The social-ecological system concept

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Expansion of social-ecological systems (SES) science: robust basis
Social-ecological systems are linked systems of people and nature, emphasising that humans must be seen as a part of, not apart from, nature (Berkes and Folke, 1998)
The theory of SES – definitions (ii)

• A coherent system of biophysical and social factors that regularly interact in a resilient, sustained manner;

• A system that is defined at several spatial, temporal, and organisational scales, which may be hierarchically linked;

• A set of critical resources (natural, socioeconomic, and cultural) whose flow and use is regulated by a combination of ecological and social systems; and

• A perpetually dynamic, complex system with continuous adaptation

SES components

Conceptual diagrams of SES: showing direction of interactions and complexity

The application of SES concept –
learnings from
and
projects
Ecosystems (incl. biodiversity)

Biophysical Structure or process
(eg. vegetation cover or Net Primary Productivity)

Function*
(eg. slow water passage, biomass)

Service
Biomass work, information

Human System
(socio-economic-cultural context)

Benefits
(contribution to health, safety, etc)

Social & Economic Value
(measured by Preferences & WTP)

OpenNESS start: TEEB cascade model

Adapted, based on: De Groot et al., 2010
OpenNESS end: integrated valuation of ES
A farm, forest enterprise or supply chain brings together:

Human capital, Cultural capital, Natural capital
- Social capital, + (human-natural) + (biotic, abiotic)
- Manufactured capital
- Cultural capital (human-natural) + (biotic, abiotic)

Human action + natural production processes generate

Biophysical drivers (climate, entropy)

Societal drivers (prices, policies, customs, knowledge)

Bundles of Goods and Services
- for society + for other elements in the ecosystem

Governance (property rights, common law) determines the split into:
- Private goods & services (food, timber, hunting, energy)
- Public or common goods & services (water quality, landscape, biodiversity, soils)
Examples from PEGASUS: Skylark case, NL

Skylark case study: regional farmers group Midden Brabant

RESOURCE SYSTEM
[Area of Water Board De Dommel, small-scale landscape close to cities, with small rivers flowing to Meuse]

RESOURCE UNITS
[Arable farms of Skylark participants Midden Brabant]
[Main ESBO’s: water and soil]

ACTION SITUATIONS
[Layout of buffer strips along shores in return for land to be leased elsewhere, improvement of soil organic matter]

ACTORS
[Direct: arable farmers, Skylark, Water board, food processors] [Indirect: other farmers incl. livestock, local population, province, drinking water companies, state, EU]

GOVERNANCE SYSTEM
[Private: Network of farmers learning from each other, personal farm plan, food processing industry asking for sustainable products] [Public: WFD, ND, CAP, AES, property rights, etc.]

Model based on McGinniss and Ostrom, 2014
Examples from Pegasus: Hope Farm, UK

RESOURCES
Surrounding farms; more widely Bedfordshire and Cambridgeshire Claylands NCA - Hope Farm typical: natural boundary at County edge (Cambridgeshire claylands group)

RESOURCES UNITS
Soils and soil management issues, existing wildlife esp. birds; streams and ditches – water quality & quantity, Outreach network, conservation management contractor, main contractor, Ian Dillon & Rob Field/ RSPB knowledge and research

ACTION SITUATIONS
- RSPB seeking to influence arable farming to enhance outcomes
- Forward-looking farmers trying to improve performance, increase resilience, benchmark and innovate
  - markets for ‘green’ cropping?
  - an appetite for public outreach / education

ACTORS
Direct: Farmers, key landowners, contract farmers, government agencies (NE/EA), advisors, peer groups
Indirect: local communities, local processors, tourism and added-value outlets, RSPB supporters, commodity purchasers / traders

GOVERNANCE SYSTEM
CAP greening, cross-compliance, VI and AECM, RSPB project management, farmer/local and RSPB-led networks, buying groups and trading options, development schemes from new RDPE, CSF, ‘conservation grade’ label

Macro-level prices for outputs and inputs, pesticide legislation, WFD
Strengths of SES

- Helps to **structure** the analysis of complex processes
- Ensures **linkages and dynamics are in-built**, focuses upon relations and state (thresholds, potential, resilience), considers both human-induced and biophysical drivers and constraints together
- Helps to analyse and assess the specific **context** of public goods and ecosystem services provided by agriculture and forestry in different situations, also their appreciation and value to society, together
- It involves **collaboration across disciplines, sectors** and requires input from stakeholders – in a participatory approach - this can lead to better understanding, agricultural management and decision making.
- Useful in **stakeholder communication**
Weaknesses of SES

• **Dynamics**: SES were unable to show change and the shifting dynamics of the case studies (results of one workshop). But... if SH exercise was repeated or undertaken retrospectively then a more dynamic picture would appear.

• **Scale**: It works well for the analysis of territorial and well defined case studies, but it is difficult for broader (national) scales or for spatially scattered actions and initiatives.

• **Communication**: The SES is a researcher’s tool that needs to be translated to SH.
SES opportunities – seeing new connections

Nature places

Events, culture and traditions

Local transport / access

Opportunities for young people, women

New ideas

Food production

Visitor accommodation

Village shop

Care and stimulation for elderly / children / disadvantaged groups

Skills and training

Marketing and promotion

Standard links
Challenges

• SES analysis requires long term research to capture the dynamics. This supports the idea of (long-term) programmes embracing a range of medium term projects.
• Integration of quantitative and qualitative methods
• Getting a common understanding from different disciplines and knowledge (same word means something different)
Thank you for your attention

Thanks to colleagues from OpenNESS and PEGASUS