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The Coral Reef Economy

The business case for investment in the protection, preservation
and enhancement of coral reef health

EXECUTIVE SUMMARY

Economic value of coral reefs today

Proactive policies to protect and restore the health of the world's coral reefs could generate a substantial economic gain, provide important societal benefits, including to local communities, and help deliver the UN Sustainable Development Goals.

This study presents new analysis of the value, costs and benefits of the coral reef economy to highlight that shifting the trajectory of coral reef health from one of continuing decline towards a healthy state could unlock tens of billions of dollars in additional value. The findings show that this shift can be largely achieved through strategic interventions using available tools and methods, indicating that the goal of closing the gap between the forecast benefits of a healthy reef and the current trend towards coral reef degradation is within our reach.

A quantitative model of selected interactions between live coral cover and the economic returns generated by three sectors that benefit directly from coral reefs – tourism, coastal development and commercial fisheries – was applied to two case study regions: the Coral Triangle in South East Asia and the Mesoamerican Reef in the Caribbean. The analysis found that a healthy coral reef scenario is expected to deliver additional economic benefits amounting to \$34.6 billion and \$36.7 billion in the Mesoamerica Reef and the Coral Triangle, respectively, between 2017 and 2030.

While much of the added financial value would be captured by the private sector, these gains could also create opportunities for governments to develop policies that redistribute part of this wealth to those adversely affected by changes in reef management, such as local fishing businesses. In addition, the societal co-benefits of ecosystem restoration to promote healthy reefs could potentially exceed the private gains, for example through improvements to municipal sanitation, more sustainable local fisheries, reduced soil erosion, and enhanced cultural heritage values.

Today the management of coral reef ecosystems is primarily funded by the public sector, but this is proving insufficient even to maintain reef health, let alone meet internationally adopted targets. The need for new sources of financing is now widely recognised, including in UN Environment Assembly resolution 2/12 adopted in 2016.

There is a strong business case to be made for both the private and public sectors to invest more in the protection, preservation and enhancement of coral reef health. By quantifying the value of a healthy coral reef across three key sectors and highlighting the incentives for the private sector to finance interventions that improve coral reef health, this study is intended to support and inform active engagement and increased investment by governments and businesses alike.

Modelling a healthy coral reef future

The magnitude of change that could be achieved by enhancing coral reef health is due to the exceptional value of the ecosystem services they provide. Reefs are a key source of food, livelihoods and economic opportunity to people in more than 100 countries and protect shorelines around the world from erosion. They host a quarter of all known marine species and attract national and international tourists alike.

This study is centred around two components: a scenario analysis and an intervention analysis. The scenario analysis estimated the economic returns attributable to the coral reefs in the two regions today, and modelled expected changes under a healthy reef scenario compared to a degraded (i.e. business-as-usual) scenario. The intervention analysis modelled a range of policies that could be adopted to achieve healthy reef status and estimated the expected economic net-benefits and returns on investment.

The four strategic interventions studied are: no-take marine protected areas; constructed wetlands for enhanced wastewater management; afforestation for erosion management; and vegetative filter strips to reduce erosion on cropland.

The results of the scenario and intervention analysis were then combined to assess the degree to which these four interventions could close the gap between the forecast benefits of a healthy reef and the business-as-usual scenario. The findings are encouraging: by 2030, the interventions could potentially reduce the gap by 70% in the Coral Triangle and by 45% in Mesoamerica.

The models developed for this study represent a simplification of complex interactions between coral reefs and the economy and do not capture the full value of coral reefs. However, conclusions based on the results can inform future advocacy and, in particular, help encourage the private sector to play a more active role. They also provide a foundation for further efforts to extend the analysis in the future.



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KEY FINDINGS

The results of this study highlight that achieving improvements in coral reef health and unlocking major financial gains could be within reach.

Coral Reefs Underpin Significant Economic Value for the Private Sector

The private sector economic value of coral reefs across the tourism, commercial fisheries and coastal development sectors is linked to their health. Today, their economic value to these three sectors equals \$6.2 billion per annum in Mesoamerica and \$13.9 billion per annum in the Coral Triangle. If reefs continue to decline, their per annum value could fall by \$3.1 billion in Mesoamerica and \$2.2 billion in the Coral Triangle by 2030.

The Value of Future Healthy Coral Reefs is High

A shift toward a healthy state by 2030 could unlock an additional \$35 billion (or \$2.5 billion per annum) in additional value to the three sectors in Mesoamerica, and an additional \$37 billion (or \$2.6 billion per annum) in Indonesia. These potential returns highlight the financial business case for the private sector, along with governments and NGOs, to invest in coral reef health. Innovative and sustainable financing mechanisms will be essential to ensure investment flows.

Societal Co-Benefits of Healthy Coral Reefs Could Exceed Private Gains

The societal benefits of ecosystem restoration could be even greater than the financial gains of the private sector. For example, reducing the discharge of untreated municipal wastewater into coastal environments can create health benefits. Erosion management may reduce agricultural soil loss, while coastal afforestation can support sustainable forestry and increase carbon capture. The expansion of no-take zones promotes sustainable fisheries by preserving fish stocks and diversity. The results of this study should therefore not be taken as a reflection of the total value of coral reefs, but as one component of the broader economic, social and environmental benefits of protecting coral reef assets.

Policies to Enhance Coral Reef Health Generate a Financial Return on Investment

A range of policies and interventions that could produce financial net benefits are available to governments and the private sector. The potential return on investment ranged from 44:1 for the expansion of no-take marine protected areas in Mesoamerica, to 9:1 for better erosion management on agricultural land in Indonesia. These findings should encourage businesses, policymakers and NGOs to devise policies and initiatives to help grow a sustainable reef-dependent economy.

Interventions to Protect Coral Reefs Contribute to the Sustainable Development Goals

Action to enhance the health of coral reefs will help deliver the 2030 Development Agenda and SDGs. The four interventions analysed all directly deliver on SDG 14 to conserve and sustainably use the oceans, seas and marine resource, while



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also contributing to SDG 6 on ensuring water and sanitation for all, and SDG 15 on the sustainable use of terrestrial ecosystems.

Climate Change Poses Significant Risk and Adds Uncertainty

Efforts to enhance coral reef health must be considered within the longer-term context of climate change, which presents an existential threat to many reefs. Even if the objectives of the Paris Agreement are achieved, reports warn that up to 90% of all coral reefs could be lost by 2050. Acting on local threats (including overfishing, erosion, and pollution) in order to maximise reef resilience may help moderate impacts, but climate change effects, including ocean warming and altered cyclone and rainfall patterns, add uncertainty to the analysis presented in this report.

Toward a Healthy Reef by 2030

This study shows that interventions targeting sustainable fisheries, wastewater and erosion management could have a positive impact on the health of coral reefs and the reef-dependent economy. In Mesoamerica, these interventions could close 45% of the gap between the estimated value derived from a degraded and a healthy reef by 2030. In the Coral Triangle, the interventions could close 70% of the gap. These results highlight that the goal of rapidly achieving major improvements in coral reef health could be within reach.



INTERNATIONAL SUSTAINABILITY UNIT

The Prince of Wales' International Sustainability Unit

Established in 2007 by HRH The Prince of Wales, the International Sustainability Unit (ISU), which closed in March 2018, addressed critical challenges facing the world, particularly the question of how to sustain the health of the environment while advancing development goals. The ISU commissioned this report in order to reveal and demonstrate how economic growth and ocean conservation need not be in conflict, and how sustainable development depends upon a healthy marine environment, especially for those countries that were dependent upon ocean ecosystems. www.princeofwalescharitablefoundation.org.uk/about-us/subsidiaries-and-programmes/international-sustainability-unit



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International Coral Reef Initiative

The International Coral Reef Initiative (ICRI) is an informal partnership between nations and organizations which strives to preserve coral reefs and related ecosystems around the world. ICRI has declared 2018 the third international year of the reef.

www.icriforum.org
www.iyor2018.org



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