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Marine Protected Areas: Securing Benefits for Sustainable Development

Declining health for oceans: growing demand for their benefits

Our oceans have been under too much stress, from too many human activities, for too many years. Today, they face a complex mixture of environmental, social and economic impacts. Overfishing and other extractive activities, coastal development, pollution and tourism are damaging essential natural habitats and reducing populations of marine species at an incredible rate. This well-documented degradation is deteriorating further due to climate change, through the effects of warmer temperatures and the acidification that results when oceans absorb carbon dioxide from the atmosphere.

Since 1985, we have lost half of the world's coral reefs.¹ In 2016 alone, a 400-mile stretch of the Great Barrier Reef was severely damaged by coral bleaching.² Of the 600 fish stocks, or subpopulations, monitored by international research bodies, 31 per cent are currently fished at unsustainable levels, largely due to illegal, unreported or unregulated activities, and 58 per cent are fully exploited.³ After a 49 per cent drop in fish stock populations between 1970 and 2012, a brief period of stability followed. Now, they are falling again.⁴ In short, we are using the ocean's resources faster than ocean ecosystems can replenish them. It is a familiar destructive pattern: once we extract too many resources, weakened ecosystems recover more slowly. When we return for more, less of the resource is available and it is more difficult to extract. So, we put in more effort and cause more damage. Eventually, the resource is exhausted—or extinct.

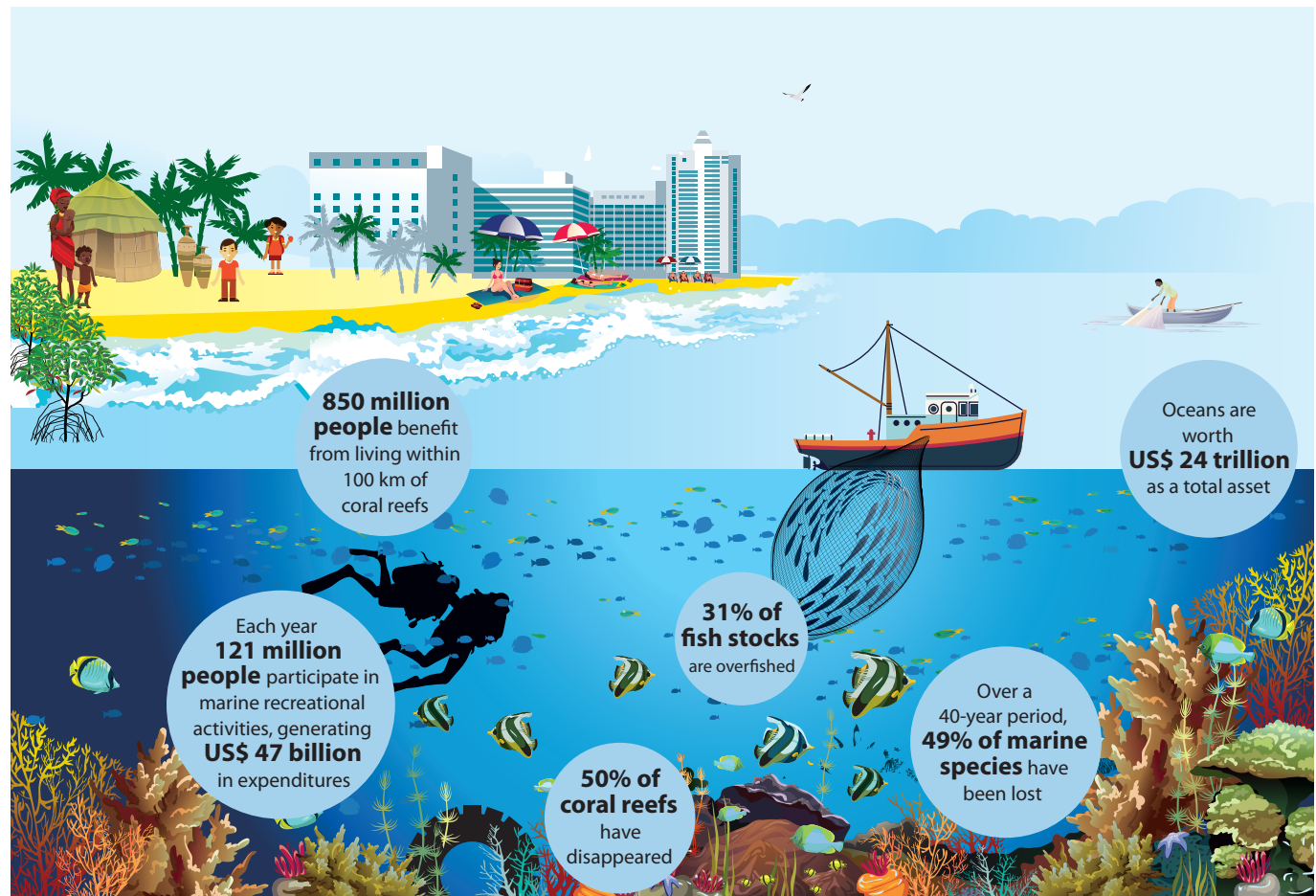


This is a pattern of societal self-harm. Human life depends on the benefits oceans provide for health, well-being and economic growth. Ocean processes sustain the fish that provide the major source of protein for nearly three billion people.³ A study shows that our oceans are worth at least US\$24 trillion.¹ If oceans were a country, they would be equivalent to the seventh largest economy in the world.

Marine protected areas offer one of the best options for maintaining or returning ocean and coastal ecosystems to healthy conditions, particularly when developed as part of

a wider management system.⁵⁻¹⁰ Ecological benefits come from protecting species, habitats and ecosystem functions. Social benefits come from engaging stakeholders in the planning and the fair sharing of benefits. Economic benefits come from ensuring the long-term sustainable use of natural resources and tourism incomes. The combined impact could support many of the 17 Sustainable Development Goals of the 2030 Agenda for Sustainable Development, including reducing poverty, improving food security and tackling impacts of climate change.

Ocean and coastal values at stake



The rise of marine protected areas

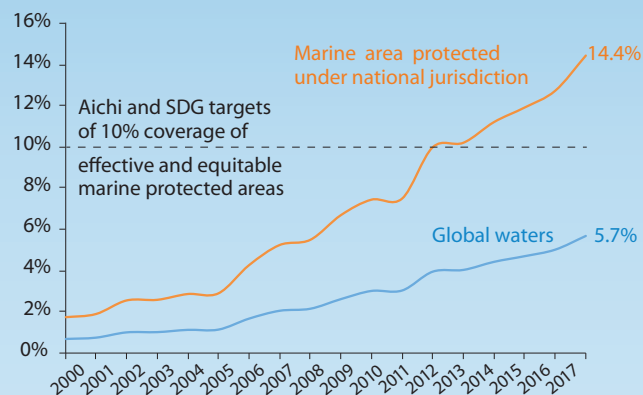
Most countries now agree that we need to protect at least 10 per cent of coastal and marine areas by 2020.¹¹ This is one of the Aichi Biodiversity Targets and is echoed in the 2030 Agenda for Sustainable Development.^{11,12}

Already, there has been a 25 per cent increase in the last 15 years.¹³ By July 2017, 15 292 marine protected areas were designated, covering 5.7 per cent of the global ocean. Estimated 14.4 per cent of coastal and marine areas under national jurisdictions are designated as protected areas.¹³ The latter number suggests that the 2020 target has been achieved for national seas, but the reality is a little more complex. It is complex because the physical area covered is just one part of the commitment. There are growing concerns that designation is not enough and the focus needs to shift to effectiveness.^{14,15} There is some evidence that current governance capacity may not be sufficient to support effectiveness and delivery towards social and economic targets, as well those for biodiversity conservation.¹⁶ Today, 45 of the 15 292 designated zones account for more than 72 per cent of the total protected marine area.¹³ These large areas are important for maintaining secluded and pristine marine ecosystems. However, their size and remoteness also raises questions about the effectiveness of their governance strategies and the limited opportunity to share the benefits.¹⁴ Marine protected areas must provide effective biodiversity conservation and the *equitable* sharing of related costs and benefits. The emphasis should be on both quality and quantity.

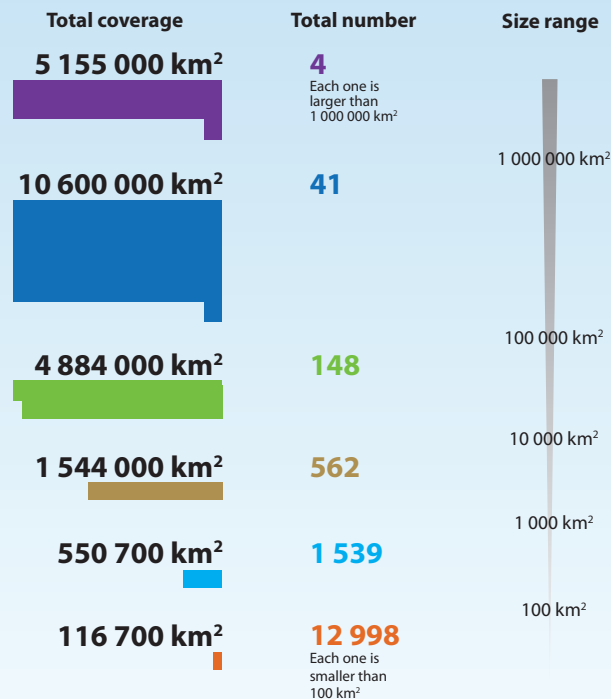
The questions on effectiveness are not limited to very large marine protected areas. A new UN Environment study, "Enabling Effective and Equitable Marine Protected Areas: Guidance on combining governance approaches", has analysed the governance of 34 protected areas in national seas.¹⁶ Just over half were given a medium effectiveness rating, indicating that some human impacts are completely addressed and others partially. The remainder were given a low effectiveness rating, indicating that some impacts are addressed either inadequately or not at all. Additional studies show that about 40 per cent of marine protected areas have major deficiencies, leading to weak and ineffective governance.¹⁷

Recent trend in global coverage of marine protected areas

Coverage



Size distribution



Data as of July 2017

Data source: UN Environment World Conservation Monitoring Centre





Better governance makes marine protected areas more effective

For marine protected areas to be truly effective they need strong governance to influence human behaviour and reduce the impacts on the ecosystem. The approach should be inclusive, promoting a sense of stewardship that demonstrates the social, economic and environmental benefits for user communities.


Because our seas are intricate ecological systems that support complex social and economic systems, maximising the effectiveness of protected areas can be resource intensive. Often challenges include lack of knowledge, political will, community support and financial investment. Too often, marine protected areas are seen as a short-term up-front cost, rather than being embraced as long-term investments with substantial social, economic and environmental benefits. Each MPA has different challenges, but marine resource users are less likely to flout rules and regulations if they are involved in discussions and decision making.

Marine protection debates ask about the best or correct way to improve governance, focusing on three approaches. Each of them has drawbacks: Top-down governance focuses on regulations imposed by governments. This can lack the inclusion of local communities, causing less collaboration. Bottom-up governance focuses on locally agreed restrictions with which people cooperate. This can lack the legal enforcement to restrict incoming users. Market-based governance focuses on economic initiatives producing financial gains, such as giving local communities alternative livelihoods and property rights. This approach can impede conservation objectives by disrupting local cooperation and creating additional environmental damage.

Research on the effectiveness of marine protected areas shows that focusing on a single governance approach creates weaknesses that can compromise conservation intentions. Instead, there should be an integrated approach that combines the roles of national governments, local communities, and market schemes.^{16,18} The relative importance of each role will depend on the behaviour to be addressed and the wider environmental, social, economic and political context.




Aichi Biodiversity Target 11
By 2020, at least 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures and integrated into the wider seascape



Target 14.2
By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration

Target 14.5
By 2020, conserve at least 10 per cent of coastal and marine areas, consistent with national and international law and based on best available scientific information



Video: How to choose marine reserves



Video Link: <https://www.openchannels.org/videos/how-choose-marine-reserves>
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Combining governance approaches in practice

Chumbe Island, Tanzania



Private marine protected area:

- Mainly funded by eco-tourism initiatives
- High staff to tourist ratio to create more jobs, 95% of staff are Tanzanian
- Strong collaboration with Tanzania's Department of Fisheries to enforce penalties, supported by local wardens, fishermen and police

Bluefields Bay, Jamaica



Community-led marine protected area:

- Discussions and decisions involve all relevant local communities
- Aiming for financial independence to support itself and the local community
- Government funds patrols to enforce regulations, which are supported by state laws
- International and local organisations handle financial and operational management, provides skilled resources for training and education

Great Barrier Reef Marine Park, Australia



Multiple-use protected area:

- Close collaboration between federal and state governments
- Zoning system for equitable sharing of benefits from ecosystem services
- Tourism employs over 70,000 people and generates income of AU\$5 billion each year
- Collaboration with indigenous communities to ensure livelihoods, culture and traditions, for example fishing rights are protected

Every protected area is unique, but there are common driving forces that can increase governance challenges. These forces include expanding demands from global fish markets that drive up the levels of commercial fishing; local poverty that drives people to fish for subsistence and basic livelihoods; growing tourism that increases pressure on infrastructure development and recreational access; and economic migration from poorer inland areas to coastal areas seeking opportunities for work or a better standard of living.^{16,18} These forces could undermine conservation objectives. Clearly, defining the objectives during the marine protected area designation process makes it possible to understand the specific requirements for addressing conflicts and supporting the effectiveness of the protected area. A governance framework can support the development and implementation of measures to mitigate specific human behaviours and should include enforcement and financial strategies to

support the overall objectives of the protected area. At the same time, it should allow benefits and costs to be equitably shared, while still protecting biodiversity.

Case studies of marine protected areas demonstrate how combinations of governance approaches can be effective. Australia's Great Barrier Reef Marine Park is an example of a top-down effort, while collaboration with local indigenous communities ensures their livelihoods, cultures and traditions; Tanzania's Chumbe Island Coral Park is a private, ecotourism-focused protected area, while there is strong collaboration with the government to enforce penalties, supported by local wardens, fishermen and police; and Jamaica's Bluefields Bay is a community-led conservation area, but the government funds patrols to enforce regulations supported by state laws. Each of these efforts has adopted techniques from various approaches to adapt to local needs and conditions.^{16,18}

Governance of marine protected areas

Marine protected areas are most effective when they use a combination of governance approaches ...

Top-down governance

Government involvement is needed for laws and regulations to protect biodiversity and natural resources against destruction and degradation from users

Bottom-up governance

Involvement of local communities in decisions, and utilizing local knowledge is key to success. It promotes local ownership, responsibility and empowerment

Market-based governance

Markets are important for economic incentives, alternative compatible livelihoods and financial sustainability. Attaching economic value to biodiversity helps promote balanced decisions.

What is a marine protected area?

Marine protected areas exist in a variety of forms. Definitions and classifications may differ, but typically they are designated to protect or manage marine and coastal biodiversity, ecosystems and/or resources. They are used in both coastal areas and open oceans across tropical, temperate and polar regions. They may be administered under different levels of regulations, protection and management approaches.

... to address conflicts and reduce impact of activities, and

... to ensure equitable sharing of costs and benefits



Law enforcement



Management and legislation

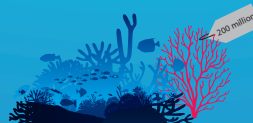


Research and monitoring

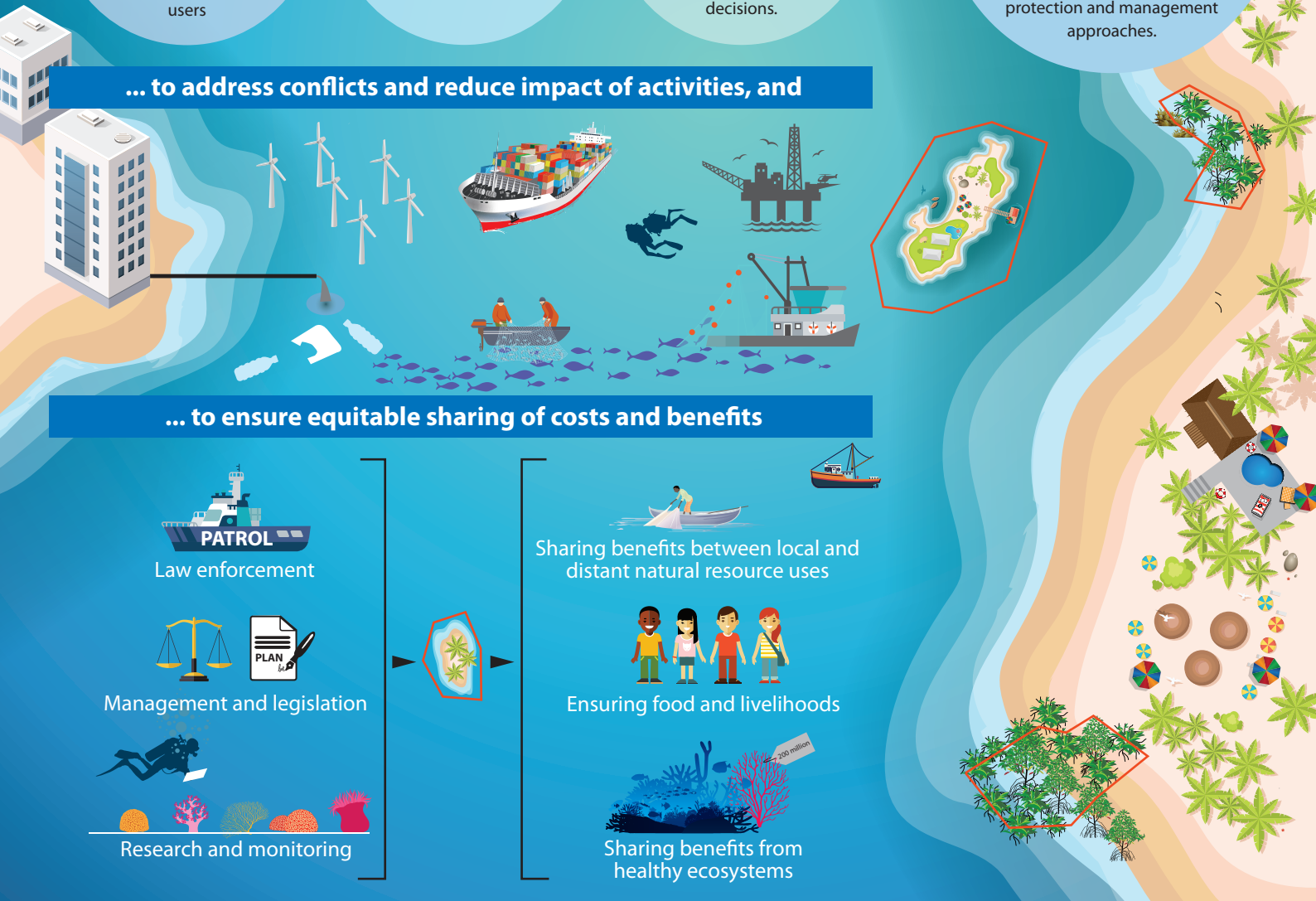
Sharing benefits between local and distant natural resource uses



Ensuring food and livelihoods



Sharing benefits from healthy ecosystems



The future: using protected areas for sustainable development

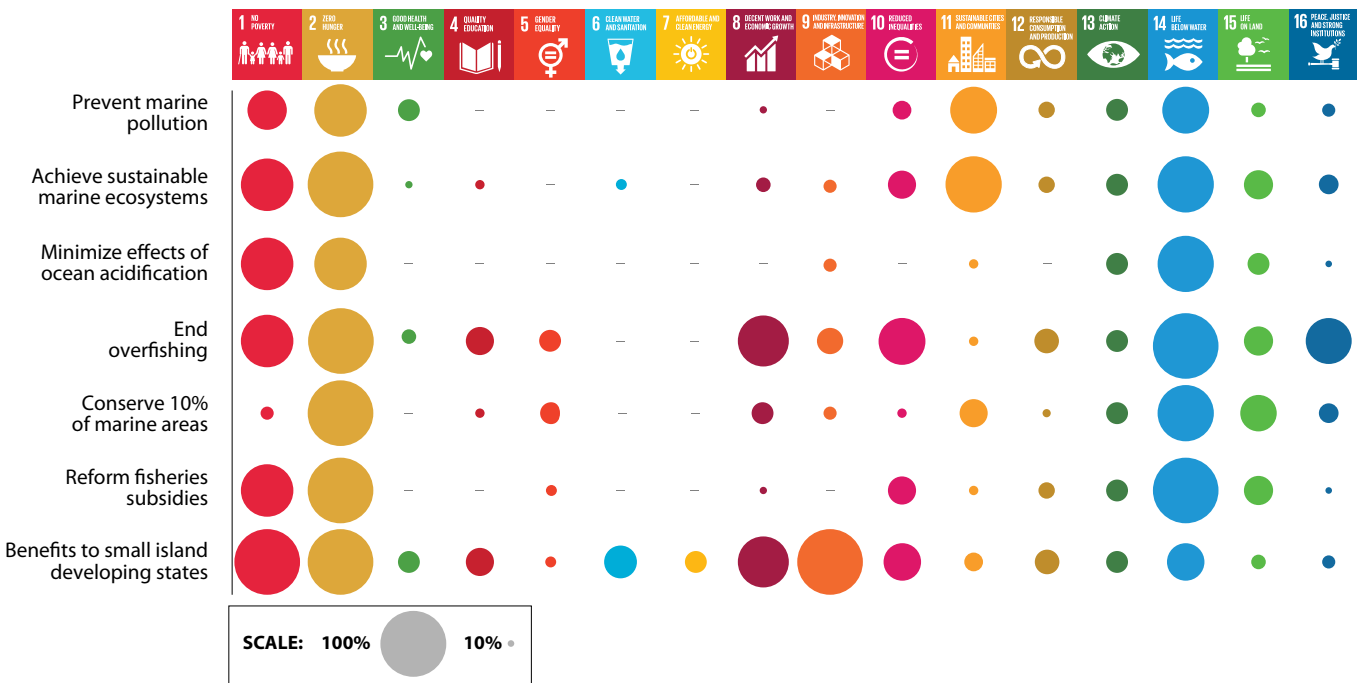
The opportunities created by marine protection are as vast as the ocean. However, a perception shift is required to focus on the quality as well as quantity of protected areas, and to recognise the benefits as well as the costs. Economic and social benefits can comfortably co-exist with marine protection, if governed with a full understanding of the surrounding environment.

An economic scenario estimates that a network of protected areas covering 10–30 per cent of our oceans could cost US\$45–228 billion per year, but could deliver astonishing social and economic gains through the provision of ecosystem service benefits (for coastal protection, fisheries, tourism, recreation and carbon storage) of US\$622–1 145 billion over the period 2015–2050.¹⁹ Such benefits could be between

3 and 20 times greater than the costs. That could also mean more productive and sustainable fisheries and a reduction in the decline in global fish stocks. There would be a growth in tourism and other economic opportunities. For example, studies suggest that increased biodiversity from a protected area can attract up to 36 times more revenue from tourism than from fishing.²¹ In addition, cost-benefit analysis suggests there are economies of scale to be achieved from increasing the size of marine protected areas in relation to establishment and operational costs.¹⁹

However, as with broader marine governance, there is no single solution. Each scenario must be individually considered. As noted earlier, there are indications that larger marine protected areas can have lower levels of management and effectiveness.^{15,17,18} Diminishing returns have also been suggested as scale increases, but this depends on the volume of biodiversity in each area.¹⁹ Each site would require

Co-benefits of achieving targets for Sustainable Development Goal 14: Life below water



Source: Adapted from Singh et al. (2017)²²



a cost-benefit analysis to understand the social, economic and environmental implications. They would all have to demonstrate their effectiveness at reducing impact on marine resources and ecosystems, while increasing the equitable sharing of benefits.

In 2016, the Rome Call to Action and the related Scientists' Consensus Statement set out a road map to promote effective and equitable marine protected area with clear targets and actions.^{23,24} The United Nations Oceans Conference, June 2017, built on this, recognising the need to combine biodiversity conservation and sustainable use, with a clear role for people and the equitable sharing of costs and benefits.²⁵

Efforts to ensure healthy oceans and coasts may present a good return on investment in terms of delivering wider sustainable development. A recent study highlights many co-benefits from achieving the different targets under Sustainable Development Goal 14 on oceans towards the attainment of the overall 2030 Agenda for Sustainable Development.²²

This is the important opportunity to strengthen our efforts to safeguard the health of our oceans and thereby continue to benefit from them. It is more vital than ever for countries to look beyond achieving maximum coverage targets for marine protected areas, to be able to use them to achieve sustainable development.



Video: Fisheries Economics & Policy: Marine protected areas



Video Lnk: www.youtube.com/watch?v=n6_JLZnQe6Y
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References

- Hoegh-Guldberg, O. *et al.* (2015). Reviving the Ocean Economy: the case for action – 2015. WWF International, Gland. <https://www.worldwildlife.org/publications/reviving-the-oceans-economy-the-case-for-action-2015>
- Coralcoe (2017). Life and death after Great Barrier Reef bleaching. ARC Centre of Excellence for Coral Reef Studies website. <https://www.coralcoe.org.au/media-releases/life-and-death-after-great-barrier-reef-bleaching>
- FAO (2016). *The State of World Fisheries and Aquaculture 2016: Contributing to food security and nutrition for all*. The Food and Agriculture Organization of the United Nations, Rome. <http://www.fao.org/3/a-i5555e.pdf>
- WWF (2015). *Living Blue Planet Report: Species, habitats and human well-being*. WWF International, Gland. <https://www.worldwildlife.org/publications/living-blue-planet-report-2015>
- Ballantine, W.J. and Langlois, T.J. (2008). Marine reserves: the need for systems. *Hydrobiologia*, 606, 35–44. https://link.springer.com/chapter/10.1007%2F978-1-4020-8808-7_3
- Guidetti, P. (2006). Marine reserves reestablish lost predatory interactions and cause community changes in rocky reefs. *Ecological Applications*, 16, 963–976. [http://onlinelibrary.wiley.com/doi/10.1890/1051-0761\(2006\)016%5B0963:MRRLPI%5D2.0.CO;2/epdf](http://onlinelibrary.wiley.com/doi/10.1890/1051-0761(2006)016%5B0963:MRRLPI%5D2.0.CO;2/epdf)
- Leleu, K., Remy-Zephir, B., Grace, R. and Costello, M.J. (2012). Mapping habitats in a marine reserve showed how a 30-year trophic cascade altered ecosystem structure. *Biological Conservation*, 155, 193–201. <http://www.sciencedirect.com/science/article/pii/S0006320712002443>
- Moland, E., Olsen, E.M., Knutsen, H., Garrigou, P., Espeland, S.H., Kleiven, A.R., Andre, C. and Knutsen, J.A. (2013). Lobster and cod benefit from small-scale northern marine protected areas: inference from an empirical before-after control-impact study. *Proceedings of the Royal Society B: Biological Sciences*, 280, 20122679. <http://rspb.royalsocietypublishing.org/content/280/1754/20122679.full.pdf>
- Mumby, P.J. and Harborne, A.R. (2010). Marine reserves enhance the recovery of corals on Caribbean reefs. *PLoS One*, 5, e8657. <http://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0008657&type=printable>
- Pita, C., Pierce, G.J., Theodossiou, I. and Macpherson, K. (2011). An overview of commercial fishers' attitudes towards marine protected areas. *Hydrobiologia*, 670, 289–306. <https://link.springer.com/content/pdf/10.1007%2Fs10750-011-0665-9.pdf>
- CBD (2017). Aichi Biodiversity Targets website. Convention on Biological Diversity, Montreal. <https://www.cbd.int/sp/targets/>
- United Nations (2017). Sustainable Development Goal 14 website. Sustainable Development Knowledge Platform. United Nations, New York. <https://sustainabledevelopment.un.org/sdg14>
- UNEP-WCMC (2017). The World Database on Protected Areas dataset. United Nations Environment Programme – World Conservation Monitoring Centre, Cambridge. <http://www.wdpa.org/>
- Jones P.J.S. and De Santo, E.M. (2016). Viewpoint – Is the race for remote, very large marine protected areas (VLMPPAs) taking us down the wrong track? *Marine Policy*, 73, 231–234. <http://www.sciencedirect.com/science/article/pii/S0308597X1630481X?via%3Dihub>
- Watson, J.E.M., Dudley, N., Segan, D.B. and Hockings, M. (2014). The performance and potential of protected areas. *Nature*, 515, 67–73. <https://www.nature.com/nature/journal/v515/n7525/pdf/nature13947.pdf>
- UNEP (2017). Enabling effective and equitable marine protected areas: guidance on combining governance approaches. United Nations Environment, Nairobi.
- Leverington, F., Costa, K.L., Pavese, H., Lisle, A. and Hockings, M. (2010). A Global Analysis of Protected Area Management Effectiveness. *Environmental Management*, 46(5), 685–698. <https://link.springer.com/content/pdf/10.1007%2Fs00267-010-9564-5.pdf>
- Jones, P.J.S. (2014). *Governing Marine Protected Areas: Resilience through diversity*. Routledge, London.
- der, L., Baulcomb, C., van der Lelij, J.A.C., Eppink, F., McVittie, A., Nijsten, L. and van Beukering, P. (2015). The benefits to people of expanding Marine Protected Areas. IVM Institute for Environmental Studies Report R-15/05. http://assets.wfn.nl/downloads/mpa_rapport_volledig.pdf
- Balmford, A., Gravestock, P., Hockley, N., McClean, C.J. and Roberts, C.M. (2004). The worldwide costs of marine protected areas. *Proceedings of the National Academy of Sciences of the United States of America*, 101(26), 9694–9697. <http://www.pnas.org/content/101/26/9694.full.pdf>
- Sala E., Costello, C., Parme, J.D.B. and Sumaila, R.U. (2016). Fish Banks: An economic model to scale marine conservation. *Marine Policy*, 73, 154–161. https://www.researchgate.net/publication/306420445_Fish_banks_An_economic_model_to_scale_marine_conservation
- The 10x20 Initiative (2016). *Rome Call to Action*. Conference on Marine Protected Areas: An Urgent Imperative A Dialogue Between Scientists and Policymakers, Ministry of Foreign Affairs and International Cooperation, Rome, 7–9 March 2016. http://www.italyun.esteri.it/rappresentanza_onu/resource/resource/2016/03/rome_conference_cta_final.pdf
- The 10x20 Initiative (2016). *Scientists' Consensus Statement on Marine Protected Areas (MPAs): Characteristics, Governance, and Sustainable Financing*. Conference on Marine Protected Areas: An Urgent Imperative A Dialogue Between Scientists and Policymakers, Ministry of Foreign Affairs and International Cooperation, Rome, 7–9 March 2016. http://www.italyun.esteri.it/rappresentanza_onu/resource/resource/2016/03/scientists_consensus_statement_on_marine_protected_areas.pdf



24. United Nations (2017). Report of the United Nations Conference to Support the Implementation of Sustainable Development Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable Development. A/CONF.230/14. United Nations, New York. https://sustainabledevelopment.un.org/content/documents/15662FINAL_15_June_2017_Report_Goal_14.pdf
25. Singh, G., Cisneros-Montemayor, A., Cheung, W. and Ota, Y. (2017). *Oceans and the Sustainable Development Goals: Co-benefits, Climate Change & Social Equity*. The Nippon Foundation and University of British Columbia Nereus Program, Vancouver. <http://www.nereusprogram.org/wp-content/uploads/2017/05/SDG-Report-2017-online-version-compressed.pdf>
26. Burke, L., Reyta, K., Spalding, M. and Perry, A. (2011). *Reefs At Risk Revisited*. World Resources Institute, Washington DC. <http://www.wri.org/publication/reefs-risk-revisited>
27. Cisneros-Montemayor, A.M. and Sumaila, U.R. (2010). A global estimate of benefits from ecosystembased marine recreation: Potential impacts and implications for management. *Journal of Bioeconomics*, 12, 245-268. https://www.researchgate.net/publication/227346912_A_global_estimate_of_benefits_from_ecosystem-based_marine_recreation_Potential_impacts_and_implications_for_management
28. Nordlund, L.M., Kloiber, U., Carter, E. and Riedmiller, S. (2013). Chumbe Island Coral Park governance analysis. *Marine Policy*, 41, 110-117. <http://dx.doi.org/10.1016/j.marpol.2012.12.018>
29. Thorpe, C. (2011). Governance analysis of Bluefields Bay Special Fisheries Conservation Area, Jamaica. MSc Thesis, University College London. <https://www.ucl.ac.uk/mpag/docs/Bluefields.pdf>

Graphic references

