

China-US Scientific Engagement on Sustainability

Panel II: Biodiversity ↔ Food

Challenges & Opportunities to Link Knowledge with Action

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The State of the World's Insects. Eggleton P. *ARER* 45:61-82 (2020)

Human use of the environment and resources

Agrochemicals, Environment, and Human Health. Devi I, et al. *ARER* 47 (2022) **F=>B&H** Review in Advance <https://doi.org/10.1146/annurev-environ-120920-111015>

Organic and Conventional Agriculture: A Useful Framing? Shennan C, et al. *ARER* 42:317-346 (2017)

Forest-agriculture mosaics in tropical and subtropical Asia

Gold = “working landscapes”

Green = “forest”



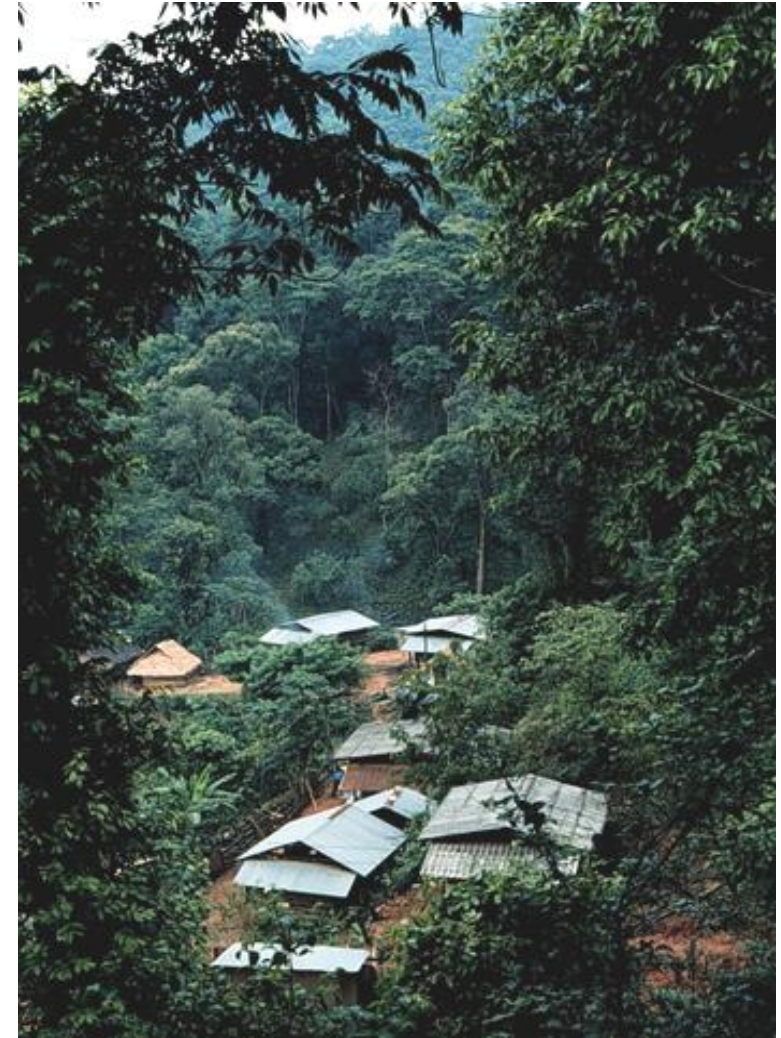
From agricultural plots to working landscapes

Multifunctionality, a system-level attribute, is an outcome of **multiple goals** and **multiple land uses** interacting ecologically and socially across **multiple scales** in space and time.

Multiple stakeholders (*often with conflicting interests*) shape and constrain effective governance options.

These complexities make it **impossible to “manage” landscapes effectively through top-down, command-and-control approaches** within administrative “silos”.

Effective local voice and appropriate incentives are necessary (*but not sufficient*) for achieving local and higher-level goals.



Miang tea agroforest, Chiang Mai Prov., N. Thailand

What about arid, semi-arid, and Mediterranean landscapes?

Central Valley, California, USA



Seasonal wetlands



Riparian corridors



Annual hedgerows



1. What are major challenges?

Multi-functionality, with multiple land uses, scales, and stakeholders.

Creating an effective and **just balance between local and national interests**, including meeting international commitments.

2. What are promising opportunities for scientific collaboration?

Shifting paradigms from plot-level “productionism” to working landscapes as coupled social-ecological systems.

Developing institutions, networks, and human resources to shift paradigms.

Programmatic models:

- NSF’s Sustainable Regional Systems
- Integrated ecosystem assessment (Millennium Assessment, IAASTD, IPBES)

Proposal for collaboration: regional or national food systems assessments in China and the US