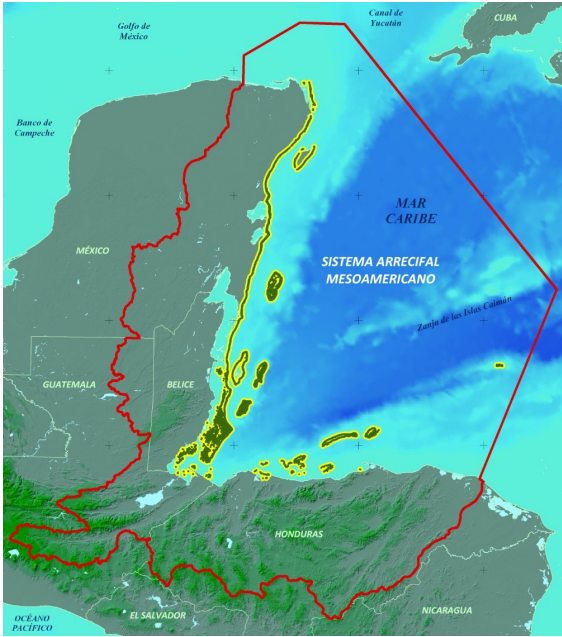


Economic Valuation *of the*
Ecosystem Services
of the Mesoamerican Reef



The Mesoamerican Reef (MAR) is a high-value natural asset. Stretching over 1,000 kilometres along the coast of Mexico, Belize, Guatemala, and Honduras, the MAR ecology, and the reef ecosystem's health and resilience, provides a foundation for sustainable development in the MAR region.



A healthy Mesoamerican Reef delivers annual economic benefits of more than USD 4.5 billion, securing resilient and sustainable lives and livelihoods for millions of people.



The bar chart above shows the annual economic value of the ecosystem services that the MAR provides to the economy, in USD billions. This represents the size of the regional reef-related economy, showing the annual reef-derived economic value attributed to the MAR in the **tourism** and **fishing** sectors. It also depicts the yearly flood damage costs that are avoided due to the **coastal protection** the barrier reef provides.

How much are people willing to pay annually for reef conservation (USD)?

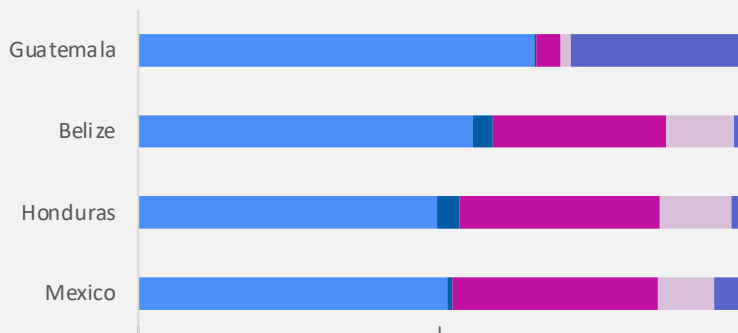
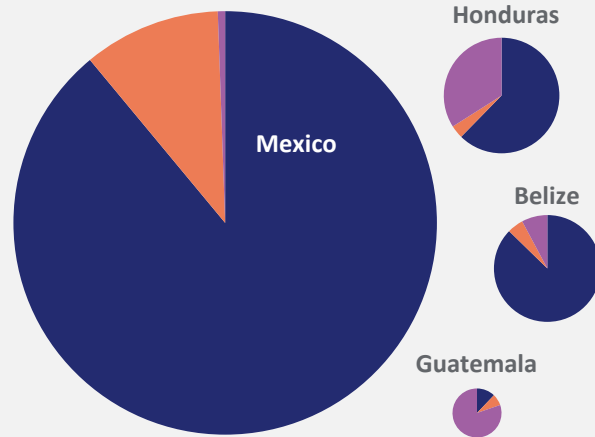
Additional to its "use value," the intrinsic, global environmental value of the MAR—which is the home to a mosaic of distinctive coral types and endangered and charismatic species—is internationally recognized. The conservation of the MAR is therefore supported by national and international biodiversity financing; additional to this public funding, individuals are increasingly willing to contribute to the protection of the global environment. Individuals' "willingness to pay" (WTP) for reef conservation was evaluated, giving another measure of the economic value of the MAR. Results of surveys in eight countries indicate the amount that people in the MAR region, as well as international "non-users" of the MAR, are willing to pay per year, per person:



Distribution of the MAR's economic value

The pie charts below show the relative economic value that the MAR provides to the MAR country economies, by sector. For example, the relative areas of the “Mexico” circle and the “Guatemala” circle show that the Mexican reef-related economy is estimated to be close to 75 times the size of the Guatemalan reef-related economy, while the reef-related economies of Honduras and Belize are of similar sizes (together, accounting for 12% of the total regional reef-related economy). In each pie chart, the blue represents the proportion of economic value that the MAR generates in the **tourism** sector, purple shows its **fishing**-related economic value, and orange demonstrates the proportion of reef-related economic value that accrues in the form of **avoided costs of flood damages**.

Honduras appears to have the most diversified sectoral beneficiaries of the MAR's ecosystem services, while reef-related **tourism** dominates in Mexico and Belize, reflecting the relative importance of the tourism sector in these countries. Guatemala is the only MAR country whose **fishing** sector receives the largest proportion of its reef-related value, likely reflecting the geography of its Caribbean coastline and structure of its local economy.



% of the MAR's economic benefits realized by:

■ Owners ■ Employees ■ Customers ■ Government ■ Non-users

The bar chart to the left shows **who benefits** from the ecosystem services of the MAR, in terms of the distribution of benefits across property and business owners, workers employed in reef-related businesses, customers enjoying reef-related hotel and recreational services, government collecting reef-related tax revenues, and people who do not depend directly on the MAR for their livelihoods (“non-users”).

Note that data on the “reef-related economy” in the MAR countries is presented for the MAR-adjacent State of Quintana Roo in Mexico, Department of Izabal in Guatemala, Atlántida, Colón, Cortés, Gracias a Dios, and Islas de la Bahía in Honduras, and at the country-level in Belize.

Regional economic valuation: Methodology

The bar chart below represents the economic value (in USD billions) attributed to the the ecosystem services of the MAR, in terms of reef-related tourism, fishing, and coastal protection.



This document presents the results of the study: *Economic Valuation of the Ecosystem Services of the Mesoamerican Reef, and the Allocation and Distribution of these Values*

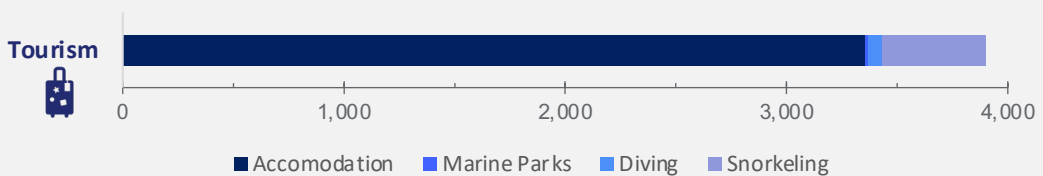
What role does the Mesoamerican Reef play in the regional economy?

From fisherfolk dependent on a reliable catch to attractive seascapes providing opportunities for tourism and recreational businesses, reef ecosystem services are the cornerstone of a myriad of livelihoods. The MAR supports business revenues, household incomes, food security, and foreign exchange earnings in the **tourism** and **fishing** sectors. It also acts as natural infrastructure, providing **coastal protection** to millions of people.

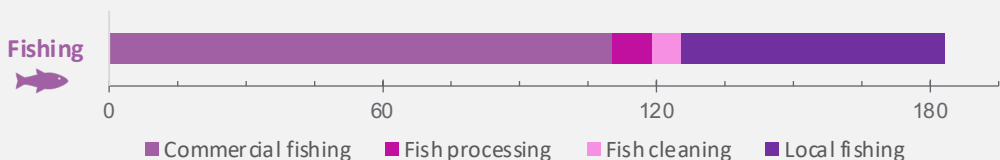
How important is the reef-related economy in the MAR region?

The bar charts below show the size of the reef-related economy in the MAR region, by sector and specific economic activity (in USD millions).

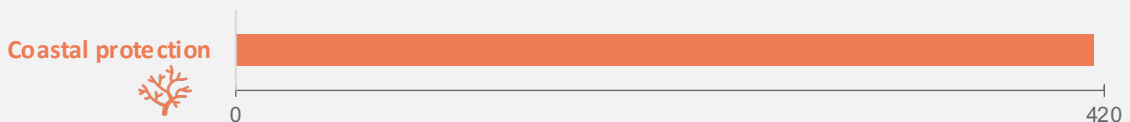
Note the indirect economic impacts of reef-related tourism activities have been incorporated into the valuation of each reef-related tourism activity, and the indirect economic impacts of reef-related commercial fishing has been incorporated into commercial fishing.



Tourism is the most significant economic sector in the MAR Region, and the MAR attracts millions of visitors every year. In addition to visiting the coralline beaches, tourists choose the MAR Region because of the underwater biodiversity, as evidenced by expenditure on diving, snorkeling, and marine park user fees.



Healthy reef ecosystems are crucial for productive fisheries. While the economic value of the reef-related fishing sector may be relatively small, local artisanal fishing is one of the most important productive activities—a source of income and food security—for small MAR communities. Significantly, fishing is not only a livelihood, but also a cultural tradition.



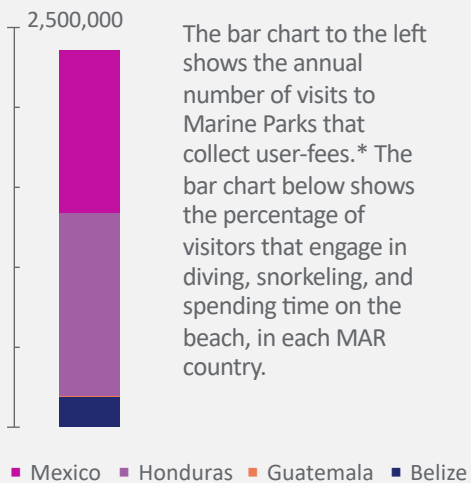
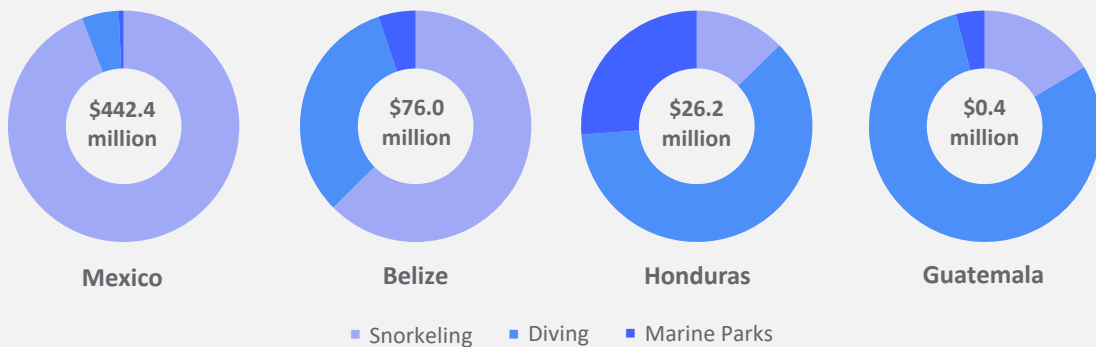
The MAR is a nature-based solution to the physical and economic impacts of climate change, protecting coastal property and infrastructure against ocean-related risk. Further to the coastal protection value captured by this study—in terms of avoided costs of coastal flood damages attributed to the MAR—the MAR protects against additional hazards, such as sea level rise and beach erosion.

How does the MAR support the tourism sector?

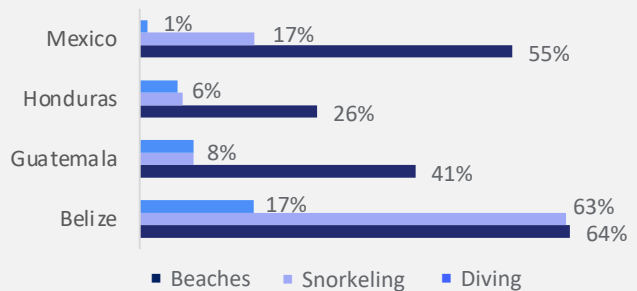
The MAR is a phenomenal asset to the tourism sector, attracting visitors from around the world to enjoy the surf, sand, and underwater biodiversity. Reef-related tourism accounts for 23% of tourism expenditure in Quintana Roo, and 21% in Belize. MAR-related tourism is also critical for Roatan and the Bay Islands of Honduras; for example, Islas de la Bahía Marine National Park had over 1 million visits in 2017. Reef-related accommodation accounts for 75% of the economic value that the MAR provides in the regional tourism sector, with significant benefits to hotels; the other 25% comes from directly reef-related recreational activities.

Reef-related recreation

The doughnut charts below show the relative economic importance of visiting marine parks, diving, and snorkeling in the MAR countries, with the absolute economic value of reef-related recreational activities, by country, provided in the center of each doughnut.



While snorkeling is the most remunerative activity in Belize and Honduras, diving provides the most economic value in Guatemala and Honduras. Honduras is the only MAR country in which Marine Parks are more economically productive than snorkeling.

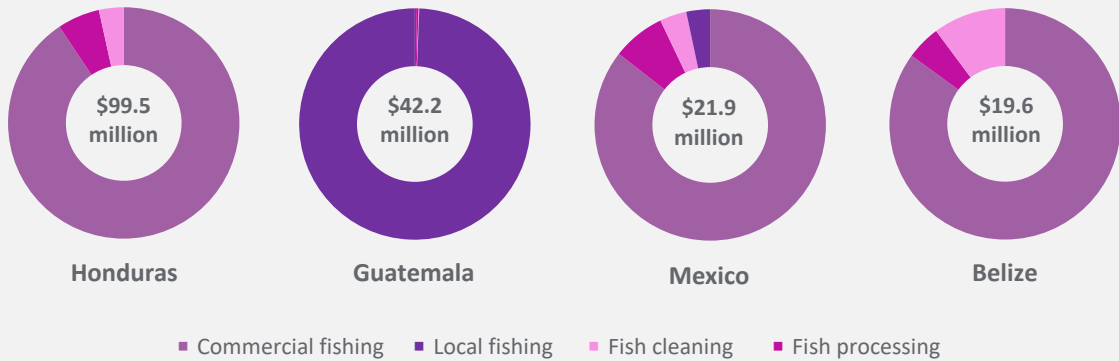


*Port Honduras, Laughing Bird Caye, Glovers Reef, and Hol Chan in Belize; Punta de Manabique in Guatemala; Monumento Natural Marino Cayos Cochinos, Parque Nacional Blanca Jeannette Kawas (Punta Sal), Parque Nacional Punta Izopo, and Parque Nacional Marino Islas de la Bahía in Honduras; and Parque nacional Costa Occidental de Isla Mujeres, Punta Cancún y Punta Nizuc, Arrecifes de Cozumel Banco Chinchorro, Arrecifes de Puerto Morelos, Arrecifes de Sian Ka'an, Caribe Mexicano, and Arrecifes de Xcalak in Mexico.

How does the MAR support fishing livelihoods?

Fish provides an important source of protein and food security in the MAR Region, and there are tens of thousands of fishers who rely on reef-associated species for their livelihoods.

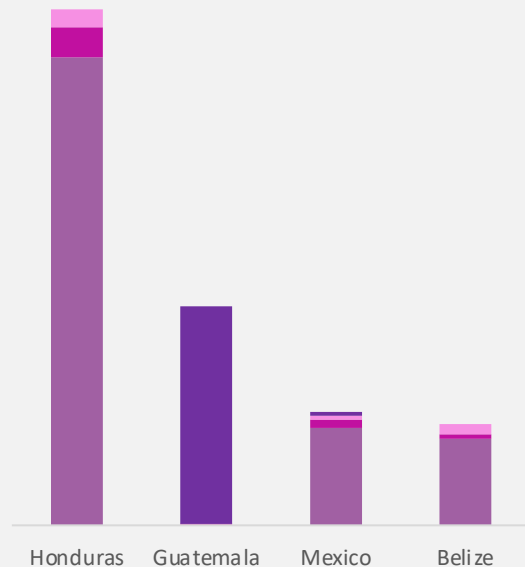
The doughnut charts below show the relative economic importance of commercial fishing, local fishing, fish cleaning, and fish processing in the MAR countries, with the absolute economic value of reef-related fishing activities, by country, provided in the center of each doughnut.



While commercial fishing is the most remunerative activity in Belize, Mexico, and Honduras, local fishing—i.e., fish production for local sale, consumption, and enjoyment, which is not captured by official government statistics—provides the most economic value in Guatemala. Note that that local fishing is not quantified for either Belize or Honduras, as data was unavailable.

The bar chart to the right displays the absolute values of reef-related fishing activities in the MAR countries.

There are many artisanal fishers across each of the MAR Countries, who depend on the MAR’s ecological role underpinning productive fisheries. For example, while the aggregate size of the entire reef-related economy is relatively small in Guatemala, fishing in Punta de Manabique is often the only economic activity and source of income for the small communities living nearby. In Belize and Mexico, the MAR also supports high-value sport fishing. Additionally, industrial fishing takes place on the Bay Islands, La Ceiba, and Cuaquira in Honduras, explaining the relatively high reef-related commercial fishing value.



*Note that commercial fishing includes direct and indirect economic impacts.

MAR Country valuations

The bar charts below give a comparative view of the reef-related economy in each of the MAR countries, displaying the economic value the MAR provides by sector and specific economic activity (in USD millions).

Variations across countries are reflective of distinct characteristics of the coastal economies. The distribution of economic value from MAR ecosystem services suggests strategies for engagement with reef-dependent actors to participate in strengthening reef resilience, as well as potential opportunities for sustainable development.

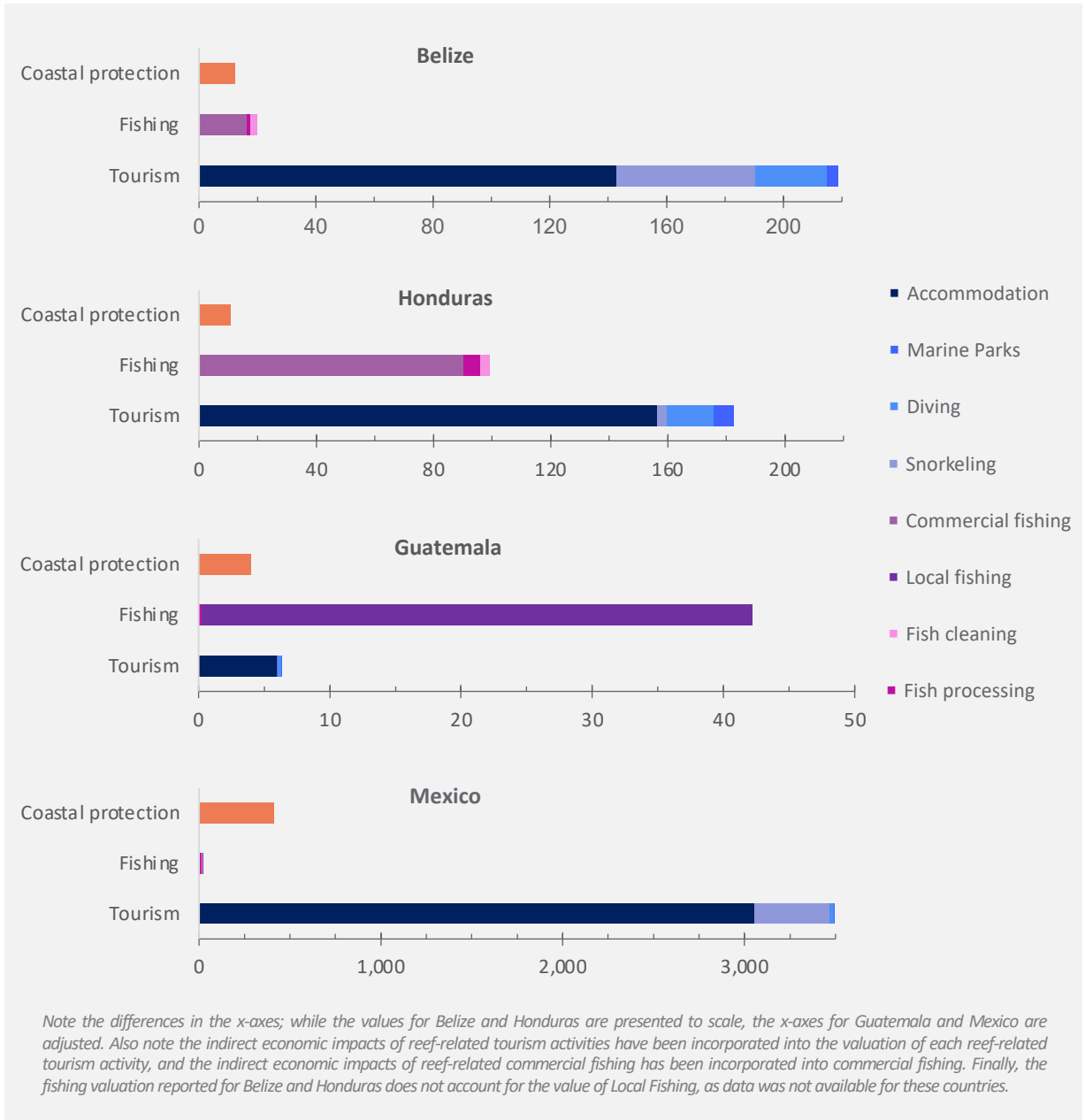




Photo: Fundación Albatros

Summary text and analysis prepared by
Jacqueline Wharton, Ecosystem Resilience Specialist

Acknowledgments

This document was produced through the project Reef Resilience and Risk Financing in the Greater Caribbean, carried out by MAR Fund in partnership with Willis Towers Watson.

This project was supported by the Ocean Risk and Resilience Action Alliance (ORRAA) and was funded with UK aid from the UK government.

