GEF-Satoyama Study: Knowledge Co-production for Mainstreaming Biodiversity in Socio-ecological Production Landscapes and Seascapes (SEPLS)

23 August 2018

IGES-NRE
Study objectives

- Co-produce knowledge to help mainstream biodiversity and enhance human well-being in SEPLS

- Main audience: policy makers and practitioners on SEPLS
Full report outline

1. Executive Summary
2. Introduction
   ► Background; general description of GEF-Satoyama Project; research objectives; and report outline
3. Methodologies
   ► Analytical framework: Values; traditional & local knowledge; governance; and their interplay
   ► Methods: Online survey; field survey; Indicators of Resilience Assessment; and synthesis
4. Results and discussions
   ► Ten project case studies: Values; traditional & local knowledge; Governance; and their interplay
   ► Synthesis: Values, traditional & local knowledge, governance on SEPLS and their interplays
5. Conclusions
6. Reference list
## Overall process for the report production

<table>
<thead>
<tr>
<th>Month</th>
<th>Activities</th>
</tr>
</thead>
</table>
| Aug   | Consolidation WS  
- Discuss with grantees and experts  
- Identify messages for policy makers and practitioners |
| Sep   | Elaborate draft full report  
Prepare a summary report |
| Oct   | Report the progress to IPSI-7  
Review by grantees and experts  
Finalise, layout and print |
| Nov   | Distribute the summary report and present PPT at CBD COP-14 |
Today’s presentation outline

1. Setting the scene
   • Analytical frame and methods
   • SEPLS profile
2. Values of SEPLS
3. Traditional & local knowledge on SEPLS
4. Governance of SEPLS
5. Values – knowledge – governance interplay
6. Points for discussion
1. Setting the scene
   - Analytical frame and methods
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6. Points for discussion
Analytical frame -values

Unit of analysis
- Species
- Natural/protected forest
- Managed/resource forest
- Grassland/rangeland
- Freshwater
- Coastal ecotone
- Sea
- Farmland
- Settlement/urban

(IPBES, 2017)
Analytical frame – traditional & local knowledge

**Definition:** “Traditional ecological knowledge” (Berkes, 2010)

“*cumulative body of knowledge, practice, and belief, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living being (including humans) with one another and with environment*”

**Key questions:**

- How traditional and local knowledge contribute to biodiversity and human well-being in SEPLS?
- What are the major drivers undermining these contributions?
- What policy responses, measures and processes exist?
Analytical frame – governance

Stakeholder structure:
• Owner
• Land and resource managers and users
• Other major stakeholders

Drivers of biodiversity changes:
• Direct drivers: land use and land cover change; urbanization and infrastructure development; over-exploitation; pollution; invasive alien species; climate change
• Indirect drivers: demographic; economic; socio-cultural; science & tech; and policies, governance system and institutions

Policies and measures:
• Regulations (e.g. command and control)
• Market and incentives (e.g. PES, tax exemptions, subsidies)
• Voluntary agreements
• Information and education
Methods

Online survey
• Major questions – status and trend of nature, values, traditional & local knowledge, threats to biodiversity, governance
• Perfect response from 10 grantees by 30 April 2018 – Thank you!!

Field survey
• Indo-Burma: IMPECT project, Thailand (2017/5/18-29)
• Tropical Andes: UIS project, Columbian Andes (2017/6/5-14)
• Madagascar and Indian Ocean Islands: EPCO project, Mauritius (2017/6/19-28)

Data extraction from project documents
• Project proposals
• Annual reports
• Highlight reports
• Resilience Indicator assessment reports

Grantees’ review
– Thanks for dedicated support!!
## SEPLS profile

<table>
<thead>
<tr>
<th>Project proponent**</th>
<th>NAF</th>
<th>MAF</th>
<th>GRL</th>
<th>FAL</th>
<th>FRW</th>
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NAF: Natural & protected forest  
MAF: Managed & resource forest  
GRL: Grassland & rangeland  
FAL: Farmland  
FRW: Freshwater  
COE: Coastal ecotone (including mangroves)  
SEA: Inshore sea  
URB: Urban and residential area
1. Setting the scene
   • Analytical frame and methods
   • SEPLS profile

2. Values of SEPLS

3. Traditional & local knowledge on SEPLS

4. Governance of SEPLS

5. Values – knowledge – governance interplay?

6. Points for discussion
Values

1. SEPLS provide vital habitats for several threatened species

<table>
<thead>
<tr>
<th>IUCN Red List</th>
<th>NAF</th>
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2. SEPLS underpins human livelihood, security and development through the provision of numerous ecosystem goods and services.

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<td>1.7</td>
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</table>
Ecosystem type:
Mangrove
Inshore sea (barachois)
Settlement /urban

Species:
SP1: Mangrove \((Bruguiera gymnorrhiza)\)
SP2: Mangrove \((Rhizophora mucronata)\)
SP3: Crabs \((Scylla serrata, Thalamita crenata)\)
SP4: Gazon pic fesse \((Zoysia tenuifolia)\)
SP5: Mauritius Fody \((Foudia rubra)\) EN

Value type:
9. Hazard regulation
12. Food and feed
13. Materials
14. Medicine
16. Recreation and tourism
Example 2: UIS, Colombia

Values:

Ecosystem type:
Natural/protected forest
Managed/resource forest
Grassland / rangeland
Freshwater wetland
Freshwater / inland waterbodies
Coastal ecotone, e.g. mangrove
Coastal and near shore sea
Farmland
Settlement / urban

Value type:
1. Pollination & seed dispersal
2. Air quality regulation
3. Climate regulation
4. Ocean acidification regulation
5. Freshwater quantity, location and timing regulation
6. Freshwater and coastal water quality regulation
7. Soil formation, protection and decontamination
8. Hazards and extreme events regulation
9. Detrimental organisms regulation
10. Energy
11. Food and feed
12. Materials and assistance
13. Medicinal, biochemical and genetic resources
14. Learning and inspiration
15. Physical and psychological experiences
16. Supporting identities

SP1: Perdiz santandereana
SP2: Gray-bellied night monkey
SP3: Nogal
SP4: Panela quemada
SP5: Molinillo
3. The configurations of the connections between biodiversity and people are unique to each SEPLS, but can be broadly characterized.
1. Setting the scene
   • Analytical frame and methods
   • SEPLS profile

2. Values of SEPLS

3. Traditional & local knowledge on SEPLS

4. Governance of SEPLS

5. Values – knowledge – governance interplay?

6. Points for discussion
### Example 1: IMPECT, Thailand

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Ecosystem domain</th>
<th>Description</th>
<th>Trend</th>
<th>Knowledge holder</th>
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<tbody>
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<td></td>
<td>Spiritual leader</td>
</tr>
<tr>
<td>Local and empirical knowledge</td>
<td>Forest</td>
<td>Biodiversity learning centre; use of herbs</td>
<td>⇧</td>
<td>●</td>
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<tr>
<td></td>
<td>Freshwater</td>
<td>Water quality indicator animals</td>
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<td>●</td>
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<td></td>
<td>Farmland</td>
<td>Traditional crop varieties</td>
<td>⇧</td>
<td>●</td>
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<tr>
<td>Resource management system</td>
<td>Forest</td>
<td>NTFP harvest</td>
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<td>●</td>
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<td>Farmland</td>
<td>Rotational farming system</td>
<td>⇧</td>
<td>●</td>
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<td>Social institutions</td>
<td>Forest</td>
<td>Customary law for forest management</td>
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<td>Sacred water sources as a mechanism for conservation</td>
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<td>World view</td>
<td>Farmland</td>
<td>Interlinked spirituality, knowledge and practice for rotational farming</td>
<td>⇧</td>
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</table>
Traditional & local knowledge

4. Rich traditional and local knowledge is an integral part of SEPLS, enabling local communities to access, utilize and sustainably manage various ecosystem goods and services, but declining overall

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>Management systems</th>
<th>Social institutions</th>
<th>World view</th>
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<td>Animals and plants</td>
<td>NTFPs uses; grow and use high-value trees; rotational farming, lunar calendar</td>
<td>Customary forest management law</td>
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<tr>
<td>Animals and plants</td>
<td>NTFPs uses; grow and use high-value trees; rotational farming, lunar calendar</td>
<td>Customary forest management law</td>
<td>Taboos relating to primates; Folklores and lycanthropy; taboos on animal killing</td>
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<tr>
<td>High value species; medicinal plants; primate taxonomy, ecology and roles</td>
<td>NTFPs uses; grow and use high-value trees; rotational farming, lunar calendar</td>
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<td>Predict water flow changes</td>
<td>Restrict fishing during spawning season</td>
<td>Myths and legends related to unusual increase of stream flow and flush floods</td>
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<tr>
<td>Predict water flow changes</td>
<td>Restrict fishing during spawning season</td>
<td>Myths and legends related to unusual increase of stream flow and flush floods</td>
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<td>Clean water indicator animals</td>
<td>Restrict fishing during spawning season</td>
<td>Myths and legends related to unusual increase of stream flow and flush floods</td>
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<td><strong>COE</strong></td>
<td>High value species; fish spawning and nursing in mangroves</td>
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<td>High value species; fish spawning and nursing in mangroves</td>
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<td>Fish taxonomy, habitat and movements</td>
<td>Species-specific fishing methods</td>
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<td><strong>FAL</strong></td>
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<td>organic farming; Pest management; Rotational farming</td>
<td>Karen’s spirituality, knowledge and practice; Rituals to beg forgiveness for animals and plants harmed</td>
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<tr>
<td>crop soil and climatic requirements; Local crop varieties;</td>
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<td>Karen’s spirituality, knowledge and practice; Rituals to beg forgiveness for animals and plants harmed</td>
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</table>
Traditional & local knowledge

5. Traditional & local knowledge is being lost due to several interconnected causes

- Changing values and lifestyles
- Modern education
- Challenges in knowledge transmission
- Population outflow
- Land transformation
- Limited recognition by governments
- Non-existent
Traditional & local knowledge

6. Some measures are available to maintain and evolve traditional & local knowledge to enhance biodiversity and human well-being in SEPLS.

- Changing values and lifestyles
  - Informal community schools
- Modern education
  - Documentation and database; senior-youth mutual learning; traditional-modern knowledge integration
- Challenges in knowledge transmission
  - Enhance community self-reliance
- Population outflow
  - Ecological production
- Land transformation
  - Participatory GIS; lobbying
- Limited recognition by governments
  - Knowledge generation through experiments and adaptive process
- Non-existent
1. Setting the scene
   • Analytical frame and methods
   • SEPLS profile
2. Values of SEPLS
3. Traditional & local knowledge on SEPLS
4. Governance of SEPLS
5. Values – knowledge – governance interplay?
6. Points for discussion
Key finding 7:

A range of different direct drivers (particularly resources overexploitation, LULUCC & pollution) affect – to different extents – the various ecosystem domains, including the species identified as key for the local communities.
The direct drivers are **reinforced by a series of indirect drivers:**

- **Growth of human population** increasing the pressure of direct drivers such as resource overexploitation (EPCP, WCS, Dahari, TERI), land use changes (AMPA, GIF) and pollution (FIDES).
- **Economic drivers:** Development of coastal areas (EPCO), cash crop production (WCS), export markets (GIF), negative incentives (shrimp industry [FIDES]), extreme poverty (AMPA), unemployment (Dahari).
- **Socio-cultural drivers:** Unsustainable changes in lifestyle (WCS), lack of social cohesion (Dahari), breakdown of traditional power structures, young people leaving practices/conservation (FIDES, FFI, UIS).
- **Policies & governance systems:** Ineffective governance (EPCO, UIS), lacking institutions (Dahari) and govt. support for conservation (TERI, FIDES), weak law enforcement (WCS), and low participation (FIDES)
- **Science & technology:** Road infrastructure increasing illegal wood extraction (WCS, FFI), roads & communications increasing hunting & fisheries (WCS, GIF, TERI), solar panels for electric fishing (FFI)
Key finding 8:

A range of **policies and measures** at different scales, address – to varying degrees – several of the drivers affecting the main ecosystem domains and key species in the SEPLS:
Governance: Policies & measures and actors

Key finding 9:

The main actors in charge of the policies and measures that address the direct drivers are public or government entities, but in some SEPLS NGOs and community organisations are responsible for implementing specific instruments addressing drivers in specific ecosystem domains:
Governance: Ownership/management right holders & stakeholders

Key finding 10:
With few exceptions, the main ownership right holders of the different ecosystem domains coincide with the management right holders, while additional important stakeholder groups are also involved in/affected by the management of most ecosystem domains.

<table>
<thead>
<tr>
<th>Actor category</th>
<th>NAF</th>
<th>MAF</th>
<th>GRL</th>
<th>FAL</th>
<th>FRW</th>
<th>COE</th>
<th>SEA</th>
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Main ownership (O) and management (M) right holder as well as stakeholder (S) types in each ecosystem domain (NAF: natural/protected forest; MAF: managed/resource forest; GRL: grassland/rangeland; FAL: farmland; FRW: freshwater wetland and waterbodies; COE: coastal ecotone (including mangroves); SEA: inshore sea; and URB: settlement/urban)
Example:UIS, Colombia

**Responsibilities:**
- Administration / participation
- Agriculture
- Water conservation, supply & consumption
- Biodiversity conservation

**Actors:**
- **National level**
  - Central govt.
  - National Parks
- **Subnational level**
  - Departmental govt.
  - Environmental agency
- **Local level:**
  - Community Action Boards
  - Local farmers associations (mixed & female)
  - Water supply & sewage system groups
  - Producer federations’ local representatives
  - Water supply company
  - Hydropower plant
  - PES scheme

**Subnational level (Neighbouring municipality):**
- San Vicente Town hall
- Producer federations’ local representatives
- Water supply company
- PES scheme

**Local level (Individual):**
- Individual Farmers (male & female) with **ownership & management rights** of:
  1. Agroforestry (Cocoa, coffee, mixed) and silvo-pastoral schemes
  2. Fruit orchards and pastures
  3. Resource forest and natural forest outside the National Park

**Colombia**

- Santander

**“Las Cruces” micro-basin**
1. Setting the scene
   • Study objectives
   • Analytical frame and methods
   • SEPLS profiling
2. Values of SEPLS
3. Traditional knowledge on SEPLS
4. Governance of SEPLS
5. Values – knowledge – governance interplay?
6. Points for discussion
## Synthesis

### Value – knowledge – governance interplay (1) [extracts]:

<table>
<thead>
<tr>
<th>Ecosystem</th>
<th>NCP*</th>
<th>ILKP</th>
<th>Governance: issues and stakeholders</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NAF/MAF</strong></td>
<td>Habitat creation Pollination/seed dispersal Regulation of climate Freshwater quantity Freshwater quality Reg. of extreme events Energy Food &amp; feed Phys. and psychological experiences Supporting identities</td>
<td>Traditional beliefs in spirits: Lemur species conservation (WCS), forest conservation (IMPECT). Little knowledge exchange betw. communities &amp; NP (UIS). Local knowledge (LK) of land, animals and plants (e.g. <em>tree species protecting water</em> sources (Dahari, UIS, TERI). LK of management systems (e.g. Lunar calendar [FIDES])</td>
<td>Natural resource management delegated to local communities: co-management scheme (WCS, TERI), community based forest management (IMPECT) or natural resource management committees, but lacking capacity (Dahari). Locals largely excluded from access &amp; jobs in NP, water sources disputed (UIS). Environmental authority largely absent from NR management (Dahari, UIS). Restrictions on hunting &amp; logging (TERI). Private owners protecting forest (FIDES).</td>
</tr>
</tbody>
</table>
## Synthesis

**Value – knowledge – governance interplay (2):**

<table>
<thead>
<tr>
<th>Ecosystem</th>
<th>NCP*</th>
<th>ILKP</th>
<th>Governance: issues and stakeholders</th>
</tr>
</thead>
</table>
| COE       | Habitat creation  
Freshwater quality  
Regulation of extreme events  
Food  
Genetic resources | LK of shell & crab species (FIDES). General **understanding** of the functions of **mangrove ecosystem**, but no knowledge & practices for sustainable management (EPCO). LK on **coral reef** and **sea grass beds** as important feeding, reproduction and foraging grounds for fish (GIF) | Estuary under **state’s protected area system** with limited community’s participation, or under **community protected area** currently with limited legal support; Regulations on season/ size limits for crab harvest (FIDES). **Owned** by national govt., **managed** under concession (EPCO), **claimed** by community **Managed** by various entities, coastal development **overseen** by central govt. (GIF) |
| SEA       | 1. Habitat creation  
12. Food,  
13. Material, 15. Learning and inspiration  
16. Physical & psychological experiences | In **Barachois**, LK on harvesting fish, molluscs, crabs, etc. for subsistence; In **lagoon**, fisher folk own knowledge on fishing grounds, but no collective knowledge, practice and institution for sustainable management (EPCO). LK of inshore sea as an important habitat for all fish species and foraging ground for juvenile sharks (GIF) | **Barachois** area **managed** by EPCO under concession, **overseen** by central govt.; in **lagoon**, fisheries **management by central govt.** through law enforcement (EPCO). Seychelles Fishing Authority **enforcing fishing regulations**, e.g. sites and gears restrictions, under the provisions of New Fisheries Act 2014, which provides mechanisms for enabling co-management approaches (GIF). |
1. Setting the scene
   • Study objectives
   • Analytical frame and methods
   • SEPLS profiling

2. Values of SEPLS

3. Traditional knowledge on SEPLS

4. Governance of SEPLS

5. Values – knowledge – governance interplay?

6. Points for discussion
Identify and map best practices

• **Value**
  ✓ Actions to enhance the recognition of the values of SEPLS

• **ILKP**
  ✓ Actions to address the loss and to promote the use of traditional and local knowledge

• **Governance**
  ✓ Options to strengthen the governance of SEPLS to ensure biodiversity and human wellbeing
Thank you!