LEGATO

RICE ECOSYSTEM SERVICES

10 lessons learnt

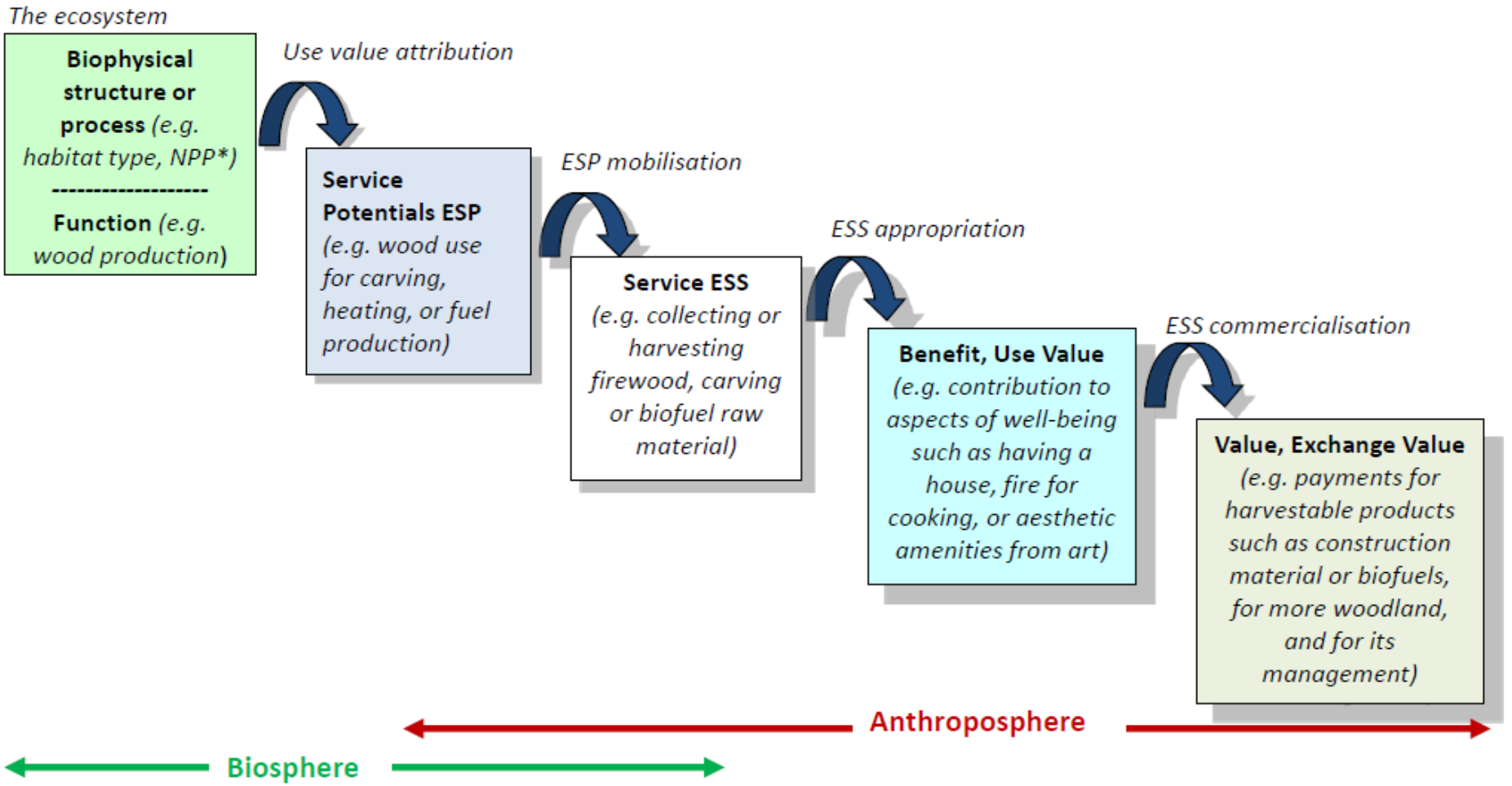
LEGATO Final Conference, Banaue Hotel, Banaue, Ifugao, Philippines, August 2016

1a. The ESS concept

- ESS are no free gifts of nature, but social constructs using nature
- Services come with disservices, winners come with losers
- In every step of defining, generating and appropriating them human agency is crucial
- What is a service and who benefits are issues of power, not of science

The ESS Cascade

(Potschin & Haynes-Young, modified)



* NPP: Net Primary Production

1b. The ESS concept

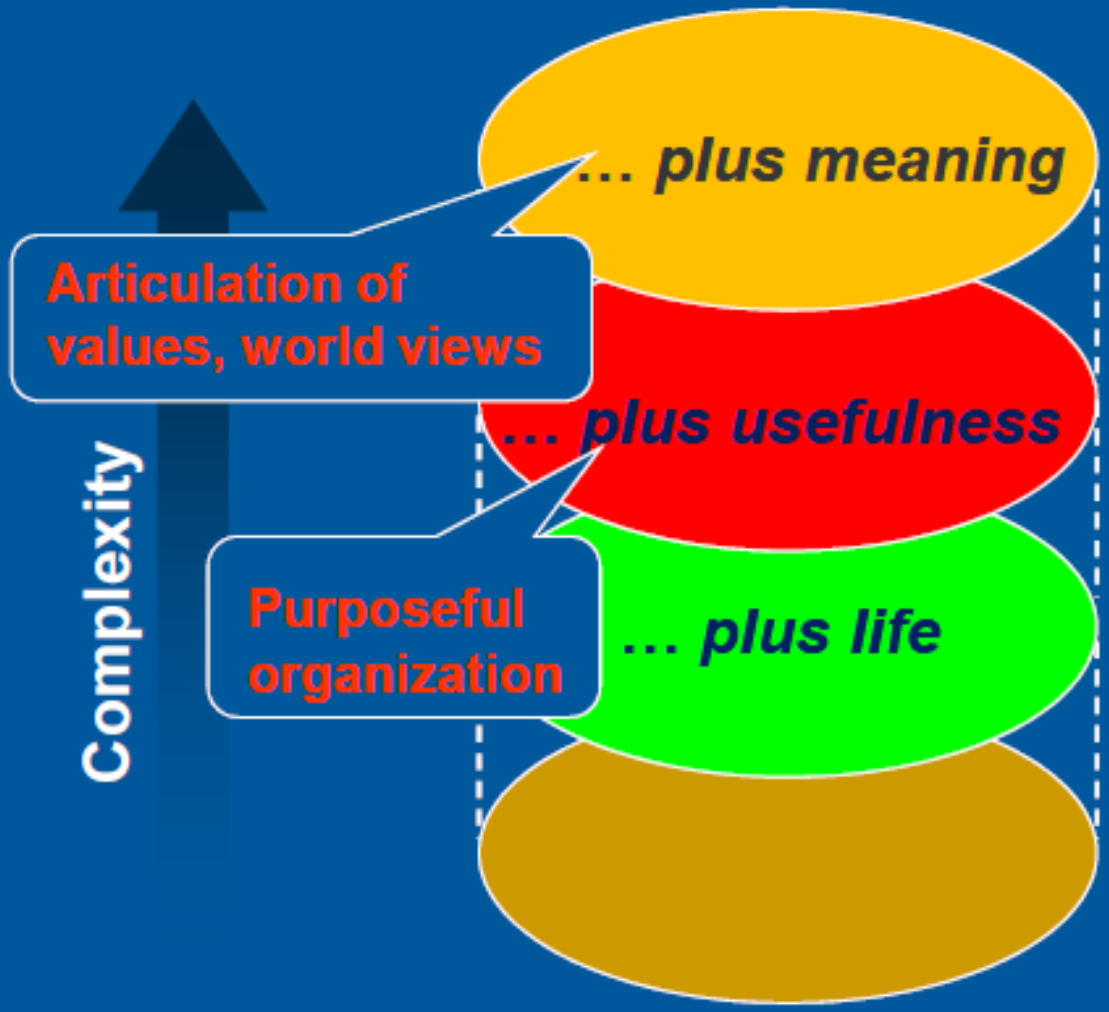
- Spangenberg, J. H., von Haaren, C., Settele, J. 2014. The Ecosystem Service Cascade: further developing the metaphor. Integrating societal processes to accommodate social processes and planning, and the case of bioenergy. Ecological Economics 104: 22–32, DOI: http://dx.doi.org/10.1016/j.ecolecon.2014.04.025.
- von Haaren, C., Albert, C., Barkmann, J., de Groot, R.S., Spangenberg, J.H., Schröter-Schlaack, C., Hansjürgens, B. 2014. From explanation to application: introducing a practice-oriented ecosystem services valuation (PRESET) model adapted to the context of landscape planning and management. Landscape Ecology 29(8): 1335-1346. http://dx.doi.org/10.1007/s10980-014-0084-1
- Seppelt, R., Fath, B., Burkhard, B., Fisher, J.L., Grêt-Regamey, A., Lautenbach, S., Pert, P., Hotes, S. Spangenberg, J.H., Verburg, P.H., van Oudenhoven, A.P.E., 2012. Form follows function? Proposing a blueprint for ecosystem service assessments based on reviews and case studies. Ecological Indicators 21, 145-154.

2a. Cultural ESS

- ESP attribution is culture-dependent, a matter of the semiotic system of societies
- Cultural change changes the ESP attributed to ESF (e.g., swidden agriculture is lost, eco-tourism complements farming)
- Cultural ESS are badly defined and grossly neglected in ESS research
- Each object of cultural significance holds a cultural value, provides a cESS

Orders of system complexity

After M.A.K Halliday (2005)



ENVIRONMENTAL RESEARCH – UFZ

2b. Cultural ESS

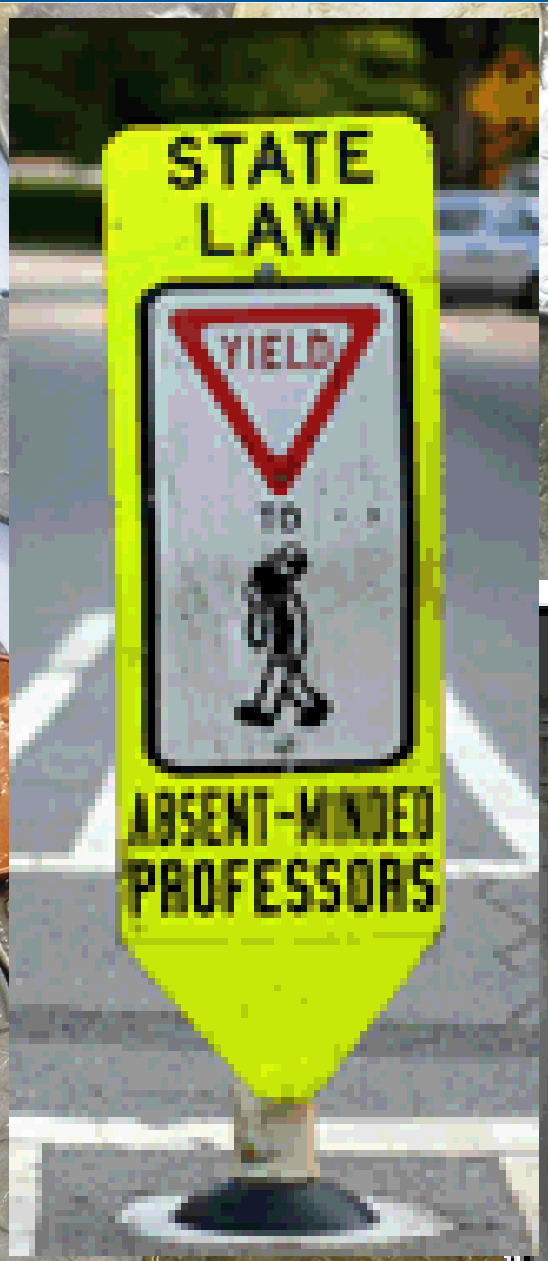
- *Spangenberg et al. (in prep). Farmers' values and ESS valuation in SEA wet rice agriculture*

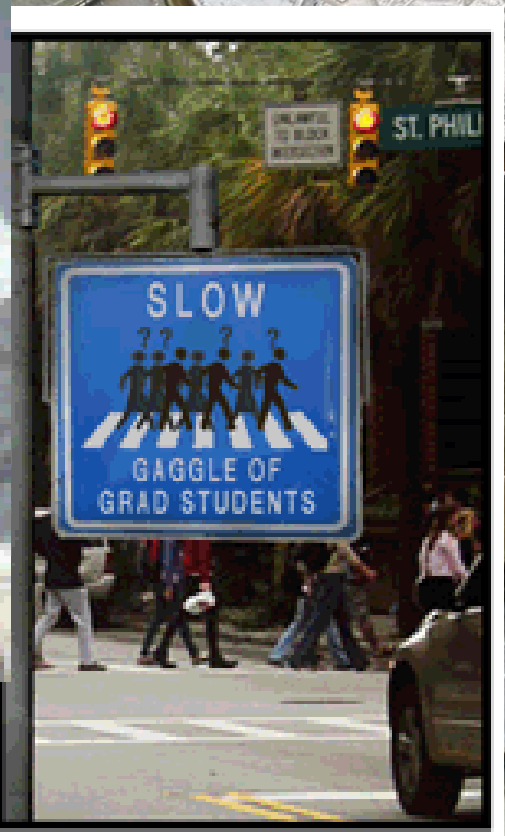
- Spangenberg, J.H., Görg, C., Truong, D. T., Tekken, V., Bustamante, J. V., Settele, J. 2014. Provision of ecosystem services is determined by human agency, not ecosystem functions. Four case studies. Int. J. Biodiversity Science, Ecosystem Services & Management 10(1): 40-53, http://dx.doi.org/10.1080/21513732.2014.884166.

- Tekken, V., Spangenberg, J.H., Escalada, M., Burkhard, B., Truong, D. T., Settele. J. (submitted). "Things are different now": a qualitative assessment of farmer perceptions of cultural ecosystem services of traditional rice landscapes in Vietnam, and the Philippines. Ecosystem Services

3a. Valuation

- Economic values are omnipresent, but only a fraction of all values held by farmers
- Most objects hold more than one kind of value, in particular cultural values
- Values cannot be aggregated, trade-offs cannot quantified: CBA/vMCA do not work
- For cESS, tools, materials, processes etc. hold independent value not expressed by the value of the final product (≠economics)


STATE
LAW
YIELD
ABSENT-MINDED
PROFESSORS


SLOW
GAGGLE OF
GRAD STUDENTS


FRUSTRATED
POST-DOC
XING

3b. Valuation

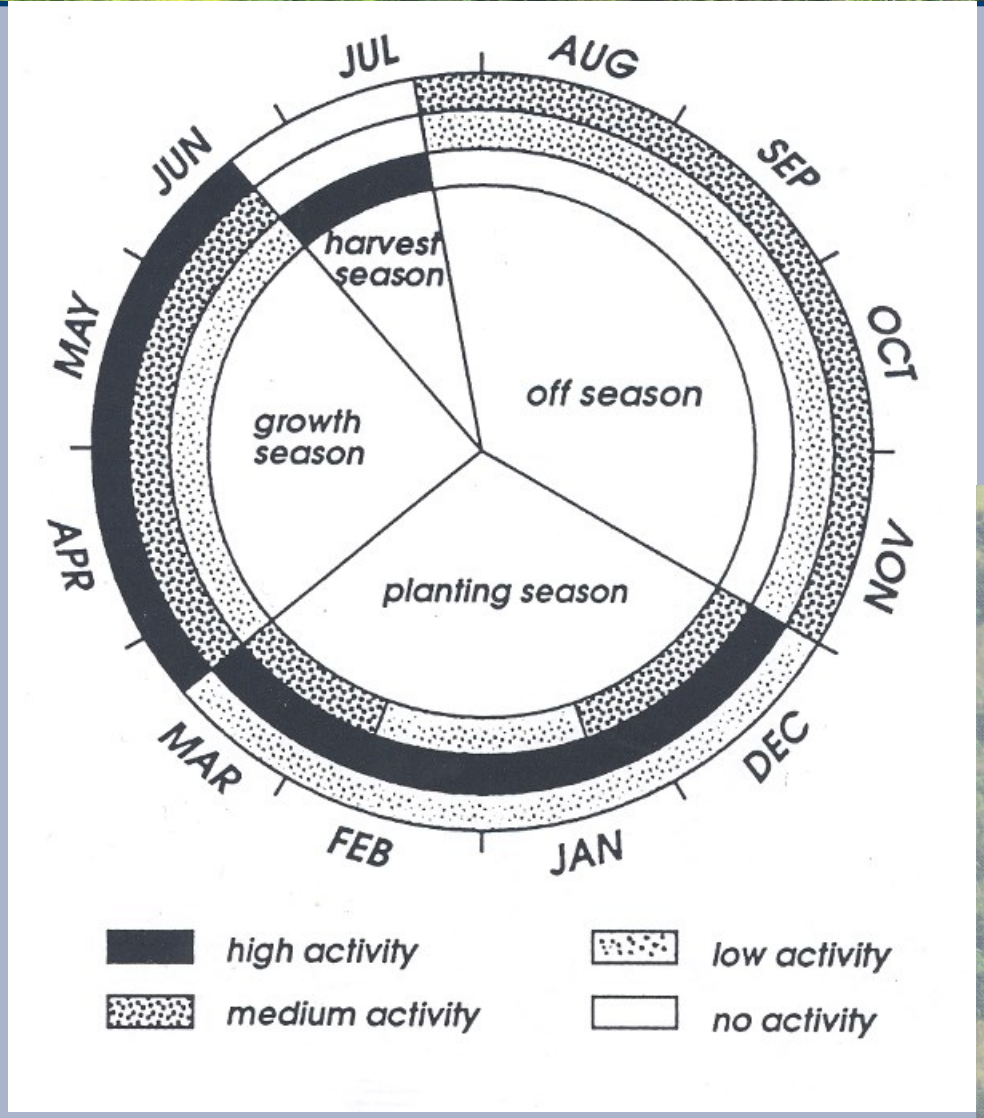
- Spangenberg, J.H. 2016. The world we see shapes the world we create: how the underlying worldviews lead to different recommendations from environmental and ecological economics – the green economy example, Int. J. Sustainable Development 19(2): 127–146. DOI: http://dx.doi.org/10.1504/IJSD.2016.077208

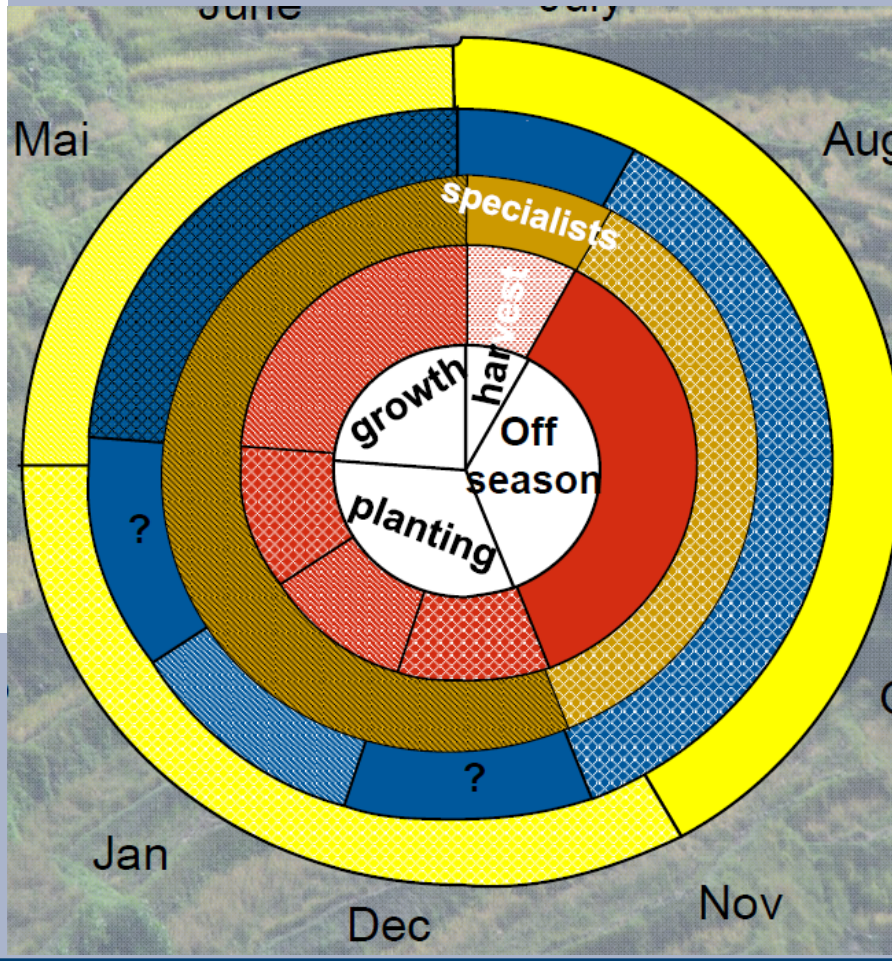
- Spangenberg, J.H., Settele, J. 2016. Value pluralism and economic valuation – defendable if well done. Ecosystem Services 18: 100-109. DOI: http://dx.doi.org/10.1016/j.ecoser.2016.02.008

- Spangenberg, J.H., Settele, J. 2010. Precisely incorrect? Monetising the value of ecosystem services. Ecological Complexity 7(3): 327-337. DOI: 10.1016/j.ecocom.2010.04.007.

4a. Economic situation

- Farming is hard work, with low income and bad reputation. Nonetheless farm workers want to become farmers, farmers never give up, but advise their children to seek better jobs
- Remittances are an important source of income, but never discussed
- Farmers seek additional sources of income like eco-tourism and wood carving. The future of international tourism income is uncertain.
- Food security is at risk as the average age of farmers increases. Still small and medium farmers supply their families with aromatic rice. Merging small farms is no real solution.





The Rice cycle in Banaue has changed significantly

historical data after Concklin, modified)

4b. Economic situation

- *Farmers – the missing factor for food security? Observations from SEA. in prep.*

- *The cost of farming in SEA irrigated rice agriculture – farmers' perspectives*

- **Spangenberg, Joachim H. 2014. Ecosystem Services in a Societal Context. Sander Jacobs, Nicolas Dedoncker, Hans Keune, Ecosystem Services. Global Issues, Local Practices. Elsevier, Amsterdam: 91-95, DOI 10.13140/2.1.3134.7522.**

5a. Environmental and social justice

- Justice concepts and conditions differ – e.g. inheritance rules (all land to eldest child or dividing it up) change the conditions for sharing
- Tourism value is created by farmers, as a side effect of farming, and does not benefit them
- Direct contracts with tourism business can support benefit sharing and are preferable to public schemes as they avoid the evaporation of money
- What can be rented out is restricted by tradition and cultural rules. Charging for the view is an innovative approach not violating rules (as in Bali)

5b. Environmental and social justice

- *Spangenberg et al. (in prep). Environmental justice and the role of ESS: concepts and case studies*

- Spangenberg, J.H. (in press). Hot air or comprehensive progress? A critical assessment of the SDGs. Sustainable Development.

- Spangenberg, J.H. 2013. Pick Simply the Best: Sustainable Development is About Radical Analysis and Selective Synthesis, not About Old Wine in New Bottles. Sustainable Development 21(2): 101–111.

6a. Governance

- Government and global markets set framework conditions for rice production. Law enforcement suffers from corruption. Learning from failure is rare
- Middle men all along the process chain provide market access, pay low but immediately, give credit, accept not fully dried rice.
- Pesticide dealers need no qualification, company salesmen praise pesticides and extension workers do not visit farmers
- Community management is effective (forests, PH) if not supressed by authorities (VN), traditional values are often important


B-MEG
BULAYUNGAN
Store
San Miguel
Pure Foods
SAN MIGUEL CORPORATION
BULAYUNGAN
AGRI- SUPPLY
ANIMAL & AQUA FEEDS
VITARICH
PIGROLAC
PREMIUM HOG FEEDS
PIGROLAC
PREMIUM HOG FEEDS
Farmer's
Edge
PIGROLAC
PREMIUM HOG FEEDS

6b. Governance

- *Spangenberg, J.H., Görg, C., Settele, J. et al. (in prep). Stakeholder analysis and involvement in ESS research in South East Asian rice agriculture*

- *Spangenberg, J.H., Görg, C., Settele, J. et al. (in prep). Community resilience in land use research – the case of LEGATO*

- **Spangenberg, J.H., Douguet, J.-M., Settele, J., Heong, K. L. 2015. Locked Into Continuous Insecticide Spraying in Rice. Developing an integrated ecological and socio-political DPSIR analysis. J Ecological Modelling 295: 188–195, http://dx.doi.org/10.1016/j.ecolmodel.2014.05.010.**

7a. Interdisciplinarity & Integration

- For societal problem solving, multi-disciplinary is indispensable
- Sharing of insights between disciplines and knowledge integration are difficult, require open minds and are time consuming
- Mutual understanding of methods and the kinds of insights (complementarity of qualitative and quantitative approaches) is a precondition for co-production and integration
- Developing joint storylines and publications require more work than for collaborations within the same or between closely related disciplines, are often considered less relevant and too time consuming

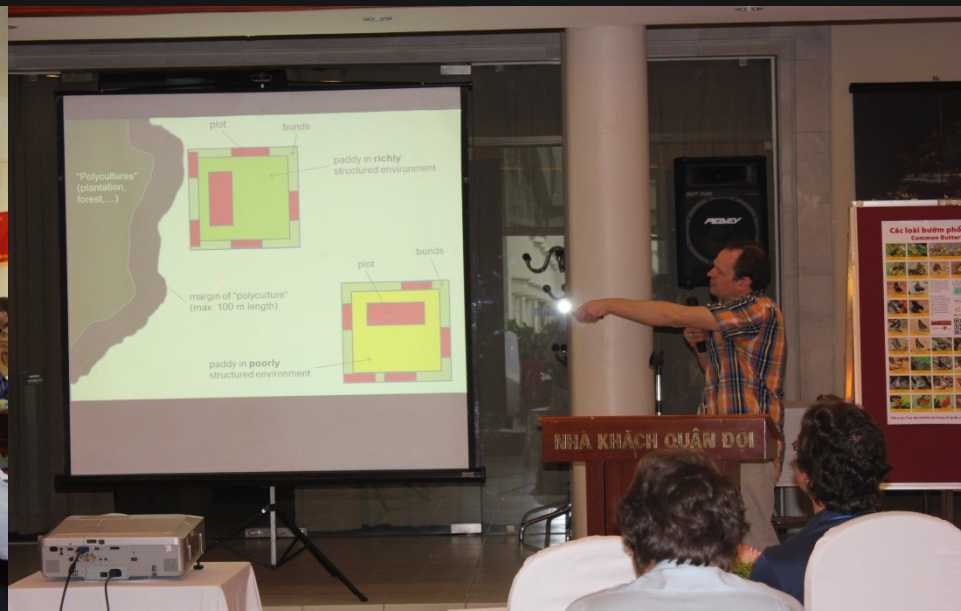
7b. Interdisciplinarity & Integration

- Spangenberg, J.H., Beaurepaire, A.L., Bergmeier, E., Burkhard, B., Görg, C., Heong, K.L., Horgan, F.G., Hotes, S., Klotzbücher, T., Marion, G., Moritz, R.F.A., Schädler, M., Schmidt, A., Tekken, V., Türke, M., Vaclavik, T., Westphal, C., Wiemers, M., Settele, J. (tbs). Cross-disciplinary research results integrated into an ecosystem service framework. The LEGATO example of integrating research results from the analysis of global change impacts and social, cultural and economic system dynamics
- Siew, T. F., Aenis, T., Spangenberg, J.H., Nauditt, A., Frank, S., Rodriguez-Labajos, B., Ribbe, L., Settele, J., Wang, J., Döll, P. 2016. Transdisciplinary research in support of land and water management in China and Southeast Asia: evaluation of four research projects. Sustainability Science 06/2016; DOI:10.1007/s11625-016-0378-0
- Spangenberg, J.H. 2011. Sustainability science: a review, an analysis and some empirical lessons. Env. Conservation 38 (3): 275–287.

8. Transdisciplinarity, stakeholder participation and management

- Scientists are experts for methods, stakeholders are experts for relevance. A successful project needs both
- Teaching stakeholders the terminology of science tends to generate answers the scientist wanted to hear, but not what the stakeholder had to say
- Stakeholders are no homogenous group, and conflicts prevail. The project and its researchers will be made stakeholders, like it or not: it is better to actively chose a role
- Projects have a limited duration, frustrating stakeholder expectations. Expectation management and early communicating an exit strategy are important

Consulting business and science, informing politics, learning from farmers



Talk to the winners: Consulting administrative and political stakeholders

But don't mention the losers

E.g. farmers, women, indigenous peoples

8b. Transdisciplinarity, stakeholder participation and management

- Spangenberg, J.H., Görg, C., Settele, J. 2015. Stakeholder involvement in ESS research and governance: between conceptual ambition and practical experiences – risks, challenges and tested tools. Ecosyst Serv 16: 201–211.
- Förster, J., Barkmann, J., Fricke, R., Hotes, S., Kleyer, M., Kobbe, S., Kübler, D., Rumbaur, C., Siegmund-Schultze, M., Seppelt, R., Settele, J., Spangenberg, J.H., Tekken, V., Vaclavik, T., Wittmer, H. 2015. Assessing eco-system services for informing land-use decisions: a step-wise approach for place-based ecosystem service assessments. Ecol & Soc 20(3): 31.
- Görg, C., Spangenberg, J.H., Tekken, V., Burkhard, B., Truong, D.T., Escalada, M., Heong, K.L., Arida, G., Bustamante, J.V., Chien, H.V., Klotzbuecher, T., Marquez, L., Marxen, A., Manh, N.H., Sinh, N.V., Villareal, S., Settele, J. 2014. Engaging local knowledge in biodiversity research: experiences from large inter- and transdisciplinary projects. Interdis Sci Rev 39(4): 323–41.

9a. Ecological Engineering

- The principles are simple, but require a change of management which needs both, teaching and regula support
- Social processes must be taken into account (traditions, habits, collective change from rice to fruit): economic success is not enough
- Communication is crucial and can be successful, through traditional channels and new media alike
- If combining ecological engineering with elements of SRI (water management) will reduce methane emissions should be explored


NO TO
FOREST
FIRE
PLANT TREES
FOR
WATER

9b. Ecological Engineering

- Spangenberg, J.H., Sebesvari, Z. (tbs). Pesticide use, biodiversity loss and farmer´s health risk in Vietnam. Env. Science and Policy.

- Settele, J., Spangenberg, J.H. 2014 Conservation Science. Nature online comments http://www.nature.com/news/working-together-a-call-for-inclusive-conservation-1.16260.

- Settele, J., Spangenberg, J.H., Heong, K.L., Burkhard, B., Bustamante, J.V., Cabbigat, J., Chien, H.V., Escalada, M., Grescho, V., Hai, L.H., Harpke, A., Horgan, F.G., Hotes, S., Jahn, R., Kühn, I.f, Marquez, L., Schädler, M., Tekken, V., Vetterlein, D., Villareal, S.B., Westphal, C., Wiemers, M.. 2015. Agricultural Landscapes and Ecosystem Services in South-East Asia - the LEGATO-Project. Basic and Applied Ecology 16(8): 661–664. DOI: 10.1016/j.baae.2015.10.003

10a. Future Work

- The relationship between biodiversity at landscape scale, landscape structure and ESS is far from clear
- How the ESS concept can be integrated into the Ostromian SES analysis is just beginning to be understood (everybody is part of a dense social web, the "free individual decision" exists even less than in Europe)
- How cultural changes influence the time rhythms basic to agriculture is unexplored
- To what degree insight from one place are transferable to similar places requires new research

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RICE ECOSYSTEM SERVICE

Antropogenic landscapes cannot be understood without understanding culture

10b. Future Work

- *Falk, T. et al. (in prep). Forests, meadows and ecosystem service governance. An Ostromian approach.*

- *Spangenberg, Nguyen, A. et al. (in prep). The times are changing. Annual rhythms in rice agriculture in SEA*

- **Václavík, T., Langerwisch, F., Cotter, M., Fick, J., Häuser, I., Hotes, S., Kamp, J., Settele, J., Spangenberg, J.H., Seppelt, R. (submitted). Investigating transferability potentials of place-based research in land system science. Environmental Research Letters.**

- **Spangenberg, J.H. 2012. Biodiversity loss. V. Bitzer, R. Cörvers, P. Glasbergen, I. Niestroy (Eds.), European Union, Governance and Sustainability. Open Universiteit Textbook, Open Universiteit: Maastricht: 285-308.**

"We have become far too clever
to survive without wisdom"
E. F. Schumacher

Thank you for
your attention

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or can be ordered via
http://seri.academia.edu/JoachimHSpangenberg