

**Islamic Republic of Iran
Department of Environment**

**The Project on Development and
Implementation of a Master Plan for
Environmental Conservation and
Management of Southern Coastal Areas of
the I.R. Iran (Case Study Hormozgan)**

Final Report (Summary)

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Japan International Cooperation Agency (JICA)

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List of abbreviations

Abbreviation	English
CEQG	Canadian Environmental Quality Guidelines
CBD	Convention on Biological Diversity
C/P	Counterpart
DOE	Department of Environment
EIA	Environmental Impact Assessment
EBSA	Ecologically or Biologically Significant Areas
GIS	Geographic Information System
HAB	Harmful Algae Bloom
HQ	Headquarter
IUCN	International Union for Conservation of Nature
IEA	Important Ecosystem Area
ILUPEC	Infrastructure, Land Use Planning and Environment Committee
JCC	Joint Coordination Committee
JICA	Japan International Cooperation Agency
M/P	Master Plan
NDP	National Development Plan
NGO	Non-governmental organization
NOSCP	National Oil Spill Contingency Plan
PBO	Planning and Budget Organization
PDC	Planning and Development Council
PMO	Port and Maritime Organization
PMU	Project Management Unit
ROPME	Regional Organization for the Protection of Marine Environment
SEA	Strategic Environmental Assessment
WG	Working Group
WGC	Working Group Committee

1. BACKGROUND

1.1 Background of the Project

The Persian Gulf and Gulf of Oman, located in the southern coast of Iran is an area renowned for oil and gas industries, but it is also an area with important natural ecosystems such as mangroves, tidal flats, coral reefs and seagrass beds, which are the habitats of various marine life and birds. However, the coastal environment has been affected by anthropogenic activities leading for example to marine pollution, increase in water temperature and salinity, red tide, mass mortality of marine life, biodiversity decline and habitat destruction.

Under such circumstances, the Government of the I.R. Iran requested the Japanese Government to provide technical assistance for the development of a master plan for coastal conservation and management of the southern coastal area of Iran. After a series of discussions between Japan International Cooperation Agency (JICA) and Department of Environment (DOE) and relevant organizations, both parties agreed through signing of Record of Discussion (R/D) in March 2017 to implement the project titled “The Project on Development and Implementation of Master Plan for Environmental Conservation and Management of Southern Coastal Area of the I.R. Iran (Case Study Hormozgan) (hereinafter referred to as “the Project”)”.

1.2 Goals and outputs of the Project

The main goals to be attained upon the completion of the Project are as follows:

- To develop a mechanism for the formulation and implementation of the Master Plan for Environmental Conservation and Management of Southern Coastal Areas of the I.R. Iran (hereinafter referred to as “M/P”).
- To enhance the capacity of DOE and other stakeholders required for the formulation and implementation of the M/P.

These goals are expected to be achieved through attaining the following Project outputs:

- Output 1: Development of a mechanism for stakeholder involvement in formulation and implementation of the M/P.
- Output 2: Formulation of the M/P including its implementation plan and monitoring and evaluation plans.
- Output 3: Sharing of knowledge and experience gained during the Project with other three southern coastal provinces of the. I.R. Iran and other stakeholders such as Regional Organization for the Protection of Marine Environment (ROPME) member states.
- Output 4: Recommendation of measures to improve existing environmental regulatory and policy framework.

1.3 Implementation organizations of the Project

DOE is the main implementation body of the Project. In addition, the Deputy Governor and Planning and Budget Organization (PBO) of Hormozgan Province took part as the implementation body of the Project.

1.4 Project period

The Project commenced in September 2017 and was implemented over a three-year period.

2. ACTIVITIES OF OUTPUT 1

Output 1: Development of a mechanism for stakeholder involvement in formulation and implementation of the M/P.

2.1 Establishment of organizational structure for M/P formulation

Under the leadership of DOE, the M/P was formulated by establishing four organizational units, namely, Project Management Unit (PMU), Joint Coordination Committee (JCC), Working Group (WG) and Working Group Committee (WGC). Table 2.1.1 shows the main responsibilities and members of each organizational units.

Table 2.1.1 Main responsibilities and members of each organizational units

Organization	Main responsibilities	Members
PMU	<ul style="list-style-type: none"> • Implementation, management and approval of Project activities. • Coordination with other relevant organizations. 	<ul style="list-style-type: none"> • Project Director (Deputy of Marine Environment, DOE HQ) • Deputy Project Director (Director General of the Coasts and Coastal Wetlands Office, DOE HQ) • Provincial Project Manager (Director General of DoE Hormozgan) • Experts of DOE HQ and Hormozgan • Deputy Governor of Hormozgan • PBO Hormozgan • JICA Project Team
JCC	<ul style="list-style-type: none"> • Facilitate coordination with relevant authorities in Tehran and Hormozgan. • Review of progress of Project activities. • Review and exchange views on major Project issues and recommend corrective measures. 	<ul style="list-style-type: none"> • Chairperson: Deputy of Marine Environment • Representatives of PMU, WGs • Deputy Governor of Hormozgan • Representatives of PBO • Representatives of JICA Iran Office / JICA Project Team
WG	<ul style="list-style-type: none"> • Collect and collate required data and information. • Discussion and provide solution on technical issues. • Plan and implement required studies and research. 	<ul style="list-style-type: none"> • DOE experts, universities, research institutes, local government, NGOs etc.
WGC	<ul style="list-style-type: none"> • Exchange of information between WGs • Monitoring of progress • Discussion of issues especially cross-cutting activities 	<ul style="list-style-type: none"> • Representatives of each WG.

Source: JICA Project Team

3. ACTIVITIES OF OUTPUT 2

Output 2: Formulation of the M/P including its implementation plan and monitoring and evaluation plans.

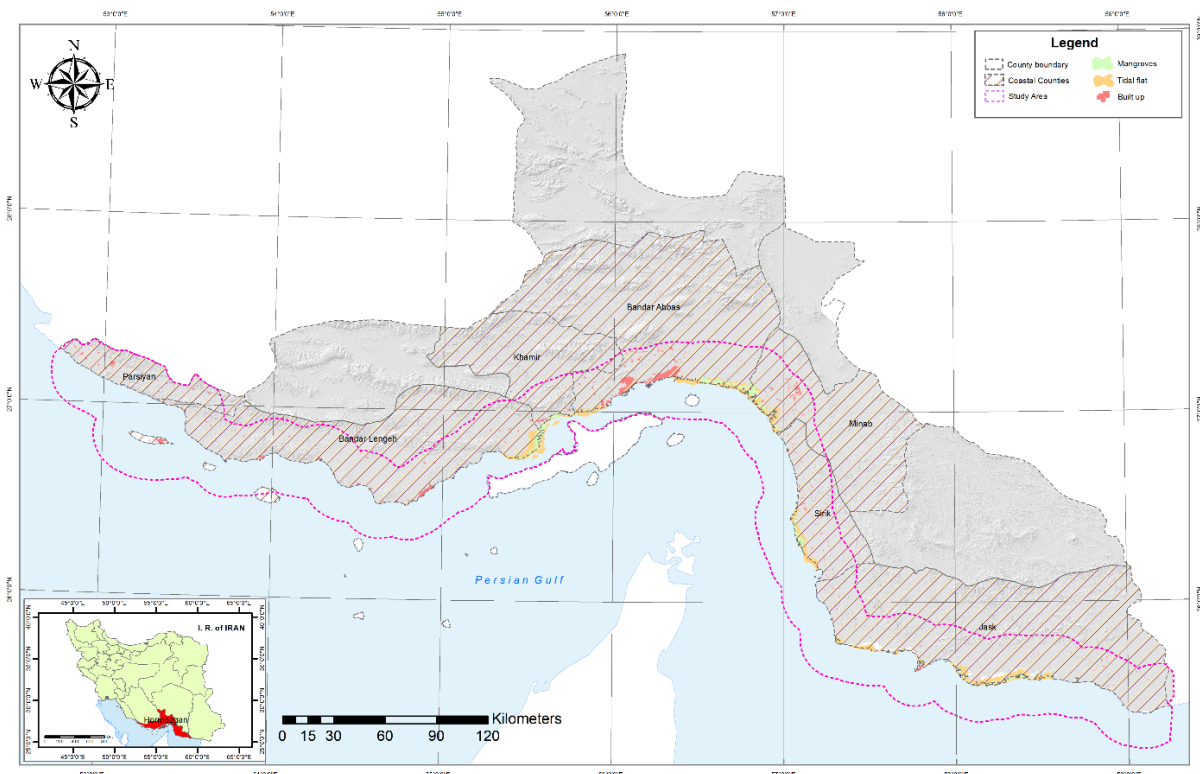
The draft M/P was finalized in February 2020 and subsequently submitted to the Hormozgan government for approval. This Chapter describes the main activities conducted related to Output 2.

3.1 Objective of the M/P

The principal objective of the M/P is to formulate strategies and action plans for the future conservation and management of the coastal environment in manner to achieve balance between development and environmental conservation.

3.2 Target area of the M/P

The target area of the M/P was set as the coastal area of mainland Hormozgan Province and Lavan and Shidvar islands. The target area is comprised from seven counties, namely, Parsian, Bandar Lengeh, Khamir, Bandar Abbas, Minab, Sirik and Jask. Figure 3.2.1 shows the target area of the M/P.



Source: JICA Project Team

Figure 3.2.1 Target area of the M/P (purple dot-line shows approximate study area)

3.3 Target year of the M/P

National Target 17 of Iran's National Biodiversity Strategies and Action Plan (2016-2030) aims to sustainably manage and protect marine and coastal ecosystems by 2030. The target year of the M/P was also set as year 2030, for to be consistent with National Target 17.

3.4 Basic process of M/P formulation

The M/P was formulated through the following key steps:

- **Step 1:** Establishment of organizational structure
- **Step 2:** Selection of main study area
- **Step 3:** Analysis of current status and future developments
- **Step 4:** Risk assessment on important coastal habitats and species
- **Step 5:** Development of spatial zoning plan
- **Step 6:** Development of strategies and action plans
- **Step 7:** Development of implementation framework

3.5 Selection of main study area

Although the scope of the M/P is the Hormozgan coastal area, the study mainly focused on areas that support important coastal habitats and hence have high conservation priority. Such areas were termed as "Important Ecosystem Area (IEA)", which was identified by referring to the Ecologically or Biologically Significant Areas (EBSA) criteria, adopted by the Convention on Biological Diversity (CBD). Based on information obtained through existing literatures, field reconnaissance and expert opinion, an area that fitted one or more of the EBSA criteria was selected as IEA. Eventually five IEAs were selected, namely, Jask, Gaz, Minab, Khamir and Parsian regions. Figure 3.5.1 shows the locations of the selected IEAs. Note that the area of the selected IEAs were limited to shallow water areas as information of offshore areas were scarce. Further research is required to identify IEAs in offshore areas.



Note: The boundary of IEAs indicated in the figure is not a fixed one but rather shows the rough locations of the IEAs.

Source: JICA Project Team (prepared using Google Earth)

Figure 3.5.1 Locations of the selected IEAs

3.6 Analysis of current status and future developments

Fundamental for formulating the M/P is to acquire an in-depth understanding of the status of environment and human activities of the coastal area including future development prospective. The Project therefore conducted detailed surveys in the field of ecology, pollution and socioeconomic over one-year period between 2018-2019. This Section summarizes the environmental status of the Hormozgan coastal area based on the detailed survey results.

3.6.1 Ecosystem

Ecology survey was conducted for important coastal habitats (coral, seagrass, seaweed, intertidal flat, mangrove) and species (marine mammals, birds, sea turtles). Main findings of the survey are summarized as follows:

Habitats

- Corals were distributed along the shallow waters (around 1-5 m depth range) of Lavan and Shidvar islands. A total of 11 coral species were identified, with *Porites* species being most dominant followed by corals in the Merulinidae family. One IUCN threatened species, *Favites spinosa* (VU), was found in the north-side of Shidvar island. Coral degradation was significant in most areas with some areas exceeding 80% dead coral coverage. Live coral coverage was in general low in both islands with most areas ranging between 1-10%. Highest live coral coverage was recorded in the western tip of Lavan island ranging between 20-30%.

- Seagrass beds were distributed along the intertidal area between Bandar Khamir and Bandar Abbas, with an estimated total area of around 3,600 ha. Seagrass coverage was at most around 30-50%. Only two species were identified namely *Halodule uninervis* and *Halophila ovalis*.
- Seaweed beds were found along the rocky coastline of Bandar Lengeh, Parsian and Lavan/Shidvar. A total of 43 species were identified, including Sargassum species. Sargassum often form dense seaweed canopies, which are known to function as an important habitat for various invertebrates and fish species.
- Tidal flats were extensively distributed along the coastal area from Bandar Khamir to Jask. The tidal flats consisted of three substrate types namely: sandy, sandy-mud and muddy. A total of 35 benthic species were identified mainly consisting of crustaceans, mollusks, fish and polychaetes. Invertebrate species composition varied quite significantly with substratum type, which implies that biodiversity is enhanced when tidal flats are comprised of varying sediment types.
- Mangroves were distributed mainly in sheltered areas of the tidal flats and along water channels. Only two mangrove species were identified namely: *Avicennia marina* and *Rhizophora mucronate*. *Rhizophora mucronate* was found only in Gaz region. Some mangrove areas were significantly eroded due to boat wakes. Nests of the invasive Black Rat (*Rattus rattus*) were observed in some mangrove areas.

Species

- Humpback dolphin (*Sousa plumbea*) and Finless porpoise (*Neophocaena phocaenoides*) were frequently sighted along the shallow coast between Minab and Khamir. Humpback dolphin and Finless porpoise are classified as endangered (EN) and vulnerable (VU) under the IUCN Red List. Since these species inhabit nearshore areas, they are vulnerable to human activities.
- Thirteen bird species were observed to be breeding in the study area, consisting of spoonbill, herons/egrets, thick-knees, plovers and terns. Mangrove forest was a common breeding site for spoonbill and egrets/herons. Smaller birds such as plovers and terns nested mainly in bare/shrubby grounds along the supratidal zone. Five threatened bird species under the IUCN Red List were observed in the study area (Great Knot, Steppe Eagle, Socotra Cormorant, Greater Spotted Eagle, Eastern Imperial Eagle) which were mainly observed along the intertidal flat/mangrove areas.
- Nesting sites were widely distributed along the sandy coasts of Hormozgan mainland and offshore islands. Confirmed nesting species were only Hawksbill turtle and Green sea turtle. Nesting sites of Green sea turtle was limited to Shidvar and Jask region. Over 250 sighting data were collected consisting mainly of Hawksbill and Green sea turtles. Sightings were recorded not only around nesting sites but throughout the Hormozgan coastline. This implies that the entire Hormozgan coast is an important area for sea turtles especially around coral reefs, seaweed beds and seagrass beds, which are likely to be important foraging areas.

3.6.2 Pollution

Pollution survey was conducted along the entire Hormozgan coastal area, consisting of seawater, wastewater and sediment quality. To consider seasonal variations, seawater and wastewater surveys were conducted for multiple seasons. Main findings of the survey are summarized as follows:

Seawater quality

- Fecal Coliform and *Enterococcus* values were in general high in the Bandar Abbas region, especially near urban areas. Urban wastewater is probably the main pollution source as high levels were also detected from nearby wastewater outlets.
- Cadmium (Cd) and Hexavalent chromium (Cr (VI)) values were high at some locations. Cd was especially high near Hara protected area, which its value (0.0224 mg/l) was almost 200 times the referred guideline value (Canadian Environmental Quality Guidelines: CEQG). Since there are no major pollution source in the vicinity, it is difficult to specify the reason. Nevertheless, this site should be monitored continuously in the future. Cr (IV) was especially high in the Bandar Abbas region, which could be due to industrial effluents from the Bandar Abbas industrial area.

Sediment

- Significant pollution was recorded for heavy metals, especially nickel (Ni) and chromium (Cr). Values were high around the Bandar Abbas industrial region, which could partly be due to the effluents from the metal industries.

Wastewater

- High wastewater temperature was recorded from outlets of some refineries and power plants.
- High salinity was recorded from outlets of some industrial zone, desalination plant and shrimp farms.
- High fecal coliform levels were recorded from outlets of domestic wastewater and urban runoff in Bandar Abbas.

3.6.3 Socioeconomic

Socioeconomic survey focused mainly on sectors and activities that are potential risks to the coastal environment. Information and data were collected through literature review and interviews with organizations and local community. The main findings of the survey are summarized below.

- Based on the population growth rate from 2006 to 2016, the total population of the coastal area in 2030 was projected to exceed 1.5 million which is an increase of around 0.5 million from 2016 level. The ratio of urban population in 2030 is projected to exceed 70% of the total population.
- Currently, heavy industries (e.g. petrochemical, metal, shipbuilding) are concentrated mainly in the Bandar Abbas region. Such heavy industries are now planned to be expanded to relatively rural areas such as Jask and Parsian. New infrastructures (e.g. ports, power plants) are also planned to be developed in association to these new industries.

- There are 28 desalination plants in the Hormozgan coastal area, which are mainly concentrated in Bandar Abbas and Bandar Lengeh. The country's largest desalination plant (production capacity: 1 million m³/day) is under construction, which is located near Hara Protected Area.
- Shrimp farming is one of the most important and growing economic activities in the Hormozgan coastal area. While the current production is about 20,000 tons/year, it is planned to be increased to around 200,000 tons through expansion of existing farms and development of new farms. Wastewater from shrimp farms may affect the local ecosystem, as many of the existing and planned shrimp farms are located near protected areas.
- Currently there is only one public sewage treatment plant in operation along the Hormozgan coastal area, which is in Bandar Abbas city.
- Waste management of domestic wastes is generally poor in most cities and villages in Hormozgan. Most of the landfill sites have no adequate pollution control measures in place such as leachate liners and soil capping. Furthermore, many waste disposal sites are located near the coastline or rivers, in which their wastes could easily be transported by wind or rain to the sea and end up as marine litter.
- Ecotourism is an emerging economic activity in the coastal area. Ecotourism may have adverse impacts on the ecosystem, since most are operated within protected areas or sensitive ecosystem (e.g. mangrove and tidal flats).
- Traditional animal husbandry raises livestock such as goats and camels, which usually graze freely in open spaces where food is available. Some mangrove areas are used for such purposes.

3.7 Risk assessment on coastal ecosystem

In order to formulate conservation strategies and actions, it was considered important to identify the current and future risks of human activities on the coastal environment. Risk assessment was hence conducted on important coastal habitats (coral, seagrass, seaweed, tidal flat, mangrove) and species (sea turtle, bird, marine mammal) within the IEAs by using InVEST Habitat Risk Assessment (HRA) model. Human activities that were considered as risks were selected based on the outputs of the socioeconomic survey and WG discussions which are as follows: 1) Wastewater from coastal industries, 2) Wastewater from coastal urban areas, 3) River discharge, 4) Marine litter from coastal urban areas, 5) Marine litter from river discharge, 6) Ship wastewater, 7) Ship underwater noise, 8) Light pollution, 9) Fishing (gill net, trawling), 10) Fishing (set net), 11) Animal grazing and 12) Tourism. Risk assessment was conducted by setting current (year 2019) and future (year 2030) scenarios of selected human activities. Tables 3.7.1 and 3.7.2 show the risk assessment results for habitats and species respectively.

Table 3.7.1 Risk assessment results on habitats

IEA	Current (2019)	Future (2030)
Jask	<ul style="list-style-type: none"> • Mangroves in East Jask PA are particularly at high risk due to combination of shrimp farm wastewater, animal grazing and tourism. • Mangroves in West Jask PA are under moderate risk due to tourism activities. 	<ul style="list-style-type: none"> • Mangroves in the east of Gabrik PA will be under new risk due to wastewater discharge from multiple large-scale shrimp farms planned in the area. • Risks on mangroves in West and East Jask PA will increase mainly due to expected intensification of tourism.
Gaz	<ul style="list-style-type: none"> • Mangroves are under relatively high risk mainly due to animal grazing and tourism. 	<ul style="list-style-type: none"> • Risks on mangrove will increase mainly through intensification of tourism. • Tidal flats in north and south of the IEA will be under new risk due to wastewater discharge from multiple large-scale shrimp farms planned in the area.
Minab	<ul style="list-style-type: none"> • Mangroves downstream of Tiab are under relatively high risk due to tourism. • Seagrass beds in front of Velayat Park are particularly at risk due to recreational activities in the intertidal area. • The risk on tidal flat is high especially downstream of Tiab, due to combination of tourism, river discharge and industrial wastewater (mainly from Tiab shrimp farm). 	<ul style="list-style-type: none"> • Risks on mangroves (e.g. mangrove downstream of Tiab) will increase in the future mainly through intensification of tourism. • Risks on seagrass will increase in the future mainly through intensification of tourism. There will also be additional risk from marine litter discharged from the Bandar Abbas urban area. • The risk on tidal flat will spread over a to wider area due to wastewater discharge from multiple large-scale shrimp farms planned in the area. Tourism will also increase the risk to a certain extent.
Khamir	<ul style="list-style-type: none"> • The main risks on mangroves are animal grazing and tourism. • The main risk on seagrass bed is fishing. • The main risks on tidal flat are industrial wastewater and river discharge. 	<ul style="list-style-type: none"> • Risks on mangroves will increase in the future mainly through intensification of tourism. • Risk from industrial wastewater will increase significantly mainly due to additional discharge from new shrimp farms and industrial zones.
Parsian	<ul style="list-style-type: none"> • Risks on corals are high in the marine area between Shidvar and Lavan, and around Shidvar Island which are where there are overlap of stressors (e.g. fishing and ship wastewater, fishing and tourism). • Seaweeds beds along the Parsian coast are under moderate risk mainly from fishing. 	<ul style="list-style-type: none"> • Risks are more or less similar between current and future.

Source: JICA Project Team

Table 3.7.2 Risk assessment results on species

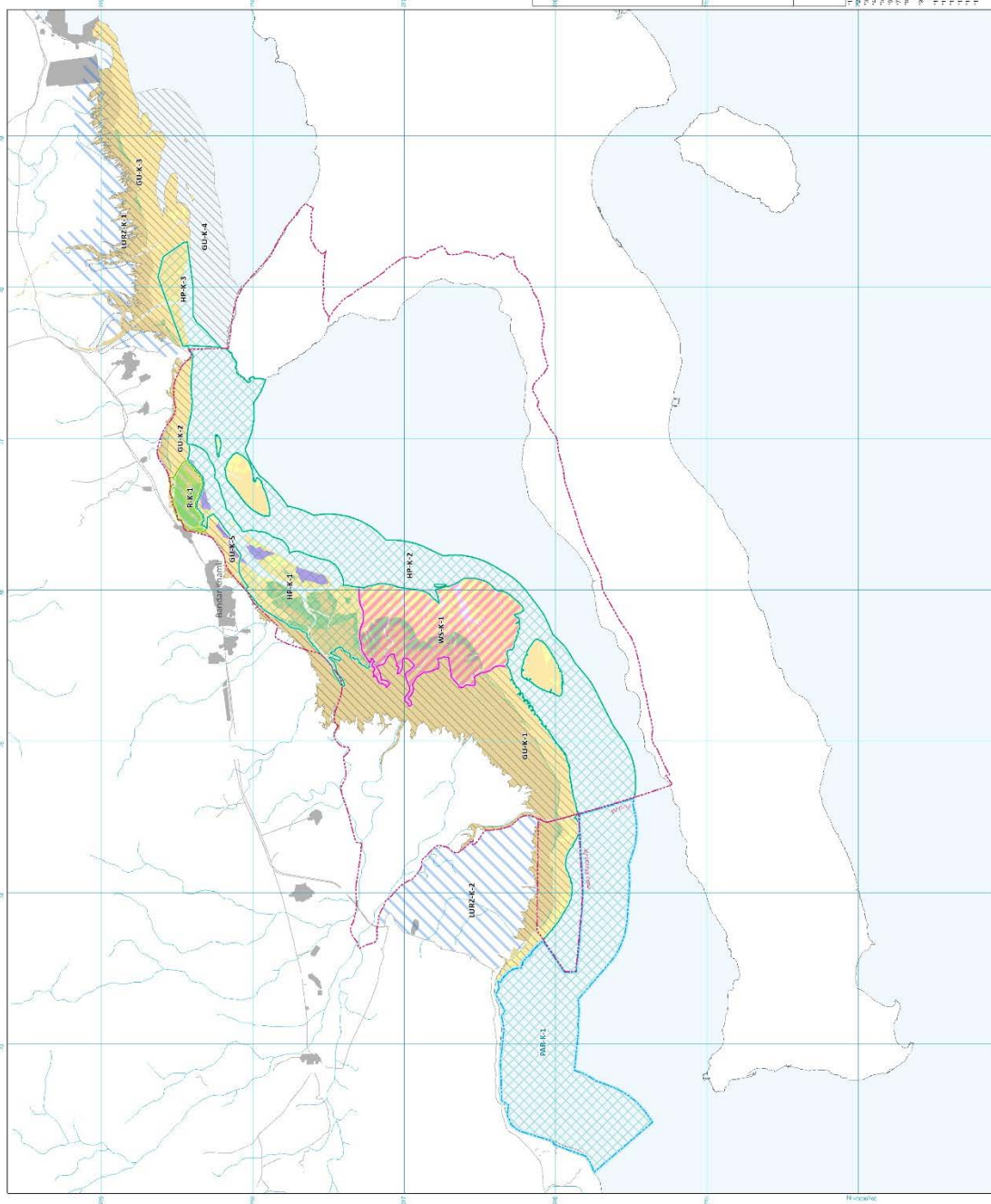
IEA	Current (2019)	Future (2030)
Jask	<ul style="list-style-type: none"> • Risks on breeding birds are relatively high inside West Jask PA. This is mainly due to its proximity to Jask urban area. • There is a moderate risk on turtles nesting along the coastline east of Jask. This is mainly due to light generated from the hinterland areas. 	<ul style="list-style-type: none"> • Risks on breeding birds will increase especially in Gabrik PA and East Jask PA. This is mainly due to intensification of coastal industrial activities (e.g. shrimp farming) and tourism, which may lead to degradation of bird breeding habitats.
Gaz	<ul style="list-style-type: none"> • There is a moderate risk on bird breeding site (e.g. mangrove) inside Gaz PA, mainly due to combination of tourism and animal grazing. • There is moderate risk on turtles nesting along the north coast of Gaz. This is mainly due to light generated from hinterland areas. 	<ul style="list-style-type: none"> • Risks on bird breeding site will increase mainly through intensification of coastal industrial activities (e.g. shrimp farming) and tourism, which may lead to degradation of bird breeding habitats.
Minab	<ul style="list-style-type: none"> • Since the habitat of marine mammals extends over a wide area, marine mammals are at risk from various stressors. While the highest risk is from fishing, they are also at risk from pollution caused through wastewater discharges from industries and river. • Foraging turtles are under risk from fishing activities and indirectly through degradation of their foraging habitat (e.g. seagrass bed). The seagrass bed is mainly under risk from fishing and tourism. • There is moderate risk on turtles nesting along the sandbar near Kolahi. This is mainly due to light generated from the hinterland area with some small contribution from marine litter. 	<ul style="list-style-type: none"> • Risk on breeding birds will increase mainly through intensification of coastal industrial activities, which may lead to degradation of bird breeding habitats. • Risk on marine mammals will increase mainly through intensification of coastal industrial activities and marine litter. • Risk on foraging turtles will increase mainly through intensification of coastal industrial activities and marine litter. • Risk on nesting turtle will increase mainly through intensification of marine litter.
Khamir	<ul style="list-style-type: none"> • Breeding birds are at risk from various stressors that may directly or indirectly affect breeding birds. • Since the habitat of marine mammals extends over a wide area, they are at risk from various stressors. While the highest risk is from fishing, the narrow strait between Pohl and Laft ports is particularly of high risk for marine mammals due to the additional risks from ship underwater noise. They are also indirectly at risk from wastewater discharges from industries and river. • Foraging turtles are under risk from fishing activities and indirectly through degradation of their foraging habitat (e.g. seagrass bed). The seagrass bed is mainly under risk from fishing and tourism. 	<ul style="list-style-type: none"> • Risk on breeding birds will increase mainly through intensification of coastal industrial activities, which may lead to degradation of bird breeding habitats. • Risk on marine mammals will increase mainly through intensification of coastal industrial activities and marine litter. • Risks on turtle foraging area will increase mainly through intensification of coastal industrial activities and marine litter.
Parsian	<ul style="list-style-type: none"> • There is a high risk on bird breeding site at Shidvar Island, mainly due to combination of tourism and light pollution. • In general, risk on foraging turtle is moderate mainly due to fishing. However, the narrow strait between Lavan and Shidvar is a high-risk area for foraging turtle due to the additional risks from ship underwater noise. • There is moderate risk on nesting turtle in Parsian and Lavan areas mainly due to light pollution. The nesting site in Shidvar is under higher risk due to combination of tourism and light pollution. 	<ul style="list-style-type: none"> • Risks are more or less similar between current and future.

Source: JICA Project Team

3.8 Zoning plan

Zoning plans were formulated for the five IEAs, as it was considered as an effective management tool to balance human activities and environmental conservation. In the zoning plan, five zoning categories were established namely: 1) Sanctuary Zone, 2) Habitat/Species Protection Zone, 3) Recreation Zone, 4) Traditional Sustainable Use Zone and 5) General Use Zone. Permissible and non-permissible activities were set for each o zoning category. Figure 3.8.1 shows an example of the prepared zoning plan.

Hormozgan Province Coastal Habitats Conservation Masterplan Zoning Plan
 (Draft, ver. 2.0 - 2020.12.10)
Khamir IEA Overall Map



LEGEND

Existing Protected Areas (PA):

- World Heritage Site
- Nature Reserve
- Wildlife Sanctuary
- Marine Protected Area
- Coastal Protected Area
- Other

Proposed zoning and user regulations:

- Development Zone (D)
- Conservation Zone (C)
- Recreation Zone (R)
- Other

Other zones:

- Special Use Zone (S)
- Other

Zone	Development Zone (D)	Conservation Zone (C)	Recreation Zone (R)	Other
Development Zone (D)	✓	✗	✗	✗
Conservation Zone (C)	✗	✓	✗	✗
Recreation Zone (R)	✗	✗	✓	✗
Other	✗	✗	✗	✓

1. The map shows the zoning plan for the Khamir IEA. The map is divided into various zones, each with a specific color and pattern. The zones are: DAB-R-1, DWR-R-2, GU-K-1, GU-K-2, GU-K-3, GU-K-4, GU-K-5, GU-K-6, GU-K-7, HP-K-1, HP-K-2, HP-K-3, HP-K-4, HP-K-5, HP-K-6, HP-K-7, HP-K-8, HP-K-9, HP-K-10, HP-K-11, HP-K-12, HP-K-13, HP-K-14, HP-K-15, HP-K-16, HP-K-17, HP-K-18, HP-K-19, HP-K-20, HP-K-21, HP-K-22, HP-K-23, HP-K-24, HP-K-25, HP-K-26, HP-K-27, HP-K-28, HP-K-29, HP-K-30, HP-K-31, HP-K-32, HP-K-33, HP-K-34, HP-K-35, HP-K-36, HP-K-37, HP-K-38, HP-K-39, HP-K-40, HP-K-41, HP-K-42, HP-K-43, HP-K-44, HP-K-45, HP-K-46, HP-K-47, HP-K-48, HP-K-49, HP-K-50, HP-K-51, HP-K-52, HP-K-53, HP-K-54, HP-K-55, HP-K-56, HP-K-57, HP-K-58, HP-K-59, HP-K-60, HP-K-61, HP-K-62, HP-K-63, HP-K-64, HP-K-65, HP-K-66, HP-K-67, HP-K-68, HP-K-69, HP-K-70, HP-K-71, HP-K-72, HP-K-73, HP-K-74, HP-K-75, HP-K-76, HP-K-77, HP-K-78, HP-K-79, HP-K-80, HP-K-81, HP-K-82, HP-K-83, HP-K-84, HP-K-85, HP-K-86, HP-K-87, HP-K-88, HP-K-89, HP-K-90, HP-K-91, HP-K-92, HP-K-93, HP-K-94, HP-K-95, HP-K-96, HP-K-97, HP-K-98, HP-K-99, HP-K-100.

Source: JICA Project Team

Figure 3.8.1 Zoning plan of Khamir IEA

3.9 Strategies and action plans for the conservation and management of the coastal environment

Strategies and action plans for the conservation and management of the coastal environment were developed through extensive discussions with WG members. The action plan was developed for the period from year 2021 to 2030. A total of more than 40 actions were developed under the 5 strategies. Table 3.9.1 outlines the actions proposed under each strategy. Note that the actions are not only limited to provincial level activities but also includes national level activities such as improvement of the legal system.

Table 3.9.1 Outline of the actions proposed under each strategy

Strategy 1: Strengthening of knowledge base and data management of the coastal environment and information sharing with the stakeholders	
Outline	<ul style="list-style-type: none"> • Development of Coastal Data Information Management System • Conduct research on under-studied fields and areas
Strategy 2: Strengthening of EIA/SEA implementation	
Outline	<ul style="list-style-type: none"> • Strengthening of EIA/SEA legislation • Development of technical guidelines • Capacity building • Implementation of public awareness activities
Strategy 3: Strengthening of conservation and management of important habitats and species with participation of local community	
Outline	<ul style="list-style-type: none"> • Development of conservation and management plans of important ecosystem and species • Development of management plans of protected areas and consider designation of new protected areas. • Strengthening of control of invasive species • Development of ecosystem management guidelines • Implementation of ecosystem restoration projects (corals and seagrass) • Study on HAB warning system • Strengthening of ecosystem monitoring • Capacity building • Implementation of environmental education and public awareness activities
Strategy 4: Strengthening of pollution control and management	
Outline	<ul style="list-style-type: none"> • Strengthening of pollution control legislations (e.g. establishment of environmental standards, effluent discharge license scheme, standardization of sampling and analysis method) • Strengthening of pollution monitoring and inspection • Development of pollution source inventory • Study on Total Pollution Load Control System • Capacity building
Strategy 5: Integration of coastal conservation and management among the southern coastal area and ROMPE members	
Outline	<ul style="list-style-type: none"> • Development of M/P of other coastal area provinces • Information sharing and cooperation with ROPME members

Source: JICA Project Team

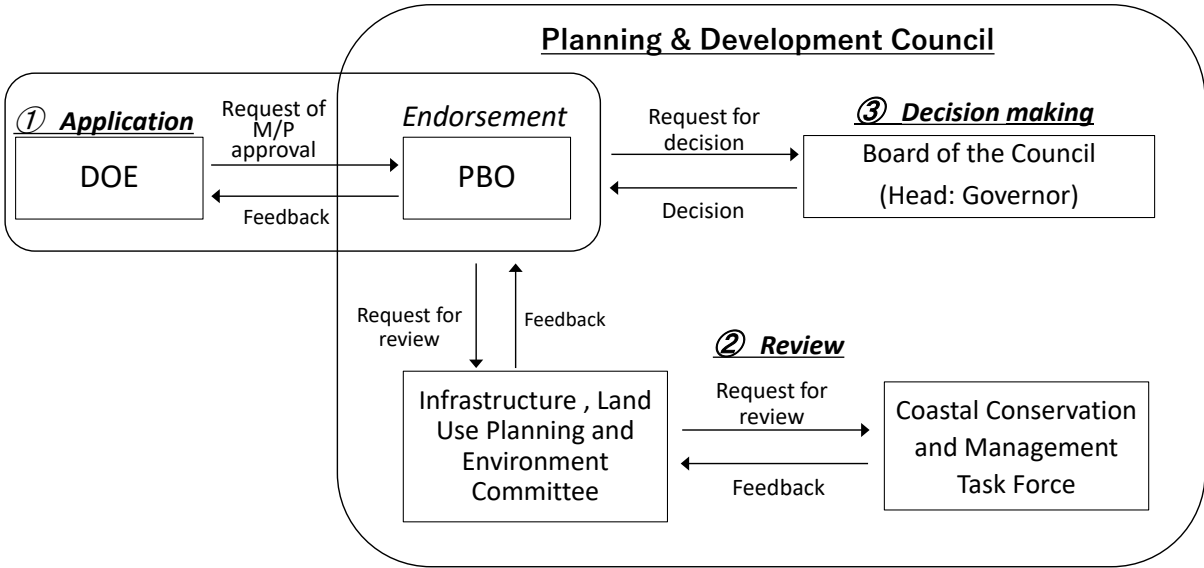
3.10 Implementation framework

Implementation of the action plan will require the participation of wide range of stakeholders from national to provincial levels, including government organizations, NGOs and research institutes. Effective approaches were discussed at length among the WG members, and was concluded to establish a specialized unit provisionally termed “Coastal Conservation and Management Task Force (hereinafter termed “Task Force”)”, which will consist of all relevant stakeholders with PBO Hormozgan acting as

the head and DOE as the secretariat. The Task Force will stand under the “Infrastructure, Land Use Planning and Environment Committee (ILUPEC)” of “Planning and Development Council (PDC)” of Hormozgan Province.

3.11 Supporting of M/P approval

The M/P is planned to be approved at both provincial and national levels. PDC will be the approving authority at the provincial level and Supreme Council of Spatial Planning at the national level. Figure 3.11.1 shows the approval process of M/P at provincial level.



Source: JICA Project Team

Figure 3.11.1 Approval process of M/P at provincial level

DOE submitted the draft M/P to PDC in March 2020. DOE then made a presentation of the M/P to PDC in May 2020. The M/P is now under review by PDC.

3.12 Other activities

3.12.1 Formulation of ecosystem monitoring plan

Regular monitoring is essential for conservation and management of ecosystem. However, apart from annual bird census, DOE currently does not implement regular ecosystem monitoring in Hormozgan. The M/P therefore proposes to plan and implement ecosystem monitoring, and a draft ecosystem monitoring plan was prepared for future reference.

3.12.2 Formulation of pollution monitoring plan

DOE does not conduct regular pollution monitoring of coastal waters. Some that have been conducted are within a limited area and period and their methodologies are not consistent. Sediment quality is a good indicator of pollution but such monitoring is also not regularly implemented. The M/P therefore proposes to plan and implement seawater/sediment monitoring, and a draft pollution monitoring plan was prepared for future reference.

3.12.3 Review of environmental standards

The M/P proposes to establish environmental and effluent discharge standards for coastal waters. While there are various approaches for setting standards, the recommended approach will be to refer to existing standards of other countries. The JICA Project Team prepared a comparison table of the water and sediment quality standards set by other countries for future reference.

3.12.4 Emergency contingency plans

(1) Oil spill

In case of oil spill incidents in Iranian waters, the government will respond in accordance to the National Oil Spill Contingency Plan (NOSCP). The NOSCP stipulates the responding agency in accordance to the scale of oil spill (e.g. spill volume and range). Apart from small-scale spill, PMO is the main responding agency. Under the NOSCP, working groups will be established consisting of relevant government organizations including DOE. The main responsibilities of DOE are impact assessment and monitoring of oil spills. In Hormozgan, oil spills from fishing boats and oil-smuggling vessels are an emerging issue, which in some cases have affected protected areas. Hence, oil spill response will be an important component to consider when developing management plan of protected areas.

(2) Red tide and harmful algae bloom (HAB)

While red tide/HAB is frequent in Hormozgan coastal area, the most damaging incident was by the bloom event of a dinoflagellate (*Cochlodinium polykrikoides*) during 2008-2009. The bloom devastated coastal marine ecosystems causing massive kills of marine organisms, and severely damaged aquaculture/fishing industries. To minimize risk of future damage, the M/P proposes to consider HAB warning system, which is a system to monitor, forecast and alert HAB occurrence to coastal users.

3.12.5 Side-scan sonar survey

Habitat distribution is not well understood especially along the mainland subtidal areas where waters are often turbid, hence making surveys difficult with conventional approaches (e.g. satellite image analysis or diving surveys). As an alternative approach, the JICA Project Team planned to conduct side-scan sonar survey, which can detect and map subtidal habitats even under turbid conditions. Unfortunately, the survey was cancelled due to political unrest in the region. The JICA Project Team instead prepared manual/video instruction of the side-scan sonar survey, which can be referred for future implementation as proposed in the M/P.

4. ACTIVITIES OF OUTPUT 3

Output 3: Sharing of knowledge and experience gained during the Project with other three southern coastal provinces of Iran and other stakeholders such as ROPME member states

4.1 Master Plan formulation guideline

DOE is planning to formulate M/P for the other coastal provinces. Based on the knowledge and experiences acquired through the formulation of Hormozgan M/P, the JICA Project Team prepared “Master Plan Formulation Guideline”, which is intended to be used by experts of DOE and relevant organizations of the other provinces in the process of preparing their respective M/P.

4.2 Knowledge sharing plan

The knowledge acquired through the M/P formulation and future implementation will be shared continuously with stakeholders of other provinces and ROPME members. A knowledge sharing plan was prepared focusing on sharing the M/P formulation method and implementation outputs. Although the Marine Environment and Wetland Deputy of DOE HQ will be the main implementation body, resources of other DOE departments (e.g. environmental education and public relation) should also be utilized to enhance the effectiveness of knowledge sharing activities.

4.3 Knowledge sharing seminar

A seminar/workshop was planned to be held for sharing the knowledge acquired through the M/P formulation with DOE and stakeholders of other provinces. However, the seminar/workshop were not held due to Corona-related travel restrictions. Instead, the JICA Project Team prepared training program and materials for M/P formulation, which can be used by the C/P in future seminar/workshop.

4.4 Dissemination at international conferences

The outputs of this Project were planned to be disseminated at international conferences (e.g. CBD and Ramsar), but were not possible due to Corona-related travel restrictions. Instead, the JICA Project Team prepared dissemination materials (posters and brochure), which can be used by the C/P in future conferences.

5. ACTIVITIES OF OUTPUT 4

Output 4: Recommendation of measures to improve existing environmental regulatory and policy framework.

5.1 Gap analysis and recommendations

Gaps in the existing environmental legislations and institutions were analyzed and recommendations for improvement were made from the perspective of implementing coastal environmental conservation. Tables 5.1.1 and 5.1.2 provides the results of the gap analysis of the existing environmental legislations and institutions respectively.

Table 5.1.1 Gap analysis of environmental legislations

Legislation	Gap	Recommendation
The Act of Environmental Protection and Improvement	The Act nor the Regulation often do not provide detailed provisions on the actual approaches and methods to achieve environmental conservation, especially in regards to ecosystem. Therefore, coastal ecosystem is often not conserved and managed in a systematic manner.	The following improvements are recommended to enhance coastal environmental conservation: <ul style="list-style-type: none"> • The Act should have provisions to develop management plans for important ecosystems and species. • The Act should have provisions to implement ecosystem monitoring.
The Act for Hunting and Fishing	As per Article 29 of the Act, this Act does not apply to fishing in waters of the Persian Gulf/Gulf of Oman. Instead fishing in the Persian Gulf/Gulf of Oman is controlled under other relevant fisheries acts. This implies that the list of protected species and their damage fines set under Article 3 of the Act do not apply to fishermen in Persian Gulf/Gulf of Oman, despite fishermen being one of the major threats to the listed species.	In order for the Act to be more effective in achieving its objective, it is recommended to apply the damage fines for protected species to all commercial fishermen including those operating in Persian Gulf/Gulf of Oman. However, important fisheries resources (e.g. commercial shark species) may be exempted providing that they are fished under approved resource management plan.
The Act for Conservation, Restoration and Management of the Country's Wetlands	As per Article 4 of the Act, entities who damage wetlands, will be subject to a fine in accordance to the degree of damage done. While the amount of fine will be determined by the court, DOE will initially estimate the damage based on the method and rates set in the Regulation. However, the method/rates are set basically based on physical damage and does consider damage to the ecosystem as a whole. Article 4 of the Act also requires entities who damage wetlands to "compensate" the damage. However, the act does not specifically state the definition of "compensation", which can be a source of confusion and dispute with the violator. The list of invasive species prescribed under the Act does not include coastal species.	To enable appropriate assessment of wetland damage, it is recommended to develop a guideline for wetland damage assessment taking into consideration ecosystem damage. The Act should also clearly state the definition of "compensation", and subsequently develop a guideline for wetland compensation methods. Coastal species should be added to the list of invasive species.
EIA	Currently EIA is practiced based on the decrees and cabinet decisions made under the 5-year National Development Plans. Following are some of the main issues of current EIA system: <ul style="list-style-type: none"> • The current EIA legislation is insufficient against EIA offenders as there are no clear sanctions and penalties for any deficiencies 	For effective implementation of EIA, it is desirable to establish an EIA specific law that is line with international standards. For this it is important to gain the understanding of developers that EIA is an effective tool for achieving sustainable development, and is not necessarily to halt development.

Legislation	Gap	Recommendation
	<p>by developers. Accordingly, many projects have commenced without EIA approval.</p> <ul style="list-style-type: none"> • There are deficiencies in screening and scoping, public participation, alternative consideration, and EIA audit. • Some high-risk projects are missing from the list of projects that are subject to EIA such as sea dredging/dumping, ship recycling yard and urban development. • There is no requirement to publish decisions concerning EIA. 	
The Act of Fair Water Distribution	As per Article 5 of the Regulation, DOE is responsible for developing water quality standards. Although standards have been developed for inland waters, there are no water quality and discharge standards for coastal waters yet.	To improve pollution control of the coastal area, standards for seawater and wastewater discharge should be urgently established. Sediment quality standards should also be established, which is a good indicator of pollution. Sampling and analysis methods should also be standardized.
5-year National Development Plan (5NDP)	Article 38 of the 6th 5NDP (2017-2021) focuses on environmental conservation which among others include SEA/EIA implementation, wetland conservation, integrated waste management, wastewater treatment and forest management. The Article however does not mention conservation of coastal environment.	In order to realize the M/P goals, it is recommended to incorporate as a national policy “comprehensive coastal environmental conservation” into the 7th 5NDP.

Source: JICA Project Team

Table 5.1.2 Gap analysis of environmental institutions

Institution	Gap	Recommendation
General	In order to effectively conserve the coastal environment, it is important that relevant stakeholders and government organizations are comprehensively involved and cooperate throughout the process. However, realizing such unified cooperation is not straight forward as government organizations are often highly sectionalized and hence tend to focus on their own interests only.	Conservation of coastal environment should preferably be planned and implemented by local stakeholders as they are usually the ones that are most knowledgeable and aware of the local situation. Implementation of the various M/P actions will involve various tasks such as coordination, consensus building, budgeting and planning. Considering such challenges, it is recommended to establish under the current provincial institutional framework a new organization specifically tasked to plan and implement the M/P actions.
DOE	While DOE will play a central role in the implementation of the M/P actions, their current institutional capacity is limited. For example, DOE Hormozgan currently does not have a specialized department for coastal environmental conservation, and also have limited equipment and human resources. This is mainly because coastal conservation works were relatively limited in the past. The Deputy of Marine Environment and Wetland of DOE HQ may also face some difficulties in committing sufficient number of staffs for the M/P implementation, as the department has limited human resource and will have other national commitments.	In order to effectively implement the M/P, it is necessary to strengthen the institutional capacity of DOE. On the other hand, the current policy of the Iranian government is to gradually downsize the government through for example enhancement of private sector outsourcing. Therefore, institutional capacity building should first focus on strengthening the capacity of existing DOE staff. However, this approach may not be enough considering that various new activities are planned in the M/P. Hence options for recruiting new coastal environment experts should also be considered. Procurement of survey and lab equipment will also be necessary to implement the monitoring and inspection activities proposed in the M/P.

Source: JICA Project Team

6. COMMON ACTIVITIES

6.1 Database

A GIS database was developed which stores the data/information collected through the Project.

6.2 Promotion activities

Various promotion materials (e.g. brochure, poster, video) of this Project were prepared and shared with stakeholders during events and meetings.

6.3 Training in Japan

Initially, training in Japan was planned three times. However, the 2nd and 3rd training courses were not implemented due to Corona-related travel restrictions.

The 1st training course was conducted from August 26th-September 3rd 2019. The main objective was to introduce Japanese policies and measures on coastal ecosystem conservation. A total of 10 trainees participated coming from DOE, Hormozgan government and PBO.

The 2nd and 3rd training courses were planned to introduce coastal conservation measures in Japan, which are related to the action plan of the M/P. Since these training courses were cancelled, WEB-based training course was implemented during September 7-9, 2020 focusing mainly on ecosystem conservation and pollution control.

6.4 Technical transfer (apart from training in Japan)

Training course on InVEST risk assessment was conducted for the DOE experts in HQ and Hormozgan. The training focused on learning the basic process of InVEST HRA model.

6.5 Seminar

A seminar was held on December 4th, 2019 at Bandar Abbas to explain and discuss the draft M/P to the stakeholders. The seminar mainly focused on the action plan and implementation structure, and the participants expressed their support for future implementation.

7. CONCLUSION AND RECOMMENDATION

Degradation of coastal ecosystem is becoming more prevalent in Hormozgan as confirmed through the Project. For example, degradation of coral reef is significant, which in combination with global warming affects, may further reduce or even become extinct in the future without some active intervention. Tidal flats and mangrove forests are also being affected through human activities and intrusion of invasive species. These are worrying trends as such impacts were observed even in protected areas. While good environmental quality is fundamental for sustaining ecosystem health, significant water and sediment pollution were confirmed especially around urban areas. Pressures on the coastal environment will certainly increase in the future through for example population growth, urban and industrial development, in which rural areas are no exception.

Although DOE has been implementing coastal conservation activities to some extent, their activities have been rather limited partly due to lack of institutional and human capacity and budget, as well as deficiencies in some of the related laws and regulations. While conservation activities should be implemented by engaging related stakeholders, such cooperation between stakeholders have been limited thus far.

Considering these issues, the M/P proposes actions necessary for the sustainable conservation and management of the Hormozgan coastal environment including its implementation structure. While DOE will play a central role in the implementation, it will be a huge challenge to implement from both technical and financial aspects considering that there are more than 40 actions and in which many of them will be new initiatives in Iran. Therefore, in order to ensure that the action plan will be implemented as scheduled and effectively, JICA's continuous support is very much needed.