ADB ASIAN DEVELOPMENT BANK

# Regional: Marine Aquaculture, Reefs, Renewable Energy, & Ecotourism for Ecosystem Services

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| Project Name | Marine Aquaculture, Reefs, Renewable Energy, & Ecotourism for Ecosystem Services |
| Project Number | 54137-001 |
| Country | Regional |
| Project Status | Proposed |
| Project Type / Modality of Assistance | Technical Assistance |
| Source of Funding / Amount | |
| Strategic Agendas | Environmentally sustainable growth<br>Inclusive economic growth<br>Regional integration |
| Drivers of Change | Governance and capacity development<br>Knowledge solutions<br>Partnerships<br>Private sector development |
| Sector / Subsector | Energy - Energy efficiency and conservation - Renewable energy generation - biomass and waste - Renewable energy generation - small hydro - Renewable energy generation - solar |
| Gender Equity and Mainstreaming | Some gender elements |
| Description | The proposed knowledge and support technical assistance (TA) will facilitate future investment in sustainable ocean economy development through two main activities: (i) assessment of marine resource commercialization prospects (including energy, seafood, and tourism) and identification of investment projects in selected developing member countries (DMCs); and (ii) review and recommendations on policy and regulatory frameworks to facilitate large-scale investment and on mechanisms to accelerate financing of selected projects.<br>This TA is aligned with the Asian Development Bank (ADB) Strategy 2030, specifically operational plan for priority 3 under healthy oceans . The proposed TA is directly aligned with Sustainable Development Goals (SDGs) 7 for affordable and clean energy, and is indirectly aligned with other SDGs, notably SDG 14 for life below water. The TA is also aligned with the ADB Action Plan for Healthy Ocean and Sustainable Blue Economy and targets DMCs with extensive large coastlines (_Littoral States_) and exclusive economic zones (EEZs). This TA is included in the 2020 Management approved results-based work plan of the Sustainable Development and Climate Change Department. |
| Project Rationale and Linkage to Country/Regional Strategy | The ocean economy today is dominated by energy production, fishing, shipping, and tourism. These activities are based on the _linear economy_ and are inherently unsustainable: ocean energy production is mainly crude oil and natural gas, marine fisheries are in effect a form of strip mining, ships run on petroleum fuels, and tourism can overwhelm the ecosystems of popular destinations. By necessity, the ocean economy of the future will be based on renewable energy production and utilization, regenerative marine aquaculture, low-emissions shipping, and ecotourism, all of which are implemented in a manner that preserves, regenerates, and enhances marine ecosystem services. In this context, archipelagic and island states (_big ocean states_) have potential comparative and competitive advantages in creating sustainable energy and food supply chains that in turn support cleaner shipping and ecotourism.<br>The oceans contain enough renewable energy to power our civilization however these resources are largely untapped due to the distances between resources and demand centers. Offshore wind, marine floating solar, in-stream tidal conversion, and ocean biomass can all be deployed at gigawatt scale. Marine solar and offshore wind are increasingly cost-competitive with fossil-based electricity generation and, in some locations, these are producing surplus energy which is being converted to hydrogen and oxygen using electrolysis of water. Rapid cost declines and deployment of these technologies can be expected in the next five years due to manufacturing economies of scale, technology efficiency increases, factory-based mass production of key components, and plug-and-play architecture. The challenge is to develop regenerative energy infrastructure to convert new energy generation into discrete transportable fuels or other tradable commodities such as ammonia, hydrogen, and methanol, some of which could be used as fuels for cleaner marine transport. Cultivated reefs and sustainable seafood production can be co-located with marine energy production facilities with mutually beneficial ecosystem benefits and become new tourism destinations.<br>Most marine seafood production in DMCs is currently unsustainable due to overfishing and illegal fishing, but this industry can be transformed if governments provide policy leadership. The potential output from advanced marine aquaculture has been estimated at more than 100 times current global seafood consumption. Seagrass cultivation and other marine permaculture can mitigate the local effects of acidification on shellfish and corals. Oceanic organisms from seagrasses to plankton add up to only 0.05% of earth's plant biomass but they cycle through about the same amount of carbon every day as all terrestrial plants. Seagrass and mangroves can sequester carbon up to 35 times faster than terrestrial forests, presenting a possible _blue carbon_ finance opportunity.<br>Tourism is a major contributor to today's ocean economy, but like other economic development is rarely controlled or regulated based on ecosystem services limits. Overdevelopment at popular destinations can easily overwhelm local infrastructure for water supply, wastewater and solid waste management, resulting in uncontrolled stress on local ecosystems (especially coral reefs and mangroves). As the coronavirus disease (COVID-19) pandemic has dramatically reduced mass tourism, there are opportunities for _new normal_ redevelopment of tourism, integrated with renewable marine energy, regenerative marine aquaculture, and cleaner transport.<br>The proposed TA will facilitate an integrated development approach combining marine aquaculture, reefs, renewable energy, and ecotourism for ecosystem services (MARES), with initial emphasis on renewable energy production for value added economic activities. This TA will explore new pathways to reduce and replace fossil fuel use while responding to the challenges posed by ocean acidification, a major problem associated with greenhouse gas pollution. For example, the use of marine-based renewable energy to make _green_ hydrogen, can be implemented with minor modification of existing business models for offshore oil and gas production, offshore wind power, and traditional development of liquified natural gas export projects. The key challenge in demonstrating scalable green hydrogen supply chains is to secure advanced market commitments whereby energy consumers contract for long-term purchase of hydrogen. DMCs can reach the _tipping points_ for rapid supply chain development by creating policies, regulations, and physical space in EEZs for the gigawatt-scale investment required, most of which will need to be via private sector with commercial financing. DMCs need support to develop the cross sectoral institutional awareness. Project structuring and de-risking not unlike that used in the Cambodian Solar Park Project will be applied as appropriate. |
| Impact | Marine Food Security and Supply Chain Efficiency enhanced |
| Outcome | Private sector action to promote regenerative marine business sector mobilized |

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| Outputs | Healthy ocean investments supported<br>Knowledge, regional cooperation, and financing for innovation in healthy oceans improved |
| Geographical Location | Regional |

| Summary of Environmental and Social Aspects |
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| Environmental Aspects |
| Involuntary Resettlement |
| Indigenous Peoples |
| Stakeholder Communication, Participation, and Consultation |
| During Project Design |
| During Project Implementation |

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| Responsible ADB Officer | Peters, Stephen S. |
| Responsible ADB Department | Sustainable Development and Climate Change Department |
| Responsible ADB Division | SDSC-ENE |
| Executing Agencies | Asian Development Bank<br>6 ADB Avenue,<br>Mandaluyong City 1550, Philippines |

| Timetable | |
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| Concept Clearance | 05 Feb 2022 |
| Fact Finding | 18 Mar 2020 to 18 Mar 2020 |
| MRM | - |
| Approval | - |
| Last Review Mission | - |
| Last PDS Update | 21 Oct 2020 |

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| Date Generated | 23 October 2020 |