Shaikh</td>
<td>pikht, jam, special juice (called bekmez)</td>
<td>especially good for anemia and low blood pressure</td>
</tr>
<tr>
<td>Shatut</td>
<td>for kings</td>
<td>jam, compote</td>
<td>tonsilitis, high blood pressure, eaten with chop sticks</td>
</tr>
</tbody>
</table>
Indicators to measure the resilience of social-ecological systems

Retention and acquisition of indigenous knowledge

- Widespread use of knowledge
- Transmission across generations
  - Persistence oral traditions (songs and stories)
  - Education system that teaches this knowledge
  - Geographical diffusion of knowledge (exchange between communities)
- Acquisition of knowledge: innovation and experimentation
- Documentation of knowledge

Complexity and intensity of interactions with the ecosystem

Conservation of resources

Multiple uses of land and plants

Food sovereignty and self-sufficiency

Use of indigenous and local languages

Use of indigenous and local languages
Figure 2. Structure and composition of a typical Kandyan homegarden in Sri Lanka
Figure 3. Agroforestry raises tree cover to 50 per cent in this landscape where natural forest cover is less than 10 per cent.
Basawakkulama wewa (Abaya Wewa Ancient Reservoir)

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Ancient village tank in intermediate zone
In Inyuu village, fruits of berchemia come into season in the months of February and March when the mango season is already over. Berchemia grows naturally but is managed both in cropland and in the wild.
A child eating tamarind fruits at Inyuu village, Chuluni District
A girl drawing water from a well made by scooping out sand from a dry stream bed, Tiva village, Kitui District
A woman selling edible gourds and cowpea leaves in Kalundu market, Kitui town.
A member of Kyanika Adult Women’s group working in a group farm. The crop is an early maturing pigeon pea.
Potato Park and Ruta Condor reviving the customs, rules and cultural cosmologies that promote the maintenance and exchange of biodiversity that supports Kechwa & Aymara communities in the Andes. On an old Inca ruin an hour or so outside of Cusco. A woman is picking up potatoes that have been left in the frost overnight. This is done only with some special potato varieties and gives them a very peculiar flavour.