19 March 2013
Thematic Issue 37: Ecosystem-based Adaptation

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Source: Jones, H.P., Hole, D.G. & Zavaleta, E.S. (2012) Harnessing nature to help people adapt to climate change. *Nature Climate Change.* 2:504-509.

DOI: 10.1038/NCLIMATE1463.

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Ecosystem-based adaptation provides promising approach

The advantages of soft ecosystem-based climate change adaptation over hard infrastructure-based approaches are becoming increasingly recognised. A new analysis highlights these advantages and calls for more effort to improve our understanding of ecosystem-based adaptation's (EbA) effectiveness.

The importance of adapting to climate change is an internationally recognised issue and this is reflected in the funds committed to it. However, although financial recognition is a huge step forwards, it is important to ensure the money is spent effectively and sustainably.

Adaptation to climate change can be categorised into two approaches. 'Soft' approaches focus on capacity building and information, such as early warning systems and educating at-risk communities. 'Hard' approaches use specific technologies and actions, such as sea walls or levees. EbA shares features from both and involves management, conservation and restoration activities to protect and enhance ecosystem services, for example, flood protection by wetlands.

The study outlines three ways in which EbA may complement or improve hard approaches. Firstly, it can increase overall capacity to cope with climate change. For example, on the Yangtze River in China, hard infrastructure of dams and dykes have been integrated with a seasonal opening of sluice gates to restore connections between the natural features of river, lakes and wetlands. This increases floodwater retention, water purification and agricultural opportunities.

Secondly, EbA may be more cost-effective than hard interventions. For example, in the Maldives, building sea walls costs about US$1.6-2.7 billion (€1.2-2.1 billion) compared to preservation of the natural reef, which has an initial set up cost of US$34 million (€26 million) and maintenance costs of US$47 million (€36 million) per year.

Lastly, in some cases, EbA may be the only possible option. For instance, in many small island states it is not possible to combat death of coral reefs with hard measures, so responses in the form of marine protected areas are the only foreseeable solution.

EbA has advantages over hard approaches in that it tends to provide multiple benefits in addition to climate change adaptation. For example, it may help conserve biodiversity, improve health and recreation, and provide economic opportunities in terms of tourism. In contrast, few hard interventions provide benefits beyond the specific adaptation function for which they were designed.

Compared to hard approaches, EbA also tends to be more flexible, which is valuable in the face of an uncertain climate in the future. For instance, levees protect coasts from a limited sea-level rise, but protective wetlands can migrate inland as sea levels increase, adapting to the new conditions. Furthermore, hard engineering interventions may need frequent and costly maintenance, whereas EbA is more likely to be self-managing or require low maintenance.

There appear to be several advantages of EbA, however, the researchers call for a firmer evidence-base to support and encourage its use. There is a need for better quantification of EbA's benefits, the effects of climate change on ecosystems' capacities and more detailed comparisons between EbA and other adaptation strategies. With more knowledge, these approaches can be better applied to provide smart solutions.