Interlinking ecosystem services and Ostrom’s framework through orientation in sustainability research

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Outline

• Social-ecological systems
• ES cascade & diagnostic SES Framework
• SES research in sustainability science
• Interlinking ES and SESF
Social – ecological system thinking

ECOSYSTEM
SUPPLY SIDE

SOCIAL SYSTEM
DEMAND SIDE
Social – ecological system thinking
The diagram illustrates various frameworks and approaches related to social-ecological system thinking. These include:

- **DPSIR**
- **The Natural Step (TNS)**
- **Earth Systems Analysis (ESA)**
- **Ecosystem Services (ES)**
- **Sustainable Livelihood Approach (SLA)**
- **Management and Transition Framework**
- **Social-Ecological Systems Framework (SESF)**

The diagram categorizes these approaches into two sides:

- **Supply Side**: DPSIR, The Natural Step (TNS), Earth Systems Analysis (ESA), Ecosystem Services (ES)
- **Demand Side**: Sustainable Livelihood Approach (SLA), Management and Transition Framework, Social-Ecological Systems Framework (SESF)

Additional frameworks and concepts include:

- **Human Environment Systems Framework (HES)**
- **Material and Energy Flow Analysis (MEFA)**
- **Vulnerability Framework (TVUL)**

This diagram is based on Binder et al., 2013.
Social – ecological system thinking

- DPSIR
- The Natural Step (TNS)
- Earth Systems Analysis (ESA)
- Ecosystem Services (ES)
- Sustainable Livelihood Approach (SLA)
- Social-Ecological Systems Framework (SESF)
- Management and Transition Framework
- Human Environment Systems Framework (HES)
- Material and Energy Flow Analysis (MEFA)
- Vulnerability Framework (TVUL)

Binder et al., 2013
ES cascade

Biodiversity

Functions

Ecosystem Service

Human Well-being

value

socio-cultural value domain

monetary value-domain

Biophysical value-domain

Goverance

ECOSYSTEM SUPPLY SIDE

SOCIAL SYSTEM DEMAND SIDE

Martín-López et al. 2014
SES research in sustainability science

1

Analyze & describe:
SES processes
SES research in sustainability science

1

Analyze & describe:
SES processes

Research

System knowledge
SES research in sustainability science

1. Analyze & describe: SES processes

2. Define & debate: Targets, visions, perspectives, trade-offs
SES research in sustainability science

1. Analyze & describe: SES processes
   - Research
   - Deliberation

2. Define & debate: Targets, visions, perspectives, trade-offs
   - Target knowledge

System knowledge
SES research in sustainability science

1. Analyze & describe: SES processes
   - Research
   - Deliberation

2. Define & debate: Targets, visions, perspectives, trade-offs
   - System knowledge

3. Operationalize: Policy, decision-making, communication, education
   - Target knowledge
SES research in sustainability science

1. Analyze & describe: SES processes

2. Define & debate: Targets, visions, perspectives, trade-offs

3. Operationalize: Policy, decision-making, communication, education

Transformative knowledge
System knowledge
Target knowledge

Research
Deliberation
Implementation
**System knowledge**

**Ecosystem Services**
- Understanding of ecosystem/supply side
- Assessment of ecosystem services (based on ES classification, e.g. CICES)

**Diagnostic SES Framework**
- Description of:
  - Resource system
  - Resource units
  - Governance
  - Actors
Target knowledge

Ecosystem Services

- identification of perceived ES benefits
- adaptation of governance process through stakeholders’ perspectives

Diagnostic SES Framework

- Actors’ perspectives, goals & values
Transformative knowledge

Ecosystem Services

- Biodiversity
- Functions
- Ecosystem Service
- Human Well-being
- Value
- Biophysical value-domain
- Socio-cultural value domain
- Monetary value-domain
- Governance

Diagnostic SES Framework

- Social, economic and political settings
- Ecological system
- Resource system
- Resource units
- Interactions → Outcomes
- Governance
- Actors
- External ecosystems

Policy pathways, communication paths between actors

- Reconciling trade-offs between different goals & values
- Identification of governance pathways
- Education
SES knowledge

System
- Ecological System
- Social System

Target
- Valuation
- Analytical

Transformative
- Conceptual
- Actionable

△ Ecosystem services (ES)
○ SES framework (SESF)
# Compatibility of ES and SESF

<table>
<thead>
<tr>
<th>What <strong>ES</strong> can <strong>learn from SESF</strong></th>
<th>What <strong>SESF</strong> can <strong>learn from ES</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• incorporate standardized approach to social system</td>
<td>• expand on ecosystem functioning as fundamental basis for SES</td>
</tr>
<tr>
<td>• specify social system &amp; governance stage</td>
<td>• broaden value domains: not only economic, but also biophysical &amp; socio-cultural</td>
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</tbody>
</table>

| services-to-ecosystems | |

What **ES & SESF** both can **improve**

engage more with transformative knowledge application
THANK YOU!

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References

