Ecosystem Services for Poverty Alleviation workshop

Date: 17 and 18 May, 2012
Location: Hawkwell House, Oxford

Agenda:

Thursday 17 May		Chair/presenter:
10.00	Welcome and introduction	
10.20	Introduction of participants	
10.40	Presentation of the definitions/understandings ESPA uses of	
	* ecosystem services	Caroline Howe
10.50	* poverty	Helen Suich
11.00	**Break**	
11.15	Background Session	Genevieve Patenaude
	Objective: to highlight the evidence (focussing on the links between	Rebecca Kent
	ES and PA) arising from the use of existing conceptual frameworks.	Garry Peterson
	Presentations & discussion	Kate Raworth
1.15	**Lunch**	
	Objective of the afternoon sessions:	
	To present case studies of how the following factors have been	
	incorporated into ES for PA research.	
2.00	Equity and access	Kate Schreckenberg
2.45	Trade-offs	Bhaskar Vira
4.00	**Break**	
4.15	ES & PA links	Caroline Howe/
5.00	Breakout groups.	Chair
Friday 18 May		
9.00	Introduction of new participants and summary of day 1 for new participants	Chair
9.10	Group work:	Groups
	Working with framework elements and incorporating the issues discussed on day 1	
10.30	**Break**	
10.45	Feedback from group work	
12.30	**Lunch**	
1.15	Continue feedback from group work	
2.00	Summary/overview	Georgina Mace
3.00	**Coffee and end!**	

Thursday 17 May

Welcome and introduction

The purpose of this workshop was to determine the evidence for different conceptualisations of the links between ecosystem services and poverty alleviation. Particular attention was given to the pathways linking poverty alleviation to ecosystem services. The workshop used existing frameworks as a starting point for systematically examining the evidence for proposed links and interactions, as well as where understanding or information is missing.

Though these links may be known by individual groups and researchers, they are not well documented in the literature. Thus, this workshop brought together social and natural scientists to help determine where we are in identifying the links between ecosystem services and poverty alleviation.

The meeting began with presentations of the ESPA definition of ecosystem services and understanding of poverty, in order that participants could start with a common understanding of these issues.

An ESPA perspective on ecosystem services – Caroline Howe, ESPA Research Associate (Imperial College)

Unlike the Millennium Ecosystem Assessment (MA), the ESPA programme separates benefits from ecosystem services; the services *underpin* final benefits for people. The MA also refers to cultural services, but in the context of ESPA these are called benefits. Some services are also benefits, such as flood regulation, but there are processes and services which are not benefits, as they have no ultimate human beneficiaries.

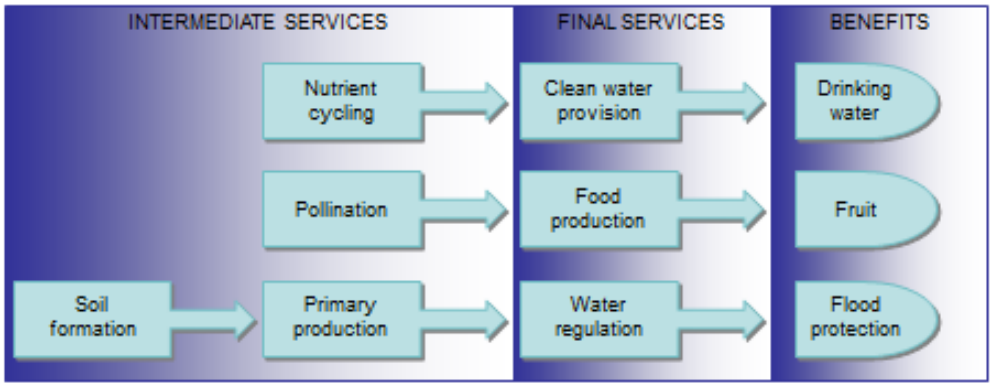


Table from Fisher et al, (2008)

For valuation, we focus on benefits, as these also include other capital inputs which transform them from services into benefits (e.g. labour and machinery for logging). Biodiversity could be described as an intermediate service or a final service (e.g. for crop improvement). It can also be a benefit such as a charismatic species that people will pay to see.

There are no simple linear relationships, some services can have multiple benefits. But if we only count distinct benefits then we should avoid double-counting, and this also takes account of capital and human inputs into those benefits.

The ESPA understanding of poverty – Helen Suich, ESPA Research Associate (University of Oxford)

The framework is not prescriptive, but lays out a range of factors to consider and use (or not) as relevant. The ESPA poverty framework was drafted and then refined at a workshop in September 2011, freely available at www.espa.ac.uk/files/espa/povertyframework.pdf

Poverty is usually broadly defined as the lack of or inability to achieve a socially acceptable standard of living, or the possession of insufficient resources to meet basic needs; recognising that both 'socially acceptable' and 'basic' are open to interpretation and may change culturally and over time.

In recent decades understanding has moved from single to multidimensional poverty. This doesn't necessarily change *who* is characterised as poor, but will significantly affect how we conceptualise problems and thus how we attempt to address poverty alleviation.

This framework does not dictate which dimensions should be included, they should be chosen because of their relevance to research, should reflect the way that communities and individuals at research sites understand and experience poverty, and be appropriate for the scale of research activities. The connections and interactions between them are important, as multiple deprivations compound the difficult of trying to escape from poverty.

Poverty dynamics describe how poverty changes over time; whether people move into or out of poverty, stay poor, or become poor(er). Vulnerability is key, and is a sense of insecurity that something bad could happen, from which it would be difficult or impossible to recover. Equity is a principle of fair treatment that is a necessary consideration in any poverty analysis, and it is interpreted to mean that individuals should have equal opportunities (though this does not necessarily result in equal outcomes). Issues of power are central to the analysis of both vulnerability and equity.

Measuring poverty should be broader than simply 'who' the poor are – but should improve the understanding of what the underlying factors and dynamics which cause poverty are? The use of mixed methods is strongly encouraged.

Conceptual frameworks

This session aimed to highlight existing evidence linking ecosystem services and PA; giving an overview of existing frameworks, where there are evidence gaps and how things have changed over time.

A socio-ecological systems analysis of the political economy of Ecosystem Services for Poverty Alleviation – Genevieve Patenaude, University of Edinburgh

Various agendas have emerged from the MA to highlight and investigate ES, wellbeing and poverty. There is increasing popularity of the concept of ES, but also significant existing scholarship. This project distinguished between conceptual frameworks that are designed to aid with thinking and those designed to support data collection. The project reviewed existing research and designed an overarching conceptual framework using the contributions of nine major

frameworks.

Unlike the Millennium Ecosystem Assessment (MA) and the Economics of Ecosystems and biodiversity (TEEB), the framework puts people centrally, with ecosystem services on the left and wellbeing on the right. The inclusion of access and control is a key distinction of the framework, as access is more important than simply aggregate availability of a service. Our work found that ecosystem services provide a means for poverty *prevention*, but not necessarily poverty *reduction*. The understanding of access to ecosystem services varies greatly, for example, between services which flow through well-known commodity chains compared with provisioning or cultural services which are less well understood.

The innovations in this framework include the recognition of social differentiation, distinctions between categories of ES, consideration of poverty reduction distinct from poverty prevention, distinctions between adaptation and mitigation, and the inclusion of external human influences.

One caveat is that a framework is generic for use as a thinking tool and can be challenging to contextualise. A framework shouldn't be used in isolation, but needs to be holistically applied using supporting concepts. It can encourage the operator to think through their own application. The next step will be to operationalise the framework, and create 'how to' guidance.

Human Adaptation to Biodiversity Change – Rebecca Kent, School of Oriental and African Studies

This project conceptualised biodiversity change as a change in assets that people use to realise their livelihoods. Assets have become more prominent in discussion about poverty; asset accumulation is seen as key to poverty reduction and by helping to prevent people falling into poverty, they can improve resilience.

A criticism of the Sustainable Livelihoods framework was the tendency to quantify different assets and then simply see how those have changed. Work on livestock has shown how single assets can be used for different benefits, e.g. income, saving, social, consumption, insurance. These benefits are informed by many primary and intermediate ecosystem services (soil functions, water cycle etc.)

Eight asset functions were derived: Consumable, social, productive, exchange, savings, protective, regulating, supporting. The framework was then applied to the example of invasive species in south India. More evidence is needed of the relationship between the 'asset function mix' and livelihood pathways.

The safe and just space for humanity – Kate Raworth, Oxfam

This framework builds on the work of planetary boundaries, and incorporates social issues. The planetary boundaries framework suggests the boundaries as an 'environmental ceiling', below which is the safe operating space for humanity. However it would be simple to occupy that space and have mass poverty, and thus be deeply socially unjust. Thus the 'social foundation' is incorporated, creating the doughnut. The eleven social elements were chosen by reviewing all of the government submissions to Rio +20 conference, and pulling out the ones mentioned by more than half of all submissions, so this is a single snapshot of what is considered important, not a definitive list.

The space between the environmental ceiling and the social foundation is the safe and just

operating space for humanity, and is the space of inclusive and sustainable economic development. This framework recognises that some basic resources are required to meet the needs for decent living individuals, whilst recognising that globally we need to operate within the limits of the planetary boundaries.

The size of the doughnut (i.e. the space between the environmental ceiling and the social foundation) will be affected by technology, population, distribution, governments, etc.

The boundaries are inter-related – to produce food, people need to convert land, use water and fertilisers, but can result in biodiversity loss, contribute to climate change, and can undermine water availability, all of which undermine the subsequent potential to grow food.

For more information: http://www.oxfam.org/en/video/2012/introducing-doughnut-safe-and-just-space-humanity

Ecosystem services in social-ecological systems – Garry Peterson, Stockholm Resilience Centre

Depending on context it may be appropriate to use just a social or ecological system, but social–ecological systems (SES) can bring these together. It must be noted that whenever we talk about ES, it is understood that they have still shaped for a long time by humans, and decisions we are making today are often based on activities from hundreds of years ago. Conceptual frameworks are useful but we also need operational frameworks and a way to map from one to another. By recognising that there are not an infinite way that social and economic forces can interact, it is possible to view them in bundles. This complexity can actually make things easier to understand.

Approaches to ecosystem services for poverty alleviation include enhancing provisioning services (for subsistence); enhancing landscape function (resilience); agriculture for markets ($); niche products ($); ecosystem service tourism ($); biocultural enhancement/re-invention (cultural); and payments for ecosystem services ($).

But there is a distributional question that underpins these – because in aggregate, increases don't necessarily alleviate poverty.

Areas where further research is needed:

- How do ecosystem services produce human wellbeing - especially non-provisioning services?
- How to measure regulating ecosystem services?
- How do ecosystem service interactions vary across time, space, and people?
- Interactions
- How to conceptualize; memory; spatial subsidies; mobile links
- Urban vs./and Rural
- Ecosystem service regimes
- Shared drivers; feedbacks; robustness; ecosystem services use
- Combined social-ecological dynamics (endogenous vs. exogenous)
- shifts in beliefs (e.g. property prices); technology
- How can people most effectively engineer ecosystems to produce bundles of desired ecosystem services
- Problem of fit – bundles vs. isolated services (e.g. carbon sequestration)

Ecosystem services: equity and access – Kate Schreckenberg, University of Southampton

See also the Defining Equity poster

There is an assumption that increasing values of ecosystem services will lead to poverty alleviation. However, it is important to question whether changing values actually lead to poverty alleviation and to greater equity.

This framework for defining equity in the context of ecosystem services has four layers which move from content, to target, to goal, to process. At a content level we ask *what* counts as a matter of equity. The next level considers targets and scale, asking *who* counts as a subject of equity and where can we draw boundaries. The goal layer asks *why* we should consider equity and whether people do, while the final process layers asks *how* the parameters of equity are set.

The case study looked at a Plan Vivo project which sold carbon credits to pay farmers to plant trees in Uganda. All beneficiaries need a minimum amount of land and a bank account, necessarily excluding the poorest. There is now a programme to pay 10% into a community fund to include other community members. A significant equity issue related to prices on the carbon market – the project began by paying market prices and found that neighbouring farmers were receiving very different prices, which could cause conflict, so have now standardised prices. In terms of the community fund there are questions over distribution, should it be pro-rata, or according to merit or need. Procedural issues surround contracts being issued in English and what would happen if trees were lost (either through natural/external forces, or by farmers changing their minds and logging). The farmers have only one source of information about tree planting – the organisation Ecotrust – which raises concerns about contextual equity. The importance of equity at different scales is also shown: at the intra-household level men dominate decision-making over payments; along the value chain, farmers receive a fairly good 50-60% of the global carbon price.

For more information: http://redd-net.org/themes/equity

Trade-off analysis for ecosystem services and poverty alleviation – Bhaskar Vira, University of Cambridge

There is significant work already looking at how to measure and value ES, but less which explores how negotiations occur and on trade-offs and identification of winners and losers. There was a lot of optimism about the possibilities for 'win-win' outcomes. However, even where aggregate increases occur, they can mask distributional issues of how those increases are distributed. Some will get more than others, and these relative shares can be a source of conflict, as negotiations don't always have amicable outcomes.

There are biophysical trade-offs between services, such as between provisioning (e.g. timber) and other services (e.g. *in situ* stocks such as carbon). Trade-offs also occur between stakeholders with different resource interests, access or power.

Uncertainty about how ecosystem services function (i.e. these functions and interactions are not completely understood) and of the future impacts of current actions can make it difficult to work out what the trade-offs will be. This is true for both spatial and temporal dimensions.

Links between ecosystem services and poverty alleviation. What is known? – Caroline Howe and Helen Suich

A literature search was undertaken to determine the extent of current knowledge on the links between ecosystem services and poverty alleviation. An initial search unearthed 266 papers, 203 of which were classified as being directly or indirectly relevant. A majority of the papers were found to include case studies, rather than being conceptual, many of which were focussed on global issues, or were in middle-income or transitional economies.

Many papers did not specify which ecosystem service(s) they were addressing. Of those that did, many discussed 'biodiversity' but did not specify if it was an ecosystem service, or which type it was. The specific dimensions of poverty considered were also rarely described, and very few papers looked at more than one dimension. Only 30 papers were deemed to explicitly discuss the links between ecosystem services and poverty alleviation. It was frequently difficult to classify the habitat types covered in the paper, and indeed there are many habitat types not considered at all.

A specific example, which demonstrates the complexity of even single case study looking at these links, was adapted from the case study in Shackleton and Gambiza (2008). The paper describes an invasive shrub, *Euryops floribundus*, which had thrived due to overgrazing, at a site in South Africa. The plant is now used for energy for warmth and cooking, for medicinal purposes, fencing poles and cultural benefits. The study also found that invaded areas had higher biodiversity, contrary to assumptions about ecosystem services and invasive species. Given the current use of the invasive, it's removal (as a strategy to improve ecosystem service management) could disproportionately affect poorer households and individuals, who rely on it for fuelwood.

Discussion groups

Exploring the questions:

- What are the gaps in our knowledge about ecosystem services for PA?
- What are the key factors/conditions that affect whether ecosystem services contribute to PA?

Group 1

Discussed the importance of getting policy makers involved in designing frameworks from the start. There can be a mismatch between the questions asked by policy makers and by researchers which should be recognised.

There is also a scale mismatch – an example is that climate change predictions are accurate over 100 years and very large (spatial) scale, but adaptation occurs on a smaller (spatial) scale and often over a much shorter timeframe. Policy makers often want much more fine resolution information than is available, in order to make decisions.

Projects need to be truly transdisciplinary, rather than having natural and social scientists collaborating on a grant, doing their research separately and then trying to bring it together at the end. There is also a question of whether the language of ecosystem services is a barrier to engagement for traditional development scientists.

Some civil society groups and countries are not happy with the concept of the green economy, due to risks inherent in commodification and the valuation of nature. It is vital that ESPA links in with other major programmes such as PECS and WAVES the UK national ecosystem assessment and EU FP7, etc.

Comments

- Policy questions should drive research but should policy makers be involved in the actual design of research? The policy making process in country should also be understood – it can be very different from one country to the next.
- The influence of the sustainable livelihoods framework suggests the engagement of development scientists, but it seems there are a group of researchers and practitioners who do not consider natural resource interventions to be part of their toolkit.

Group 2

Conceptual frameworks should have a grounding in real interventions with goals and criteria for success.

The problem if often tackled from one direction (i.e. moving from ecosystem services toward poverty alleviation), but are we wrong to be so unidirectional? Should we be also thinking about poverty alleviation leading to improved management of ecosystem services? Both perspectives require differentiation and scaling from project to landscape, and external influences are also key – national governments, commodity shocks, etc.

Governance, institutions and capacity at all scales have been missing from much of the discussion so far.

Comments

- The key point in designing a conceptual framework is to have a question to answer. For ESPA the question is the link between ecosystem services and PA, so frameworks must be targeting the poorest people.

Group 3

There are many different models of poverty alleviation, all of which will have different links to ES, and conversely those ecosystem services will contribute to different aspects of development agendas. Development decisions can have positive or negative effects on ES, but if they are not considered at all then the impacts are more likely to be negative. Again this will occur in both directions. ESPA needs to explore how to link with the various different ways that people are thinking about development, rather than trying to identify a single development path.

Comments

- There are going to be differing levels of interest in thinking about ecosystem services from different development stakeholders and groups.
- We are looking for a way to connect how activities which are aimed at poverty alleviation might be positively, negatively or neutrally affected by ecosystem services.

Group 4

The links between ecosystem services and poverty are actually reasonably well understood, but we don't know how the multiple chains of causality interact, or work within the systems and dynamics; nor do we know which causal pathways are most important, which is then how we intercede with policy.

Within some systems the dynamics are understood, but links to winners/losers are not well made, or how their context determines who (and whether) people can win/lose. We also don't know enough about the relationship between ecosystem services and the implications of how to manage

these at different scales.

It may be difficult to generalise from one context to another, but it is likely the transferability of methods will be important. It is useful to categorise different frameworks according to audience, scales etc.

Comments

- We haven't yet discussed homogeneity and heterogeneity; it is assumed that natural systems are heterogeneous and managed are homogeneous. Heterogeneous systems are generally more resilient, but will never be as efficient.
- PA has to have a policy context – any research needs to be translated somehow into a form for making better decisions.
- When presenting a framework we have to be clear what question was asked and who the audience are.
- Whilst there is a value in characterising frameworks between conceptual and practical/policy, we should not only be policy-led. One of our challenges in academia is to challenge the popular discourse, there is a danger of losing that if we are only led by policy.

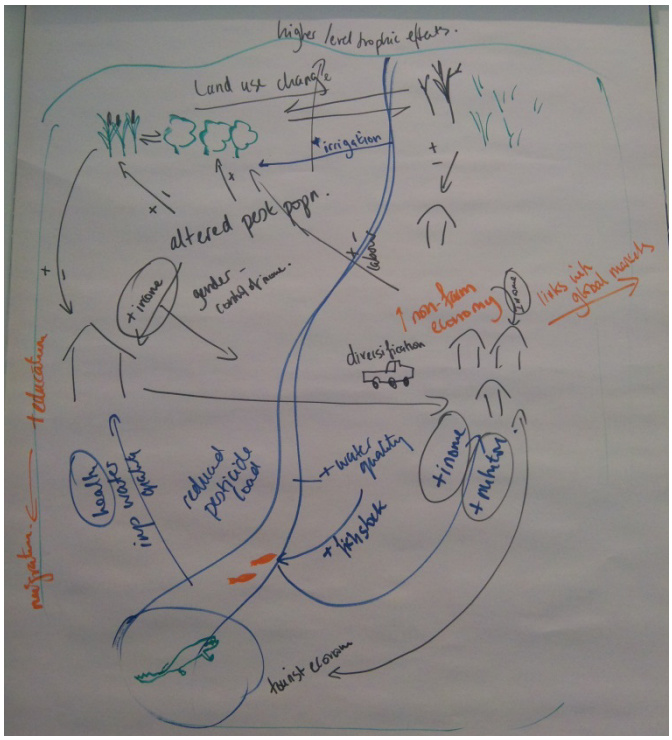
Friday 18 May

Groupwork: Take a system in which poor people live and interact with the environment.
List (some) of the ecosystem services and the dimensions of poverty affected by those services.
What would be the kind of interventions that would help people to move out of poverty?

- How could the ecosystem services in the system be better managed?
- How could you achieve poverty alleviation without compromising ecosystem services?

Tell us the story … including information on the interactions amongst poverty dimensions and amongst ecosystem services, as well as the interactions and feedbacks between them.

Case study 1 – Bt cotton



Started by looking at the landscape level – what different land uses exist, and the impact of Bt cotton introduction on ecosystem services within the landscape. Existing land uses: cotton production, subsistence food production, open access grazing and firewood collection, etc. The river is also used for fishing, water extraction and tourism (in terms of a nearby nature reserve). The introduction of Bt cotton would change pesticide use regimes, altering pest populations, impacting on water quality, soil health, other soil ecosystem services (and other higher level trophic effects not discussed).

Poverty effects were assumed to be related to increasing yield, which could have positive household impacts but which would depend on control of income derived, access to land and who controls what it is used for, etc. Depending on how increased income is spent, there could be improvements to food security, education, healthcare etc.

A shift in land use to growing Bt cotton may have negative effects on the production of non-cotton crops (i.e. a shift away from food crop production) and common property resources (negatively affecting those reliant on these shared resources). However, there may also be increases in labour

requirements associated with cotton production, which may benefit casual workers.

Impacts on water can have health impacts at the catchment level. River quality also affects fish stocks, with improved fishing having a positive impact on nutrition and potentially on income.

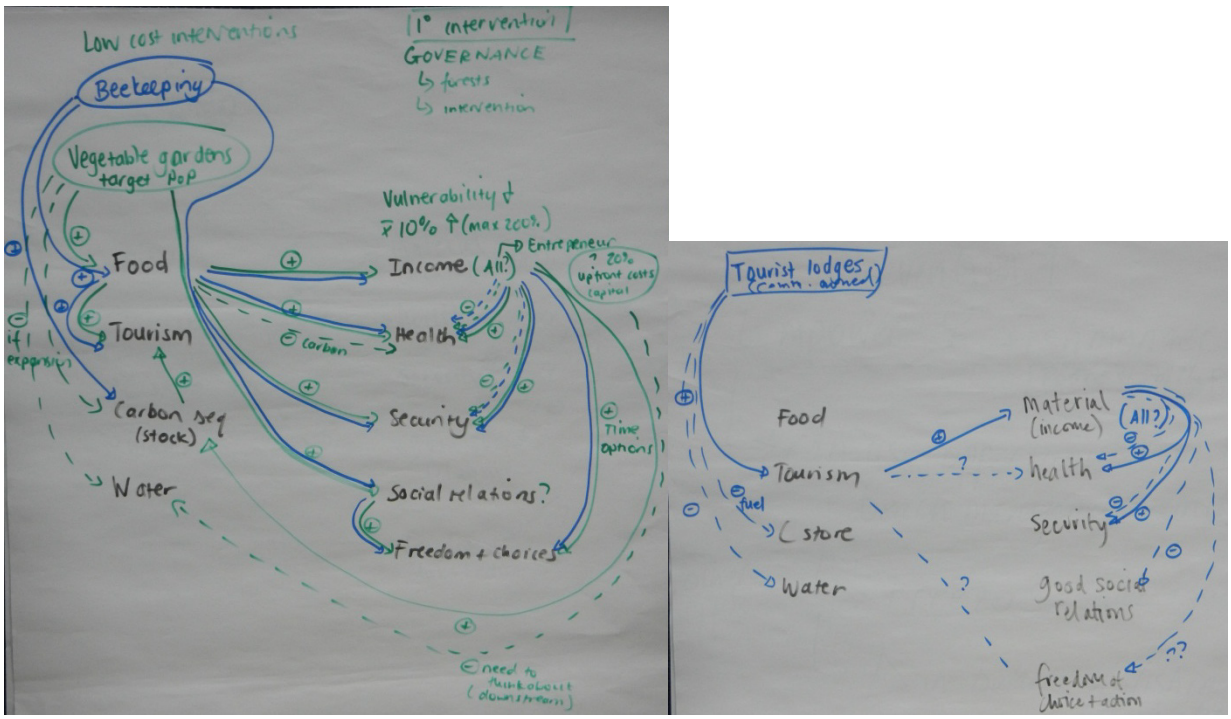
On a broader scale, exposing farmers to global markets can increase vulnerability to price fluctuations, and improving incomes can lead to outward migration – which may have positive or negative impacts

Many of the links and examples here would be applicable for any agricultural intervention.

Discussion

- There are potential difficulties with cash crops that require upfront investment, which can lead to farmer indebtedness and increased vulnerability.
- The improved outcomes may relate to the access to extension, which enables farmers to take advantage of the benefits available from growing Bt cotton. Some of these benefits and skills may be transferable to the production of other crops.
- There may be potential long term implications for water if Bt cotton becomes a successful cash crop, depending on water availability.

Case study 2 – small villages at the edge of a protected area in the Himalayas



There are a number of small, low-cost interventions in the area, including beekeeping and vegetable gardening, with some homestays for tourism, and a consideration of payments for water.

The major services considered in this analysis were food, tourism, carbon sequestration and water (quality and quantity). Beekeeping and vegetable gardens have potential negative impacts on water and carbon sequestration, but strict enforcement prevents these impacts. Most of the benefit flows go directly through income and health, and then flow through income to other dimensions. Income buys time and increases options, but income impacts are dependent on how the income is

used (e.g. for education, health, productive uses, for consumption, etc.). There is work on-going to explore possible negative impacts on health through the use of polytunnels. It appears that there is a bundled approach to involvement in interventions, with the same 'entrepreneurial' households getting involved in beekeeping, vegetable gardening and tourism.

The governance of the intervention directs whether the benefits are positive or negative. In this case study, the primary intervention is a governance intervention; the activities are incorporated in to this. Where outcomes have the potential to be negative, in this case, they have often been avoided because of the focus on good governance. Programmes have also had a strong focus on targeting the poorest, on strengthening capacity and empowerment, and on building institutions. This is relevant also to the discussion of tourism (where the data relating to whether impacts are positive or negative is missing) – the process of how the community is involved in tourism development is critical to the outcomes, and whether the realised impacts are positive or negative.

Discussion

- These interventions were designed very carefully by a local NGO for this context; they could not simply be replicated elsewhere. Intermediaries and structures on the ground are critical, and the importance of governance is perhaps one of the more generalizable points across sites.
- As the system is based on existing social structures, feedbacks can be picked up and built in from the start.
- Small interventions like this can have very high benefits at a local level, especially for the poor, but at a larger scale are eclipsed by large developments like REDD+, major tourism etc.
- Unanticipated negative impacts can sometimes be driven by state interventions, which are not done in consultation with local communities, and may work against other local initiatives.
- Sustainability in the context of ESPA is poverty alleviation able to withstand change in environment and social systems, with built-in resilience though governance/process management.

Case study 3 - arid and semi-arid lands and western Ghats

Arid and semi-arid lands (ASAL)

The group started by mapping the system and how people within it are affected by external interactions. In the arid and semi-arid lands under discussion, there is huge competition for land, which tends to fall in one of three different uses:

- traditional livestock production and pastoralism;
- land with some level of wildlife protection with people living on the edges (approximately 40% of the land); and
- highly competitive areas with external investment in cash or carbon crops. This latter type was not considered in depth as it is outside the remit of ESPA to affect change, though people are being driven out of this land, and displaced elsewhere (perhaps to urban areas).

Land with some wildlife protection is believed to bring in tourism benefits for people, but there are not many resident within these areas, they are mostly on the edges. In the livestock producing areas, land is becoming much more pressured, as increasingly poor people are being compressed into smaller and smaller areas.

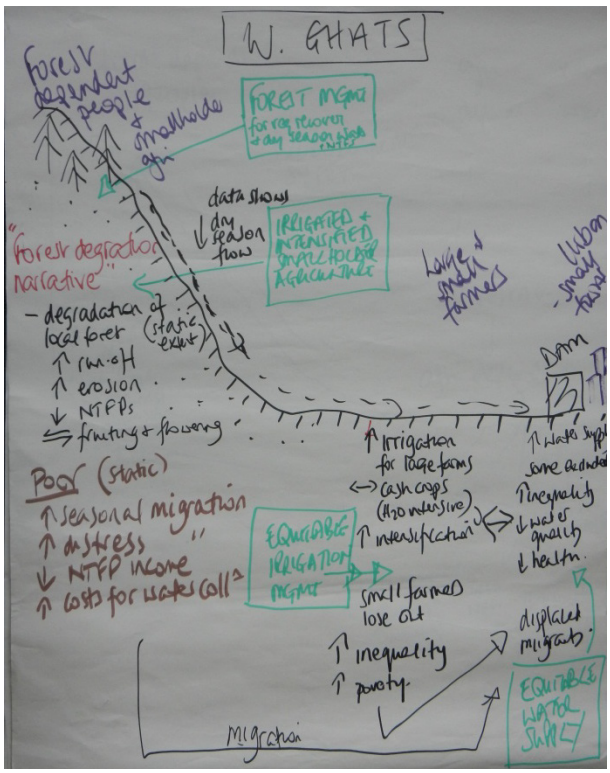
There are significant interactions between the three types. Tourism in the conservation areas which can impact pastoralists both positively (e.g. if they're managed for better water and soil, etc.) and negatively (if displacement of residents occurs). One intervention, the intensification of pastoralism, may help to enhance land quality and increase equity in that people benefit in a more even handed way.

Western Ghats

This system moves from upstream forest-dependent people in a catchment moving downstream to the endpoint, which is a dam constructed to provide sustainable water supplies to growing urban areas. The water moves through a lowland systems agriculture is increasingly intensive, and on a large scale for cash crops, supported by irrigation water from the dam.

The communities in the upland area are relatively stable, with some (but not much) seasonal migration. However, forest quality is declining, so it will be less able to deliver benefits (water, timber, NTFPs) through time. The reasons for this change are not clear.

In the farmland area, farmers are well-of (or not) largely dependent on whether they have access to water for irrigation. Many have been displaced, and only a few are benefiting, thus there is increasing inequality and overall poverty. In urban areas, access to water varies greatly across the population, because it is not equitably distributed.



A significant intervention could be to look at forest management – what can be done to recover forest ecosystem services and improve stream flow in the dry season. This is a strong natural science question that will have large impacts for the poor. Other options include irrigated and intensified smallholder agriculture, though that has potential negative implications for other ecosystem services. Governance-level interventions such as more equitable irrigation management and water supply for urban areas could have significant impact on poverty alleviation.

Discussion

- The water table in the middle zone is also under threat as those without access to the river are increasingly using bore holes for irrigation.

Case study 4 – fisheries in Kenya

Based on an ESPA project in coastal Kenya, between Mombasa and Mombasa National Marine Park, which is a multi-use area. The project has looked at the impacts of a number of interventions on different user groups based on how they interact with the fisheries: boat owners, fishermen, male traders (buy high-value fish to take to market) and female traders (buy low-value 'trash fish' to fry and sell locally). Other beach users include tourists, hawkers, tourism operators, etc. The dimensions of well-being repeatedly identified by stakeholders were money, earnings, a good job, savings, property, capital and several relating to the 'developmental mind', e.g. an ability to plan and use assets wisely. Three interventions were explored: empowering female fishmongers, tourism and aquaculture.

1. By empowering female fish mongers (the group that appear to be most marginalised), equity could be increased and this could potentially help the communities they serve as well. Empowerment could mean that women's participation in Beach Management Units which can create by-laws and control fishing along the beach could be more active than it is currently. Other ways to improve returns could be through improving the bargaining power of the women, using freezers, value-adding (i.e. processing), or changing the times that fish is marketed (e.g.

in the morning rather than evening). Empowering women may actually take them out of the system altogether (i.e. they acquire skills and use them in other sectors). The outcome of many of these would be higher income, but the impacts would depend on how this income is spent. It is also difficult to estimate the likely impact on resources within the lagoon.

2. Tourism is already evident along the beach, and generally increases the overall income in the community, with the hope that it trickles down. Three main types: big international hotels, small-scale eco-tourism and empowering the community to capture tourism income coming in (e.g. through boat rides and selling local crafts). The first two types are likely to increase demand to fish, (likely of high value fish, particularly for large hotels) which increase incomes for some local people but not many. Large hotels are likely to have significant impact on ecosystem services, increase pollution, and may involve conflict between tourists and fisherfolk (the latter who may be excluded from using certain parts of the beach). Tourists who come to see the marine park will generate additional income for the wildlife service and should help with conservation.
3. Aquaculture can help to meet the existing unmet demand for fish through increased production. Two main types: 'pro-food' and 'pro-cash'. The first using herbivorous species, small-scale production but likely needing subsidies. The second using carnivorous species, likely feeding on the trash fish that had previously been sold to local people, increasing pollution, disease and antibiotic use, and potentially removing an important source of protein and micronutrients for the local poor. Neither of these scenarios is ideal with respect to poverty alleviation or impacts on ecosystem services.

The group identified significant gaps in this context:

- The dynamics of labour flow – what happens if fishers move to work in hotels, will others step in? If women move up the ladder of traders, will poorer women come in to sell the trash fish and create even more demand?
- What are the nutritional impacts of changing local food availability, particularly where trash fish are eaten whole, there may be micronutrient benefits that cannot be replaced by other foods.
- What are the ecological dynamics of the local reef, sea grass and mangroves are not well understood – how do impacts on one affect the others?
- How do external drivers affect these industries?

Discussion

- The institutional landscape is key. Institutions and strengthening local governance can be useful policy-level or direct interventions, as local institutions can help as buffers in the face of shocks. External support is often necessary for institutional strengthening, and unless local institutions are recognised and supported at the national level, they can be very easily undermined.

Final round-up

- What makes interventions 'work'; where work is the delivery of sustainable poverty alleviation?
    - Likely factors appear to be: local relevance, links to local social context, governance, regulation, compatible settings.
    - Is everything locally relevant or are there generalities? If so, what determines these generalities (i.e. can we identify things that tell us whether solutions are generalizable?)
    - Uncertainties have been shown in all factors in each case study, so generalising findings is inherently risky.
- What happens as wellbeing improves?

    - More income can improve non-income dimensions of poverty and enhance environmental outcomes. What are the feedbacks into other dimensions of poverty and from people back to ecosystem services?
- Mixed scales: environmental, economic and social factors all have their own dynamics spatially and temporally.
    - We often think about the near term within community systems, but forcings come from larger spatial scales.
    - We also need to start thinking longer term at smaller scales.
    - Be sure to include consideration of the national scale.
- What about aggregating case studies (an IFRI/Ostrom-type approach)?
    - Meta-analyses of interventions, also primary data collection on specific questions.
    - Be aware that the conservation and social science literatures can show opposite conclusions from assessments of the same interventions.
    - ESPA terminology is not out there enough to do useful meta-analyses, would need to develop protocols/frameworks for exploring these in more detail.
- Consideration of urban areas is important, but is so far missing in ESPA.
    - Mobility is a huge knowledge gap – spatial but also livelihoods etc.
    - More longitudinal research is needed.

Papers listed:

Shackleton, C. M. and Gambiza, J. (2008), Social and ecological trade-offs in combating land degradation: the case of invasion by a woody shrub (*Euryops Floribundus*) at Macubeni, South Africa. Land Degrad. Dev., 19: 454–464. doi: 10.1002/ldr.849

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