Carbon and Livelihood Outcomes on the Forest-Farm Frontier

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Roadmap for presentation

• Motivation
• Background
• Key questions
• Methods
• Results: Patterns of outcome relationships and drivers
• Intervention mechanisms
• Conclusions
Motivation

• Increasing interest in patterns of outcome relationships; tradeoff or synergy?
• Basic knowledge about drivers of individual outcomes across social and ecological contexts still inadequate
• Identify patterns of relationships among outcomes of interest and the drivers of these patterns
Examples

• Existing knowledge remains basic:
  – high levels of agricultural output associated with low levels of biodiversity and forest cover;
  – roads + low governance associated with high deforestation and biodiversity loss;

• Finer-grained multi-outcome knowledge?
  – What is the association between carbon and aggregate livelihood contributions?
  – Do variations in levels of participation affect relationships between forest cover and livelihoods
Background

Overall - Recent reviews provide some sense of distribution and causes of single outcomes; but we do not know how different drivers are associated with outcomes of interest (carbon and livelihoods).

One reason is that generalizations about relationships are based on limited data, inadequate medium-range theories, and insufficient methods-related advances.
Key concerns

• Much discussion over tradeoffs and synergies – but little work that examines effects of given causes on several outcomes together

• Assessing these relationships simultaneously can enable interventions that support multiple improved outcomes
Key Questions

1. What are the patterns of relationships between forest cover and livelihoods at the forest-farm frontier, and what are the drivers of observed patterns of relationships?

2. What mechanisms do external agencies (government, civil society, donors, and corporate actors) use to influence and alter forest cover and livelihood outcomes at the forest-farm interface? (and with what effect?)
Methods

• Identify existing studies of policies and external interventions with information about impacts on two or more outcomes of interest (carbon, livelihoods, agricultural change, biodiversity)

• Do so through keyword searches, and code the studies for specific information related to outcomes, but also nature of interventions and context
Methods - Research Process

• Using joint keyword searches, identified more than 400 studies; after reviewing abstracts and scanning the studies, 123 coded for information
• Fewer than 15 studies explicitly mention adaptation and carbon/mitigation; we use livelihoods and forest condition/cover as proxies
Methods – Specific Focus

• Stated goal of intervention (in term of outcomes)
• Scope of intervention (area and # people)
• Type of pressure (for selective clearing, clear cutting, or both)
• Effectiveness of enforcement
Distribution of cases

Asia = 71;
Africa = 10;
Latin America = 41
Preliminary Results: Outcome Relationships

- Relatively few studies provide information on agricultural outcomes and biodiversity (less than 40%); on forest and livelihoods, more than 100 (of 123 cases).
- High (also statistically significant) association between agricultural outcome and livelihoods ($r=0.63$, $n=57$), and forest outcomes and biodiversity ($0.52$, $n=48$).
Results: Livelihoods and forest conditions

Positive association ($r=0.41$, $n=98$)

- Why? (some earlier studies find no correlation – Chhatre and Agrawal find a correlation of 0.009 between livelihoods and forest condition for 125 cases of forest commons)

Different universe of cases. Focus of current study -- external interventions aimed at promoting joint outcomes - agriculture part of the focus)
Results: Goals and Pressures

- No statistical association between the stated goal of an intervention and whether the outcomes related to that goal are positive – true for all four goals! (inference: other influences at play wash out the impact of stated objectives; strong unintended outcomes common)

- No statistical association between types and number of pressures and positive or negative outcomes (inference: demographic and economic pressures are mediated by policies and institutions)
Results: Scope of intervention

More ambitious interventions have more indifferent or negative results; focused projects more likely to promote positive outcomes.

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<th>Livelihood Outcomes</th>
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Pearson chi2(2) = 9.5358  Pr = 0.008

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Pearson chi2(2) = 7.5158  Pr = 0.023
Results: Role of enforcement effectiveness

- Strong impact of more effective enforcement on both forest condition and livelihood outcomes
Intervention mechanisms: Information, incentives, institutions

Distribution
Institutions/regulations=55; Incentives = 20; information = 7; Mixed = 37
Effects of different types of interventions mechanisms

• Use of multiple forms of interventions has a weak statistical association with improved livelihood outcomes, but not with forest outcomes.
Conclusions - methods

• Lack of consistency in data, methods, and approaches limits what can be inferred from secondary literature reviews.
• Because of these differences, common patterns are more interesting than lack of associations.
Conclusions - Findings

• Importance of scope of policy/project indicates continuing weaknesses in governance mechanisms in the developing world

• Enforcement effectiveness repeatedly found as a key explanatory variable – earlier studies include Gibson et al (2005 World Development), and Chhatre and Agrawal (2008, PNAS)
Future work

- Gain more accurate measures of the scope of the interventions in terms of numbers of people and area
- Undertake more careful statistical analysis
- Focus more on the specific work that different interventions mechanisms (information, incentives, institutions) perform and their relationship to each other