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34. The risks of global warming to coral reef ecosystems

by
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Coral reefs are said to be the world's most biodiverse environments. Many coastal communities are highly dependent on the ecosystem services they provide. But rising water temperatures contribute to their degradation. The BIOCORE project works to devise policy suggestions to minimise these losses and ensure sustainable management and conservation of coral reefs.

Threats such as natural and anthropogenic stress are compromising the ocean's ability to provide ecosystem services. Combinations of stressors such as climate change, overfishing and pollution are overwhelming the ocean's inherent resilience and natural balance, making it harder to reverse this damage, while the degradation of marine and coastal ecosystems results in the loss of goods and services to coastal and inland communities (UNEP, 2006).

As the Intergovernmental Panel on Climate Change (IPCC, 2007) has highlighted, coral reefs are under great stress as a result of global warming. Their low adaptive capacity results in particular vulnerability to thermal change. They are also sensitive to other effects of global warming such as ocean acidification, and can suffer in coral bleaching events.

Most coral reef areas are in developing countries where people are poor. They are highly dependent on these ecosystems for food, employment in fishing, shoreline protection, recreational services through tourism, and cultural and spiritual benefits. Burke et al. (2011) point out that the adaptive capacity of countries to avoid reef degradation and loss is greater for nations with high levels of economic development and resources, for example oil producers or those that offer offshore financing schemes, as do the Caribbean islands, than for countries in conflict areas. It is vital, when mapping these ecosystems, to consider the socio-economic and political drivers in order to assess the vulnerability of the community and ecosystem.

As part of the Seventh Framework Programme for Research, funded by the European Union, the BIOCORE project – Risks of global warming: The case of coral reef ecosystems in developing countries – aims to assess the contribution of coral reefs to human well-being under the effects of climate change.

This project has again revealed that high-income countries adapt better after bleaching events. This means that their adaptation efforts have improved over time. This shows the importance of adaptation plans and strategies when assessing the vulnerability of communities in low-income and emerging countries to climate change. The project is in its last phase, during which analysis will estimate the impact of coral reef ecosystem quality on the socio-economic and cultural values of countries. The findings were presented in early June 2013.

One recommendation identified by BIOCORE is to bridge the gap between policy and science in marine ecosystems and in communities facing the challenges of climate change. The idea is to develop a co-ordinated approach to examine the ecological, socio-economic and cultural issues. Specifically, there is an enormous opportunity for social science researchers to investigate the resilience and recovery of marine ecosystems and human communities. This can be done by identifying key vulnerable ecosystem states and areas, evaluating how increases in global temperature affect them, providing early warning of disaster, and recommending conservation and management strategies for communities to help them adapt to climate change effectively and efficiently. Moreover, the governance challenges in the ecological and social context cannot be ignored. Awareness-raising and information dissemination programmes concerning marine ecosystems should be tailored to suit policymakers and other stakeholders. They should also be based on scientific evidence, and provide fair and unbiased ways to manage the adverse effects of climate change on human and ecosystem well-being.

Bibliography

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