ESPA Annual Science Conference 2016

Conference Abstracts

espa
ecosystem services
for poverty alleviation

Thursday, 17th November 2016

Christo Fabricius, Nelson Mandela Metropolitan University & Katrina Brown, University of Exeter

What makes coastal people vulnerable to global change? New insights from maladaption

Coastal areas are melting pots where fast changes such as violent storm surges, flooding rivers, arriving migrants and seasonal surges of tourists combine with slow changes such as rising population, coastal infrastructure development, urbanization, rising seas, warming places, shifting weather patterns and fluctuating economies. This has created unprecedented uncertainties, with risks and vulnerabilities to social-ecological systems and built infrastructure, some inescapable and others avoidable. In this paper, based on evolving insights from the UK, France and South Africa, we present useful conceptual frameworks to come to grips with the avoidable risks and vulnerabilities linked to maladaptive actions. Instead of reducing vulnerability, maladaptations enhance or merely transfer vulnerabilities to others. We show how the unfortunate recipients of the vulnerability baton are often, but not always, the poor. We provide a typology of maladaptations, discuss some of their underlying causes and provide examples of their unintended consequences. We also outline knowledge exchanges and engagements that might raise awareness of these issues. A better understanding of the complex, multi-scale feedbacks between adaptive actions taken in one place, and their consequences for other places (or other people) is required to avoid maladaptations. This will however require shifts in mind-sets, frameworks, metaphors and models, to complex adaptive systems thinking – a far cry from present practice.

Francis Johnson, SEI Africa Centre

Comparing policies and institutions for ecosystem-based poverty reduction under alternative bioenergy pathways in sub-Saharan Africa

More than 2/3 of energy in African LDCs is for traditional biomass that damages ecosystem services. The same rural households are also food insecure due to low productivity and lack of market access. Plentiful land and suitable climate often make these same areas candidates for significant expansion in modern bioenergy and biofuels. African countries are thus facing a new transition in biomass resource as they reconcile environment and development goals at local and national levels. Whereas research and analysis has tended to emphasise socio-economic and techno-economic perspectives, the ecosystem services approach illuminates valuable and underestimated linkages, synergies and conflicts with poverty reduction goals. This research/presentation addresses policies, institutions and practices that can significantly affect the bioenergy pathways to be followed in Africa, with emphasis on case studies in Malawi, Mozambique and Swaziland. These countries are struggling with how to phase out traditional biomass use and phase in modern bioenergy. By analysing ecosystem services that are affected in specific contexts, the key barriers and institutional constraints for sustainable bioenergy pathways are considered. A combination of surveys, interviews and interactive dialogues provided the basis for this institutional comparison, offering a roadmap for African countries to better internalise ecosystem impacts into land sue and energy planning.

Katrina Brown, University of Exeter

The gendered nature of ecosystem services

This paper discusses the extent to which pour conceptualisation, understanding and empirical analysis of ecosystem services are inherently gendered; in other words, how they might be biased and unbalanced in terms of their appreciation of gender differences. We do this by empirically investigating how women and men are able to benefit from ecosystem services. This highlights the different dimensions of wellbeing affected by ecosystem services, and how these are valued by men and women. But it is not just the division of ecosystem services costs and benefits that is gendered. Using the heuristic device of the ecosystem wellbeing chain proposed by Daw et al. (2016), we show how links in the chain are gendered. We conclude that this gendered understanding of ecosystem services is important not just for how ecosystem services are conceptualised, but also for the development and implementation of sustainable and equitable policy and interventions.

Sarobidy Rakotonarivo, University of Copenhagen

Win-win illusions: the need to rethink coercive models of forest conservation in the tropics

The importance of ecosystem services (ES) to human well-being is obvious among the ES science community. However, the local welfare costs of policies supplying ES (such as carbon sequestration and biodiversity conservation) have been under-appreciated. The clearance of forests provides access to fertile soils (and provisioning services) for millions of small farmers in the tropics, who may be negatively affected by conservation restrictions. This talk summarises lessons learned from surveys assessing the net welfare impacts of forest protection within a REDD+ project in Madagascar. We found that poor households bear disproportionate costs of conservation policies (10 to 50 per cent of their annual incomes). The median Net Present Value of these costs ($2521) is significantly higher than the compensation provided under international social safeguards. Our findings cast doubt on whether fair and just compensation for coercive conservation measures is likely. However, we find a strong demand for securing local forest tenure and evidence that doing so may better protect global ES. Safeguarding both ES delivery and local well-being may require a radical change from current policies, including devolution of secure forestland tenure to local people and genuinely negotiating conservation with forest owners. *(192 words)*

Janet Fisher, University of Edinburgh

Why should ecosystem services be governed for poverty alleviation? Establishing the ethical foundations of ESPA

This talk will report recent research on the fundamental question of relevance to the ESPA community: why should ecosystem services be governed primarily in the interests of poor people? This is an important question because it is clear that in the presence of ecological and social trade-offs, ecosystem services (ES) do not automatically benefit poor people, but have been demonstrated to accrue to better-off and more powerful actors. It is also a timely question, not only because many environmental interventions continue to take place in settings characterised by entrenched poverty but also because demand for ES from non-poor and spatially distant actors is predicted to rise in coming decades. It is a particularly timely question for the conservation community, who we are engaged with in this research, because of active debates about the 'new conservation' and the ethical principles underpinning conservation practice. This talk will report on two strands of recent research undertaken through the WhyESPA project. The first is an empirical examination of rationales for pro-poor governance of ES found within contemporary debates about conservation in the 21st Century. The second is an examination and comparison of propositions in the literature in political philosophy and environmental ethics as to why the poor or poorest should be prioritized in allocations of resources. The talk is most relevant to the 4th question posed in the conference agenda, and will conclude by reflecting on how WhyESPA's findings can be used to support better justifications for pro-poor governance of ES in different sectors.

Julia Jones, Bangor University

What are the combined local welfare outcomes of different futures for forest conservation in Madagascar?

The ecosystem services supplied by tropical forests, such as biodiversity conservation and carbon storage, have global values and so attract global investment. The impact of such investment on poverty is however complex. We suggest such investments have the potential to affect poverty status and broader wellbeing of local people through two mechanisms. First, the investments themselves (which may comprise cash payments, or development activities) will have direct social and economic impacts locally, strongly mediated by local institutions and opportunities for small investments to generate sustainable incomes. Second, land-use change (such as forest conservation or restoration) which the payments incentivize may have positive impacts (e.g. through hydrological benefits, maintaining access to wild harvested products) or negative impacts (e.g. through limiting agricultural expansion). In this presentation we will explore past land uses changes and likely local welfare impacts of future forest conservation in the eastern rainforests of Madagascar. This represents the first attempt to synthesise findings from significant parts of the p4ges project: our work on local opportunity costs of conservation, benefit distribution from livelihood projects, and locally valued ecosystem services (hydrological services and wild harvested products). The presentation speaks to all four 'big questions' the conference will address.

Kate Schreckenberg, University of Southampton

Advancing equity and justice in protected areas

By 2020, almost a fifth of the world's terrestrial surface will be in some form of protected area. According to the CBD's Aichi Target 11, these protected areas should all be 'effectively and equitably managed'. This presentation aims to explore what 'equitable' means in the context of protected areas. Drawing on theoretical advances by two completed ESPA projects combined with expert knowledge, we developed a framework for advancing equity and justice in protected areas. Here we present the framework and the results of a fieldwork validation exercise in three East African protected areas. We illustrate how explicit consideration of the principles of recognition, procedural equity and distributive equity (and how each is experienced by different stakeholders) can help to understand and resolve conflicts in protected areas and may also be useful at protected area system level. In the process, we also reflect on the sometimes long and winding pathways from academic projects to practical impact.

James Kairo, Kenya Marine and Fisheries Research Institute

Moving on with Mangrove REDD+: A review of realities, opportunities and challenges

REDD+ and other carbon standards provide funding for protection of carbon stocks whilst at the same time providing support for additional benefits such as livelihoods enhancement and biodiversity conservation. Although mangrove forests are included under REDD+ framework, progress in most countries has been slower than for terrestrial forests despite carbon pools of mangroves being shown to exceed that of terrestrial forests. In addition, root causes of mangrove deforestation and degradation are widely similar to terrestrial forests, but the benefits derived from mangrove conservation are far felt, such as; flood control, shoreline protection, sediment trapping, and provision of habitats for fish and other wildlife. This presentation will focus primarily on the progress of implementing Mikoko Pamoja in Kenya (the first community type project to protect and restore mangroves through sale of carbon credits) and the prospects of establishing similar initiatives across the region. SPACES and other ESPA projects in Kenya have been working to extend mangrove carbon project in Vanga. The complex issues of measurements, permanence, leakage and baseline levels as applied in carbon markets will be discussed.

Dan Brockington, University of Sheffield

Ecosystem services and poverty alleviation: exploring the debate between different epistemic communities

Research communities are structured by their paradigms, research agendas and programmes that determine which questions need answering. They are also structured by *epistemic communities* which share values, goals, normative agendas, methods, training, common experiences and conferences. Conflicts between epistemic communities can produce particularly confused academic and policy debates. Examining the nature of these conflicts, and their epistemological, conceptual, methodological and empirical bases allows for clearer and larger-scale research agendas to be defined and pursued. With respect to work on ecosystem services and poverty alleviation, we hypothesise that there are different epistemic communities undertaking research into the use/management of ecosystem services for poverty alleviation, each with their own set of definitions, metrics, values and approaches towards governance and action. This has resulted in a fractured debate about the outcomes of using ecosystem services for poverty alleviation, the remaining research gaps and an approach going forward. In this paper we will report findings from three ongoing research activities into the epistemic communities producing research on ecosystem services and poverty alleviation. First, from the literature we have identified a series of normative positions held by these different epistemic communities. Second, we used these positions to produce a quantitative survey of practicing researchers and policy makers in the field, exploring the confusion and disagreements that drive debates about ecosystem services and poverty alleviation. We carried out a quantitative analysis of beliefs held by members of different epistemic communities and explored where the sources of confusion and/or conflict lie and to what extent these confusions/conflicts are important within the debate surrounding ecosystem services for poverty alleviation. Finally, we have performed a social network analysis of the main authors producing research publications on ecosystem services and poverty alleviation. This has allowed us to explore who has written authoritative science in this field over the last 15 years, to what extent their professional backgrounds and training pathways are shared, how research on these topics is funded, how concentrated the research collaboration networks are and if they are linked or maintained by career pathways and/or funding. We use these methods to explore the areas of agreement and disagreement that define the different epistemic communities in this field and we hope, by making explicit the conflicts in current writings and policy, especially at the international level, we may be able to move forward with greater understanding of the different positions at work. This may offer a mechanism by which different intellectual communities can understand one other and explore potential opportunities for partnership and a sharing of ideals between different research communities.

Edwin Pynegar, Bangor University

Learning from a pioneering randomised control trial of incentive-based conservation: challenges and solutions

Protecting quality and quantity of water supplies through conservation of forested watersheds has a long history. Recently there has been strong interest in achieving this through incentive-based interventions, although both their effectiveness and practicality remain unclear and hotly debated. In 2011 the ESPA-funded Bolivian NGO *Fundación Natura Bolivia* set up a pioneering randomised control trial (RCT) of incentive-based conservation in the Bolivian Andean forests, in which landholders are compensated for conserving forested land and preventing livestock from contaminating watercourses. We present results representing general challenges which implementers of incentive-based conservation and randomized evaluation of conservation interventions must tackle, illustrated throughout with examples related to water quality from this RCT. Spatial aspects of multiple-outcome conservation RCTs – a feature normally not shared with RCTs in medicine or development microeconomics – may complicate meaningful evaluation. Additionally, the voluntary nature of incentive-based conservation is likely to lead to mismatches between areas of land actually conserved and those which would be required to be conserved to achieve the desired outcome. Evaluators must consider multiple spatial and temporal scales when designing an RCT, and must design the intervention itself carefully to ensure that linkages between the conservation intervention and the desired ecosystem services are captured most effectively.

Friday, 18th November 2016

Tim Daw, Stockholm Resilience Centre

Beyond landings—how do fisheries contribute to the lives of the poor?

Fisheries are a link between marine ecosystems to the wellbeing of poor coastal communities. The importance of fisheries for livelihoods, income and nutrition is increasingly recognised, while links to cultural services through place identity, and social interactions have also been explored. Policy discourses in East Africa often focus on enhancing production and catch value, by rebuilding stocks, or enhancing fishing technology. Drawing from the transdisciplinary SPACES project, we integrate data on fish stocks, landings, wellbeing, cultural significance, fishing activities, incomes, fish consumption, food security and household livelihoods across contrasting peri-urban and rural sites in Kenya and N. Mozambique. We use the SPACES conceptual framework to understand how marine ecosystems, through fisheries, contribute to the wellbeing of different people on the E. African coast. This detailed mapping of the processes that link fish stocks to the wellbeing of different people identifies that abundance or productivity of a fisheries resource may not be the critical determinant of its contribution to wellbeing, particularly for the poorest. Thus increasing stocks or production is not guaranteed to improve wellbeing, and other innovations or 'policy levers' may enhance fisheries' contribution to the wellbeing of the poor.

Daniela Diz, University of Edinburgh

Sharing the benefits of sustainable fisheries: from global to local legal approaches to marine ecosystem services for poverty alleviation

The application of the Ecosystem Services Framework to the marine environment and its contribution to poverty alleviation has been mainly focused on provisioning services. This contribution explores the role of intermediate services such as regulating and supporting services, as well as cultural services, including spiritual values, cultural identity and traditional knowledge to healthy and productive fisheries, by highlighting the main findings of the ESPA project 'sharing the benefits of sustainable fisheries: from global to local legal approaches to marine ecosystem services for poverty alleviation'. The project explores how the ecosystem approach can provide a broader and complementary framework for the investigation and analysis of equity and justice than the Ecosystem Service Framework (s) alone, especially when considering questions pertaining to the multiple dimensions of poverty and wellbeing enhancement in small scale fishing communities in dynamic multi-scalar contexts. In this context, international obligations underpinning the ecosystem approach were analysed, including the reference to "equitable" in relation to benefit-sharing, thus adding value to the ecosystem services discourse by bringing about a broader approach that systematically includes equity issues, and further contributes to the implementation of the 2030 Agenda for Sustainable Development. More specifically, the project findings address questions related to fishing resource use conflicts, trade offs, access, and the sustainable levels of exploitation in connection with international human rights regarding the right to food and health, and to a healthy and productive marine environment.

Caroline Abunge, Wildlife Conservation Society, Kenya

The changing contribution of different forms of tourism to local livelihoods during a period of crisis

Nature-based tourism can make important contributions to local livelihoods, alleviating poverty and enhancing wellbeing. It can take many different forms (e.g. luxury high-end tourism or budget backpacker tourism), and these can differ in their poverty impacts. For example, forms of tourism differ in the type and scale of benefits they can provide, the factors determining access to such benefits and their resilience to different forms of shock. These phenomena have been studied in isolation in various places, but not together. In this study, we use data from the ESPA SPACES project to examine the contribution to local livelihoods of two different coral-reef based tourism value chains on the coast of Kenya, both before and during a major tourism crisis triggered by terrorist attacks. One value chain is based on relatively high-value tourism organised through vertically integrated and well capitalised companies that offer complete packages for visitors. The other is based on relatively low-value tourism organised through a large number of small scale local actors that each offer a single service to tourists. Our results demonstrate that while both forms of tourism make important contributions to local livelihoods, the low-value form is more resilient in the face of a tourism crisis.

Simon Willcock, SRUC

Minimum adequate models for mapping ecosystem services in sub-Saharan Africa

Policy and interventions to manage the provision of ecosystem services (ES) to the rural poor require accurate spatial information on ES and their use by people. Here, we compare the accuracy of several large-scale existing ES models with varying levels of complexity with existing primary datasets on water availability, stored carbon, charcoal and grass-fed livestock production from across sub-Saharan Africa at several policy-relevant spatial scales. Preliminary findings indicate 1) that the simplest models (land cover based benefits transfer using global values) are unrepresentative of these key ES even at the country scale; 2) biophysical process models (e.g. WaterWorld, LPJ-Guess) generally perform better, particularly if linked to very simple models of beneficiaries built using globally available spatial data; 3) models built at the 1 x 1 km resolution generally perform better than 10 x 10 km resolution models; 4) bespoke regional models (validated for South Africa) perform best in most instances; but, crucially 5) none of the current modelling platforms perform sufficiently well to meet most stakeholder needs at the local scale.

Paul Muoria, Nature Kenya/Kenyatta University

Biodiversity conservation, ecosystem services, and sustainable livelihoods inform land use planning in Kenya's Yala Delta

The Yala River, where it enters the eastern side of Lake Victoria, forms Kenya's largest freshwater wetland – Yala Swamp. This large shallow area of water is covered by vast stands of papyrus (*Cyperus papyrus*) and forms an internationally important habitat for a wealth of biome restricted and endangered, endemic wildlife. Its shores are also home to many thousands of people, many of whom depend partially or completely on the ecosystems of the swamp for their livelihood. There is a recent history of land use conflict and environmental degradation as competition for resources between a rapidly growing population of local people and industrial interests increase.

We have conducted a rapid ecosystem service appraisal of the extensive papyrus stands of the Yala delta. This work forms part of the wider project to provide a full case to the Government of Kenya and Siaya and Busia County governments for increased protection of the majority of the swamp and its endemic bird and mammal species, as well as sustainable use of this ecosystem upon which many tens of thousands of very poor people depend. The ecosystem service appraisal has been instrumental in the development of a land use plan for the future, acceptable to all users of the swamp, from intensive agricultural farming interests, to the subsistence farmers living around its margins and the fishermen of the swamp's satellite lakes.

Maharani Mansour, Universidad Eduardo Mondale & Pedro Zorrilla-Miras, University of Edinburgh

Integrating Bayesian networks and geographic information systems as a tool in understanding land use and land cover change-ecosystem service links: a case study for Abalone, Mozambique

Wood for charcoal production constitutes a key ecosystem service in Mozambique, where the market for charcoal is estimated at US$400 million a year. The importance of this sector for rural populations in Abalone District is highlighted by the fact that 70% of households in our study were involved in charcoal production. In order to understand how changes in Land use land cover (LULC) affect ecosystem services (i) we present a probabilistic modelling approach combining Bayesian Belief Networks, Geographic Information Systems, Remote Sensing data, field data, and expertise from stakeholders. (ii) we formalised these as spatially explicit rules, based on the biophysical data, in order to establish the relationship between LULC and ecosystem services. (iii) we created future LULC maps which can be used to model future delivery of ecosystem services. Several ecosystem services from woodlands were included in analyses charcoal, firewood, wood construction material, grass and wild food. We analysed three future scenarios; 1) business as usual, 2) sustainable development and 3) a combination of both. The results highlight that rural communities are most risk of changes in ecosystem services, and that availability of suitable wood for ecosystem services will decrease considerably under the business as usual scenario.

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