

Final Progress Report

Sustainability Science Program

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Field: Institutional and environmental policies in the area of agroforestry and payments for environmental services, natural & rural systems management, linking knowledge with action in natural resource management

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Sustainability Science Research:

Title: *Linking Knowledge with Action: Typology and Dynamics of Boundary Organizations in the Context of Compensation and Rewards for Environmental Services in Asia and Africa*

Abstract: In the context of compensation and rewards for environmental services (CRES), boundary organizations are brokers who can influence the behaviors and practices of other parties at different layers of the knowledge-action system. Conversely, they can also be co-opted through the struggles between parties to defend their own social spaces, cultural boundaries, and positions within the wider power structure. The experience of the World Agroforestry Centre (ICRAF) in the projects [Rewarding Upland Poor for Environmental Services](#) (RUPES) in Asia and [Pro-Poor Rewards for Environmental Services in Africa](#) (PRESA) in Africa provides rich cases to explore the types and dynamics of boundary organizations within the knowledge-action system. The study examined the ways in which their true nature and orientation predicts the delivery and outcomes of the boundary work. The study was based on two hypotheses: 1) the development of a CRES mechanism occurs in the context of a number of rural institutions and interest groups, which directly affect the formation of interest groups, the transaction costs of institutional change and the public choice process through which choices are made; and 2) boundary organizations that serve as intermediaries between ecosystem stewards and beneficiaries have their own objectives, which may align with one or another de facto interest group with the stewards and or beneficiaries. Results from the study guided the formulation of guiding principles and pointers for conducting boundary work in the context of pro-poor rewards for environmental services in Africa and the work of global partnership of *Alternatives to Slash and Burn* (ASBB) in forest margins.

Main problem: The study sites are in the Manupali watershed, in the southern Philippines and the Nyando Basin in Western Kenya. The study seeks to understand the different types and configurations of boundary organizations, and their roles in linking knowledge to/with/and actions of multiple stakeholders in the context of environmental service payments.

Key questions: The study sought to answer the following questions:

1. What conditions allow for boundary organizations to function well, or not well?
2. What internal or external conditions allow for the boundary work to take place?
3. What conditions are essential or desirable for successful boundary work?
4. What might the operational features or protocol of a successful boundary work in the PRESA project?

Research approach and methods: The study employed a “case study” approach using different data gathering techniques such as survey-interviews, documents review, workshops and focus group discussions, expert’s consultation, and retrospective analysis. Both quantitative and qualitative data were used in understanding and analyzing the depth of the study. The study also benefited from spatial and hydrological data previously collected by ICRAF scientists, including the author in the study sites.

Key literatures:

1. Linking knowledge with/to action
2. Knowledge production, co-production, dissemination
3. Environmental service payments
4. Actor-oriented paradigm/perspectives
5. Social capital
6. Organizational theory

Outputs: The study/fellowship has produced the following international public goods.

1. **ASB policy brief:** “*Linking scientific knowledge with policy action in Natural Resource Management*”. This brief articulates the challenging quest for better integration of knowledge and actions of three key actors in forest management, namely local people, local governments, and scientists. It also highlights the virtues and risks of independent scientific inquiry and the multi-actor negotiations in the knowledge-action world, and finally outlines some pointers for preparing boundary work within forest margins.
2. **PRESA policy brief:** “*Key activities and guiding principles for linking science and policy for PRESA*”. This brief outlines ways on how boundary organizations operate to reconcile the supply and demand of science in the context of pro-poor rewards for environmental services in Africa. It is useful for multiple boundary organizations working together in one or more geographic settings.
3. **CID working paper:** “*Boundary Work: Knowledge negotiation for payments of environmental services in the Philippines---- preliminary findings from an actor-oriented perspective*”. This paper analyses the work of scientists and partners of the World Agroforestry Centre (ICRAF), who are deeply involved in a negotiated process of collaborative knowledge production, to develop PES schemes with multiple actors in the Manupali Watershed, in the southern Philippines. The paper describes how histories of migration, land use change, political conflict, and research and development interventions are important in understanding the kind of boundary work that needs to be done, where

the primary aim is reconciling the multiple forms of knowledge and ambitions of multiple actors involved in PES.

4. **Research paper (for journal publication):** “*Typology, Dynamics and Roles of Boundary Organizations in the Context of Compensation and Rewards for Environmental Services in Asia and Africa*”. This paper is a synthesis of studies conducted for the Philippines and Kenya on the types and dynamics of boundary organizations in their efforts to link science and policy for ecosystems rewards and payments.
5. **Joint fellows paper:** “*Managing Ecosystems Functions for Sustainable Agriculture in Latin America, Asia and Africa.*” (tentative title). This paper articulates the nested links of ecosystem functions to ecosystems services viewed in the context of a human-ecological value chain. This paper is intended for a PNAS journal, and is a collaborative product of co-fellows Edmundo Barrios and Esther Mwangi.

Professional advancement:

1. I continued supervising PhD and MSc students at the Australian National University and the University of the Philippines-Los Banos.
2. Non-SSP projects and publications:
 - 2.1. USAID-SANREM-CRSP Vegetable-Agroforestry policy studies for Vietnam and the Philippines. During the fellowship, my paper on the “policy context of vegetable-agroforestry in the Philippines” was published in the International Journal for Ecology and Development. I also synthesized the studies for Vietnam and the Philippines for a journal publication.
 - 2.2. SANREM-CRSP cross-cutting research in linking knowledge with action. I analyzed the case studies for Vietnam and the Philippines, and contributed in conceptualizing a volume on “Linking Knowledge-Action” that features case studies from SANREM research in Asia, Africa and Latin America. The literature review of the volume benefited much from the support provided by SSP.
 - 2.3. Landcare International. During the fellowship, the volume “Landcare: Local Action-Global Progress”, which I am principal editor was published by the World Agroforestry Centre and Australian Landcare International.
3. Proposal writing. During the fellowship, I was involved in developing a number of proposals with the World Agroforestry Centre and partners for submissions to the International Fund for Agriculture and Development (IFAD), Indian Council for Agricultural Research (ICAR), AusAID, USAID-SANREM CRSP, the EU, IFPRI and the Earth Institute at Columbia University.
4. Job search: Senior Scientist and Management for ICRAF’s global research project 6, which deals on policies and institutions that enhances the role of trees in multifunctional landscapes.

5. Training: Building Ecosystem Services Research Capacity for Semi-Arid Africa (BESSA) was organized by PRESA and the Macaulay Land Use Research Institute in the UK. Over 64 environmental practitioners from across the world participated the training.
6. Workshops/Roundtable/Panel:
 - 6.1. Land Use Carbon and Poverty Reduction Roundtable, 13 March 2009, National Geographic Society in Washington, D.C. The roundtable was co-sponsored by the World Agroforestry Center (ICRAF), Ecoagriculture Partners, CARE, World Vision and Conservation International.
 - 6.2. One-day session on Linking Knowledge with Action was organized in conjunction with the BESSA training for African researchers in ecosystems services. 1 April 2009. Nairobi, Kenya.
 - 6.3. Side event for the Commission on Sustainable Development (CSD 17): I was Panel Discussant on the session “Delving into a Deep Green Revolution: Responding to a Food Crisis and Climate Stresses with Pro-Active Risk Management Strategies and Livestock in Africa.” UN Headquarters, NY. The session was organized by Heifer Project International. 5 May 2009.
 - 6.4. Landscape Measures 'Proof of Concept' Planning Workshop, Washington, DC, 12 May 2009. The workshop was hosted by the H. John Heinz III Center for Science, Economics and the Environment, and facilitated by the Generative Change Community (GCC).
7. Seminars organized/co-organized within Harvard University:
 - 7.1 CID Graduate Lunch Seminar Series: “Philanthropy and Civic Action” by Antonio Meloto. Gawad Kalinga, Philippines. 27 February 2009.
 - 7.2 Frontiers in Sustainable Development Seminar: " Women in Agriculture and Marketing: Evidence and Lessons from the Philippines and Vietnam" by Dr. Ma Elena Chiong-Javier, Professor of Behavioral Science and Director, Social Development Research Center, De La Salle University, Philippines. 5 May 2009.
 - 7.3. “Leading a Culture of Change” session for the GK Gawad Kalinga Summit. Taubman Center. 13 June 2009.
8. SSP Fellows small-group projects
 - 8.1 *Linking Knowledge with Action*. Fellows in this group gathered to exchange knowledge and experiences in linking knowledge with action as applied in different or similar fields. The fellows benefited from providing useful feedback to improve their understanding and practice on linking knowledge with action.
 - 8.2 *Ecosystem Services*. Fellows in this group shared knowledge and experiences, and agreed on developing a joint-paper that articulates the continuum of ecosystems functions-services to societies.
 - 8.3 Sustainability Science Curriculum. Fellows in this group exchanged ideas and worked on improving the 2008 Sustainability Science Curriculum.

SSP-Related Seminars and Presentations:

1. Graduate Seminar Series on Sustainable Development at the School of Environmental Science and Management (SESAM), University of the Philippines, Los Banos, Laguna. 26 January 2009

Sustainability Science: Concept, Values and Principles

Abstract

Sustainability science emerged from the recognition that humans face severe problems of ecological degradation and poverty, and that these problems are inextricably linked. The field developed at the center of a diverse set of research and innovations relevant to society's efforts to facilitate a transition toward sustainability. With a core focus on advancing understanding of coupled human-environment systems, sustainability science is defined by the problems it addresses rather than by the disciplines it employs. Research in sustainability science transcends concerns of its foundational disciplines and focuses on understanding the complex dynamics that arise from interactions between human and environmental systems. In distinguishing how it addresses its research questions, four broad characteristics of sustainability science are identified i) problem-driven focus on human-environment systems; ii) integrative approach to understanding complex human-environment interactions; iii) attention to cross-scale dimensions of those interactions; and iv) its boundary spanning work at the interface of research and practice. Principles and values guide the position of sustainability science, which are hinged on contentious principles and values of the broad sustainability development framework.

2. Undergraduate seminar series for Agricultural Engineering students at North Carolina Agriculture and Technology-State University & Women and Development seminar series at the International Research, Education and Development (IRED), Virginia Tech. 4-5 February 2009.

Linking Knowledge with Action: Meeting NRM challenges through SANREM

Abstract

Huge imbalance between the generation of knowledge and subsequent translation into interventions and practices that improve environmental decision making and deliver benefits to communities exist. Finding effective ways of linking research to action and promoting the uptake of evidence-based interventions is increasingly a priority for researchers, practitioners and policy-makers, and a systematic understanding of how, why and when evidence informs policy and action remains a crucial enterprise for public policy. Knowledge-action systems are more likely to be effective if they produce information that is perceived by users to be simultaneously salient, credible, and legitimate, which are acquired by being collaborative, user-driven, problem focused; engaging the continuum of decision maker to knowledge producer; involve boundary organizations; have a learning orientation; and include investments in capacity building. Thus exploring the knowledge-action interface requires an understanding of how and why multiple actors (researchers, policy makers and resource users) engage with each other at multiple levels, the quality of those interactions, and the influence of the socio-political context. The diverse resource management problems, resource settings, and variety of strategies used by the SANREM CRSP research projects provide a rich set of cases to explore the relationships between knowledge generation and policy practice. This participatory process provides a solid foundation for exploring the conditions under which research knowledge can influence the practice and behavior of policy makers, practitioners and resource users, and for formulating strategies to use, disseminate and implement research findings.

This seminar focuses on the experience of the SANREM project in Southeast Asia, particularly in the Philippines and Vietnam. We present initial findings of an ongoing study of the SANREM-TMPEGS project, with respect to the variety of strategies used by researchers to try and link their research to policy makers and resource users. .

<http://www.ag.ncat.edu/agedispatch/2009/01/> or <http://www.oired.vt.edu/WID/events.html>

3. AAAS Chicago. 13 February 2009.

Linking knowledge with action: typologies and dynamics of boundary organizations for compensation and rewards for environmental services in Asia and Africa.

<http://pathtosustainable.wordpress.com/2009/02/16/aaas-saturday-morning-discussions-of-sustainable-development-and-borgs/>

4. International Research Institute for Climate and Society (IRI), Columbia University, 13 April 2009.

Meeting Climate Change Challenges through Linking Knowledge and Action

Abstract

Climate change is one of the huge challenges facing humanity today. The scientific community is expected to produce the best available science that could advice policy on appropriate interventions. However, in general, there is a huge imbalance between the generation of knowledge and its subsequent translation into interventions and practices that improve environmental decision making and deliver benefits to communities. This is more problematic in the case of climate change, where longer-term research is needed to produce the best approximation of trends and variability. Within the frame of sustainability science, climate change research should advance understanding of coupled human-environment systems, and focus on the problem it seeks to address rather than by the specific disciplines or methods it employs. This talk presents effective ways of linking research and action, and how knowledge produced from good science can be simultaneously salient, credible, and legitimate, to meet societal needs.

http://portal.iri.columbia.edu/portal/server.pt/gateway/PTARGS_0_2_3526_0_0_18/Climate%20C_K2A_IRI.pdf

5. Linking Knowledge with Action Session at “Building Ecosystems Services Research in Sub-Saharan Africa” (BESSA). 1 April 2009, Nairobi, Kenya.

<http://presa.worldagroforestry.org/blog/2009/04/15/photo-gallery-bessa-training-workshop/>

Collaborators outside Harvard University:

1. World Agroforestry Centre
2. Dr. Manuel Reyes, NCA &T-SU
3. Drs. Theo Dillaha & Keith Moore, Virginia Tech
4. Dr. Dang Tanh Ha, Nong Lam University, Vietnam
5. Dr. Ma. Victoria Espaldon, University of the Philippines, Los Banos
6. Dr. Amor Ines, IRI, Columbia University
7. Dr. Leah Onyango, Maseno University, Kisumu, Western Kenya

8. Dr. Sara Scherr, Ecoagriculture Partners
9. Dr. Louise Buck, Cornell University
10. Dr. Ruth Meinzen-Dick, CAPRI-IPFRI

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Reflection and Acknowledgement:

The SSP fellowship has provided me with a fertile ground for professional growth through scholarly work and social networking. The program enabled fellows to advance their basic understanding of the dynamics of human-environment systems. Personally, this guided my reflection of my own experience in working with multiple stakeholders at multiple scales, in theorizing field realities and reflecting this back on to practical actions, and vice versa. This greatly helped in conceptualizing scientifically valid and practically novel research designs/projects. The regular fellows' seminar is an excellent venue for learning and exploring novel and innovative pieces of work in the field of sustainability science. I particularly value the fellows' small group projects as another way of knowledge sharing and getting peer support, where professional and personal relations grow—this is where more meaningful interactions take place, building up opportunities for future collaboration. I also appreciate the freedom and space given for independent inquiry on subjects that really matters to individual fellows. I never thought that I would have the freedom to infuse my work interest into my fellowship research, providing a solid bridge of continuity between my previous and present work, and onto my future work; yet there are still unexplored and missed opportunities, so let me take this opportunity to suggest, that the SSP may benefit more from an organized team of fellows working together in one particular cutting-edge problem/issue, in the true spirit of interdisciplinary research and the teachings of sustainability science. Finally, I attribute to the fellowship the exciting job opportunities that opened up before me— this wonderful experience has greatly increased my value in the job market. I wish that the SSP will continue to thrive in quality and quantity, and will vigorously take scientific leadership in the field of sustainability science-- and I am much more delighted to be part of it.