

Nature's contribution to poverty alleviation, human wellbeing and the SDGs (Nature4SDGs)

Project description

The Nature4SDGs project is a 2-year collaboration between academic institutions in UK, India and Sweden. We will leverage multiple existing datasets on the relationship between nature and wellbeing, and how this varies for different types of people in varied parts of the Global South. We aim to support the delivery of Agenda 2030 by understanding trade-offs and synergies between SDGs, and the challenge of sustainable development that leaves no-one behind.

Agreed in 2015 by all the countries of the United Nations, the Sustainable Development Goals of Agenda 2030 represents a blueprint for enabling humanity to achieve a sustainable future, in which all people can flourish while protecting the environment on which we all depend. Delivering on Agenda 2030, will require (a) measurement of the progress towards relevant indicators and (b) understanding how policies and interventions can effectively lead to progress on different indicators. Governments are now starting to report annually on the set of 230 indicators originally identified.

Despite the focus on indicators for individual SDGs, they are linked together leading to possible synergies but also trade-offs. For example, the 2018 SDG report highlights that pressures for food, energy and shelter have increased land degradation, threatening the livelihoods of over one billion people. Agenda 2030 thus has to be delivered holistically and the trade-offs and possible synergies between the SDGs need to be understood. In many cases, marginalised people, whether the poorest or women, have different relationships with nature that are not well represented by data aggregated at national level. For example, improvements in national-level indicators of food security may hide the fact that the poorest are getting hungrier. Therefore, to fulfil the SDGs’ overarching aim to 'leave no-one behind', we need to understand how nature-wellbeing relationships are experienced by marginalised groups so that appropriate policies can be put in place that support everybody. This project will significantly improve our understanding of the complex interactions between people and the environment required to make progress in achieving the Agenda 2030, particularly SDGs 1 (no poverty), 2 (zero hunger), 10 (reduced inequalities) and 15 (life on land).

Our objectives are to:

- (i) assess the contribution of nature to multidimensional human wellbeing at local level, focusing specifically on the experience of the poorest;
- (ii) analyse the policies and contextual factors at various scales which drive the observed relationships between nature and wellbeing; and
- (iii) determine how well local, socially disaggregated nature-wellbeing relationships are reflected in national-level and modelled data used to report on the SDGs.

To do this, we will draw on recent data sets from seven projects from the [Ecosystem Services for Poverty Alleviation](#) programme and one closely aligned project. These fine-grained social-ecological data sets combine quantitative household survey data with qualitative contextual data from 11 sites in the Global South with varied levels of intervention and degradation. Combining data from these different sites provides us with the unique opportunity to deliver new insights into the contribution of nature to human wellbeing at local level, and how this is influenced by different biophysical, socio-economic and policy factors. Practically, our cross-site comparison will improve understanding of how key policies (particularly related to conservation and agriculture) affect the nature-wellbeing relationship. Furthermore, we will review how such local-level nature-wellbeing interactions are reflected in national-level data and models ([Co\\$tingNature](#) and FEEDME) of ecosystem services and SDGs. By engaging with policy-makers in the countries where the original data were collected (particularly India) we aim to contribute to the development of rigorous sustainable development indicators, more appropriate environment-related policies, and interventions which ensure that no-one is left behind.

Funded through the Towards a Sustainable Earth (TaSE) programme by UK Research & Innovation councils, the Department of Biotechnology, India and the Swedish Research Council for Sustainable Development, Formas.

Projects

- [SPACES - Sustainable Poverty Alleviation from Coastal Ecosystem Services](#)
- [ACES - Abrupt Changes in Ecosystem Services and Wellbeing in Mozambican Woodlands](#)
- [ASSETS - Attaining Sustainable Services from Ecosystems through Trade-off Scenarios](#)
- [PEFESPA - The Political Ecology of Forest Ecosystem Services and Poverty Alleviation](#)
- [PIMA - Poverty and ecosystem Impacts of payment for wildlife conservation initiatives in Africa: Tanzania’s Wildlife Management Areas](#)
- [P4GES - Can Paying 4 Global Ecosystem Services Reduce Poverty?](#)
- [DELTAS - Assessing health, livelihoods, ecosystem services and poverty alleviation in populous deltas](#)

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Project Summaries

	SPACES	ACES	P4GES	PIMA	ASSETS		PEFESPA	DELTAS
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Attaining Sustainable Services from Ecosystems through Trade-off Scenarios

Many food production systems require intensive management and are prone to failure outside of the range of their optimal environmental conditions. Concerns are growing about the ability of current agricultural systems to support rising human populations without further degrading critical ecosystem services (such as water provisioning, pollination).

This project examined the multiple (and multi-directional) links between ecosystem services, food security and maternal and child health outcomes in poor rural communities, applying the DPSIR framework (drivers, pressures, state, impact and response).

Objectives

This project aimed to explicitly quantify the linkages between ecosystem services that affect - and are affected by - food security and nutritional health for the rural poor at the forest-agricultural interface. The project implemented a range of participatory research methods, household questionnaires and food diaries to identify how dynamic ecosystem services at the landscape scale translate to local-level nutritional diets and health. Research was undertaken in 26 communities on a transect from highly forested (Colombia) through rapid deforestation (Peru) to highly deforested (Malawi).

Key findings

- Food insecurity is not necessarily a result of low production but of access, for example infrastructure, markets, and means to buy.
- Markets have become important food sources because they are available all year round with decent volumes and diversity. But they are largely inaccessible to the resource poor.
- Fruit production and diversity is low, and this is reflected in the rarity of fruit in meals.
- There is a mismatch between knowledge and action - knowledge about environmental degradation is high, but there is inertia to take action by all stakeholders.

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Assessing health, livelihoods, ecosystem services and poverty alleviation in populous deltas

The project adopted a holistic approach to evaluating ecosystem services and poverty in the context of changes such as subsidence and sea level rise, land degradation and population pressure in delta regions. The project investigated potential consequences of these changes for ecosystem services and how this will affect multi-dimensional well-being of the people living in the delta. The approach was tested and applied in coastal Bangladesh and tested conceptually in other populous deltas.



The project developed the influential Delta Dynamic Integrated Emulator Model (Δ DIEM), an integrated model which allows future trajectories of coastal Bangladesh to be explored, including changes in ecosystem services and associated livelihoods. This model will be applied for long term strategic planning processes by the Government of Bangladesh in coastal Bangladesh, leading to the Delta Dynamic Integrated Emulator Model being developed, extended and applied nationally.

Objectives

The overall aim of the project was to provide policy makers with the knowledge and tools to enable them to evaluate the effects of policy decisions on ecosystem services and people’s livelihoods. This links science to policy at the landscape scale and engages national level policy processes that impact at a community level.

Key findings

- Ecosystem services can support poor populations in deltas, and are especially important for the poorest and most marginalised delta residents.
- Ecosystem services do not offer a pathway out of poverty, but rather are a basic support for subsistence living and livelihoods.
- Whilst climate change has a real and tangible impact on the coastal zone, up to 2050 at least, socio-economic/policy changes are likely to be more important in the sustainability of coastal Bangladesh. The future is more influenced by human choices/policy interventions than climate change, and development can play a large role in Bangladesh – which is contrary to much perceived wisdom on this topic. For example, depending solely on practice, some fisheries might either decline slightly or collapse completely within a decade.
- Integrated assessment of large complex systems (deltas) and complex questions (ecosystem services and livelihoods) is feasible, and can deliver policy relevant insights.
- The importance of ecosystem services is likely to decrease with time as other parts of the economy grow more rapidly.
- The drivers of poverty on the delta front are spatially diverse including salinisation and water-logging, which impact ecosystem services directly, and in some areas a lack of transport infrastructure, which impacts access of agricultural production to markets.
- Absolute poverty is likely to decline to 2050, but inequality or relative disparity will persist due to stagnation in marginal areas.
- Beyond 2050, climate change will be more challenging for Bangladesh with faster changes including a stronger monsoon, higher sea levels, increased storminess and associated impacts such as salinisation. The details of these threats will depend on near-term climate policy and resulting emissions.

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Can Paying 4 Global Ecosystem Services Reduce Poverty?

This project focused on a tropical forest in Madagascar to achieve the depth required for a complete analysis. Poverty is acknowledged as more than a lack of material wealth.

Tropical forests were selected as they are globally important for climate regulation and biodiversity, they support millions of livelihoods, and international payment mechanisms are increasingly important drivers of land use change. Payment schemes which influence land use have the potential to impact the poverty status of local people both positively (e.g. through hydrological benefits) and negatively (e.g. through limiting agricultural expansion).

While the initial focus for the Reducing Emissions for Deforestation and Forest Degradation programme (REDD) was on forest conservation, rewards for enhancing carbon storage through forest restoration, and afforestation/reforestation are now increasingly being debated. The type of approach incentivised, and the institutional structures through which payments are channelled, will influence the impact on the poor.



Objectives

The project aimed to investigate the relative impacts on poverty of different potential structures of international payment schemes. The project aimed to understand the supply and distribution among stakeholders of ecosystem services flows from land use changes that would be incentivised under different types of international incentive scheme. Moreover, the impacts of international payments on poverty through land use change (LUC) and distribution of payments received.

The project also aimed to synthesise the results to develop recommendations for incentive mechanisms for effective poverty alleviation and to deliver a project which takes full advantage of synergies between social and natural science research, closely linked to stakeholder needs.

Key findings

- Forest conservation and restriction on forestland result in significant costs to local communities, particularly to poorest households, and in the case studied in Madagascar, the compensation to households impacted by conservation was inadequate and poorly distributed. Households with local socio-economic and political power were able to access compensation, while those without were less likely to receive compensation for their loss.
- Livelihood projects implemented as part of safeguard process (to compensate for conservation costs) were the most expensive but with lowest proportion of expenditure reaching the affected communities (compared to other approaches of delivering livelihood projects to communities).
- Forest soils store substantially more carbon than in above ground biomass, with the former surprisingly well conserved even after forest degradation/loss.
- Study on impact of deforestation on hydrological function has shown that infiltration capacity can rebuild after land is abandoned and left to regenerate; but it is unclear whether active reforestation can speed up the process.

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The Political Ecology of Forest Ecosystem Services and Poverty Alleviation

Forest-dependent peoples are one of the major groups of chronically poor in India. The prevailing governance regime in forested landscapes, mostly unchanged since colonial times, limits the access of these communities to forests and their ability to manage the forests according to their needs. This is a principle cause of poverty amongst forest-dwellers, and arguably also the cause of forest degradation where ineffective state control renders forests effectively open-access.

Decentralised community forestry has been advocated as a solution by advocacy groups supporting the rights of forest-dwellers. However, foresters and conservationists argue that community forestry may adversely affect biodiversity and other ecosystem services generated by the forest.



This study analyses how different governance regimes, viz., community forestry, state forestry and protected area management, affect the magnitude, sustainability and distribution of the benefits of ecosystem services across various social groups. The project focused on four sites in Nayagarh and Khorda districts of Odisha state in India. The clusters shared a broadly similar agro-ecological context, but represented different governance regimes. The three contrasting governance regimes prevailing in these sites are state-controlled timber-oriented management (Reserve Forest or RF) in Arang village, state-controlled conservation-oriented management (Protected Area or PA) in Baisipalli village, and community forest management (CFM) in Teen Mauza village cluster and Dengajhari village.

Objectives

The specific objectives of the project were:

- To understand the de facto nature of governance under different de jure governance regimes.
- To identify the range, form, magnitude and distribution of forest ecosystem services across local, regional and global stakeholders, and across classes within local stakeholders, measured in different units.
- To understand the trade-offs and synergies involved if state-controlled regimes (RFs and PAs) are changed to community-based forest management.
- To understand the trade-offs and synergies involved if state-controlled regimes (RFs and PAs) are changed to community-based forest management.
- To understand whether this current flow of ecosystem services is sustainable and the factors influencing this sustainability.

Key findings

The research generated multiple findings at the conceptual and empirical level.

- Conceptually, through a critical review of the literature on ecosystem services, we demonstrated the contributions of, but also significant pitfalls in, the ecosystem services framework. Contributions are the strongest in the area of regulating services. Pitfalls include inattention to dis-services and trade-offs, to the social distribution of the well-being derived from the flow of ecosystem services, and the crucial role of labour, capital and technology inputs into ecosystem management. We proposed an alternative conceptual framework that explicitly incorporates these factors
- Our analysis of the governance regimes showed significant difference between de jure and de facto arrangements. E.g., state-controlled timber forestry (RF) in reality allowed substantial theft of timber from the forest. Protected Areas permitted some amount of extraction of non-timber forest products (NTFPs), thereby softening the adverse impact of strict conservation. Community forestry regimes varied in their ability to impose strict regulations on extraction—in one case allowing unrestricted grazing and in the other being unable to prevent theft of firewood by the neighbouring village from the community-managed forest.
- Our analysis of ecosystem service flows across governance regimes identifies significant variations but also some unexpected commonalities across regimes. E.g., standing carbon was of course much lower in CFM sites, but biodiversity in CFM sites was comparable to that in the PA site. Livelihood provisioning services were of course highest in CFM sites, whereas they were much lower in the other sites. Dis-services such as crop damage were the highest in the PA regime. Thus, the CFM regime provided a fair degree of conservation service at a lower local livelihood cost (foregone benefits and actual damage) than the PA or state regimes.
- CFM in villages with internal differentiation on class and caste grounds struggled with the challenge of providing equitable access to all villagers. Even in non-CFM villages, there was informal access discrimination.
- The distribution of benefits from a particular service, such as non-timber forest products, depended critically on how the value chain was organised. The most commercially valuable NTFP, kendu leaf, was state-controlled, and the state

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Poverty and ecosystem Impacts of payment for wildlife conservation initiatives in Africa: Tanzania’s Wildlife Management Areas

This project seized a unique policy moment, a decade on from the time when Tanzania’s poverty reduction strategy, Mkukuta, triggered nationwide implementation of community-based natural resource management/payments for ecosystem services-based Wildlife Management Areas (WMAs), with other countries in the region poised to roll out comparable initiatives.

The Wildlife Management Areas comprise different ecosystems, socio-political structures, and a broad range of ecosystem services. Comparing the social and ecological outcomes for communities before and after Wildlife Management Areas are established and for people inside and outside the areas’ boundaries (within the same ecosystems) offered an ideal opportunity for rigorous impact evaluation.



Objectives

The project aimed to enable grassroots natural resource users to articulate their experiences to policy-makers and practitioners. They were able to voice how availability, access to and use of ecosystem services have changed in quality and quantity, and how these changes have affected their poverty and wellbeing.

Establishing what works, why and for whom is not only of use to the million or more rural people directly affected by Wildlife Management Areas, but also delivers insights and best practice lessons that can be generalised to the many millions more whose livelihoods and wellbeing are changed by comparable community based natural resource management and payments for ecosystem services initiatives.

Key findings

- The Wildlife Management Areas studies are very variable environments, and the 7-year period from their inception to the project review is insufficient to show clear directional changes in habitat or biodiversity ecosystem services.
- The frequency of consumption of domestic animals and bushmeat taken together is not significantly affected by the presence of a Wildlife Management Area. But, when the two types of meat are considered separately, northern Areas exert a significant positive effect on frequency of bushmeat consumption, and southern Areas a significant negative effect.
- Wildlife Management Areas on balance adversely impact women’s access to resources, ability to use those resources, and the significance of that access and use to women as individuals and as members of society.
- Wildlife Management Area governance is characterised by a lack of meaningful inclusion and participation in relevant decision-making processes pertaining to their establishment, design, and management.

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Sustainable Poverty Alleviation from Coastal Ecosystem Services

The project aimed to better understand the links between ecosystem services (ES) and wellbeing in order to design and implement more effective interventions for sustainable poverty alleviation. This was done in the context of coastal, social-ecological systems in two poor African countries; Kenya and Mozambique.

The project was highly interdisciplinary, including: ecological field methods, simulation modelling, social science methods, participatory dialogues within communities and multi-stakeholder workshops.

SPACES developed and applied novel methodologies and processes. The team expanded the thinking and conceptualisation of ecosystem services such as the question of ecosystem service elasticity. Moreover, the team applied the reef budget methodology to the Western Indian Ocean, developed a basic needs methodology, and linked VCA to fisheries in the African context for the first time.



Objectives

The research aimed to have direct impact on the wellbeing of poor inhabitants of the rapidly transforming coastal areas, while also providing indirect impact to coastal poor in other developing countries through international dissemination of findings. Research findings were disseminated to benefit multiple stakeholders at various levels.

Key findings

- The contribution of an ecosystem service to wellbeing is not necessarily related to the condition of the ecosystem. A high quality ecosystem does not benefit or contribute more to wellbeing than a low quality ecosystem. Access affects poverty and wellbeing more in the short term than a degraded ecosystem.
- Different kinds of ecosystem services and wellbeing are linked in monetary and non-monetary ways. The practice of engaging in an ecosystem service and the use of an ecosystem service contributes to wellbeing as does the money gained from it. For example, the practice of cooking fish together fosters relationships, using fish for school lunch supports education, and selling fish for income contributes to economic security.
- Increasing fishers’ wellbeing is not as simple as catching more fish. It is instead important to look at how money is distributed along the value chain and how the money is used.
- In coastal Kenya, the people who are the wealthiest are not always better off in terms of meeting their basic needs or living in a better quality house. There is a difference between income and assets, and that income does not translate to assets.

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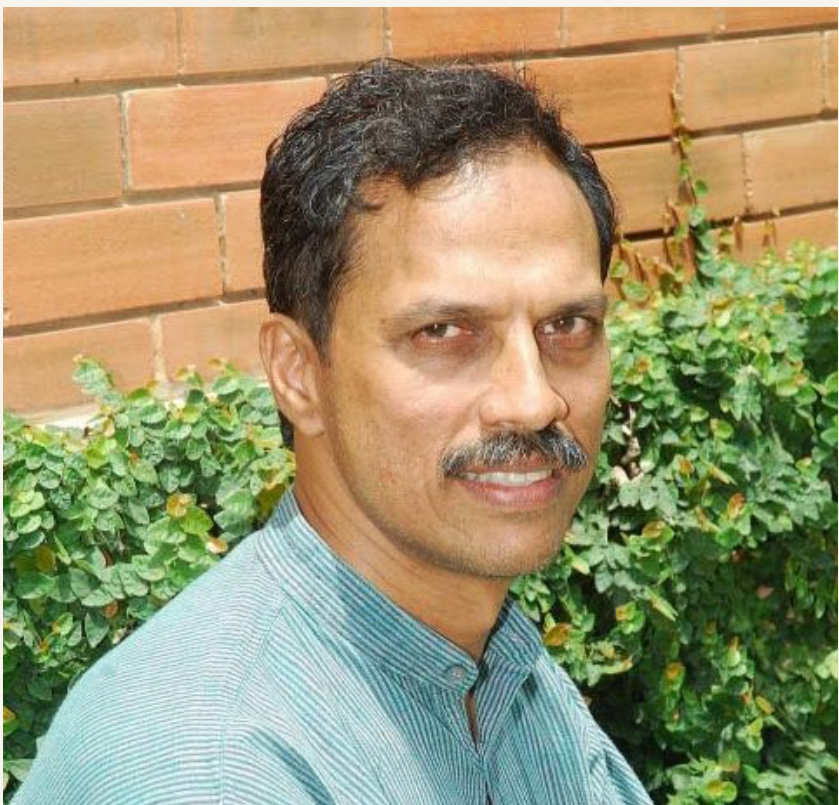
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News

[Call for applications for two Postdoctoral positions at ATREE](#) - **Deadline 31 August 2019**

Link to news item at King's College London:

<https://www.kcl.ac.uk/news/news-article.aspx?id=16616168-49ca-4d34-8dfb-e6d1c70af17d>

Link to news item at Stockholm Resilience Centre:

<https://stockholmresilience.org/research/research-news/2019-02-16-humans-nature-and-the-sdgs.html>

Read about the TaSE initiative and projects awarded under the first funding call:

<https://nerc.ukri.org/press/releases/2019/07-tase/>