SESSION 1: EVOLUTION IN FRAMING ECOSYSTEM SERVICES

*** Presenter**

1. SEEING THE WOOD FOR THE TREES: EXPLORING THE CO-EVOLUTION OF FRAMEWORKS OF ECOSYSTEM SERVICES FOR HUMAN WELL-BEING

UNAI PASCUAL* AND CAROLINE HOWE

Ecosystem service (ES) frameworks connect with different societal goals and priorities regarding ecosystem management and development planning, shaping the way different epistemic communities apply them in policy. The ES framing has undergone a significant evolution since the publication of the Millennium Ecosystem Assessment (MA). This evolution has in turn, shaped epistemic communities and their take on policy instruments, including for example payments for ecosystem services. Over more than a decade of research and practice, subsequent ES frameworks, including those associated with the UN-led Economics of Ecosystems and Biodiversity (TEEB), the UK-led Ecosystem Services for Poverty Alleviation (ESPA) programme and the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES), have significantly influenced how we conceptualise and use the ES approach. An exploration of the evolution of ES and well-being framings shows that there has been a substantial shift towards seeing ES through a richer lens, departing from a mostly supply (biophysical) perspective, to a more balanced social-ecological perspective. Significant evolution in ES framing also includes a deeper focus on the intertwined issues of ES co-production, equity and justice in ecosystem governance, and a pluralistic conceptualisation of values. We conclude that future research, implementation and development of ES for human well-being framings must not seek to be all encompassing through a single framework, nor rely too heavily on data-heavy technological developments. Instead, they must work towards finding a way of describing our relationship with nature that speaks to all people and thus can offer the potential to achieve social and environmental transformations.

2. JUSTICE AND EQUITY: EMERGING RESEARCH AND POLICY APPROACHES TO ADDRESS ECOSYSTEM SERVICE TRADE-OFFS

NEIL M. DAWSON, BRENDAN COOLSAET* AND ADRIAN MARTIN

An environmental justice framework is a broad approach to understand diverse perspectives on environmental management and change, in terms of distributional impacts, decision-making procedures and recognition of various values and identities. The approach is well suited to elicit the nature and extent of ecosystem service trade-offs, and to bring forward the views of poor and marginalised stakeholders, often underrepresented through standard ecosystem service frameworks. Equity (increasingly synonymous with justice in academic research) has emerged as an important objective for environmental policy, partly due to the moral imperative to support human rights and partly due to increasing appreciation that improvements to equity can help to secure other objectives, notably poverty alleviation and conservation. Despite greater policy reference, equity has been repeatedly evidenced across numerous sectors as failing, in practice, to deliver just processes and outcomes for local communities, particularly for the poor and cultural minorities. There is a policy need for scientific evidence to elaborate definitions, principles, guidelines and tools (avoiding oversimplified approaches) for assessment of and strategies to advance towards more equitable governance of terrestrial and marine ecosystems, particularly to guide international implementation of the Paris Agreement, SDGs and CBD targets. Recent academic progress has been made in developing principles and describing characteristics of equitable governance which may uncover innovative solutions to trade-offs. They comprise: inclusive processes to identify a range of perceived costs and benefits to different stakeholders; development of mutual understanding between interest groups; timely information sharing on objectives and responsibilities; accountability, and; collaborative and adaptive governance processes.

3. ADVANCING COMPLEX SOCIAL-ECOLOGICAL SYSTEMS PERSPECTIVES AND APPROACHES IN ECOSYSTEM SERVICES AND POVERTY ALLEVIATION RESEARCH AND POLICY

BELINDA REYERS* AND ODIRILWE SELOMANE

Studies of social-ecological systems (SES) have highlighted key elements including diversity, feedbacks, cross-scale dynamics, non-linearities and resilience in our understanding of the complex interactions between ecosystem services, human well-being and poverty alleviation. Several ESPA projects have worked to include these five elements into their work to understand the contribution of ecosystem services to poverty alleviation, particularly the mechanisms by which this takes place. In these, and other studies, it appears that applying the SES elements helped to reveal patterns in benefits, trade-offs, power asymmetries, global and regional drivers, and threshold effects, which were not previously obvious in the poverty contexts being studied. This provided a richer and more realistic understanding for informing where, when and how to act in these systems, and for monitoring and correcting actions over time. New approaches such as social-ecological systems models, hybrid models and systemic risk assessment approaches, complemented by social and ecological knowledge and evidence, were highlighted as useful for exploring, in a more participatory manner, future directions for action. Researchers highlighted the value of a wide diversity of interdisciplinary modelling approaches, as well as concerted efforts to collect fit-for-purpose and long-term social, ecological and social-ecological data, as critical to the detection and avoidance of undesirable future trajectories and known or suspected thresholds. Acknowledging that relationships between people and their environment are complex and dynamic, also requires policy environments and responses attuned to these intersectoral, cross-scalar complexities and uncertainties. The SDGs, together with learning from the ESPA programme, provide a fertile ground to recognise and govern the complex social-ecological dynamics and feedbacks, the cross-scale drivers of trade and financial flows, the power asymmetries at work in the world, and the rapidly approaching tipping points in the climate and earth system. SES insights also increase the opportunity space for sustainable development offering new directions and strategies to help achieve policy targets despite uncertain and turbulent futures.

4. LIMITS AND THRESHOLDS: SETTING GLOBAL, LOCAL AND REGIONAL SAFE OPERATING SPACES

JOHN DEARING*

The science area of ecosystem services and poverty has demonstrated the widespread threat of unpredictable changes to the way social wellbeing is inter-connected with environmental health. Such examples include the collapse of fisheries from over-fishing, the rapid soil salinization caused by shrimp farming, and the switch between clear and turbid lake water caused by gradual increases in nutrient-rich runoff. The science of 'systems' offers the best means to address the challenge of anticipating and managing the unpredictability of global change. Essential features of systems are limits and thresholds that once transgressed may rapidly create unprecedented, irreversible and often undesirable states. At the planetary scale, the concept of a 'safe operating space' describes the environmental conditions within which a system should remain to avoid transgressing thresholds. At local levels, the concept has been extended to include human wellbeing, as in 'safe and just' spaces, to assess the prerequisite conditions for achieving Sustainable Development Goals. Safe (and just) operating spaces have now been defined for the whole globe, regions and some small localities (e.g. rural China). Understanding current social-ecological interactions often requires a dynamic perspective gained from information recorded over time. Some rapidly developing regions and large tropical deltas show negative elasticity or trade-offs between recent successful poverty alleviation, rising levels of agricultural/aquacultural production and acute environmental degradation. There is the risk that these regional systems are crossing local thresholds and moving uncontrollably out of 'safe spaces' into new and undesirable system configurations where they may lack the ability to support livelihoods or the resilience to withstand changes in climate or social pressures. Simulating future changes in social-ecological systems in ways that capture thresholds remains challenging. It is recommended that future research should prioritize the wider use of historical/temporal perspectives and understanding feedback mechanisms for the development of simulation tools which give clear policy choices for safe and just outcomes.

* **Presenter**

1. INTERACTIONS OF MIGRATION AND POPULATION DYNAMICS WITH ECOSYSTEM SERVICES

W. NEIL ADGER* AND MATT FORTNAM

Economic systems necessarily require levels of mobility, including migration by individuals, in response to ecosystem service variability in space and time. Yet ecosystem services are most often modelled as being fixed in space, with management of ecosystems also focused in specific places.

Migration is a social system whereby people move location in order to avail themselves of economic opportunities or avoid risks. The migration system, in terms of aggregate flows, is dominated in the contemporary world by migration within countries, largely still to urban areas. Migration flows have major consequences for ecosystem services in source and destination areas. Out-migration reduces labour available for ecosystem service exploitation in source areas, but migrant remittances, unlike seasonally variable resource dependent livelihoods, provide a stable source of income, which may be invested in ecosystem conserving or degrading activities.

Ecosystem service availability and quality influence migration decisions. Cultural ecosystem services, for example, may engender place attachment despite the declining material value of a landscape due to the loss of provisioning ecosystem services.

Migration to new resource frontiers, especially forest frontiers, can increase pressure on ecosystem services due to the lack of ecological knowledge of migrants in particular circumstances. Depopulation of ecosystem frontiers to urban areas has offset effects of frontier population pressure in some places.

Loss of ecosystem services can create environmental risks leading to involuntary displacement of populations, in the case of sudden disaster events, or alter the balance of advantages and disadvantages of source and destination areas. However, migration decisions are driven by multiple, intersecting factors, and climate and other environmental hazards both increase and decrease migration outcomes across and within localities.

Demographic changes have profound effects on ecosystems. Demand for ecosystem services changes over life courses, and the trend of shrinking household sizes is increasing environmental burdens. Furthermore, ecosystem service decline leads to livelihood insecurity in disadvantaged populations, with knock-on effects on migration and fertility choices.

The trends in population dynamics and related migration flows, suggests important research frontiers in ecosystem service science. These include analysis of how ecosystem services in urban areas and in linked domains of influence in hinterlands and watersheds are managed to support the wellbeing of expanding urban populations. A further frontier involves generating knowledge on how ecosystem services interact with long-term population movements and how maintenance of services minimizes involuntary migration. The generic overarching goal is to explain how ecosystem management could better account for human mobility and ecosystem service variability in space and time.

2. LAND USE INTENSIFICATION

ADRIAN MARTIN*, BRENDAN COOLSAET, ESTEVE CORBERA, NEIL DAWSON, JANET FISHER, PHIL FRANKS, OLE MERTZ, UNAI PASCUAL, LAURA RASMUSSEN, CASEY RYAN

Land use intensification is widely considered to be an essential strategy for achieving global goals to eliminate poverty and to avoid damaging losses of ecosystem services. This chapter investigates whether current land use intensification activities are achieving these twin goals. To do so it reviews a body of academic literature that reports on case studies in which both social and ecological outcomes of intensification are reported. The review summarises some apparent trends across this literature whilst also zooming in to learn from more detailed analysis of a selection of exemplary cases. There are two main findings. Firstly, there are relatively few cases in which land use intensification is clearly succeeding in these twinned objectives. There are many more cases in which, for example, short-term income or productivity gains from land use intensification are resulting in long-term diminution of biodiversity and ecosystem services. Studies with longer term perspectives are already seeing how such trade-offs are leading to negative feedbacks for human wellbeing, especially for marginalised social groups. Secondly, we learn most from those studies that a) go beyond measuring production and income to measure multiple dimensions of wellbeing and ecosystem services, b) monitor dynamics of outcomes across longer time periods and across landscapes and c) that disaggregate outcome measures to identify outcomes for different social groups. Such intensive studies remain quite rare and we conclude that in order to achieve a step-change in our understanding of sustainable land use intensification, there has to be a paradigm shift in how we approach and evaluate the outcomes of intensification efforts.

3. ECOSYSTEM SERVICES FOR POVERTY ALLEVIATION TRADE-OFFS AND SYNERGIES IN URBANISING CONTEXTS

FIONA MARSHALL*, JONATHAN DOLLEY, RAMILA BISHT, LINDA WALDMAN, RITU PRIYA, PRITPAL RANDHAWA

The Impacts of urbanisation on ecosystems and the dependence of urban populations on ecosystem services are widely acknowledged but poorly understood. In the global south, rural-urban linkages are increasingly shaped and transformed by the processes of peri-urbanisation, through which rural areas become increasingly enmeshed in a mosaic of rural and urban land-use and juxtaposed rural and urban livelihoods and overlapping institutions. This is the most prominent form of urban growth in Asia and Africa.

Peri-urban areas are frontiers of sustainability transformations, where deep and sustained engagement with communities of the poor, and enhanced understanding of dynamic ecosystem service-poverty alleviation interactions, can reveal possibilities to improve the health and livelihoods of both urban and peri-urban residents; whilst also supporting more effective, efficient and equitable management of environmental resources. We demonstrate this through an example of peri-urban food systems.

Peri-urban ecosystem service –poverty interactions have some distinctive characteristics as compared with the rural. Mixed peri-urban livelihoods depend on ecosystem services in different ways. New economic opportunities my provide ecosystem service based pathways out of material poverty for the peri-urban poor, which may increase or reduce pressure on ecosystems. However, there are trade-offs with other dimensions of poverty, notably health. Poverty linkages may be defined less in terms of decline of direct access to ecosystem products with, for example, water and air pollution and flood control being of increasing concern. There are also distinctive institutional characteristics; often including administrative ambiguity, lax environmental regulations, and increasingly heterogenous communities with a lack of social cohesion. But opportunities for enhanced peri-urban environmental management emerge from building alliances across rural and urban interest groups, building on successfully community based initiatives to build rural urban synergies and integrating environment, health and socially just development perspectives into mainstream urban resilience programmes.

4. RESTORATION OF ECOSYSTEMS (AND SERVICES)

ALISON CAMERON*

Given the rapid emergence of restoration policy and agreements, and the associated proliferation of ecosystem restoration initiatives, it would be immensely rewarding to identify instances where use of the Ecosystem Services (ES) framework (MEA, 2005) has guided society towards clear “win-win” outcomes for poverty alleviation.

We use the ES framework approach to examine successes and failures in ecosystem restoration, highlighting the difficulty of designing programs to successfully progress multiple Sustainable Development Goals. As ESPA projects focussed on restoration are relatively rare further discussion identifies transferable lessons from broader ESPA research.

There is a great deal of devil in the detail in designing an ES approach to sustainable development and poverty alleviation. Numerous spatial, temporal, ecological, social and welfare trade-offs exist; with weaker and stronger, and rarely linear, trade-offs within and between all of these. ESPA studies are exemplary in their efforts to deal with this complexity by assessing multiple ecosystem services and disaggregating beneficiaries and outcomes. Evaluations using ES frameworks demonstrate that clear win-win outcomes from sustainable development efforts are rare or ephemeral achievements. From studies focussing on changing land use and natural resources management systems, usually through progressive ecosystem degradation, it is emerging that the most obvious beneficiaries through time, described by the “Environmentalists paradox”, in which welfare wins appear to outweigh ecosystem services losses, are likely experiencing short to medium term gains. Further to this, the poorest groups commonly experience “lose-lose” outcomes through land use change and agricultural intensification. This is because they lack resources to invest in change, and suffer disproportionately high reductions in ecosystem services.

These key findings from non-restoration work provide a useful new perspective from which restoration initiatives must explored, as ecosystem and welfare metrics need to be compared to the baseline of pre-restoration conditions, as well as to final goals. A quantitative evaluation of the potential for ecosystem services approaches to alleviate poverty through restoration initiatives remains elusive. However, it is clear that restoration rarely simply reverses ecological and welfare trajectories, and much work is required to better understand the trade-offs of such projects. A key finding is that restoration projects seem most successful when targeting highly degraded ecosystems. However, despite being driven by a range of drivers, and apparent engagement of a wide spectrum of stakeholders and beneficiaries, indications exist that the poorest social groups may, again, suffer “lose-lose” outcomes. The potential for this is evidenced by ESPA work assessing incentive schemes, such as Payments for Ecosystem Services, intended to mitigate pressures and promote production of ecosystem services, or to incentivise restoration. This work shows that incentives are often not effectively targeted at the poorest groups, and can often widen existing socio-economic inequities.

In summary, we find that ESPA has i. made a strategic contribution to the already substantial literature on measures of biophysical components of ecosystem restoration ii. significantly advanced the much smaller body of literature on restoration of ecosystem processes iii. broken important new ground in developing methods that could be used to quantify and value ES restoration and iv. has produced a body of literature on equity, institutional frameworks and governance issues that contains many transferable lessons to increase the effectiveness of poverty alleviation through ecosystem restoration initiatives.

5. RECIPROCAL COMMITMENTS FOR ADDRESSING FOREST-WATER RELATIONSHIPS

LANA WHITTAKER, ESZTER KOVACS AND BHASKAR VIRA*

Through the last 15 years, the role of forests in the provision and regulation of hydrological services has been increasingly recognised and researched. In this chapter, we draw on the ESPA portfolio of research (and more broadly) to review the relationships between forests, water and people, paying particular attention to how changes in forests-water relationships affect human well-being. We begin with a brief review of the nature of forest-water relationships and the increasing role that climate and demographic change, trade and urbanisation are playing in driving and influencing this relationship. We then explore the multiple trade-offs between land and water use, hydrological services and well-being and the use of reciprocal management and governance as tools to manage these trade-offs. We focus on three types of reciprocal arrangements: reciprocal social practices, Payments for Ecosystem Services and Reciprocal Water Agreements. In discussion of both trade-offs and management, we emphasise the need to consider power dynamics and the distribution of benefits both between and within hydrologically-connected communities. Finally, we reflect on the future of the management of forest-water relationships, stressing the importance of 'water-sensitive' management of forest and tree-based landscapes.

SESSION 3: GOVERNANCE

*** Presenter**

1. GOVERNING FOR ECOSYSTEM HEALTH AND HUMAN WELLBEING

FIONA NUNAN*, MARY MENTON, CONSTANCE MCDERMOTT AND KATE SCHRECKENBERG

Governance arrangements and processes influence access to and benefits from ecosystem services and therefore the potential for ecosystem services to alleviate poverty. Governance also then influences the health of ecosystems. This chapter learns from decades of governance-related research to identify how to make ecosystem governance more effectively 'pro-poor'. The chapter concludes that there is no one governance approach that can definitively deliver on improved ecosystem health and human wellbeing and, within any approach, it is not always possible to satisfy all stakeholders. Acknowledging mixed experience in community-based and collaborative governance, key lessons identified are:

- Whilst local participation in governance structures is important for conservation success and to ensure measures, such as REDD+, deliver local benefits, such participation must be meaningful and may require power relations and power dynamics across and within levels of governance to be challenged.
- Market-based schemes may deliver on efficiency, but unless deliberate attempts are made to focus on equity and poverty alleviation they may reinforce inequalities.
- Governance initiatives at local scale should be situated in an understanding of power and resource distribution across multiple scales.
- Informal institutions remain critical for ecosystem governance and new governance approaches should take existing systems into consideration.
- Deliberate effort and design of governance approaches are needed if ecosystems are to serve the poor and alleviate poverty.
- Ecosystem governance implies a holistic approach, with greater cooperation and coordination between actors involved, including between parts and levels of government.

2. CO-GENERATING KNOWLEDGE ON ECOSYSTEM SERVICES AND THE ROLE OF NEW TECHNOLOGIES

WOUTER BUYTAERT*, BORIS OCHOA-TOCACHI, DAVID M HANNAH, JULIAN CLARK, ART DEWULF

Policy actors are increasingly aware that decision-making in the context of ecosystem services management and sustainable development can benefit from collaborative and inclusive approaches to knowledge creation and the development of intervention strategies. Examples of this include calls for a more prominent role for indigenous knowledge in decision-making, the use of participatory methods for data collection and knowledge generation, and the leveraging of citizen science for sustainable development. New technologies for knowledge generation and diffusion play a prominent role in this evolution. ICT technologies such as mobile phones can be particularly transformative in the way that they facilitate access to information. But other technologies such as low-cost and robust sensors, and the advent of pervasive remote sensing using satellites and drones, can also have a big impact on the availability of information about ES and its use to influence decision-makers. Many ESPA-funded projects have been eager adopters of new technologies as a source of information, but also to extract new types of knowledge, and disseminate it between stakeholders. Often, this has had a very positive impact on the knowledge creation process. To a lesser extent has this been used to promote the involvement of stakeholders in the knowledge generation process and to make it more inclusive and participatory. Some projects have also identified potential risks related to the use of new technologies, such as exploitation by specific stakeholders, or supporting specific agendas or interest. Overall, we perceive an opportunity for an increasing diversification and tailoring of knowledge creation, moving away from a top-down process dominated by scientists, toward a more decentralized, bottom-up, and iterative approach. This evolution can have a transformative impact on local ecosystem services management, making it more inclusive, polycentric, evidence-based, and robust.

3. PAYMENTS FOR ECOSYSTEM SERVICES IN PRINCIPLE

MARY MENTON*, AOIFE BENNETT, CLARE FERGUSON

Payments for ecosystem services (PES) is an incentives based governance instrument frequently promoted as a means to achieve win-wins for ecosystems and wellbeing. PES is often conceptualised as a market-oriented approach wherein an ES is 'bought' (cash or in-kind) from an ES provider contingent upon provision of that service. Critiques of market-based approaches question whether they acknowledge the multiplicity of values linked to ES or their capacity to recognise the power asymmetries involved in PES projects that could lead them to exacerbate inequalities in access to natural resources. While some environmental economists argue that PES should focus solely on ecosystem objectives with poverty alleviation as a mere positive side-effect, others argue that PES must include pro-poor and equity objectives in order to be both ethical and successful. Although counterfactual evidence and impact evaluations of PES are limited in number, some lessons emerge regarding potential for win-wins for ecosystems and wellbeing:

- Design interventions with pro-poor and equity-based objectives while acknowledging potential trade-offs for efficiency and effectiveness for ecosystem objectives;
- Reward broad environmental stewardship or provision of 'bundles' of ES as these approaches are more effective in improving environmental and wellbeing outcomes;
- Increase long-term sustainability, local legitimacy and agency by emphasising local existing priorities and bottom-up project design which is adapted to local contexts;
- Recognise and explicitly address power dynamics and the roles of both informal and formal institutions and elite capture in influencing behaviours that affect ES but also in determining access to ES and benefits from PES.

4. PAYMENT FOR ECOSYSTEM SERVICES AT SCALES

INA PORRAS* AND NIGEL ASQUITH

Bringing theory to reality is always difficult, as Payments for Ecosystem Services (PES) in practice shows. This is particularly important when it comes to the poverty agenda in developing countries. The literature warns of the problems of "PES overloading": by trying to both protect environmental services, and reduce poverty, PES programs face expensive trade-offs, inefficiencies, and the danger of diluting policy focus. In this chapter we argue that, while this may sometimes be the case, it is only by explicitly linking both objectives that PES will achieve the political acceptance to become mainstreamed in the context of developing countries.

By analysing PES as a form of conditional transfer (CT) we are able to take advantage of extensive global experiences of CT from social protection in large scale public works programmes, especially those with an environmental component to inform the social potential of PES. We look at three types of conditional schemes:

1. Two social conditional transfer programmes: The Mahatma Gandhi Rural Employment Guarantee Act programme in India and the Environmental public works programme in South Africa. While focused on social outcomes such as jobs and poverty alleviation, have had clear and measurable environmental impacts which have reached large scales.
2. Two "hybrid" CT/PES programmes: the Bangladesh Jatka conservation programme, and the Bolsa Floresta programme in Brazil.
3. Eight PES programmes, four of them national top-down programmes: China Sloping Lands Conversion and Eco Compensation Programmes, Costa Rican PES Programme, Payments for Hydrological Services programme in Mexico and National Greening Programme in The Philippines, and four of them bottom-up initiatives: Watershared in Bolivia and spreading to Colombia, Ecuador and Peru; Payments for mangrove protection in Kenya; and community carbon projects Scolel-Te in Mexico and Trees for Global Benefits in Uganda.

We find that often the social component of PES is an important factor to create political will and financial resources, and to gather momentum. We also find examples of science-based policy tools –many of them linked to ESPA projects and researchers - that are helping these programmes improve their governance, conditionality and providing the evidence on social and ecological impacts. This is increasingly important as conservation funding needs hit the billions and, in the spirit of the SDGs- natural resource protection should also meet social goals.

Experience from the ground shows that there are no "magical triple wins", but a lot of potential for conditional transfers to support ecosystems and alleviate poverty. Knowing the potential problems -e.g. the transaction costs, the risk of targeting the wrong geographies - can help design programme that enable transformative and sustainable livelihoods of vulnerable people. An acknowledgement of the benefits and the trade-offs is a first step towards designing response actions. New tools developed by academic research can help policy makers improve the efficiency and effectiveness of these programmes.

5. PROTECTED AREAS AS A LENS FOR UNDERSTANDING THE RELATIONSHIPS BETWEEN ES AND PA

CLAIRE BEDELIAN, PAUL BARNES AND EMILY WOODHOUSE*

- Protected areas remain the cornerstone of efforts to conserve ecosystems and biodiversity globally, and are proliferating and diversifying in line with global targets. International conservation policy and the approaches of many NGOs emphasise pro-poor and equitable management with participation by local communities. However, success in producing a win-win for conservation and development remains elusive and the social impacts contested. This chapter synthesises the current evidence on the impacts of protected areas on human well-being of the poor, the nature of trade-offs and synergies within and between social and ecological outcomes, and the circumstances under which positive synergies may emerge.

- The establishment and management of protected areas have positive and negative impacts on multiple components of human well-being by changing the flow of ES to users, and reshaping institutions, social relations and cultural practices. Impact evaluations have tended to focus on material impacts but the evidence shows that supporting relational and subjective dimensions of well-being also improves the local legitimacy of protected areas.

- Positive synergies are most apparent through the protection of regulating services and the resulting positive impact on well-being outcomes. Evidence from cases of community participation in protected areas also suggests the potential for linked improvements in local agency and resource security.

- However, trade-offs are typical in protected areas and can be seen within and between different social and ecological outcomes, across spatial and temporal scales, and social groups. Strict protection restricts access to provisioning and cultural services and it is often the most marginalised groups who lose out. Trade-offs can have negative effects on conservation success through unintended social feedbacks.

- Trade-offs change through time and are regulated through context specific mediating factors including governance arrangements, management regimes, power relations, cultural values and preferences, and the social, political and historical context.

- Compensation within protected area programs acknowledges and attempts to mitigate trade-offs, but presents challenges including the equitability of distribution and ensuring compensation is commensurate with losses. Externally conceived assumptions of appropriate compensation may not capture non-material aspects of well-being which cannot be simply traded off against money and material assets. Other types of protected area benefits aside compensation should be considered.

- Any claims of ‘win-wins’ should be treated with caution. A failure to acknowledge trade-offs at an early stage is likely to result in unrealistic expectations and social conflict. Some trade-offs can be avoided or mitigated through participatory and deliberative processes at the planning stage recognising diverse actors and cultural values.

- Further research is needed that looks at the particular aspects of protected area governance that foster synergies between social and ecological outcomes. Research should prioritise the subjective experiences of those impacted by protected areas, and involve in-depth qualitative approaches that capture diverse experiences, processes of change and contextual detail.

SESSION 4: SUSTAINING WELLBEING AND PROSPERITY

* **Presenter**

1. MULTIPLE DIMENSIONS OF WELLBEING IN PRACTICE.

SARAH COULTHARD*, J. ALLISTER MCGREGOR, CAROLE S. WHITE

The use of multidimensional wellbeing in the MEA has stimulated engagement with the concept in empirical research to unpack the relationship between Ecosystem Services, poverty, and human wellbeing. ESPA research contributes to wider scientific discourse on multidimensional poverty and wellbeing assessment, in particular, through its research into the relational and subjective aspects of human interactions with Ecosystem Services. The former highlights the importance of social relationships in shaping how people can or cannot achieve wellbeing, and how this affects their use of the environment; the latter emphasizes the perceptions and values of people, who are dependent on and live with the ecosystem, in the development of ecosystem governance. ESPA research highlights the problems of reductionism in understanding how ES translate into wellbeing outcomes, and demonstrates the importance of social differentiation, and disaggregation of wellbeing impacts. This has implications for the design of interventions that are intended to have poverty alleviation objectives. ESPA research highlights the significance of trade-offs between ES and wellbeing agendas and strategies, which operate at inter-personal and policy levels, and studies suggest innovative interdisciplinary tools to identify and respond to the issue of trade-offs. Whilst the MEA identified inequality in the ways in which ES are accessed and transformed into wellbeing outcomes, ESPA research details such inequalities, in particularly those resulting from conservation initiatives. Overall, ESPA research illustrates the need for differentiation around who benefits and who loses from ES, to avoid unfairly blaming large homogenous groups, such as 'the poor', for environmental degradation.

2. GENDER AND ECOSYSTEM SERVICES: A BLIND SPOT?

KATRINA BROWN* AND MATT FORTNAM

A gender perspective is recognised as critical for achieving sustainable development that 'leaves no one behind'. Because men and women often value and benefit from ecosystem services differently, policies and actions that favour certain ecosystem services over others may have gendered costs and benefits. This chapter highlights gender trade-offs associated with ecosystem services and poverty alleviation, and draws from ESPA research findings and broader literature to critically assess how ecosystem services interventions may contribute to empowering and improving the wellbeing of women and promoting gender equality. The chapter first explores ecosystem services through a gender lens, understanding ecosystem services and poverty alleviation as predicated on a set of social relations that are inherently gendered. Second, it presents empirical accounts of the gender trade-offs that exist in ecosystem services and poverty alleviation, showcasing research findings from ESPA. Third, it seeks to identify where and how interventions directed at ecosystem services might address gender inequality and seek to empower and enhance women's life opportunities and wellbeing. We suggest that understanding social processes that underpin and mediate the relations between people and ecosystem services reveals how gender trade-offs occur, and that a more proactive approach that supports the marginalised and impoverished, many of whom are women, presents opportunities for social and gender justice to underpin ecosystem services for sustainable development. Finally, we identify possible future research directions to elucidate these important aspects of gendered ecosystem services.

3. RESILIENCE AND WELLBEING FOR SUSTAINABILITY

LUCY SZABOOVA, KATRINA BROWN, TOMAS CHAIGNEAU*, SARAH COULTHARD, TIM DAW AND TOM JAMES

This chapter analyses how ESPA research engages with concepts of resilience and wellbeing and what ESPA science adds to understanding them, and their applications in sustainable development. We assess the conceptual, methodological, and empirical applications of resilience and wellbeing concepts through a two-step methodology constituting a scoping review and inductive thematic coding of relevant ESPA outputs.

Highlights of ESPA research include significant strides to socialise resilience thinking by integrating ideas of power, agency, and social difference. Importantly, selected ESPA research goes beyond static snapshots of wellbeing to integrate notions of complexity and dynamic change into the interrelationship between ecosystem services and poverty alleviation. Applying wellbeing and resilience concepts in ESPA research enables novel insights into the multidimensional nature of trade-offs between, within, and across ecosystem services and wellbeing across multiple scales. Using these concepts allows research to probe how the complex, dynamic relationships between ecosystems services and poverty are mediated by power, politics and representation, and highlights the importance of feedbacks between natural and human systems. Furthermore, the methods developed for these studies have produced a set of inclusive and participatory techniques that elucidate and enable deliberation of different priorities inherent in decision-making processes. These tools strengthen opportunities for marginalised groups to shape the outcomes of trade-offs in management and governance of ecosystem services.

By utilising and developing these concepts in different and diverse setting, ESPA research offers the potential for novel insights into global change processes, global poverty elimination, shifting and uncertain geopolitics, insecurity and increasing inequalities central to the sustainable development agenda.

4. MAINSTREAMING BIODIVERSITY AND ECOSYSTEM SERVICES INTO THE FISHERIES SECTOR FOR POVERTY ALLEVIATION

DANIELA DIZ* AND ELISA MORGERA

This chapter addresses the extent to which the Ecosystem Services framework and methodological tools can contribute to poverty alleviation in the context of an ecosystem approach to fisheries. In doing so, it explores, in particular, how the ecosystem services literature and knowledge-base have contributed to a broader understanding of ecosystem services flows and trade-offs in fisheries management at appropriate scales for alleviating the multiple dimensions of poverty. For the purposes of this analysis, the Ecosystem Services framework is contextualised in light of broader legal and policy instruments, such as the FAO Guidelines on Small-Scale Fisheries, the Convention on Biological Diversity (CBD) and its guidance concerning marine biodiversity and local communities, and the Sustainable Development Goals (SDGs). The concept of wellbeing and poverty alleviation is central to these instruments. Therefore, due regard should be given in decision-making processes concerning the implications of such decisions to the multiple dimensions of poverty. Gaps in understanding of the flows of marine and coastal ecosystem services at different scales can act as a constraint in the development of integrated management regimes with fair and equitable outcomes for local communities, particularly small-scale fishing communities. Nonetheless, advancements in methodologies described in this chapter, including on predicted impacts of climate change on ecosystem services that the most vulnerable communities depend upon and trade-offs exercises, can assist managers, law- and policy-makers to identify more integrated, equitable and fair interventions that can result in enhanced wellbeing and poverty alleviation in its multiple dimensions.

5A. DOES GOVERNANCE TYPE IN PROTECTED AREAS MATTER FOR POVERTY? A RAPID ASSESSMENT OF THE EVIDENCE FROM SUB-SAHARAN AFRICA

YVONNE ERASMUS* AND LAURENZ LANGER

To date, 14% of the world's terrestrial areas and 3.4% of marine areas are protected. How governance structures and processes are set up has a direct impact on how protected areas are managed and consequently on conservation and social outcomes. The International Union for Conservation of Nature (IUCN) identifies four types of governance: by government, shared governance, private governance, and governance by local communities and indigenous people.

Following the identification of an evidence synthesis gap we conducted a Rapid Evidence Assessment (REA) aimed at answering the following research question:

> *What is the impact of different governance structures in protected areas on ecosystem services and multi-dimensional poverty alleviation in Sub-Saharan Africa?*

Following the screening of 9493 search hits identified by a systematic search, we included 26 studies in our REA, 20 of which were used in the synthesis of results following critical appraisal of studies' trustworthiness. The 26 included studies were conducted in 10 countries concentrated in Southern (n=11) and Eastern Africa (n=11). In terms of individual countries, Tanzania (n=7) and Namibia (n=5) had the highest number of studies. The most prominent type of governance featured were: governance by local communities (n=14); followed by governance by government (n=6); comparison of different types of governance (n=4); and shared governance (n=2). No studies assessing the effects of privately governed protected areas were identified.

The included studies cover 36 different protected areas in Sub-Saharan Africa, 33 of which are terrestrial; and the majority assessed the effects of different types of governance structures on SDG 1: poverty reduction (n=18).

Impacts on socio-economic outcomes: The different governance types in protected areas do not seem to result in the alleviation of poverty in any form, but findings suggest that there is increased livelihood insecurity among affected communities. Alternative livelihoods in protected areas governed by government is not sufficient compensation of livelihood loss, and community structures in community-governed protected areas cannot be seen as proxies for community benefit. There is evidence of equity concerns and conflict, especially around livelihood loss (alternatives are inadequate, unevenly distributed, and evidence of elite capture exists). When governance types are considered independently of one another there are few differences in outcomes by type.

Impacts on environmental outcomes: The evidence base contains little information on conservation rates measured, or on aspects of sustainable use. As a result, there is an absence of evidence on the impact of different governance structures on environmental outcomes, although there are examples of tensions between conservation and development objectives around protected areas. A weakness of the included evidence-base is that these environmental outcomes are not assessed empirically, which makes it difficult to investigate the links and synergies between ecosystem services and conservation activities and poverty reduction.

Impacts on governance processes: There is similarity across governance types in the barriers to effective governance structures. In protected areas governed by government and by communities, participation by communities in the governance structures is insufficient and unequal, communication between governance structures and communities are inadequate, while there is evidence of elite capture of governance structures.

5B. MARINE RESOURCE MANAGEMENT: IMPACTS ON MULTI-DIMENSIONAL POVERTY IN SUB-SAHARAN AFRICA[†]

CARINA VAN ROOYEN AND NATALIE TANNOUS

Protecting marine ecosystems is on the agendas of international bodies such as the United Nations (UN), with one of the Sustainable Development Goals (SDGs) to "conserve and sustainably use oceans, seas and marine resources" (UN 2015). An evidence synthesis gap exists of literature that focuses on marine resources management, human outcomes, and sub-Saharan Africa. With this gap in mind, we conducted a rapid evidence assessment (REA) aimed at answering the following research question: What is the impact of marine resources management on multi-dimensional poverty in sub-Saharan Africa? (Van Rooyen & Tannous 2017).

For the impact of different marine resources management interventions on socio-economic outcomes, we categorised management interventions according to the aim of the intervention. In the evidence-base we found studies dealing with protection of marine resources through marine protected areas (MPAs), and the administering of marine resources conservation through fisheries management restrictions.

Whilst we had studies in our evidence-base on MPAs from the International Union of the Conservation of Nature (IUCN) protected areas categories 1b, II, III and VI, we had no studies on IUCN categories 1a, III, IV and V. Marine national parks (IUCN category II) have neutral to negative impacts on socio-economic outcomes, while IUCN category VI MPAs have a negative impact on the same outcomes, with only one study finding a positive impact on income (measured as fish sales). Community-based MPAs have mostly negative perceived impacts on well-being and livelihoods (this evidence-base though is only constituted of two studies). Gender, geographical location, and socio-economic factors (such as fisheries livelihood) all influenced the experience of impact for all types of MPAs. Specifically for community-based MPAs, the extent of involvement in the MPA, as well as the extent of external support hinted at differential impacts.

Whereas the socio-economic impacts of no-take zones were found to be positive for livelihoods and food security, the impacts of this intervention included a sense of displacement and despair for communities, and the perception that benefits accrue to government more than to self and communities. The overall direction of impact on well-being is not positive. Gear restriction was perceived to have a positive impact on income, and it was also the preferred fisheries management intervention for local fishers; this though is from a small evidence-base. Our evidence-base on other fisheries restrictions (such as seasonal closure, minimum size fish, and species restriction) is too limited to make concluding remarks on. Any socio-economic impacts of fisheries management restrictions are differential for geographical location and socio-economic groupings.

We also considered whether there were differential impacts for marine resource management interventions that have as a goal the achievement of both biodiversity conservation and poverty reduction, versus those that were more protection-focused. From a small evidence-base for especially protection-focused interventions, we hesitantly take note that whether an intervention is protection-focused or aims for both biodiversity conservation and poverty reduction, it seemingly makes no significant difference to the socio-economic outcomes. In both cases though the distribution of socio-economic impacts were unequal, based on location, and socio-economic conditions.

[†] Presented together with 5A.