

Cost and Benefits of Ecosystems based Adaptation

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Introduction

Changes in global climate are increasingly having adverse impacts on human populations and natural systems. The environmental, social and economic impacts of climate change coupled with the unsustainable management of ecosystems, increase the vulnerabilities of people and nature. Furthermore, the crisis is likely to impact different groups differently and is expected to affect the marginalized (women, children and elderly) disproportionately.

Ecosystem based Adaptation (EbA) is increasingly being considered as a strong and cost-effective means of dealing with the impacts of a changing climate. It is used by a number of organisations and in many developed and developing countries as a means for climate adaptation, especially at the community level. It is also applied for disaster risk reduction. Still, there is a propensity of policy makers to implement traditional engineering solutions for adaptation rather than investing in EbA. There is, therefore, a need to raise further awareness on the cost-effectiveness of nature based solutions to deal with a changing climate.

One way to make the case for ecosystem-based adaptation, in comparison to other adaptation activities, is from the economic perspective. EbA activities can produce a number of benefits for communities but there might be cases where other adaptation options, including engineered solutions, may provide more benefits for less cost. Therefore, it is not only critical to assess the environmental and social costs and benefits of adaptation but also its economic costs and benefits, in order to engage in an informed planning process.

This study concentrates on the Philippines and reviews two case studies to highlight the importance of nature based solutions as part of a suite of adaptation options.

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This paper is based on a study that analysed economic costs and benefits of EbA in the Philippines and is available at http://cmsdata.iucn.org/downloads/final_draft_philippines_cb_a_study_for_feedback.pdf

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EbA uses biodiversity and ecosystem services as part of an overall adaptation strategy to help people and communities adapt to the negative effects of climate change at local, national, regional and global levels. It recognizes, and in fact highlights, the importance of equity, gender, and the role and importance of local and traditional knowledge, as well as species diversity. Furthermore, it provides co-benefits such as clean water and food for communities, risk reduction options and benefits, and other services crucial for livelihoods and human well-being. Appropriately designed ecosystem adaptation initiatives can also contribute to climate change mitigation by reducing emissions from ecosystem degradation, and enhancing carbon sequestration.

There are a range of approaches that are used to assess economic benefits of goods and services and these same approaches can and are used to assess costs and benefits of adaptation options including EbA. The three most commonly used ones are 1) Cost-Benefit Analysis (CBA); 2) Cost-Effective Analysis; and 3) Multi-criteria Analysis (MCA).

An economic analysis of mangrove protection and re-plantation, as compared to building a seawall, was undertaken by a Conservation International team in Calapan City, Mindoro Oriental Province using barangay Silonay as an illustration. Primarily secondary data was analysed using the least-cost and benefit-cost with avoided damage approaches.

The Least Cost Analysis revealed the most cost effective approach. The results showed that the option with the least cost is the protection of existing mangroves, while the most expensive is the construction of the seawall.

Damage costs avoided were also calculated, which highlighted the significant role intact

and healthy mangroves play in the face of extreme events. Protecting and conserving existing mangroves provided the highest avoided damages as compared to replanting them or building the seawall.

Ecosystem based Adaptation options (mangrove protection and mangrove planting) had the highest Net Present Value (NPV) and Annualized Net Present Value (ANPV), while the engineering option (seawall) had the lowest values and was negative for certain discount rates and assumed avoided damage. In terms of the Benefit Cost Ratio (BCR), over the 20 year period, the ratios remained the same for the option to protect the mangrove, increased for mangrove planting as the discount rate increased, and decreased for the seawall option as the discount rate increased.

The second case study is a Total Economic Value (TEV) of The Cagayan De Oro Basin, undertaken by Xavier University, Department of Economics. Total Economic Valuation is an important approach to assess, in monetary terms, the value of ecosystems. TEV can be useful to make the case for ecosystems based adaptation options, when it is not easy to undertake CBA of options. It can also be used as supplement to a CBA to highlight in economic terms, the productivity of an ecosystem. This can be useful in making a holistic and inclusive case for ecosystem based adaptation options to be selected.

Key Conclusions:

- Develop a holistic adaptation portfolio that can be applied across sectors, groups and over time. Consider hybrid adaptation solutions that include EbA as well as other solutions, wherever required.
- Undertake vulnerability assessments as a means to understand closely tied socio-political factors such as political

will, local capacity, access, distribution and rights.

- Make Cost-Benefit Analysis or Cost-Effective Analysis or Multi-criteria Analysis of projects; and Total Economic Value of ecosystems goods and services part of the implementation plan.
- Undertake economic valuations of ecosystem services as part of initial assessments during the planning phase of EbA projects. This will increase understanding of the role of ecosystems in human well-being. Both use and non-use values form important aspects in this case, as well as their access, distribution, scales and timelines.
- Undertake assessments after implementation as required, to compare the benefits received over time, so that they can be used to assist in the decision making processes.
- Increase understanding of and incorporate synergies between options as well as tradeoffs and co-benefits, to provide an inclusive and holistic picture for decision making.
- Ensure that distribution and equity issues form an integral part of the process as these tend to get neglected.

