espa ecosystem services for poverty alleviation

UNIVERSITY of STRATHCLYDE CENTRE FOR ENVIRONMENTAL LAW AND GOVERNANCE

Policy and Practice Briefing

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How can ecosystem services support equitable and sustainable fisheries?

There are knowledge gaps on the flows of ecosystem goods and services in the seas and oceans – and these gaps hamper equitable and sustainable fisheries management. Methods for measuring and monitoring ecosystem services can help conserve biodiversity in the fisheries sector as a way to alleviate poverty and support the achievement of the Sustainable Development Goals (SDGs).

Key messages

- Methodologies to understand ecosystem service flows and trade-offs in fisheries management can be applied even in data-poor contexts.
- Ecosystem monitoring should consider cumulative impacts of development and conservation measures on fisheries and communities.
- Early consideration of livelihoods in conservation measures is crucial for equitable and effective outcomes, and needs to be complemented by social safety nets and capacity-building.
- Payment for Ecosystem Services (PES) schemes that incorporate traditional knowledge can effectively incentivise conservation and improve livelihoods.
- Identifying overlooked trade-offs through use of disaggregated data can contribute to equitable and integrated marine and coastal management.
- A stronger focus is needed on the governance of small-scale fisheries, both among and within States, including evaluating ecosystem services as part of integrated impact assessments.

Why incorporate ecosystem services into fisheries?

Knowledge gaps on the flows of ecosystem goods and services in the seas and oceans – at different scales – can hamper the development of integrated management and the realisation of fair and equitable outcomes. However, improved methodologies – including predictions of the impacts of climate change on ecosystem services for the most vulnerable and maps of potential trade-offs – can help policy-makers and environmental managers identify more sustainable, integrated and equitable interventions in the fisheries sector.

Background

This brief outlines findings from Ecosystem Services for Poverty Alleviation (ESPA) projects that make a distinct contribution to the ecosystem approach to fisheries management (see Box 1). This approach aims to tackle multiple social needs related to fisheries, without compromising the benefits of marine ecosystem services for future generations.[1] The ecosystem approach is expected to lead to

Small-scale fish farmers in Bangladesh, who are part of the Feed the Future Aquaculture project to support sustainable aquaculture amongst communities.

Photo credit: WorldFish

Box 1: ESPA projects contributing to sustainable fisheries management

- Assessing health, livelihoods, ecosystem services and poverty alleviation in populous deltas, DELTAS (http://espadelta.geodata.soton.ac.uk)
- Sustainable poverty alleviation from coastal ecosystem services: Investigating elasticities, feedbacks and trade-offs, SPACES (www.espa-spaces.org)
- Coastal Ecosystem Services in East Africa, CESEA (www.espa.ac.uk/projects/ne-l001535-1)
- Global Learning Opportunities for Regional Indian Ocean Adaptation, GLORIA (http://gullsweb.noc.ac.uk)
- Attaining Sustainable Services from Ecosystems through Trade-off Scenario, ASSETS (http://espa-assets.org)
- Building Capacity for Sustainable Governance in South Asian Fisheries (www.espa.ac.uk/projects/ne-g008337-1)
- Marine Benefits (www.strath.ac.uk/research/strathclydecentreenvironmentallawgovernance/marinebenefits)

more holistic and participatory fisheries management, by understanding meaningful ecological management units, species interactions, environmental processes, habitat protection, the value of marine ecosystems beyond fishery harvest, and potential trade-offs to balance diverse social objectives.[2]

The approach has gained high-level policy support. Its human dimensions are emphasised under the Convention on Biological Diversity (CBD) as a way to enhance sustainable development and ensure long-term conservation with human needs linked to poverty.[3] Parties to the CBD see the conceptual framework of the Millennium Ecosystem Assessment (MA) as supporting the implementation of the ecosystem approach.[4,5] Aichi Biodiversity Target 6 refers to the application of ecosystem-based approaches to fisheries by 2020.[6,7] In addition, the 2017 United Nations Ocean Conference recognised the oceans as a key source of ecosystem services for the planet, calling for an ecosystem approach in area-based management tools.[8]

Policy recommendations

The following policy recommendations have been informed by three elements of the ecosystem approach: biogeography and ecosystem pressures; conservation to maintain or restore ecosystem services; and integrated management and understanding of trade-offs to inform societal choices and support fair and equitable benefit-sharing in small-scale fisheries.

1. Methodologies can support the ecosystem approach in data-poor contexts

The ecosystem approach delineates ecologically meaningful boundaries based on biogeography for management purposes.[2]

Developing countries often lack the data needed to run sophisticated models. However, methodologies exist for data-poor contexts, such as assessing primary production through satellite imagery to define the productivity and diversity of management units. This matters for determining sustainable catch levels through multi-species models, and for identifying essential fish habitats for enhanced protection. While these models often require data-intense parameters, less intensive methods are available[2] and have been tested in the Ganges-Brahmaputra-Meghna delta in Bangladesh[9] and other areas.[10]

Furthermore, the effects of climate change can have a negative and disproportionate impact on small-scale fishers. Global models adapted to regional and local contexts off the coast of Madagascar and in the Mozambique Channel have assessed the effects of climatically driven stressors on marine ecosystem and their services.[11] A collaboration with local experts identified climate-related challenges to fishing communities, and options for adaptation through regional indicators (e.g. coral bleaching index) that complement generic ones (i.e. sea surface temperature trends).

Simple models, coupled with forecasts from climate models, can assess future vulnerability scenarios, while an understanding of local management measures, institutional governance systems and supply chains is vital for vulnerability assessment and adaptation options.

2. Understanding cumulative impacts on marine ecosystems is also important

Marine ecosystems within each biogeographical unit face multiple anthropogenic pressures from the fisheries sector, and from rising temperatures and ocean acidification driven by climate change. The cumulative impacts on fisheries and communities should be considered when developing management measures (e.g. sustainable catch levels). For instance, Fernandes and colleagues project that fish production in the Bangladesh exclusive economic zone is likely to decrease by up to 10% by 2060 under climate change scenario A1B of the Intergovernmental Panel on Climate Change.[10] The decrease is more severe for two major commercial species: Hilsa shad (*Tenualosa ilisha*) and Bombay duck (*Harpadon nehereus*). Hilsa shad is the largest catch species in Bangladesh, employing approximately 460,000 fishers and 2.5 million people in the wider sector (trading, processing, etc.), while Bombay duck constitutes the second largest catch species.

Understanding this multi-scale picture can help to determine safe ecological limits for fisheries impacts on ecosystems in response to CBD Aichi Biodiversity Target 6, and, therefore, contribute to the achievement of Sustainable Development Goal (SDG) target 14.4 (sustainable fisheries). Long-term projections of fisheries productivity scenarios that considered climate change pressures were conducted for the Ganges-Brahmaputra-Meghna delta to identify sustainable catch levels.[11]

3. Early consideration of livelihoods supports equitable outcomes

Long-term conservation and management measures are essential components of sustainable fisheries.[12] However, outcomes may be inequitable if livelihood considerations are not fully integrated. Successful projects, including community-based carbon offsets to protect mangroves in Gazi Bay, Kenya, reveal the importance of early stewardship and livelihood considerations from planning to implementation.[13,14]

Another study on the establishment of locally managed marine areas in northern Mozambique highlights the need for integrated efforts to achieve different SDGs to ensure long-term sustainability of conservation measures and their benefits to livelihoods.[15] One example is to combine inclusive and participatory marine resource management interventions with external elements such as education and increased financial and institutional capacity in local fishing councils.[15] In the south-western coastal region of Bangladesh, improved access to electricity, sanitation, drinking water, primary education, healthcare and incomes from small-scale fishing has contributed to human wellbeing.[16]

4. Inclusive Payment for Ecosystem Services (PES) holds promise in coastal and marine areas

Because conservation measures can pose economic risks to the users of the natural resources, PES schemes have been developed to promote economic incentives for conservation. If well-designed and inclusive, market approaches such as PES can benefit local communities and their livelihoods.

Examining the role of voluntary carbon markets, Locatelli and colleagues found that a scheme to pay communities in cash and in-kind to conserve coastal mangroves in the interests of carbon sequestration and storage in Gazi Bay, Kenya, has increased conservation, restoration and sustainable use. This has contributed in turn to other mangrove ecosystem services (e.g. provision of fisheries) and the livelihoods and wellbeing of local communities.[17] The study noted the importance of incorporating traditional knowledge in valuation exercises, as well as the meaningful participation of local stakeholders in PES projects.[17]

5. Hidden trade-offs can be identified through disaggregated data

Insufficient disaggregated data on small-scale fisheries can mean that trade-offs are overlooked that affect the most vulnerable groups disproportionately.[18] Disaggregation of beneficiaries, therefore, is recognised as a key component of ecosystem services to address injustices or inequities,[19] and is important in designing equitable conservation and management measures.

In Tanzania, for example, connecting an octopus fishery to international markets increased the prices paid to fishers, but the women who once had exclusive access to the fishery were displaced by men attracted by higher profits. While the value of the ecosystem services for male fishers was enhanced, women who were already marginalised were left even further behind.[20] Approaches that take a broader view of 'value', beyond mere income, should, therefore, be promoted.[20-23]

6. A stronger focus is needed on the governance of small-scale fisheries

Small-scale fishing is affected by foreign fishing fleets (inter-State) as well as local large-scale operations (intra-State).

At inter-State level, participatory exercises to assess trade-offs[18] could inform new practices, such as fisheries impact assessments, before large-scale foreign fisheries are granted access. These assessments could consider whether such activities would undermine the right to food, and explore other poverty dimensions for small-scale fishing communities,[24] contributing to a fuller understanding of transboundary trade-offs.[25]

At intra-State level, industrial fishing activities could trigger integrated impact assessments to explore environmental, human rights and cultural effects on small-fishing communities. Incorporating ecosystem services into impact assessments for the fisheries sector and marine spatial plans makes it possible to go beyond place-based assessments. It also allows consideration of the cross-scale ecosystems and governance interactions essential for sustainability.

Such an approach would align with the approach of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)[26] incorporating overlooked impacts in broad ecosystem services research.[27]

Credit

This briefing was written by Daniela Diz (Strathclyde Centre for Environmental Law and Governance). It is based on a literature review of ESPA fisheries-related projects and consultation with relevant experts.

About the ESPA Programme

ESPA is a nine-year global development research programme established in 2009 with funding from the Department for International Development (DFID), the Natural Environment Research Council (NERC) and the Economic and Social Research Council (ESRC). ESPA is one of the most comprehensive research programmes on linkages between ecosystem services and human wellbeing, aiming to provide world-class research evidence on how ecosystem services can reduce poverty and enhance wellbeing for the world's poor.

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Endnotes

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