CHAPTER 10 PRIORITY PROGRAMS AND PROJECTS

10.1 Selection of Priority Programs and Projects

10.1.1 Establishment of evaluation criteria

The projects and programs are proposed in the sector development plan of the ECO-QESHM Master Plan. Among these projects and programs is a set of priority projects, which have been selected by scoring the candidate projects in relation to the evaluation criteria. The candidate projects are the projects and programs that should be commenced in the short term until 2021. They will be preferably completed in the short term, but timing of their completion can be expanded to the medium term until 2026 and the long term until 2036.

The evaluation standard is established to reflect the development objectives proposed in the ECO-QESHM Master Plan. The development objectives include four aspects, namely, the economy, the environment, society and human resources. The evaluation standard also includes urgency as shown in Table 2.1.1. Evaluation criteria are constructed as broadly as possible for each evaluation standard. The objectives of establishing the criteria this broadly are to avoid missing out on important requirements for the priority projects. Even though the criteria overlap with different evaluation standards, the overlapped criteria are considered to be representative of the significance of such criteria in order to achieve the vision behind the eco-island development.

The evaluation criteria for economic enhancement constitute the creation of job opportunities, livelihood improvement and regional economic growth. The promotion of export products, logistics and direct investment are also included in order to meet the role of the free zone (FZ) on Qeshm Island in terms of economic enhancement standards. The evaluation criteria are established for social and environment purposes to conserve the rich social and environmental resources on the island too. Social participation and administrative ability improvement are included in the evaluation criteria. The local residents expressed their needs concerning balanced development in the consultation meetings that were convened in process of formulating the ECO-QESHM Master Plan. The vitalization of central and western parts of the island with improved social services has been taken into consideration in the evaluation criteria. First and foremost, human resources development is important in terms of realizing the ECO-QESHM Master Plan. The evaluation criteria include the promotion of small and medium-sized enterprises (SMEs), research and development, and awareness-raising of the eco-island concept. As a whole, 21 evaluation criteria have been agreed, as shown in Table 10.1.1.

Table 10.1.1 Evaluation Standards for Priority Projects.

Evaluation standards	Evaluation criteria
1. Economic enhancement	1.1 Creation of job opportunities for local residents
	1.2 Livelihood improvement among local residents
	1.3 Regional economic growth contributing to the local economy
	1.4 Export promotion and logistics to the mainland and foreign countries in order to contribute to the local economy
	1.5 Investment promotion from the mainland and foreign countries to contribute to the local economy
2. Social enhancement	2.1 Social participation of the local community including various stakeholders
	2.2 Promotion of tradition and culture
	2.3 Promotion of social services, including water supply, electricity, education and health
	2.4 Enhancement of administrative ability for implementation
	2.5 Balanced development to vitalize the central and western parts of the island
3. Environmental enhancement	3.1 Environmental management in marine and terrestrial areas
	3.2 Vitalization of marine and terrestrial biodiversity
	3.3 Reduction of environmental pollution by economic activities
	3.4 Promotion of environmentally friendly living conditions, including solid waste management and wastewater management
	3.5 Reduction of CO_2 emissions and energy-saving
4. Human resources enhancement	4.1 Promotion of SMEs
	4.2 Promotion of research and development suitable for Qeshm Island
	4.3 Promotion of higher education suitable for Qeshm Island
	4.4 Awareness-raising of the eco-island concept focusing on the environment, tradition and culture
	4.5 Promotion of appropriate and advanced technology
5. Urgency	5.1 Urgency of project implementation

Source: JICA Project Team

10.1.2 Selection of priority programs and projects

Fifty-nine projects are selected for the candidate projects from the sector development plan. The candidate projects are evaluated in respect of the evaluation criteria. A project largely contributing to the requirement defined according to an evaluation criterion is given two points. One point is for a limited contribution. The total score is estimated for each candidate project.

The candidate projects are classified into four categories, namely, economic development, infrastructure development, environmental management, and regional and community development. The priority projects are selected from the candidate projects with the third-highest evaluation points in each category. The number of priority projects is 19, as shown in Table 10.1.2.

Table 10.1.2 Evaluation Standards for Priority Projects.

Category	Subcategory	Number of candidate projects	Number of priority projects
Economic development	Agriculture and animal husbandry	11	0
	Fishery	7	4
	Industrial development	5	1
	Tourism	4	2
Infrastructure development	Transportation	6	0
	Water supply	2	1
	Sewage treatment	3	1
	Solid waste management	7	1
	Power supply and renewable energy	2	1
Environmental management	Marine ecosystem management	3	1
	Inland ecosystem management	4	3
	Geopark management	1	1
	Institutional system	1	0
Regional and community development	Regional development	2	2
	Community development	1	1
Total		59	19

Source: JICA Project Team

Table 10.1.3 shows the evaluation results for each candidate project.

Table 10.1.3 Selection of Priority Programs and Projects

Project	1. Economic enhancement					2. Social enhancement					3. Environmental enhancement					4. Human resources enhancement					5. Urgency	Total
	1.1 Creation of job opportunities for local residents	1.2 Livelihood improvement for local residents	1.3 Regional economic growth contributing to the local economy	1.4 Export promotion and logistics to the mainland and foreign countries to contribute to the local economy	1.5 Investment promotion from the mainland and foreign countries to contribute to the local economy	2.1 Social participation by the local community including various stakeholders	2.2 Promotion of tradition and culture	2.3 Promotion of social services including water supply, electricity, education and health	2.4 Enhancement of administrative ability for implementation	2.5 Balanced development to vitalize the center and west of the island	3.1 Environmental management in marine and terrestrial areas	3.2 Vitalization of marine and terrestrial biodiversity	3.3 Reduction of environmental pollution by economic activities	3.4 Promotion of environmentally friendly living conditions including solid waste management and wastewater management	3.5 Reduction of CO_2 emissions and energy-saving	4.1 Promotion of SMEs	4.2 Promotion of research and development suitable for Qeshm Island	4.3 Promotion of higher education and vocational training suitable for Qeshm Island	4.4 Awareness-raising of the eco-island concept focusing on the environment, tradition, and culture	4.5 Promotion of appropriate and advanced technology	5.1 Urgency concerning project implementation	
Economic development																						
Agriculture and animal husbandry																						
AG-1 Technical guidance on agricultural production and farm household economy	2	1	1	0	0	1	0	0	0	2	1	0	1	0	0	0	0	0	1	1	1	12
AG-2 Promotion of apiculture/mangrove honey	1	1	1	1	0	1	1	0	0	0	1	0	0	0	0	0	0	0	1	1	1	10
AG-3 Establishment of chicken slaughterhouse	1	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	4
AG-4 Development/introduction (including breeding) of suitable date palm varieties	1	1	1	1	0	0	1	0	0	1	1	0	0	0	0	0	1	0	1	1	1	11
AG-5 Recentralization of farming lands	1	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	1	7
AG-6 Dissemination of water-saving culture	2	1	2	0	0	0	0	1	0	2	1	1	1	1	0	0	1	0	2	1	1	17
AG-7 Forage production using recycled water	1	1	1	0	0	1	0	0	0	1	1	1	1	1	0	0	0	0	2	1	1	13
AG-8 Selection of salinity-tolerant greening (afforestation) plants	1	0	0	0	0	1	0	1	0	2	1	1	1	0	0	0	1	0	1	1	1	12
AG-9 Establishment of a medicinal herbal garden	1	1	1	0	0	1	2	1	0	2	0	0	0	0	0	1	0	0	2	1	1	14
AG-10 Production of herbal plants	1	1	1	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	1	1	1	9
AG-11 Sales of herbal products at visitor centers	2	2	2	1	0	1	2	1	0	2	0	0	0	0	0	1	0	0	1	1	1	17
Fishery																						
Program for the enhancement of biological productivity through the promotion of *satoumi*																						
FS-1 Aquaculture development in local communities																						
FS-1.1 Market-based aquaculture development plan	**2**	**2**	**1**	**1**	**1**	**2**	**1**	**0**	**1**	**1**	**1**	**1**	**1**	**0**	**1**	**2**	**1**	**0**	**1**	**1**	**2**	**23**
FS-1.2 Dissemination of aquaculture to local communities	**2**	**2**	**1**	**1**	**1**	**2**	**1**	**0**	**2**	**1**	**1**	**1**	**1**	**0**	**1**	**2**	**1**	**0**	**1**	**1**	**2**	**24**
FS-1.3 Development of offshore farming and land-based aquaculture	1	1	1	1	1	1	0	0	0	1	1	1	0	0	0	1	2	0	0	2	1	15
FS-2 Habitat rehabilitation	**1**	**2**	**1**	**0**	**0**	**2**	**2**	**0**	**2**	**1**	**2**	**2**	**1**	**2**	**1**	**0**	**1**	**0**	**2**	**1**	**2**	**25**
FS-3 Community-based fishery resource management	**1**	**2**	**1**	**1**	**0**	**2**	**2**	**0**	**2**	**1**	**2**	**2**	**1**	**2**	**0**	**2**	**1**	**0**	**2**	**1**	**2**	**27**

Project	1. Economic enhancement					2. Social enhancement					3. Environmental enhancement					4. Human resources enhancement					5. Urgency	Total
	1.1 Creation of job opportunities for local residents	1.2 Livelihood improvement for local residents	1.3 Regional economic growth contributing to the local economy	1.4 Export promotion and logistics to the mainland and foreign countries to contribute to the local economy	1.5 Investment promotion from the mainland and foreign countries to contribute to the local economy	2.1 Social participation by the local community including various stakeholders	2.2 Promotion of tradition and culture	2.3 Promotion of social services including water supply, electricity, education and health	2.4 Enhancement of administrative ability for implementation	2.5 Balanced development to vitalize the center and west of the island	3.1 Environmental management in marine and terrestrial areas	3.2 Vitalization of marine and terrestrial biodiversity	3.3 Reduction of environmental pollution by economic activities	3.4 Promotion of environmentally friendly living conditions including solid waste management and wastewater management	3.5 Reduction of CO_2 emissions and energy-saving	4.1 Promotion of SMEs	4.2 Promotion of research and development suitable for Qeshm Island	4.3 Promotion of higher education and vocational training suitable for Qeshm Island	4.4 Awareness-raising of the eco-island concept focusing on the environment, tradition, and culture	4.5 Promotion of appropriate and advanced technology	5.1 Urgency concerning project implementation	
Program for value-chain enhancement																						
FS-4 Development of value-added products	2	2	2	1	1	2	2	0	0	1	2	0	0	0	0	2	2	0	0	1	2	22
FS-5 Improvement of fish-landing facilities	1	2	2	2	2	2	1	1	1	1	1	0	0	0	0	1	0	0	1	1	2	21
Industrial development																						
Oil and gas industry																						
IN-1 Liquefied natural gas (LNG) industry development	**1**	**1**	**2**	**2**	**2**	**1**	**0**	**1**	**1**	**0**	**0**	**0**	**1**	**2**	**0**	**2**	**2**	**2**	**0**	**2**	**2**	**24**
Reinforcement and materialization of existing or planned industrial parks (Towla, Kaveh and Souza)																						
IN-2 Preparation of rental factories or readily serviced industrial units	2	1	1	1	2	0	0	0	1	0	0	0	0	0	1	2	0	0	0	1	0	12
Strengthening of the vocational training system																						
IN-3 Provision of on-demand training to companies' employees via technical and vocational training schools	1	0	1	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	6
IN-4 Preparation of technical and vocational schools on industrial parks, such as Towla, Kaveh and Souza	2	1	1	1	1	0	0	1	1	0	0	0	0	0	0	1	0	0	0	1	0	10
Strengthening of SMEs																						
IN-5 Formulation of comprehensive SME development plan	1	1	1	0	0	0	1	0	1	1	0	0	1	0	0	2	1	0	0	1	0	11
Tourism																						
TO-1 Capacity development in marketing and promotion of ecotourism	**2**	**2**	**2**	**1**	**1**	**2**	**2**	**1**	**2**	**1**	**0**	**1**	**0**	**0**	**0**	**2**	**0**	**1**	**1**	**0**	**2**	**23**
TO-2 Capacity development in tourism statistics	2	1	1	0	0	2	1	0	2	1	0	0	0	0	0	1	2	1	1	0	1	16
TO-3 One Village One Product (OVOP) promotion	**2**	**2**	**2**	**0**	**0**	**2**	**2**	**1**	**1**	**2**	**1**	**1**	**0**	**0**	**0**	**2**	**1**	**0**	**2**	**1**	**1**	**23**
TO-4 Capacity development for SMEs	2	2	2	0	0	2	2	1	1	2	0	0	0	0	0	2	1	0	2	1	1	21
Infrastructure development																						
Transportation																						
Airport and air transport																						
TR-1 Qeshm International Airport improvement (Phase 1)	1	1	1	1	1	0	0	1	1	1	0	0	0	0	0	1	0	0	0	1	0	10
TR-2 Qeshm International Airport improvement (Phase 2)	1	1	1	1	1	0	0	1	1	1	0	0	0	0	0	1	0	0	0	1	0	10

Project	1. Economic enhancement					2. Social enhancement					3. Environmental enhancement					4. Human resources enhancement					5. Urgency	Total
	1.1 Creation of job opportunities for local residents	1.2 Livelihood improvement for local residents	1.3 Regional economic growth contributing to the local economy	1.4 Export promotion and logistics to the mainland and foreign countries to contribute to the local economy	1.5 Investment promotion from the mainland and foreign countries to contribute to the local economy	2.1 Social participation by the local community including various stakeholders	2.2 Promotion of tradition and culture	2.3 Promotion of social services including water supply, electricity, education and health	2.4 Enhancement of administrative ability for implementation	2.5 Balanced development to vitalize the center and west of the island	3.1 Environmental management in marine and terrestrial areas	3.2 Vitalization of marine and terrestrial biodiversity	3.3 Reduction of environmental pollution by economic activities	3.4 Promotion of environmentally friendly living conditions including solid waste management and wastewater management	3.5 Reduction of CO_2 emissions and energy-saving	4.1 Promotion of SMEs	4.2 Promotion of research and development suitable for Qeshm Island	4.3 Promotion of higher education and vocational training suitable for Qeshm Island	4.4 Awareness-raising of the eco-island concept focusing on the environment, tradition, and culture	4.5 Promotion of appropriate and advanced technology	5.1 Urgency concerning project implementation	
Port and sea transport																						
TR-3 Bahman Port expansion project	1	1	1	1	1	0	0	1	1	0	0	0	0	0	0	1	0	0	0	1	0	9
TR-4 Shahid Zakeri Ferry Port improvement project	1	1	1	1	1	0	0	1	1	0	0	0	0	0	0	1	0	0	0	1	0	9
TR-5 Selakh Port expansion project	1	1	1	1	1	0	0	1	1	0	0	0	0	0	0	1	0	0	0	1	0	9
Public transport																						
TR-6 Introduction of route bus service	1	1	1	0	0	1	0	1	1	1	1	0	1	1	1	1	1	0	1	2	1	17
Water supply																						
WS-1 Technical support for improvements to the capacity of leakage detection and non-revenue water (NRW) in Qeshm City and rural areas	**2**	**2**	**1**	**0**	**1**	**1**	**1**	**2**	**2**	**2**	**0**	**0**	**1**	**0**	**1**	**1**	**0**	**1**	**1**	**2**	**1**	**22**
WS-2 Technical support for improvements to operation and maintenance capacity in rural areas	2	2	1	0	1	1	1	2	2	2	0	0	0	0	0	1	0	1	0	1	1	18
Sewage treatment																						
ST-1 Development of the urban sewerage system for Dargahan City	**1**	**2**	**1**	**0**	**1**	**1**	**0**	**2**	**1**	**1**	**2**	**0**	**2**	**2**	**0**	**0**	**0**	**0**	**1**	**1**	**2**	**20**
ST-2 Development of a rural sewerage system for 10 villages	1	2	1	0	1	1	0	2	1	1	2	0	1	2	0	0	0	0	1	1	1	18
ST-3 Reuse of treated sewage effluent	1	2	1	0	0	1	0	2	1	1	1	0	0	1	0	1	0	0	1	1	1	15
Solid waste management																						
Project for ordinary waste																						
SW-1.1 Transport of village waste	2	2	0	0	0	1	0	1	2	1	1	0	1	1	0	0	0	0	1	0	1	14
SW-1.2 Encouraging recycling	1	0	0	1	1	1	0	1	0	0	0	0	1	1	1	1	0	0	0	1	0	10
SW-1.3 Sanitary landfilling at Towla	**1**	**2**	**0**	**0**	**0**	**1**	**0**	**2**	**2**	**0**	**2**	**1**	**2**	**2**	**1**	**0**	**0**	**0**	**2**	**1**	**2**	**21**
SW-1.4 Sanitary landfilling in the Central Area	0	1	0	0	0	1	0	2	1	0	1	0	1	2	1	0	0	0	1	1	0	12
Project for industrial waste																						
SW-2 Information system of waste type and amount	0	1	0	0	0	2	0	2	2	1	0	0	0	1	0	0	0	1	1	0	1	12
Project for hospital waste																						
SW-3.1 Infectious waste management at small clinics	1	0	0	0	0	1	0	1	0	0	0	0	1	1	0	0	0	0	1	0	0	6
SW-3.2 Incineration of infectious waste	1	1	0	0	0	1	0	1	0	0	1	0	1	1	0	1	0	0	1	1	0	10
Power supply and renewable energy																						
PS-1 Promotion project for Photovoltaic (PV) generation	**1**	**1**	**0**	**0**	**2**	**1**	**0**	**1**	**1**	**0**	**0**	**0**	**2**	**1**	**2**	**2**	**1**	**1**	**1**	**2**	**1**	**20**
PS-2 Mega solar construction project	1	1	1	0	2	0	0	1	0	0	0	0	2	1	2	2	1	1	1	2	1	19

Project	1. Economic enhancement					2. Social enhancement					3. Environmental enhancement					4. Human resources enhancement					5. Urgency	Total
	1.1 Creation of job opportunities for local residents	1.2 Livelihood improvement for local residents	1.3 Regional economic growth contributing to the local economy	1.4 Export promotion and logistics to the mainland and foreign countries to contribute to the local economy	1.5 Investment promotion from the mainland and foreign countries to contribute to the local economy	2.1 Social participation by the local community including various stakeholders	2.2 Promotion of tradition and culture	2.3 Promotion of social services including water supply, electricity, education and health	2.4 Enhancement of administrative ability for implementation	2.5 Balanced development to vitalize the center and west of the island	3.1 Environmental management in marine and terrestrial areas	3.2 Vitalization of marine and terrestrial biodiversity	3.3 Reduction of environmental pollution by economic activities	3.4 Promotion of environmentally friendly living conditions including solid waste management and wastewater management	3.5 Reduction of CO_2 emissions and energy-saving	4.1 Promotion of SMEs	4.2 Promotion of research and development suitable for Qeshm Island	4.3 Promotion of higher education and vocational training suitable for Qeshm Island	4.4 Awareness-raising of the eco-island concept focusing on the environment, tradition, and culture	4.5 Promotion of appropriate and advanced technology	5.1 Urgency concerning project implementation	
Environmental management																						
Marine ecosystem management																						
ME-1 Rehabilitation of the coral community	**2**	**2**	**1**	**0**	**0**	**2**	**0**	**0**	**2**	**2**	**2**	**2**	**0**	**1**	**1**	**2**	**2**	**2**	**2**	**1**	**2**	**28**
ME-2 Conservation of marine mammals and turtles	1	1	1	0	0	2	1	0	2	2	2	1	0	0	0	1	2	1	2	0	1	20
ME-3 Establishment and control of access to the natural environment	1	1	1	0	0	2	0	0	2	2	2	2	0	2	0	2	2	2	2	0	1	24
Inland ecosystem management																						
IE-1 Integrated management of the Hara Protected Area	**1**	**1**	**1**	**1**	**1**	**2**	**1**	**1**	**2**	**2**	**2**	**2**	**1**	**1**	**1**	**1**	**1**	**1**	**2**	**1**	**2**	**28**
IE-2 Indigenous and community conserved areas (ICCAs) promotion through technical ecological knowledge	1	1	0	0	0	2	2	1	1	2	2	1	1	2	1	0	2	1	2	2	1	25
IE-3 Rehabilitation of native species for better ecosystem services	**1**	**1**	**0**	**0**	**0**	**2**	**2**	**2**	**1**	**1**	**2**	**2**	**1**	**2**	**1**	**1**	**2**	**1**	**1**	**2**	**2**	**27**
IE-4 Phasing out of harmful economic incentives and strengthening positive incentives for better ecosystem services	**0**	**1**	**1**	**0**	**0**	**1**	**2**	**2**	**2**	**1**	**2**	**1**	**2**	**2**	**2**	**1**	**2**	**1**	**1**	**2**	**1**	**27**
Geopark management																						
GM-1 Promotion of Qeshm Island Geopark for regional hub in Middle East and North Africa (MENA) countries	**2**	**2**	**0**	**1**	**0**	**2**	**2**	**0**	**2**	**2**	**2**	**2**	**0**	**0**	**0**	**2**	**1**	**1**	**2**	**2**	**2**	**27**
Institutional system																						
EM-1 Environmental seminar	0	0	0	0	0	1	0	0	2	0	0	0	0	0	0	0	1	1	0	0	1	6
Regional and community development																						
Regional development																						
RD-1 Integrated regional development in Southern Iran	**1**	**1**	**2**	**1**	**2**	**1**	**2**	**2**	**2**	**2**	**1**	**1**	**1**	**1**	**1**	**2**	**1**	**1**	**2**	**1**	**1**	**29**
RD-2 Capacity building of the QFZO in sustainable administrative systems	**2**	**1**	**1**	**0**	**0**	**2**	**2**	**2**	**2**	**1**	**0**	**0**	**0**	**1**	**0**	**2**	**1**	**1**	**2**	**0**	**2**	**22**
Community development																						
CD-1 Establishment of a participatory approach for public participation	**2**	**2**	**2**	**1**	**1**	**2**	**1**	**2**	**2**	**1**	**2**	**2**	**1**	**1**	**1**	**1**	**1**	**1**	**2**	**1**	**2**	**31**

Note: 0 = no effect, 1 = limited effect and 2 = large effect
Source: JICA Project Team

10.2 Profiles of Priority Projects and Programs

10.2.1 Priority projects in economic development

A set of project profiles is prepared for 19 priority projects. The project profiles consist of location, implementation body, objectives, expected effects, investment cost, a description of existing conditions, a project description, and social and environmental issues. This subsection shows the project profiles of seven priority projects in fishery, industrial development and tourism in Tables from 11.2.1 through 11.2.7.

(1) Fishery

Table 10.2.1 Market-based Aquaculture Development Plan (FS-1.1)

Location	Qeshm Island and Hangom Island
Implementing body	QFZO and Iranian Fisheries Organization (IFO)
Objectives	(1) To understand the market needs of aquaculture products (2) To elaborate an aquaculture development plan for increasing fishery production (3) To clarify proper procedures for local people to start aquaculture businesses and marketing
Expected effects	(1) Aquaculture is promoted and disseminated among local communities (2) Aquaculture production increases in value and quantity (3) Fishermen's income is improved thorough aquaculture business (4) Fishing pressure on fishery resources is reduced through diversification of fishermen's livelihood
Investment cost	(Soft component)

Description

(1) Existing conditions

Aquaculture development contributes to an increase in the supply of protein sources for human, while fishermen can diversify their livelihood by starting aquaculture businesses. The Government of Iran regards the promotion of aquaculture development as one of priority issues in its Sixth Five-year Development Plan. In this context, the QFZO has already given the fish cage culture licenses to private companies, with the aim of achieving a total production of 35,000 tons of fish per year. Currently, shrimp farming is conducted on Hangom Island, whose annual production level is expected to be at least 200 tons. Fish farming and micro-algal culture activities have recently started, with seaweed culture is going to start soon. On the other hand, small-scale farming by local people is still not disseminated, although there are potential areas for aquaculture on Qeshm Island and Hangom Island. A development plan to increase aquaculture production involving local communities is necessary for livelihood improvement among local people.

(2) Project description

A variety of fishery resources, such as sandfish, shellfish, seaweed and many finfishes, are found in Qeshmi waters, some of which seem to offer the potential for aquaculture. This priority project intends to: 1) identify profitable target species for aquaculture, taking into consideration markets and technical feasibility, 2) clarify domestic and international market needs concerning the quality of fishery products, and 3) promote the smooth commencement of aquaculture businesses by local people. Project activities are as follows:

a) Candidate target species are selected from among shellfish, sandfish, seaweed and finfish species.
b) A market study is conducted for the selected species, aimed at domestic and international markets.
c) Information about the required quality of fishery products is gathered, while the feasibility of manufacturing required fishery products is assessed. The best approaches to postharvest operations, processing, food safety and distribution chains are discussed and described in order to meet the needs of markets.
d) Proper methods to procure fingerlings, seedlings and spats of target species, as well as grow-out techniques, are discussed with relevant institutes.
e) A market-based aquaculture development plan is prepared, including: 1) marketing on Qeshm Island and in cities elsewhere in Iran, 2) promoting the export of value-added products following international standards, such as Best Aquaculture Practices (BAPs) and those of the Aquaculture Stewardship Council (ASC), 3) producing an aquaculture potential site map considering target species, farming methods, existing farm areas, and environmental and socioeconomic conditions, 4) establishing a comprehensive information service system to encourage the development of aquaculture by local people, 5) promoting the utilization of financial mechanisms, such as Keshavarzi Bank, to help local people to smoothly start businesses, 6) producing a roadmap for launching aquaculture businesses, and 7) granting the right of priority use of nearshore areas for aquaculture to local fishermen who live in front of the areas so as to protect their livelihood and foster their awareness of autonomous environmental management.

(3) Social and environmental issues

a) Aquaculture causes water pollution and the degradation of sea bottom conditions if environmental considerations are ignored. The introduction of integrated multitrophic aquaculture (IMTA), which is an appropriate feeding and fertilization regime, and moderate grow-out density will work for the reduction of pollution originating from farming. Thus, those concepts should be carefully considered during the development planning phase.

b) Aquaculture development occupies wide areas in the sea and/or on land and could lead to adverse effects in socioeconomically or ecologically important areas. Careful social and environmental considerations should be made.

Source: JICA Project Team

Table 10.2.2 Dissemination of Aquaculture to the Local Communities (FS-1.2)

Location	The waters around Qeshm Island and Hangom Island
Implementing body	QFZO and IFO
Objectives	(1) To implement the market-based aquaculture development plan (2) To increase aquacultural production by local people (3) To improve fishermen's income through aquaculture businesses (4) To reduce fishing pressures on fishery resources through the diversification of fishermen's livelihood
Expected effects	(1) Number of local people engaged in aquaculture business increases (2) Aquaculture production increases in value and quantity (3) Fishermen's income is improved (4) Fishing pressure on fishery resources is reduced
Investment cost	(Soft component)
Description	

(1) Existing conditions

The Government of Iran regards the promotion of aquaculture development as a priority project. The QFZO has issued fish cage culture licenses to private companies with a total annual production of 35,000 tons of fish so far. Shrimp farming has been conducted for the last 15 years and its annual production level is estimated to be about 200 tons. More farms have recently started operations, such as a 100-ha shrimp farm, fish farms, and a micro-algae farm. Seaweed farming is also going to start soon.

Qeshmi waters possess suitable sites for aquaculture at sea and on land; for example, relatively calm water areas between 1) the mainland and Qeshm Island, 2) Qeshm Island and Hangom Island, and 3) Qeshm Island and Larak Island. There are also large areas of land along the coast, which could be made available for aquaculture. However, aquaculture businesses run by local people are still not diffused, although fishermen's income is very low and there is a high expectation that aquaculture development will offer an alternative income source to the local community. Therefore, the promotion of aquaculture with assistance from the government is highly demanded.

(2) Project description

The project intends to promote the smooth commencement of aquaculture businesses by local people as an alternative income source through the implementation of a market-based aquaculture development plan. Activity components are as follows:

a) The establishment of a technical assistance system in the form of training programs and improvements to the information service for helping local people to smoothly start and continue aquaculture businesses in a sustainable manner.
b) The establishment of partnerships with organizations engaged in aquaculture research and development in Hormozgan Province, such as the IFO, Hormozgan University, the Biotechnology Institute of the Iranian Research Organization for Science and Technology, the Natural Resources Research Center of Hormozgan Province, and the Persian Gulf and Oman Sea Ecological Research Institute, in order to effectively utilize their knowledge and expertise for the dissemination.
c) Promotion of IMTA or combined farming of different types of marine organisms, such as fish, sea cucumber, seaweed, shrimp and/or shellfish in order to reduce adverse impacts on the natural environment.
d) Promotion of the utilization of financial mechanisms.
e) Granting the right of priority use of nearshore areas for aquaculture to local fishermen who live in front of the areas to protect their livelihood and foster their awareness of autonomous environmental management.
f) Aquaculture practices, in view of the promotion of exports following international standards, such as BAPs and those of the ASC, which may become representative activities of the "Eco-Island" concept, are promoted in such a way that Qeshmi products are differentiated from products of other regions in Iran.

(3) Social and environmental issues

Water pollution and environmental degradation of the sea bottom could occur if environmentally sound aquaculture is ignored. The promotion of IMTA could be considered as a farming method of low environmental impact. An appropriate regime of feeding and fertilization and grow-out density should be carefully considered before starting aquaculture businesses, while the marine environment should be monitored on a regular basis after they are started.

Source: JICA Project Team

Table 10.2.3 Habitat Rehabilitation (FS-2)

Location	Qeshm Island and Hangom Island
Implementing body	QFZO and IFO
Objectives	(1) To compile ecological information related to fishery resources (2) To draw up a plan of habitat rehabilitation for the enhancement of fishery resources (3) To restore and create habitats for fishery resources
Expected effects	(1) Fishermen's awareness of the conservation of the marine environment and fishery resources is strengthened through habitat rehabilitation and collaborative monitoring (2) Capture production increases
Investment cost	USD 7.7 million (artificial reef modules, environmental survey, monitoring and evaluation, etc.)

Description

(1) Existing conditions

Fishermen have noticed that capture production per fishing boat is decreasing. One of reasons for the decrease is thought to be habitat degradation, due to several human activities, such as overfishing, destructive fishing, water pollution and land reclamation. The rehabilitation of natural habitats is urgent needed in order to conserve the marine ecosystem and protect fishermen's livelihood. The Global Environment Facility (GEF) and the IFO have installed about 150 artificial reef modules off the coast of Selakh and Gomboron, in 2002 and 2015, respectively, to enhance the abundance of fish and to promote the protection and wise use of fishery resources. These projects enjoy a good reputation among local fishermen, whose interest in habitat rehabilitation has grown. In addition to the artificial reefs, the rehabilitation of natural habitats, such as coral reefs, seaweed beds, seagrass beds and tidal flats, should also be considered to effectively restore the fishery resources.

(2) Project description

This project aims at the protection and propagation of fishery resources by rehabilitating and creating habitats to support fishery resources. Activity components are as follows:

a) Collection of ecological and oceanographic information related to natural habitats and fishery resources
b) Creation of a habitats map
c) Planning habitat rehabilitation and fingerlings/seeds release
d) Establishment of a partnership with local fishermen
e) Placement of artificial reefs
f) Rehabilitation of natural habitats
g) Release of fingerlings/seeds of fishery resources
h) Collaborative monitoring and evaluation of habitats and fishery resources with local fishermen

(3) Social and environmental issues

The project contributes to the rehabilitation of the marine ecosystem and increasing fishery resources. Therefore, there will be no significant adverse effects on social and environmental conditions. However, habitat rehabilitation should be conducted in collaboration with local fishermen who fully understand the objectives of the project.

Source: JICA Project Team

Table 10.2.4 Community-based Fishery Resource Management (FS-3)

Location	Qeshm Island and Hangom Island
Implementing body	QFZO and IFO
Objectives	Management of fishery resources and coastal ecosystems in the inshore areas is strengthened by autonomous actions of fishermen
Expected effects	(1) The fishery resource in nearshore areas is better managed by fishermen's initiatives (2) Local people earn more stable income through combined economic activities, such as fishing, aquaculture, processing and tourism (3) The *satoumi* concept is widely disseminated in Qeshm Island
Investment cost	(Soft component)
Description	

(1) Existing conditions

Most Qeshmi fishermen are aware that capture production per fishing boat is decreasing. There may be several reasons for this decrease, such as overfishing, illegal fishing, marine pollution and habitat loss. Comprehensive information to elucidate the actual situation regarding fishery resources and a clear policy of fishery resource management are necessary to protect local fishermen's livelihood.

The IFO has taken several actions to control fishing activities in order to reduce fishing efforts, while enhancing fishery resources. The next critical step for more effective management of fishery resources, is the establishment of a management system through fishermen's autonomous actions because the fishery resources of nearshore areas can be better managed by local fishermen and people who live and fish nearby.

Coastal areas can be wisely used through the diversification of local people's livelihoods, including fishing, aquaculture, fish-processing, and marine-related tourism such as ecotourism, fishing experience tours and recreational fishing tours. This livelihood diversification contributes to a reduction in pressure on fishery resources, as well as the conservation of marine ecosystems. A community-based approach is, therefore, essential for better fishery resource management.

(2) Project description

The project focuses on 1) capacity development of organizations engaged in fishery resource management including the collection and analysis of fishing data, 2) preparation and implementation of a coastal fishery resource management plan, 3) diversification of fishermen's economic activities, and 4) establishing a fishery resource management system through fishermen's initiatives especially in nearshore areas. The proposed activities are:

a) Improvement in the collection and analysis of fishery data and socioeconomic information of fishermen's communities.
b) Integration of key information related to fishery resources in GIS.
c) Preparation (drafting) of a fishery resource management plan, based on information about the biology and ecology of fishery resources, important habitat locations, habitat rehabilitation areas, fishing and aquaculture operations, socioeconomy in fishing communities etc. The plan will include: 1) a visualization of zoning of fishing areas designated for each type of fishing, 2) protected areas, and 3) granting territorial user rights to local fishermen in order to protect their fishing activities, including aquaculture, and promote their autonomous actions for resource management in nearshore areas.
d) Pilot project for the draft of a community-based fishery resource management plan on selected pilot site(s).
e) Capacity development of governmental organizations and fishermen's cooperatives on fishery resource management by expert(s).
f) Promotion of livelihood diversification in cooperation with other (sub)sectors' projects, e.g., aquaculture and ecotourism development projects.
g) Awareness-raising among local fishermen and residents about conservation of the marine environment and coastal fishery resource management in combination with other projects, such as a habitat rehabilitation project.
h) Strengthening the collaboration between fishing villages on activities related to fishery resource management.
i) Evaluation of a pilot project and the finalization of a fishery resource management plan.
j) Dissemination of fishery resource management across the whole islands.

(3) Social and environmental issues

Where fishing activities are strictly controlled for fishery resource management, fishermen could lose their livelihoods. The modality of fishery management and the promotion of alternative livelihoods should be carefully considered.

Source: JICA Project Team

(2) Industrial development

Table 10.2.5 Liquefied Natural Gas Industry Development (IN-1)

Location	Selakh or Souza (under studying)
Implementing body	Joint venture between a national oil company, an international oil company and a Japanese utility company
Objectives	Income improvement from LNG production and sales to international markets for the island and Iran
Expected effects	(1) Corporate tax revenue and trading revenue from LNG bunkering (2) Direct employment for LNG production (3) Indirect employment for the maintenance and service industry including banking businesses
Investment cost	USD 5,000 million for 10 million tons/year throughput capacity (for equipment)
Description	

(1) Existing conditions

Iran is the third-largest gas reserve country following Russia and Qatar. Iranian gas has not been exploited for export as LNG, although gas has been used as a feedstock for petrochemical industries. However, gas-based petrochemical products may not necessarily be competitive on the international market due to a narrowing price gap between oil and gas.

Since Qeshm is located close to international waterways, bunkering is considered to be highly appropriate. Due to tighter sulfur emission constraints at an international level, part of the marine fuel market will be shifting to LNG, while taking some shares in the bunkering market.

(2) Project description

The proposed LNG production and shipping facilities consist of 2 x five million-ton liquefaction trains, 2 x LNG tanks, utility facilities including power generation plant, and one 800 m-long jetty with loading arms for export. Land space requirement will be 1,000 x 1,200 m, which will be able to accommodate a future expansion of an additional 10 million tons/year.

The profile of LNG production industry is considered low in comparison with petrochemical industries. However, the economic benefit to both national and local government is significant.

Once the facility is constructed and operational, service industries, including maintenance, will be established in the island.

(3) Social and environmental issues

From an environmental point of view, the major emissions from the facility will be a flue gas (CO_2) from the gas turbine for power generation and thermal effluent water from the steam turbine condenser. An environmental impact assessment must be conducted.

Source: JICA Project Team

(3) Tourism

Table 10.2.6 Capacity Development in Marketing and Promotion of Ecotourism (TO-1)

Location	Qeshm Island
Implementing body	QFZO and tourism-related organization
Objectives	(1) To establish a Qeshmi brand promoting ecotourism (2) To develop a marketing and promotion strategy for ecotourism to be authorized by the QFZO (3) To strengthen public-private partnerships (PPPs) for the marketing and promotion of ecotourism (4) To support the QFZO in constructing a tourism information center (5) To establish a mechanism to operate a tourism information center with the cooperation of the public and private sectors at designated points
Expected effects	(1) By transforming the image of Qeshm and its tourist segment, benefits from tourism for locals and job opportunities will increase. (2) The QFZO can implement a marketing and promotion strategy under a unified vision (3) The QFZO can implement a marketing and promotion strategy effectively and efficiently in collaboration with relevant tourism authorities and the private sector
Investment cost	(Soft component)

Description

(1) Existing Conditions

Qeshm is currently recognized as a low-grade shopping and resort island, especially within the domestic market, despite the fact that it has numerous and unique tourism resources, which include geological, natural, and cultural assets. In terms of enhancing tourism on Qeshm, branding is key to transforming its image. Since Qeshm's designation as a UNESCO Global Geopark in 2017, it has garnered adequate support to begin establishing a Qeshmi brand. The tourist segment can be changed by proper branding and the benefits of tourism to local economy can be enhanced.

KPMG developed a marketing strategy in 2003; however, this should be subject to review since global trends and markets continue to change at an accelerated pace. Due to the lack of an up-to-date marketing and promotional strategy, and the lack of an integrated executing body for tourism marketing and promotion, a different department of the QFZO has implemented its own promotional activities, although these are devoid of any level of coordination. There are no integrated information distribution channels, such as tourist information centers; consequently, tourists who visit the island suffer from a lack of information. Enhancing not only internal coordination, but also external cooperation efforts with nationwide organizations, such as Iran's Cultural Heritage, Handicrafts and Tourism Organization (ICHHTO), and neighboring regional local governments can enhance the effectiveness of their promotional activities.

(2) Project description

The aims of the project are to: 1) establish a Qeshmi brand; 2) to develop a marketing and promotion strategy under a unified vision; 3) to implement the strategy in collaboration with relevant public-sector and private-sector entities; 4) to support the QFZO in the construction of a tourism information center; and 5) to establish a mechanism to operate a tourism information center with cooperation between public and private sectors.

The proposed activities are:

a) A Qeshmi brand, which promotes ecotourism, is to be discussed and agreed.
b) A Qeshm logo under the agreed brand is to be developed.
c) A Qeshmi brand is to be propagated by the developed logo and messages associated with the brand.
d) An ecotourism committee comprising the QFZO and private-sector agents is established in order to enhance ecotourism on Qeshm.
e) An ecotourism committee agrees upon a unified vision, and develops and implements a marketing and promotion strategy.
f) Information about existing tourism products and services are surveyed and collected.
g) Target markets are determined by the marketing and promotional strategy for ecotourism.
h) Ecotourism awareness workshops are conducted.
i) Ecotourism packages are developed in accordance with the needs and preferences of target markets.
j) Various kinds of promotional tools to penetrate target markets are developed.
k) Information centers on Qeshm, managed by a tourism committee, are established and operated.
l) Qeshm is promoted as an ecotourism destination at domestic and international tourism fairs, in collaboration with tourism authorities such as ICHHTO.

(3) Social and environmental issues

Strictly prioritizing the number of tourist arrivals, in the absence of a mechanism designed to generate benefits to the local economy, is bound to aggravate social and environmental issues. Tourists who are respectful towards the natural, cultural and environmental values of Qeshm should be increased through proper branding and promotion.

Source: JICA Project Team

Table 10.2.7 One Village One Product Promotion (TO-3)

Location	Distinguished village on Qeshm Island
Implementing body	QFZO and Village Council
Objectives	(1) To increase the number of local entrepreneurs (2) To distinguish unique local resources and produce value-added products (3) To establish sales channels of the newly produced products including tourists (4) To support the construction of a Michinoeki, which is a roadside station comprising car parking space, rest facilities and regional promotion facilities, such as shops and an information center (5) To establish a mechanism for local communities to operate a Michinoeki
Expected effects	(1) Villagers generate new business or additional income by utilizing locally available resources (2) Local micro, small and medium enterprises (MSMEs) are enhanced (3) Visitors can enjoy different types of products in each village (4) Village identity is developed
Investment cost	(Soft component)

Description

(1) Existing conditions

Qeshm has three cities and 57 villages, each with its own unique qualities. From tourists' point of view, diversity within a destination can expand its attractiveness and strengthen collaboration and networking among hosts, as opposed to inspiring competition. The Hara Mangrove Protected Area is one of the most popular tourism sites on Qeshm. Since it is popular tourism site, surrounding villages have come to recognize it as the only site from which villagers can benefit. This has resulted in fierce competition among boat operators in the surrounding villages around the Hara Mangrove Protected Area. Tourism has brought new sources of income for those villages; however, tourism may also lead to environmental degradation due to its overuse.

It was recognized that each village has unique characteristics. For instance, Laft can emphasize its uniquely scenic cultural heritage, which could make it the first ecomuseum in Iran. Haft Rangou is famous for its summer date gardens. Meanwhile, Gouron has retained the skills and cultures derived from Lenj building. The OVOP promotion will serve to emphasize the unique value of each village.

(2) Project description

The project aims to: 1) distinguish unique local resources and produce value-added products (OVOP businesses); 2) establish sales channels of the newly produced products; 3) increase the number of local entrepreneurs; 4) to support the construction of a Michinoeki; and 5) establish a mechanism for local communities to operate the Michinoeki. The proposed activities are mentioned below:

a) A financial support program for OVOP business is developed.
b) OVOP business-promoting workshops are organized in all the villages of Qeshm.
c) According to villages' enthusiasm, targeted villages are identified.
d) Guidelines for the proposal application and support system for OVOP business are developed.
e) Groups to submit proposals are supported by the village councils.
f) Proposal screening criteria are developed.
g) Common training events on business planning, management, accounting, and marketing and promotion, among others, are planned and organized for selected OVOP business groups.
h) Specific training events for developing commercial products are planned and organized for selected groups.
i) Sales activities of newly produced products are supported, such as market establishment, promotional tools development, and promotion materials development.
j) A Michinoeki, a shop offering local products, is constructed.
k) A mechanism for local communities to operate the Michinoeki is established.
l) Regular monitoring is conducted.
m) Selected OVOP business groups promote their activities to the other villagers.
n) Competition of newly devised products among OVOP business groups is organized.
o) The activities of OVOP businesses are disseminated throughout the other villages.

(3) Social and environmental issues

There will be no significantly adverse effects on social and environmental conditions. OVOP businesses that utilize scarce resources should be avoided.

Source: JICA Project Team

10.2.2 Priority projects in infrastructure development

This subsection shows the project profiles of four priority projects concerning water supply, sewage treatment, solid waste management, and power supply and renewable energy in Tables 11.2.8 through 11.2.11.

(1) Water supply

Table 10.2.8 Technical Support for Improvements to the Capacity of Leakage Detection and Non-revenue Water in Qeshm City and Rural Areas (WS-1)

Location	All villages and cities on Qeshm Island
Implementing body	Qeshm Utilities Company (QUC) and Hormozgan Rural Water and Wastewater Company (HRWWC)
Objectives	Capacity of the QUC and HRWWC is enhanced to conduct non-revenue water (NRW) reduction measures as planned in the ECO-QESHM Master Plan.
Expected effects	(1) Planning capacity of NRW reduction of the QUC and HRWWC is enhanced (2) Basic knowledge, skills and techniques for NRW control are acquired by the QUC and HRWWC. (3) HRWWC staff and private companies of subcontractors will be strengthened with the ability to operate and maintain rural water supply facilities (4) Operation and maintenance system of the water supply network in rural areas is improved to increase the profitability of the HRWW
Investment cost	USD 300,000 (for only machinery and equipment)

Description

(1) Existing conditions

Currently, about 100% of the raw water in supplied water is seawater, and supplied water is produced using seawater desalination equipment on Qeshm Island. Therefore, since the cost of producing supplied water is high and exceeds the ability of the residents (especially the rural areas) to pay for it, subsidies are being invested in the water supply business.

From the viewpoint of a sustainable water supply business in rural areas, the input of taxes should be reduced as much as possible, while the profitability of the water supply business should be improved without dependence on taxes.

In order to reduce subsidies and make the water supply business more profitable, first of all, measures against leakage are essential.

In addition, it is necessary to strengthen the management capacity for setting appropriate water tariffs and suppressing expenses.

Measures to minimize the amount of water leakage and conserve expensive freshwater produced by the desalination of seawater are a high priority in terms of realizing the concept of an eco-island.

(2) Project description

a) A baseline survey is conducted.
b) An action plan on NRW reduction is developed. Approval is obtained for the action plan from related organizations.
c) The QUC and HRWWC learn how to conduct NRW reduction measures through the implementation of the pilot project.
d) Training programs and manuals are developed, after which training to HRWWC and delegated private companies is conducted.
e) Electromagnetic flow meters and pressure gauges are procured and installed in the pilot project area.

(3) Social and environmental issues

There will be no significantly adverse effects on social and environmental conditions. The efficient use of water contributes to a reduction in environmental impact. The desalination equipment causes the saline water that is discharged into the ocean. The amount of discharged saline waster is reduced.

The implementing body shall abide by the JICA Guidelines for Environmental and Social Considerations in order to ensure that appropriate considerations will be made for the environmental and social impacts of the pilot project.

Source: JICA Project Team

(2) Sewage treatment

Table 10.2.9 Development of the Urban Sewerage System for Dargahan City (ST-1)

Location	Dargahan City
Implementing body	Hormozgan Urban Water and Wastewater Company (HUWWC)
Objectives	All the residents in the urbanized area of Dargahan City and Holor Village are covered by a modern sewerage service to improve their living and water environment
Expected effects	(1) The sanitary condition is improved in the urbanized area, especially in the area where the infiltration capacity of the leaching pit is not enough. (2) The water environment is improved in the urbanized coastal areas of Dargahan City and Holor Village (3) The reuse of treated sewage effluent and appropriate disposal/reuse of sewage sludge are promoted
Investment cost	(1) Sewer network: USD 19.8 million (IRR 594 billion) (2) Sewage treatment plant: USD 7.4 million (IRR 221 billion) (3) Side cost: USD 2.0 million (IRR 60 billion) Total: USD 29.2 million (IRR 875 billion) at IRR 30,000 = USD 1.0

Description

(1) Existing conditions

In general, the sanitary facility on the island is a system to guide human waste and graywater to a single pit, which allows leaching of each liquid portion. When the pit is filled, the next pit will be dug, meaning that the withdrawal of septage will not be performed. But, in an urbanized area, it is necessary to withdraw septage regularly from the pit due to limited land availability. The leaching pit is a septic tank with an infiltration mechanism, which is not suitable for soils with no infiltration capacity, such as clay, areas with high underground water levels and areas where there is a risk of groundwater contamination.

Dargahan City and Holor Village are high population density areas along the coast, where underground water levels are high, which does not allow for leaching from a pit and cause sanitary/odor problems. Thus, there is a need to develop a sewerage system in these areas.

In the area of the Dargahan sewerage system, the Maskan Mehr sewage treatment plant (STP) for a housing complex became operational in September 2014 with a capacity of 335 m^3/day under the management of the HUWWC.

(2) Project description

The HUWWC has already concluded the Dargahan Sewerage Development Study, covering 1,073 ha in the areas of Dargahan City, Holor Village and Azad University, which estimates the population for 2041 to be 37,400, with an estimated population of 19,300 in 2016. The total length of the sewer network is 115.5 km, while the average daily sewage flow is estimated at approximately 6,097 m^3/day. The potential STP location is raised behind a hilly rock quarry.

Regarding the sewer network of the Dargahan sewerage system, an interceptor, which is 3 km in length, was constructed along the coastline in 2013 and 2014. Several branch sewers with a total length of a few kilometers were also constructed in the Delbari area, close to the Maskan Mehr housing complex.

(3) Social and environmental issues

There will be no significantly adverse effects on social and environmental conditions. It is expected that the sanitary conditions and water environment in the urbanized area in Dargahan City and Holor Village will be improved by developing the sewerage system. Along with the development, the following are necessary to promote:

a) To consider the institutional and financial systems needed to develop and manage such a sewerage system
b) To monitor the sanitary condition in the urbanized area and the water environment in the coastal area
c) To promote the reuse of treated sewage effluent and appropriate sewage sludge disposal/use

Source: JICA Project Team

(3) Solid waste management

Table 10.2.10 Sanitary Landfilling at Towla (SW-1.3)

Location	Towla Disposal Site
Implementing body	QFZO
Objectives	(1) To establish sanitary landfilling
Expected effects	(1) Waste is disposed of properly (2) The environment at the Towla Disposal Site is improved
Investment cost	USD 2.40 million (construction of the first landfill with land of approximately 1 ha)
Description	

(1) Existing conditions
In Qeshm City, a waste collection service is well provided. Waste collected in Qeshm City, Dargahan and Towla is directly transported to the Towla Disposal Site, which is located approximately 15 km from Qeshm City, next to the Towla Industrial Area. According to the operator, the site received approximately 80 tons/day of waste as of February 2016. The current operation method, which excavates trenches, into which waste is buried, is not suitable for dealing with such large amounts. Waste is disposed of in a disorderly fashion and scattered all over the site. An area of approximately 300 ha seems to have become contaminated with waste in recent years. In addition, intentional or accidental burning of waste often happens, which causes serious smoke emissions. The site has to be improved.
The separation system has not yet been introduced. Although the company that operates the Towla Disposal Site has installed a material recovery facility, it is currently not operational. Material recovery is carried out by the informal sector on the street and the Towla Disposal Site.

(2) Project description
This project constructs an engineered sanitary landfill, with waste is properly disposed of in the landfill. An action plan for solid waste management proposes the model design of a sanitary landfill for the project. The sanitary landfill designed in the action plan applies the semi-anaerobic approach, which accelerates decomposition of waste, reduces the amount of landfill gas and improves leachate quality compared to conventional landfills.

(3) Social and environmental issues
This project is to present the further environmental deterioration of the site.
A soil test was carried out to review the model design of the controlled disposal site at the Towla Disposal Site in 2016. The test result reveals that there is no groundwater up to a depth of minus 15m from the ground surface. The clay layer is composed of an impermeable layer from the intrusion of the seawater.
There is no residential area around the Towla Disposal Site at the moment and the land use control must be enforced not to locate any residential areas in the neighboring areas.

Source: JICA Project Team

(4) Power supply and renewable energy

Table 10.2.11 Promotion Project for Photovoltaic Generation (PS-1)

Location	Qeshm Island and Hangom Island
Implementing body	QFZO
Objectives	Diffusion of renewable energies as electric power sources
Expected effects	(1) Awareness-raising among citizens toward the introduction of PV systems (2) Demonstration in anticipation of large-scale PV systems in the future (3) Energy savings and reductions in CO_2 emissions
Investment cost	USD 2 million (for equipment)
Description	

(1) Existing conditions

No power plants or specific plans using PV energies with a utility scale currently exist, while the existence of PV generation systems with a small scale (e.g., residential scale) was not confirmed for Qeshm Island. Meanwhile, the Renewable Energy Organization of Iran (SUNA), under the Ministry of Energy, officially set a target of 5% for the national generation of electricity to be provided by renewable sources. In addition, in the recent report by the International Renewable Energy Agency, of which Iran is one of the member countries, the deployment target for renewable energies in the electric power sector is quantitatively described as 30-39% of total installed capacity for 2030.

In light of these stances by the national government, the introduction of renewable energies should be highly considered in the future, including the construction of mega solar power plants.

Through the meetings with the QFZO, it was suggested that the diffusion of renewable energies as electric power sources is one of its challenges. Among the various renewable sources, it was confirmed that the diffusion of PV systems in the residential sector is the most important.

(2) Project description

Several villages, as well as the QFZO, are showing great interest in introducing PV generation in their facilities (e.g., information center in the geopark, village offices). However, while PV systems from the small to large scale are operational in desert climate areas of the world, the deterioration in efficiency caused by dust and high ambient temperatures is a concern for Qeshm Island. Therefore, in the short term (2019-2021), the introduction of PV generation systems at the initial stage should be demonstrational and on a small scale to confirm whether the systems will work as expected. Its operational data should also be analyzed and evaluated quantitatively, and varied information, including on the effects of PV generation, should be shared with local residents through promotional activities, such as seminars and leaflets, to support the diffusion of PV systems. After completion of the demonstrational phase of small-scale PV generation systems and the confirmation of the successful results of the operation, a feasibility study will be started on the construction of a mega solar generation plant on Qeshm Island, although this is not the scope of this project.

(3) Social and environmental issues

There will be no significantly adverse effects on social and environmental conditions. However, when the large capacity of PV generators is installed and connected to the distribution network in the future, the reverse power flow in a bank of distributing substations may happen. Hence, it will be necessary for the power distribution company to examine the maximum allowable capacity for a bank, while countermeasures (e.g., increase in the capacity of a bank) shall be executed as required.

Source: JICA Project Team

10.2.3 Priority projects for environmental management

This subsection shows the project profiles of five priority projects in marine ecosystem management and inland ecosystem management in Tables 11.2.12 through 11.2.16.

(1) Marine ecosystem management

Table 10.2.12 Rehabilitation of the Coral Community (ME-1)

Location	Southeast coast of Qeshm Island, where suitable access is possible
Implementing body	QFZO, NGO, Hormozgan Department of Environment (DoE)
Objectives	To rehabilitate coral distribution and enhance ecotourism together with rehabilitation activities
Expected effects	(1) Coral distribution is expanded (2) Environmental awareness is raised (3) Ecotourism is enhanced
Investment cost	USD 0.03 million (for equipment: USD 0.01 million)
Description	

(1) Existing conditions

The southeast side of Qeshm Island has potential for coral reproduction, while the area faces anthropogenic pressures, such as wastewater discharge, change in water current by the construction of artificial structures, and water runoff during rain events. Although corals can be seen everywhere in the area, the coverage ratio is severely low, due to the impact mentioned above. Since other areas of the island do not have coral reefs and their surviving potential is limited by topological reasons, the conservation and recovery of the coral community in the area, which could lead to more tourism, are highly desirable.

(2) Project description

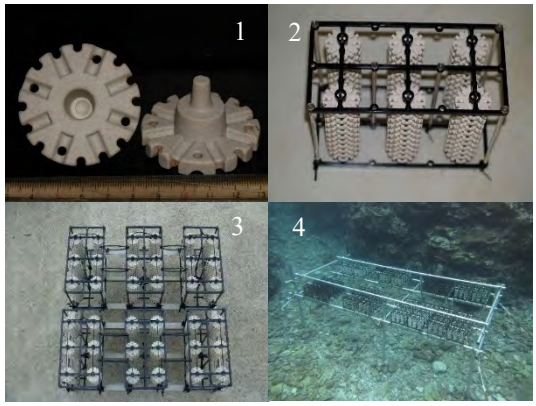
In this project, coral reproduction activity conducted by the local community in cooperation with NGOs, involving tourists, will be tested. During the spawning season of the coral (usually on a full-moon night in May-June; this needs to be confirmed), coral settlement devices will be installed in the predetermined locations, in cooperation with the local community and NGOs (diving club, environmental society, etc.). Figure 1 shows a coral settlement device. After the growth of coral polyps is confirmed, the monitoring by local community will be continued.

A coral transplantation campaign will be announced through the media to recruit volunteers from the country to join in the campaign. Coral settlement devices with coral polyps will be transplanted at the predetermined locations by volunteers, under the supervision of the local community and NGOs. The local community will be ready in terms of accommodation and logistics. After transplantation, monitoring of the transplanted corals will be continued by the local community and NGOs to report on growth through the media, as well as inviting visitors to see "my corals". This campaign will be promoted to the public through the media, as well as notify the authorities to plan countermeasures in order to avoid any impact on the area of coral transplantation. Figure 2 shows the cycle of transplanted corals.

(3) Social and environmental issues

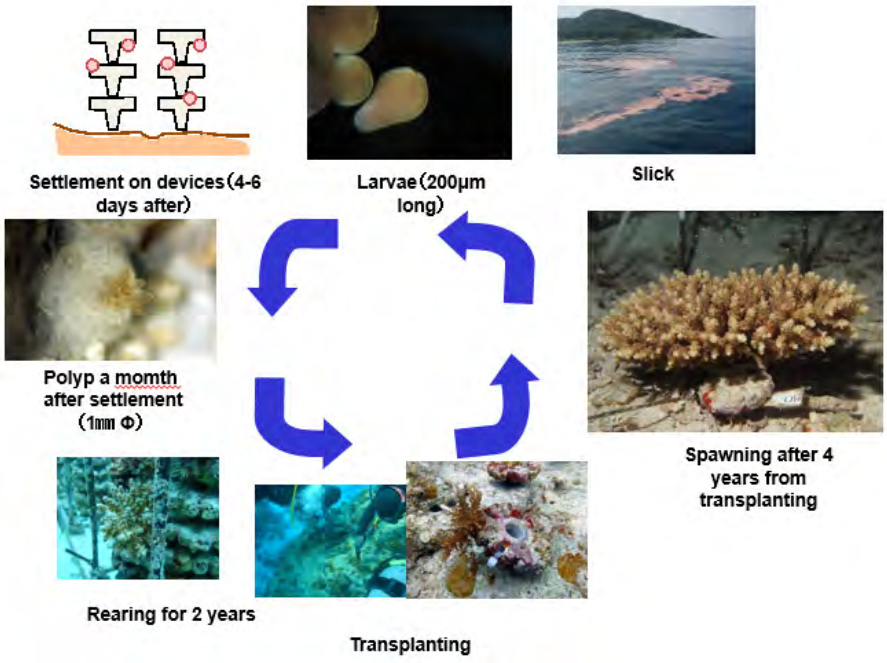
There will be no significantly adverse effects on social and environmental conditions.

a) Support from the national DoE (Tehran and Hormozgan) regarding the conservation is necessary
b) Mutual understanding about the conservation of coral between the development authority and body is necessary
c) Other conservation activities, such as the prohibition of entering the coral conservation area, and measures to deal with runoff to the coastal area during rain events, are necessary



Source: IDEA Consultants Inc.
1: coral settlement device, 2: devices set in plastic case (60 devices), 3, 4: cases set in stainless steel case

Figure 1 Coral Settlement Devices



Source: IDEA Consultants Inc.

Figure 2 Life Cycle of Transplanted Coral

Source: JICA Project Team

(2) Inland ecosystem management

Table 10.2.13 Integrated Management of the Hara Protected Area (IE-1)

Location	Hara Protected Area (part of the Qeshm Island side)
Implementing body	QFZO, DoE
Objectives	To achieve better management of the Hara Protected Area (the Qeshm side) as a UNESCO Global Geopark, a protected area under national law, a UNESCO Biosphere Reserve and a Ramsar Wetland
Expected effects	(1) Conservation of the precious biodiversity and ecosystem of the Hara Protected Area (2) Improvement in the ecosystem services provided by the Protected Area including benefits from tourism for local communities (3) Capacity building for interorganizational and international cooperation on the conservation and implementation of ecosystem services in Iran
Investment cost	USD 1 million (for facilities for tourism and monitoring)
Description	

(1) Existing conditions

The Hara Protected Area is a multidesignated international protected area. Under the Ramsar Convention, a vast area (100,000 ha), including the entire Hara Protected Area, was designated as a Ramsar site (known as the Khouran Straits) in 1975. The protected area was designated as a UNESCO Biosphere Reserve, under the name of the Hara Biosphere Reserve, in 1976. The Khouran Straits are identified as an "Important Bird Area" by BirdLife International, based on its assessment in 1994. The part of the Hara Protected Area on the coast of Qeshm Island was also included in Qeshm Geopark in the application made by the QFZO for UNESCO Global Geopark recognition in 2016.

The Hara Protected Area is under the exclusive mandate of the DoE. However, there are multiple agencies including the QFZO involved in the management of the protected area and, while there are working relationships in existence, there appears to be no overall management system or plan, nor any clear mandate and coordination of the various institutions involved. The DoE provides technical guidance to provincial offices. However, agency coordination and jurisdictions within the protected area remain unclear. There is no director of the protected area assigned by the DoE and the responsibility of the protected area seems to be undertaken by a senior officer, as one of several other responsibilities. Likewise, other staff and equipment appear to be allocated to the wider tasks of the DoE, rather than exclusively for use in the protected areas.

As a result, the protected area is now facing some threats. The ongoing evolution of the tourism sector in the protected areas is characterized by the uncontrolled development of infrastructure, such as improvements to access roads, the construction of new jetties and the expansion of jetties by reclamation. Four access roads with asphalt pavement reaching the jetties in the protected area were identified. The collection of branches and leaves as fodder for camels is an important resource use in the protected area. The use must not exceed the capacity of *Avicennia marina* to regenerate, but neither management plans nor guidelines have been obtained at this point.

It is significant that the northeastern part of the Hara Protected Area overlaps with the construction site of the Persian Gulf Bridge, which also overlaps with part of the Qeshm FZ. Some of the piers of the Persian Gulf Bridge, which link Qeshm Island with the mainland, have already been constructed within the boundary of the Hara Protected Area. Once completed, access via the bridge would significantly impact other parts of the protected area. Clearly, the possible implications of these developments will have to be carefully considered in the future management of the Hara Protected Area.

(2) Project description

a) The management committee for the Hara Protected Area (Qeshm side) is established and functions.
b) A management plan for the Hara Protected Area (Qeshm side) is formulated.
c) In the selected pilot communities, tourism and resource use plans are formulated based on the management plan of the Hara Protected Area (Qeshm side); this is to be followed by the promotion of environmentally friendly tourism and resource use.
d) The knowledge and experience concerning the management of a biological corridor are shared through international platforms, such as UNESCO Global Geopark Network (GGN), the UNESCO Man and Biosphere Programme and the Ramsar Convention.

(3) Social and environmental issues

a) The project may affect existing tourism and resource use by the local community in the protected area.
b) For the purpose of the project, infrastructure development for tourism and monitoring in the protected area is carefully assessed and conducted with mitigation and alleviation measures.

Source: JICA Project Team

Table 10.2.14 Rehabilitation of Native Species for Better Ecosystem Services (IE-3)

Location	The inland areas where ecosystem services from vegetation are deteriorating by invasive species and other factors
Implementing body	QFZO, Forests, Range and Watershed Management Organization (FRWMO) under Ministry of Agriculture Jihad
Objectives	Feasible methodologies are established and extended to improve ecosystem services (production of food, fodder and other goods, watershed function, tourism values, etc.) through control of invasive species, rehabilitation of natural vegetation, revival of traditional ecological knowledge, etc.
Expected effects	(1) Local communities and others receive improved ecosystem services (2) Biodiversity of the inland areas of Qeshm is conserved
Investment cost	USD 2 million (for equipment)

Description

(1) Existing conditions

The main area of the land surface on Qeshm Island is desertic. The major issues in relation to the conservation of inland ecosystems on the island are as follows:

a) One of the major issues affecting the achievement of the sustainable use of biological resources on Qeshm Island is the proliferation of *Prosopis juliflora,* which is invasive (causing the deterioration of native tree species), exotic and less useful than the native tree species for local communities.
b) Another issue is grazing by livestock (camels and goats) on vegetation, in particular, on native tree species.
c) The conservation of rare and endangered species (Egyptian vulture, Egyptian spiny-tailed lizard, gazelle etc.), along with their inland habitats.

Adequate management for conserving existing vegetation is required, including control of *P. juliflora*, which is an invasive alien species threatening the biodiversity on the island. The spread of this exotic tree is undesirable as it gradually competes with native tree species for water and changes the ecosystem.

The invasive trees, including *P. juliflora*, should be controlled in ecologically sensitive areas and habitats of rare and endangered species on the island in order to conserve their precious biodiversity. In the areas near to villages, which are used for farmland, grazing grounds and catchment for irrigation to the villages, negative impacts of the invasion plant species are observed on their conventional land uses. In the grasslands and woodlands under the management of the public authorities with less intensive uses by local communities, natural vegetation has also been affected by invasive species, grazing etc.

(2) Project description

To achieve the above objective of the project, the following outputs will be produced:

a) A study will be conducted to identify potential natural vegetation, distribution and ecological impacts of the invasive tree species, and impacts of traditional and modern water use on the vegetation.
b) Based on the study, a strategy and action plan are to be drafted to improve ecosystem services from the inland woodlands and grasslands by controlling and utilizing the invasive species in line with the domestic policies on forest and protected area management, the *Satoyama* Initiative and the international designations of protected areas, such as Qeshm Island Global Geopark, ICCA status, the UNESCO Biosphere Reserve and the Ramsar Wetland.
c) Based on the draft strategy and action plan, pilot projects are implemented to examine various potential methodologies to improve its ecosystem services from the vegetation, such as the elimination and conversion of the existing invasive species, utilization of the invasive species, rehabilitation of potential natural vegetation by replanting, utilization of treated sewerage to improve water conditions, revival of traditional irrigation and water supply systems, and the combination of modern desalination plants and traditional irrigation system.
d) After the evaluation of the pilot projects, based on the feasibility of the methodologies examined, the draft strategy and action plan are revised.
e) The feasible methodologies are replicated in other appropriate parts of the island.

(3) Social and environmental issues

a) The project may change existing resource use by the local community on the island.
b) Each methodology to control vegetation introduced in the project are assessed for its positive and negative impacts on the ecosystem services by applying a strategic environmental assessment.

Source: JICA Project Team

Table 10.2.15 Phasing Out of Harmful Economic Incentives and Strengthening Positive Incentives for Better Ecosystem Services (IE-4)

Location	Villages and areas where harmful economic incentives cause negative impacts on biodiversity and sustainable land use
Implementing body	QFZO and other authorities responsible for rural development and public services
Objectives	Incentives harmful to conservation and sustainable land use are eliminated, phased out or reformed; positive incentives are developed on Qeshm
Expected effects	(1) Conservation of natural ecosystems and sustainable resource use are promoted based on the economic incentives (2) The project contributes to achieve Target 3 of the Aichi Target and the *Satoyama* Initiative under the Convention on Biological Diversity (CBD)
Investment cost	Depending on measures to be introduced

Description

(1) Existing conditions

The Aichi Targets, adopted in 2010 under the CBD, states the following:

Target 3: By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio-economic conditions.

The project is implemented in order to contribute to the above target on Qeshm.

Some economic policies or practices induce harmful behavior for ecosystems, often as unanticipated side effects as policies are designed to attain other objectives, which are considered harmful incentives from the point of view of biodiversity conservation and the *Satoyama* Initiative. Such "policy failures" can include government subsidies or other measures, which fail to take into account the existence of environmental externalities, as well as customary practice governing resource use. On Qeshm, for example, the use of traditional water harvesting with catchment conservation, wells, reservoirs etc., and traditional air conditioning architecture, such as wind catchers, has been declining. One of the reasons is the easy and low-cost supply of desalinated water and electricity, which is subsidized by public authorities. The policy to provide low-cost utilities in rural areas could be justified to improve the welfare of rural communities immediately, but its potential negative impact (externality) on the natural environment and sustainable resource use should be assessed. In order to ensure the conservation of the environment and the sustainable use of its components, it is important to identify policies and practices that generate harmful incentives and consider their removal, phasing out, or reform, for instance, by mitigating their negative impacts through appropriate means.

On the other hand, there could be a positive incentive measure (economic, legal or institutional) designed to encourage beneficial activities. Positive incentive measures include incentive payments for organic farming, agricultural land set-aside schemes and public or grant-aided land purchases or conservation easements. Increasing interest is being given to the concept of payments for ecosystem services.

(2) Project description

To achieve the above objective of the project, the following outputs will be produced:

a) Existing harmful economic incentives for ecosystems and sustainable resource use are identified. Measures for mitigation, phasing out or reforming are discussed, based on careful analysis of available data.
b) Studies are conducted on approaches to develop payment for ecosystem services and other economic incentives for conservation at local, national and international levels, their advantages as well as limitations and risks, and their potential implications for biodiversity and local communities.
c) Based on recommendations from the study above, positive economic incentives are examined and introduced on the island, such as individual transferable fishing quotas and other property rights-based mechanisms, the commercialization of medicinal plants or other biodiversity-based products, and the use of certification or ecolabelling.

(3) Social and environmental issues

a) The project may change existing resource use by the local communities and public services on the island.
b) For the purpose of the project, each economic measure is designed to reduce negative impacts and promote positive impacts on the ecosystem services and resource uses.

Source: JICA Project Team

(3) Geopark management

Table 10.2.16 Promotion of Qeshm Island Geopark for Regional Hub in Middle East and North Africa (MENA) Countries (GM-1)

Location	Qeshm Island and Hangom Island as a UNESCO Global Geopark
Implementing body	Department of Geopark and other departments of QFZO with strong supports of Department of Environment, Iranian National Commission for UNESCO, UNESCO Tehran Regional Office, Geology Survey of Iran
Objectives	To promote Qeshm Island Geopark as the host for all prospective international geoparks in MENA region
Expected effects	(1) Qeshm Island Global Geopark (QIGG) is reputed in the region for its scientific and conservation activities and practices in the fields of geography, geology, education, public awareness and balanced development. (2) QIGG becomes the host of the important geopark events. (3) QIGG has strong relations with listed and aspiring geoparks. (4) Salt dome is reputed as the brand of QIGG. (5) Hormuz Island becomes a national geoaprk with the support of QIGG.
Investment cost	USD 3 million

Description

(1) Existing Conditions

QIGG had many bittersweet experiences since its establishment in 2005 and registration in the list of Global Geopark Network (GGB) since March 2006. Those experiences should be used to make a QIGG as the regional hub to host for the coming geoparks in MENA as well as domestic ones. QIGG is still the only internationally designated geopark in Iran with very high potential for supporting other geoparks.
QIGG still has insufficient scientific activities and suffers from lack of interpretation in the geosites. QFZO seems some economic problems to implement such activities, hence the top managers are not ready to give the high priority to the geopark. If the international values of QIGG is enhanced by the support of QFZO, the Qeshm Island will be a more creative and clean eco-island.

(2) Project Description

To achieve the above objective of the project, following outputs shall be produced.

a) QIGG proposes new working committees in national and international levels and participates in majority of the activities in the continent.
b) A management committee for geopark functions, in line with operational requirements, to be presented to UNESCO.
c) Collaboration between the management of the Global Geopark and the initiatives for other international designations for conservation on the island (such as the UNESCO Biosphere Reserve, the Ramsar wetland, the proposal for UNESCO World Natural Heritage status, and ICCA status) is promoted.
d) QIGG has several signed sisterhoods with national and international geoparks as well as regional research centers in MENA countries by emphasizing on programs to exchange experts, staff, and volunteers in order to enhance the network of Geoparks family.
e) QFZO reports on the status of QIGG to UNESCO following operational guidelines, in particular for evaluating the renewal of the designation in 2021.
f) QFZO, Ministry of Petroleum of Iran, Petroleum University of Technology and Geology Survey of Iran (GSI) etc, share their geological knowledge and experiences.
g) A scientific board is established for management of QIGG. The scientific board is consisted of members from GSI, State Universities of Kerman and Shahid Beheshti. The scientific board manages the several regular activities such as Geopark Week, technical support for thesis, International Workshop for Geopark Management etc.
h) QIGG examines the pertinent knowledges like marine geology, salt dome, tectonics, diapirism, gas engineering etc, according to conditions of the island and link it with other activities of QFZO in the fields of industry etc.
i) A new academic discipline (Geopark Management) is established by a reputed university in the island.
j) The capacity of the QFZO for geopark activities, such as the management of the pilot project and utilizing the geopark to promote ecotourism, is developed through training in other countries.
k) Several geo-guides are trained and be ready to serve the professional visits in the island and geosites. They are part of the tour guides association in Qeshm. They know English and Persian very well and are equipped with good promotional materials.

l) QIGG continues to promote its Salt Dome (G7) geosite as the main natural treasure. Only the guided professional tours are allocated to visit this geosite. The caves are managed perfectly. Several scientific activities are implementing.
m) QIGG technically and logistically supports Hormuz Island to be a good national geopark because of its astonishing sceneries, history and diverse local culture.
n) The geology and ecology of Hangom island is studied very well and Dolphins geosite is under protection.
o) Necessary infrastructural, interpretation materials and institutional development took place in the geosites for monitoring, interpretation and tourism development through community participation.

(3) Social and Environmental Issues
- This project is in line with the Iran's upstream plans to develop the southern parts of the country and knowledgebase activities.
- This project can improve the livelihood of the locals who live around the geosites and will have a positive social and economic effects on the life of young generation.
- The project will promote sustainable development in the island and will support the fragile environmental of the island.

Source: JICA Project Team

10.2.4 Priority projects for regional and community development

This subsection shows the project profiles of three priority projects in regional development and community development in Tables 11.2.17 through 11.2.20.

(1) Regional development

Table 10.2.17 Integrated Regional Development in South Iran (RD-1)

Location	Hormozgan Province, Bushehr Province, Fars Province
Implementing body	Planning and Budget Organization
Objectives	A comprehensive regional development plan is formulated in three provinces
Expected effects	(1) Three provinces have a plan for the sustainable development in a well-organized manner in relation to the economy, society and the environment (2) Implementation arrangements are formulated to realize the regional development plan
Investment cost	USD 7 million
Description	

(1) Existing conditions

Hormozgan Province, Bushehr Province and Fars Province are centrally located in the east and west transportation corridor along the Persian Gulf and represent the gateway to the mainland of Iran. In addition, the provinces have airports, including an international airport, as well as function as logistics and trade hubs.

Hormozgan Province has the tourism and fishery hub. The province also includes Qeshm Island, which is implementing a sustainable development master plan. Bushehr Province has one of the largest oil mine and oil-related industrial estates. Fars Province has vast agricultural fields and tourism spots.

Three provinces have a lot of development potential, such as agriculture, fishery, tourism, industry, transportation and logistics. However, each province formulates development plans discretely. Furthermore, each development plan has been implemented without enough environmental countermeasures.

(2) Project description

Based on the existing conditions, the comprehensive regional development plan should be formulated as a model project of Iran. The development plan, whose target year is 2040, will include a socioeconomic plan, a land use plan, and sector development plans for agriculture, oil, manufacturing, transport and infrastructure. A strategic environmental assessment will be conducted to assess the social and environmental impact of the proposed development plan. The development plan will include the spatial structure, which defines the functions of main cities.

The project will highlight the concepts representing sustainable development and environmentally friendly development. Therefore, the ECO-QESHM Master Plan is considered as a reference with which to examine the project activities and project approaches. The content of the development plan will be as follows:

a) Analysis of existing conditions of three provinces
b) Vision, scenario, and strategy for regional development plan
c) Formulation of comprehensive regional development plan
d) Formulation of action plans for the priority sectors
e) Formulation of the detailed plan
f) Implementation of the pilot project
g) Recommendations for an implementation framework for the comprehensive regional development plan
h) Selection of the priority projects
i) Capacity development

(3) Social and environmental issues

The development plan includes various sectors. As a requirement, the development plan must be fully assessed with regard to social and environmental issues. In particular, environment and social considerations should be given to the industrial development sector, such as the oil and gas industry. As a result, the development plan will offer clear ideas for sustainable development and become the model for comprehensive regional development in Iran.

Source: JICA Project Team

Table 10.2.18 Capacity Building of the QFZO in Sustainable Administrative Systems (RD-2)

Location	Qeshm Island, Hangom Island, Hara Protected Area (Qeshm side)
Implementing body	QFZO, Planning and Budget Organization
Objectives	The mission of the QFZO will be improved from the development of an industry and trade FZ to the development of a creative and clean system for the islands
Expected effects	(1) Regarding the vision of the ECO-QESHM Master Plan, the QFZO becomes a progressive, clean and creative organization, which will be an inspiring model of development for Iran (2) The island is developed to attain its own identity (3) Local people's lives are respected by the application of a real bottom-up approach in the planning and implementation process (4) Institutional capacity of tourism, fishery and environmental management is enhanced (5) Advanced financial systems are established to promote investment
Investment cost	(Soft component)

Description

(1) Existing conditions

At the moment, there are three departments that are responsible for tourism, the environment and the geopark in the QFZO. The remaining departments of the QFZO have no concern about the value of natural resources. The managers and experts of such departments always make attempts to follow the law relating to FZs, which applies to all FZs in Iran and is directed towards industrial development. After nearly 25 years since the establishment of the QFZO, the roles of the FZs should be reviewed to recognize their individual characteristics.

After nearly a quarter century of works by the QFZO on this remote island, industrial development is generally speaking unsuccessful. Trade has not developed as expected. Qeshm has become an importing port for residents instead of an exporting hub with heavy industry. The local manufacturing has not been established, but tourism and retail play a significant role in the life of the islanders.

In such circumstances, the concept of the geopark is considered as a good brand component to promote Qeshm nationally and internationally. Meanwhile, the geopark concept can help planners and decision makers to conserve the island, since such a concept is very similar to the concept of the eco-island proposed in the ECO-QESHM Master Plan.

The implementation of such a proposal looks difficult and will take a very long time. However, an example from another Islamic country provides useful insights. Langkawi in Malaysia remained a quiet backwater until 1986, when the country's Prime Minister Mahathir Mohamad decided to transform it into a major tourist resort. The Prime Minister helped to plan many parts of the island, and the island rapidly grew as a tourist destination; indeed, by 2012, it received over three million tourists a year. The population is about 100,000, which is a similar size to Qeshm. Langkawi has also been a member of the GGN since 2007, one year after Qeshm's first listing.

Qeshm must keep the brand to follow the concept of ecotourism and demonstrate it seriously care about the fragile environment. Qeshm can play the role of torchbearer for geoparks in the Middle East and North Africa with respects to villagers.

Given the drought in recent years, the main business of locals changed several times from agriculture to fishery then to trading and retail, all within only five decades. With young people seeking jobs, geotourism can be a good point to start developing new job opportunities in Iran.

(2) Project description

a) Missions and the strategy for the QFZO is reviewed.
b) An administrative improvement plan is formulated responding to international standards of sustainable development criteria. The plan must support the idea of a bottom-up approach in decision-making by locals, as well as the private sector, including rural cooperatives, NGOs and private societies.
c) A clear process for authorizing the master plans, urban plans and rural plans on the island will be created via formulating a specific process in collaboration with the Plan and Budget Organization and the Ministry of Roads and Urban Development.

(3) Social and environmental issues

a) People are the foundations of this new experience in planning in Iran, so their social understanding will be improved.
b) Conserving the environment via locals is an important way to achieve sustainable development.

Source: JICA Project Team

(2) Community development

Table 10.2.19 Establishment of a Participatory Approach for Public Engagement (CD-1)

Location	Qeshm Island
Implementing body	QFZO and Qeshm County
Objectives	To promote a participatory approach for public engagement
Expected effects	(1) To make the procedure of decision-making clear and transparent (2) To establish a democratic decision-making system (3) To enhance the ability of government officials and leaders in each village to pursue proper management of various resources
Investment cost	USD 0.02 million (for equipment)
Description	

(1) Existing conditions

Currently, the QFZO, which manages the FZ on this island, comes under the remit of the Executive Office of the President. Qeshm County is responsible for management of the island too. Duplicated jurisdiction causes competition, rather than corporation, between the QFZO and Qeshm County. The lack of corporation results in lack of coordination with local people as the demarcation of roles regarding community development is unclear.

Qeshm Island has various resources, such as marine biodiversity and a geopark. The most important point for community development is the sustainability that enables these resources to be properly managed by local people.

The participatory approach was applied to formulate the ECO-QESHM Master Plan and implement the pilot projects. The JICA Project Team (JPT) initiated the collaboration between local people, the QFZO and related organizations. Although the attempts involving related organizations have succeeded, the collaboration between related organizations is still too fragile to maintain the activities properly. Capacity building for the QFZO and Qeshm County is required for the participatory approach to take root.

(2) Project description

The project will consist of the activities mentioned below:

a) Roles of the QFZO and Qeshm Country are reviewed in terms of managing the community.
b) A training program for officers of QFZO and Qeshm County is prepared.
c) Villages to implement the pilot projects are selected.
d) Training is carried out for the selected officers of the QFZO and Qeshm County.
e) A plan for the pilot projects is formulated in collaboration with the QFZO, Qeshm County and villagers.
f) The pilot projects are implemented in collaboration with the QFZO, Qeshm County and villagers.
g) Guidelines for community development are formulated.

A customized training program for the participatory approach is prepared. Government officials and village council members will be trained using the training program. The training program will cover different methods to support democratic decision-making and a bottom-up approach, such as Project Cycle Management (PCM) and Participatory Rural Appraisal.

(3) Social and environmental issues

There will be no significantly adverse effects on social and environmental conditions. If any pilot project has a negative impact, it will be rejected from the project. The project will contribute to a reduction in social disparity and promote environmental conservation.

Source: JICA Project Team

CHAPTER 11 ACTION PLAN FOR THE PRIORITY SECTOR

11.1 Scope of Works of Action Plan

The Record of Discussions specifies tourism promotion, fishery, sewage management and solid waste management as priority sectors for action plans. The scope of these priority sectors is confirmed with the QFZO prior to the commencement of the study on the action plans' preparation. The action plans will be used as the primary reference in initiating the full implementation of the priority projects. The action plans will focus on recommendations to formulate and implement priority projects in the short to medium term, rather than the preparation of an ordinal sector plan in the medium to long term.

The planning direction for the action plans will be considered as follows:

- Detailed explanation about the activities to be undertaken in the priority projects
- Recommendations for institutional arrangements including organization, financial resources and legal affairs
- Planning period of the action plans is defined for the short term until 2021; however, this can be extended to the short to medium term (until 2026), when necessary, for a specific priority project

11.2 Action Plan for Tourism

11.2.1 Implementation plan for priority projects in the tourism sector

(1) Capacity development for the marketing and promotion of ecotourism

1) Objective, outputs and activities of the project

The objective of this priority project is to enhance the capacity of the QFZO to implement tourism marketing and promotion on ecotourism via regular coordination between the public and private sectors, as well as PPPs.

The expected outputs are:

(a) A Qeshmi brand, which promotes ecotourism, is established.
(b) Marketing and promotional strategy for ecotourism is developed via PPPs (including institutional development).
(c) The proposed strategy for ecotourism is implemented via regular coordination between the public and private sectors.
(d) The tourist information centers is constructed at prioritized sites by QFZO.
(e) A mechanism to operate tourist information centers is established with support from the QFZO.

Table 11.2.1 shows the detailed activities needed to achieve the expected outputs. The table also shows the indicators to evaluate the objective and each output.

Table 11.2.1 Outputs and Activities for Capacity Development in Marketing and Promotion of Ecotourism

No.	Outputs and activities		Indicators
Objective: The capacity of the QFZO to implement marketing and promotion for ecotourism is enhanced via proper coordination between the public and private sectors, as well as PPPs		A	Increase the number of visitors who recognize Qeshm as an ecotourism destination
		B	Increase the satisfaction levels of the private sector and local communities engaged in tourism
Output 1: A Qeshmi brand, which promotes ecotourism, is established			
1-1	Core values of Qeshm are discussed and agreed	1-a	The Qeshm tourism logo is recognized
1-2	A Qeshmi brand, which promotes ecotourism, is agreed based on the core values of Qeshm	1-b	The Qeshmi brand message is promoted
1-3	A Qeshm tourism logo and message are developed under the Qeshmi brand	1-c	The visibility of the logo and message increase
1-4	The Qeshmi brand image is publicized within and outside Qeshm through the logo and message		
Output 2: Marketing and promotion strategy for ecotourism is developed via PPPs			
2-1	An ecotourism committee consisting of the QFZO and private-sector entities is regularly convened	2-a	Ecotourism committee meetings are conducted regularly
2-2	An ecotourism committee agrees upon a unified vision of marketing and promotion strategy for Qeshm	2-b	A marketing and promotion strategy, including a product development strategy and target markets, is authorized
2-3	Information regarding existing tourism sites and services are surveyed and collected	2-c	Increase in the number of promotional tools
2-4	Target markets are determined by the marketing and promotion strategy for ecotourism		
2-5	Ecotourism trails and routes are developed in accordance with the demands and preferences of the target markets		
2-6	Various kinds of promotional tools are developed to penetrate target markets		
Output 3: The proposed strategy is implemented via proper coordination between public and private sectors			
3-1	Ecotourism awareness workshops are conducted	3-a	Ecotourism awareness workshops are conducted regularly
3-2	Ecotourism products and packages are developed in accordance with the marketing and promotion strategy under a scheme of public and private collaboration	3-b	An action plan to implement the strategy is prepared
3-3	Activities to implement the devised marketing and promotion strategy are planned and conducted	3-c	Increase in the number of ecotourism products and packages
3-4	Qeshm is promoted as an ecotourism destination at domestic and international tourism fairs in collaboration with tourism authorities, such as ICHHTO	3-d	Increase in the number of local communities that benefit from ecotourism
3-5	The results of the planned activities are evaluated	3-e	Increased number of domestic and international tourism fairs participated in
3-6	The strategy is reviewed according to the evaluation	3-f	The action plan and strategy are reviewed
Output 4: Establishment of tourist information centers is supported at prioritized sites			
4-1	The prioritized locations for tourist information centers are agreed	4-a	Tourist information centers at prioritized sites are planned
4-2	The land or existing building is allocated by the QFZO	4-b	Establishment of tourist information centers are supported according to the plan
4-3	The process of establishing tourist information centers is supported		
Output 5: A mechanism to operate tourist information centers is established			
5-1	Roles and functions of each tourist information center are discussed	5-a	A memorandum of understanding (MoU) for a mechanism to operate tourist information centers is signed
5-2	A mechanism of operating tourist information centers is discussed by the QFZO, tourism-related private-sector actors and local communities	5-b	Established tourist information centers start their operation
5-3	Each tourist information center is managed by the agreed operation mechanism	5-c	Increase in satisfaction levels among visitors who visit tourist information centers

Source: JICA Project Team

2) Implementing body

The Qeshm Ecotourism Committee of the QFZO in collaboration with the Qeshm Hotel Association, the Qeshm Travel Agency Association and the Qeshm Guides Association.

3) Plan of operation

Table 11.2.2 shows the plan of operation:

Table 11.2.2 Plan of Operation for Capacity Development in Marketing and Promotion of Ecotourism

No.	Activities	2019				2020				2021			
		1	2	3	4	1	2	3	4	1	2	3	4
1-1	Core values of Qeshm are discussed and agreed												
1-2	Agreement upon a Qeshmi brand, which promotes ecotourism based on the core values of Qeshm												
1-3	A Qeshm tourism logo and message are developed under the Qeshmi brand												
1-4	The Qeshmi brand, in the form of the developed logo and message, is promoted within and outside Qeshm												
2-1	An ecotourism committee consisting of the QFZO and private-sector actors is operated regularly												
2-2	The ecotourism committee agrees upon a unified vision for a marketing and promotion strategy for Qeshm												
2-3	Information about existing tourism sites and services is surveyed and collected												
2-4	Target markets are determined by the marketing and promotion strategy for ecotourism												
2-5	Ecotourism trails and routes are developed in accordance with demands and preferences of target markets												
2-6	Various kinds of promotional tools to penetrate target markets are developed												
3-1	Ecotourism awareness workshops are conducted												
3-2	Ecotourism products and packages are developed along with the marketing and promotional strategy via public and private collaboration												
3-3	Activities to implement the proposed marketing and promotion strategy are planned and conducted												
3-4	Qeshm is promoted as an ecotourism destination at domestic and international tourism fairs in collaboration with tourism authorities, such as ICHHTO.												
3-5	The results of the planned activities are evaluated												
3-6	The strategy is reviewed according to the evaluation												
4-1	The prioritized location of tourist information centers is agreed												
4-2	The land or an existing building is allocated by QFZO												
4-3	The process of establishing tourist information centers is supported												
5-1	Roles and functions of each tourist information center are discussed												
5-2	A mechanism to operate tourist information centers is discussed between the QFZO, tourism-related private-sector actors and local communities.												
5-3	Each tourist information center is managed using the agreed operation mechanism												

*Note: 1: first quarter, 2: second quarter, 3: third quarter and 4: fourth quarter
Source: JICA Project Team

4) Proposed locations of tourism information centers

Three locations are proposed for tourism information centers on the island. Qeshm City should have one general tourist information center, since almost of all visitors come to Qeshm City, where most hotels are accumulated. Qeshm City is the most appropriate location to distribute information about tourism attractions, products, and services on Qeshm, so that visitors will be encouraged to explore the island. It can also provide information on urban tourism, agrotourism and marine tourism. Sohli is located within the Ecotourism Core Zone and already has the Mangrove Information Center. By utilizing this existing facility, Sohli can be a hub for distributing information on ecotourism and aquatourism products. Doulab is located in the center of the Geotourism Core Zone. Since geosites are accumulated in the western part of the island, the location of Doulab has the advantage of being linked to the surrounding geosites. Each information center will provide different types of information and be operated by differently types of organizations as mentioned below.

Qeshm City: general tourist information center

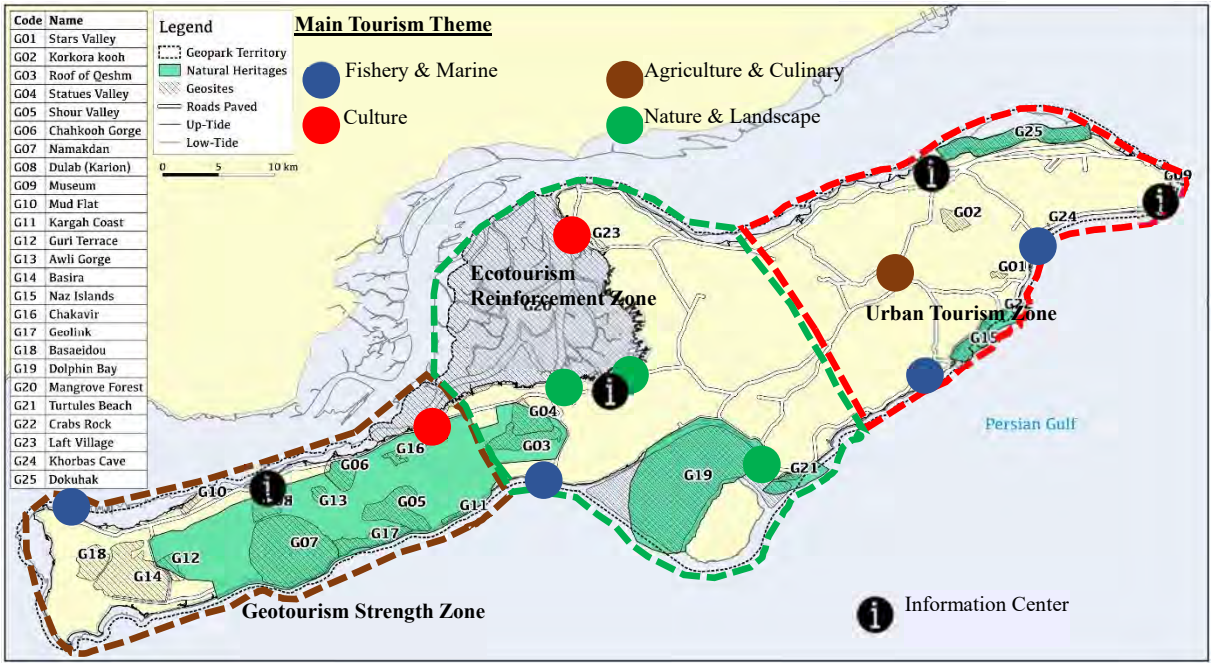
- Information to be provided: comprehensive tourism information about the whole of Qeshm
- Proposed operators: representatives from the Qeshm private sector under the supervision of the QFZO

Sohli: ecotourism tourist information center (utilizing an existing building)

- Information to be provided: detailed information on the Hara Mangrove Protected Area, surrounding sites and activities, ecotourism trails, which connect sites and activities, and available tours
- Proposed operators: boat operators' cooperatives under the supervision of the QFZO

Doulab: geotourism tourist information center

- Information to be provided: information on geosites (being a center in the western part of the geopark), surrounding sites, activities, geotourism trails, which connect sites and activities, and
- Proposed operators: Rural development cooperatives involved in tourism and local handicrafts, women's association or local communities under the supervision of the QFZO



Source: JICA Project Team

Figure 11.2.1 Proposed Locations of Tourist Information Centers

5) Legislative support

PPPs

Legislation, which enables the private sector or local communities to manage public properties, which is one form of PPP, should be implemented. The aim here is to provide public services in a more efficient and effective manner by utilizing the private sector's skills and creativity. Tourist information centers can be operated under a PPP to distribute more reliable and comprehensive tourist information.

(2) One Village One Product promotion

1) One Village One Product and Michinoeki (roadside station)

The OVOP movement and the Michinoeki concept were created in Japan to vitalize local economies. These methodologies have been applied abroad, especially in East Asia, Africa and South America.

The OVOP movement seeks to promote community-oriented economic and industrial policies by utilizing local resources, which include nature, culture and history[1]. It strongly emphasizes three principles: 1) local yet global; 2) self-reliance and creativity; and 3) human resources development, especially local leadership, in order to sustain the activities. Through implementing the OVOP movement, the concepts of *satoumi* and *satoyama* are also supported.

Michinoeki were originally spaces to rest and act as an interchange along highways. Their functions are linked to rural roads, as well as highways, creating connections between the highway network and local communities[2]. The Ministry of Land, Infrastructure, Transport and Tourism recommends that Michinoeki provide not only toilets and parking but also an information distribution facility, a restaurant and marketing spaces for local products. It forges networks between visitors and the local communities, who can benefit from such interactions.

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1 Yoshimura Teruhiko. 2004. Sustainable Local Development and Revitalization: Case of One Village One Product Movement: Its Principles and Implications. Researcher, UNCRD.

2 Yokota, Toshiyuki. 2006. Guidelines for Roadside Station - Michinoeki. Washington, DC: World Bank. http://documents.worldbank.org/curated/en/753051468137999706/Guidelines-for-roadside-station-michinoeki.

This project proposes combining these two methodologies to strengthen the supplier side and establish new marketing channels for the many domestic visitors who come to Qeshm by car.

2) Objectives, outputs and activities of the project

The objective of this priority project is to strengthen the QFZO's capacity to enhance local communities' involvement in sustainable regional development.

The expected outputs are:

(a) The number of local entrepreneurs (called OVOP business partners) and MSMEs increase.
(b) Unique local resources are identified and value-added products using local resources are produced.
(c) Sales channels (including tourists) for newly developed products are established.
(d) The construction of Michinoeki is supported by QFZO.
(e) A mechanism to operate Michinoeki by local communities is established.

Table 11.2.3 shows the detailed activities needed to achieve outputs. The table also shows the indicators to evaluate the objective and each output.

Table 11.2.3 Outputs and Activities of the One Village One Product Promotion

No.	Outputs and activities		Indicators
Objective: Strengthen the capacity of the QFZO to enhance local communities' involvement in sustainable regional development		A:	A: Support programs to foster local entrepreneurs are officially approved
		B:	B: Increase in the number of people who are aware of the support programs
Output 1:	Local entrepreneurs (called OVOP business partners) and MSMEs increase in number		
1-1	A financial support program for OVOP business partners is developed	1-a	All the procedures of the support program are conducted
1-2	OVOP business partner-promoting workshops are organized in all the villages on Qeshm	1-b	The number of local entrepreneurs and MSMEs increases
1-3	Targeted villages are distinguished according their level of enthusiasm	1-c	Dissemination workshops are conducted
1-4	Groups to submit proposals are supported by village councils		
1-5	Proposal screening criteria are developed		
1-6	Common training courses on business planning, management, accounting, and marketing and promotion etc. are planned and provided for selected OVOP business partners		
1-7	The experiences of OVOP business partners in the designated villages are shared with other villages		
Output 2:	Unique local resources are identified and value-added products using local resources are produced		
2-1	Unique local resources are discussed and identified in each village	2-a	The number of value-added local products increases
2-2	Ideas for value-added products using local resources are proposed in each village	2-b	New trials of value-added local products are observed
2-3	High-potential proposed products are selected for each village		
2-4	Necessary assistance and/or trainings to produce the selected products through the OVOP business partner program is provided		
2-5	The production process starts		
Output 3:	Establishment of sales channels (including tourists) for newly developed products		
3-1	Several sales channels of newly developed products are determined	3-a	The number of promotional tools and materials increases
3-2	Necessary assistance and/or training to develop sales channels are provided	3-b	The level of participation in domestic and international tourism fairs increases
3-3	Promotional tools and materials are developed		
3-4	Newly developed products are exhibited at domestic and international fairs	3-c	A Michinoeki becomes one of the sales channels to sell local products.
Output 4:	The construction of a pilot Michinoeki is supported		
4-1	The prioritized location of the Michinoeki is agreed upon	4-a	The concept, design and functions of the Michinoeki are documented
4-2	The land or existing building is allocated by the QFZO		
4-3	The scale and design of Michinoeki are agreed upon	4-b	The process of constructing the Michinoeki is supported according to the plan
4-4	An impact analysis of the construction is conducted		
4-5	The construction of a pilot Michinoeki is supported		
Output 5:	Establishment of a mechanism to operate Michinoeki by local communities.		
5-1	Roles and functions of Michinoeki are discussed	5-a	MoUs for a mechanism to operate Michinoeki are signed
5-2	A mechanism for operating Michinoeki is discussed by the QFZO, village councils and local communities	5-b	Established Michinoeki start their operation
5-3	Each Michinoeki is managed by an agreed operation mechanism	5-c	Satisfaction level of visitors to Michinoeki increase

Source: JICA Project Team

3) Implementing body

The QFZO in collaboration with village councils.

4) Plan of operation

Table 11.2.4 shows the plan of operation.

Table 11.2.4 Plan of Operation for the One Village One Product Promotion

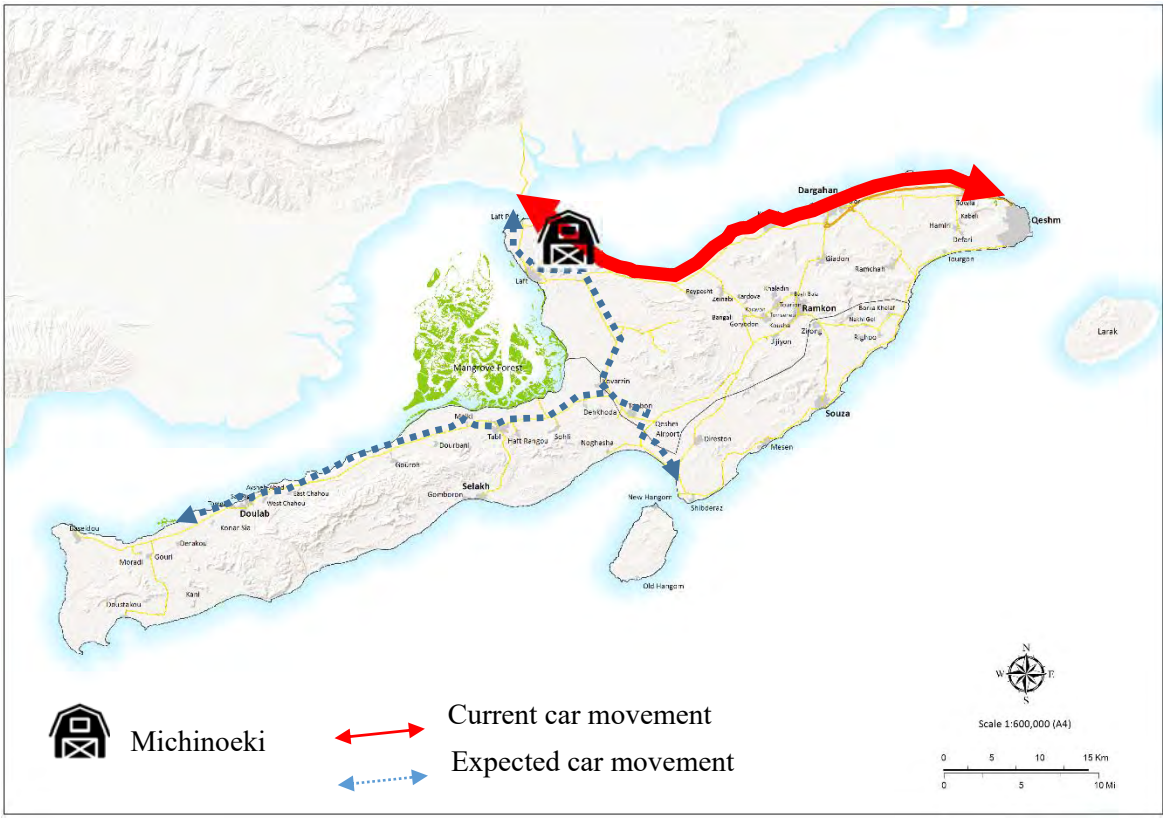
No.	Activities	2019				2020				2021			
		1	2	3	4	1	2	3	4	1	2	3	4
1-1	A financial support program for OVOP business partners is developed												
1-2	OVOP business partner-promoting workshops are organized in all the villages on Qeshm												
1-3	According to a village's level of enthusiasm, target villages are distinguished												
1-4	Groups to submit proposals are supported by village councils												
1-5	Proposal screening criteria are developed												
1-6	Common training courses on business planning, management, accounting, and marketing and promotion etc. are planned and provided for selected OVOP business partners												
1-7	The experiences of OVOP business partners in designated villages are shared with other villages												
2-1	Unique local resources are discussed and distinguished in each village												
2-2	Ideas for value-added products using local resources are proposed in each village												
2-3	Proposed products with high potential are selected in each village												
2-4	Necessary assistance and/or training to produce the selected products through the OVOP business partner program are provided												
2-5	The production process starts												
3-1	Several sales channels for newly developed products are determined												
3-2	Necessary assistance and/or training to develop sales channels are provided												
3-3	Promotion tools and materials are developed												
3-4	Newly developed products are exhibited at domestic and international fairs												
4-1	The prioritized location of Michinoeki is agreed												
4-2	The land or existing building is allocated by the QFZO												
4-3	The scale and design of Michinoeki are agreed												
4-4	The impact of the construction is analyzed												
4-5	The construction of a Michinoeki pilot is supported												
5-1	Roles and functions of Michinoeki are discussed												
5-2	A mechanism for operating Michinoeki is discussed by the QFZO, village councils and local communities												
5-3	Each Michinoeki is managed by an agreed operation mechanism												

*Note: 1: first quarter, 2: second quarter, 3: third quarter, and 4: fourth quarter
Source: JICA Project Team

5) Proposed location of a Michinoeki

About 60% of arrivals on Qeshm come from Laft Port. There is only one entry point for visitors who come by car. The current car movement is that those who arrive at Laft Port go directly to Dargahan and Qeshm for shopping, as shown by the red arrow in Figure 11.2.2. The following benefits are expected from allocating the Michinoeki, whose basic function is to provide parking, toilets and a rest area. Its additional functions are to distribute tourist information and provide spaces to sell local products.

- To reduce car accidents by providing a rest area during long journeys
- To widen areas where local residents can benefit from tourism by motivating visitors to explore the western and southern parts of Qeshm through distributing tourist information of the areas shown by the blue arrow
- To benefit the local economy by selling local products



Source: JICA Project Team

Figure 11.2.2 Proposed Location of the Michinoeki in Laft

6) Legislation support

Financial support for MSMEs

A financial support mechanism is required to support the startup of local entrepreneurs, to help build their capacity and to enhance MSMEs. There is an incubation center on Qeshm, but it has lost the ability to support local entrepreneurs. It simply rents out its facilities such as conference rooms. It is essential to foster local businesses that can vitalize the local economy of Qeshm.

PPPs

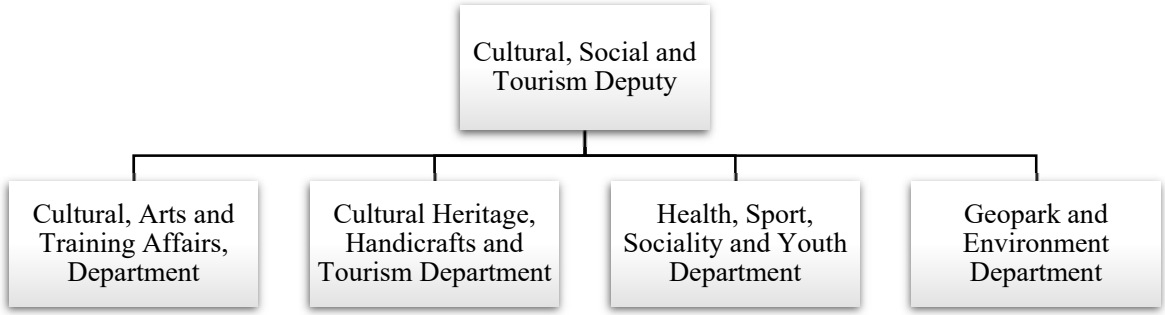
Similar to the project for capacity development for the marketing and promotion of ecotourism, involvement from the private sector is also useful to this project in order to establish legislation. which enables the private sector or local communities to manage public property, which is a form of PPP. It aims to provide public services more efficiently and effectively by utilizing the private sector's skills and creativity. A constructed Michinoeki can be operated under a form of PPP.

11.2.2 Recommendations of institutional rearrangements in the tourism sector

(1) Current conditions of tourism-related institutional arrangements

1) QFZO

Figure 11.2.3 below shows the current organizational chart for the QFZO, which is responsible for tourism development on Qeshm. In addition, the Public Relations and International Affairs Department is responsible for tourism promotion activities.



Source: JICA Project Team

Figure 11.2.3 Organization Chart for Tourism Development in the QFZO

Under the umbrella of the Cultural, Social and Tourism Deputy, each department should have its unique roles and functions and clear job descriptions; however, overlapping activities by different departments have been observed due to the lack of coordination between them. This has caused a level of disparity even among local communities. For instance, training for local guides and developers of local handicrafts was provided on an ad hoc basis by both the Cultural Heritage, Handicrafts and Tourism Department and the Geopark and Environment Department. In order to utilize limited resources more effectively and efficiently, it is necessary to establish a coordination committee between the departments within the QFZO.

On the topic of tourism promotion, the Public Relations and International Affairs Department is currently responsible; however, the department has shown that it is more focused on promoting the QFZO than the tourist attractions of Qeshm. It is recommended that the Cultural, Social, and Tourism Deputy, in collaboration with private-sector actors, take over tourism promotion activities. The existing Qeshm Tourism Association, which consists of the QFZO and the private sector, can be activated to implement promotion activities.

2) Private-sector actors

The following tourism-related organizations have existed on Qeshm:

- Qeshm Hotel Association: Established in 1996, 57 hotels are registered in the association. This does not include local guest houses. There are seven board members who are elected every four years.
- Qeshm Travel Agency Association: The first travel agency on Qeshm was established in 1994. The association was formed in 2010 with 35 registered members including travel agencies and tour operators. There are around 10 companies arranging tours on Qeshm for domestic and international visitors. The rest are travel agencies that arrange tickets to mainland Iran and overseas.
- Qeshm Tour Guides Association: Established in 2014, there are currently 50 members. This number is expected to grow to 150 in 2017. They cooperate with each other on tour fees, activities, destinations, routes etc.

3) Local service providers

The following local service providers exist on Qeshm:

- Local guest house owners: As of 2017, there are 27 local guest houses on Qeshm, although their business has increased at a rapid pace. They provide meals and accommodation to tourists, providing unique local experiences and warm hospitality.
- Boat operators' cooperatives: There are five boat operators' cooperatives on Qeshm (as of 2017). Two are located in Shibderaz and Hangom for dolphin-watching tours. The other three are in Kovarzin, Sohli and Tabl. They provide boat tours to tourists within the Hara Mangrove Protected Area.

- Gouron Tourism Development Cooperative: This was established in 2017 to develop tourism in Gouron. Gouron has preserved traditional skills and techniques to build Lenj (traditional wooden vessels). The Gouron Lenj Building and Sailing Open Museum, which is currently under construction, utilizes the traditional knowledge of cooperative members.
- Taxi services: Since Qeshm does not have any public transportation services, taxi services are an important form of transportation for those individuals who visit Qeshm without a car. They bring tourists to local guest houses and jetties for any tours and act as intermediaries who connect tourists with local service providers. A certain number of taxi drivers possesses local guide licenses. They also fulfil the role of a local guide.

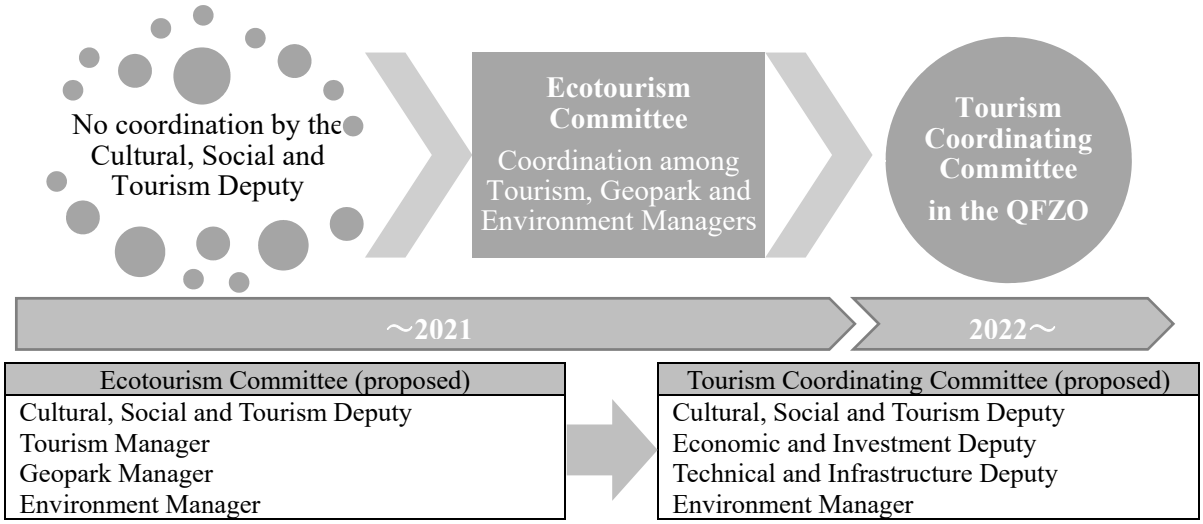
(2) Recommendations for institutional rearrangements in the tourism sector

1) QFZO

The following institutional rearrangements are recommended:

Establishment of a tourism coordinating committee within the QFZO

The priority project suggests the establishment of a specialist committee to facilitate collective efforts to enhance ecotourism on Qeshm. This practice can be expanded in order to establish a tourism coordinating committee within the QFZO, which includes the department dealing with tourism-related investment issues, as shown at Figure 11.2.4. The proposed members of the committee are also described in the figure. This tourism coordinating committee on Qeshm will take responsibility for developing tourism policy.



Source: JICA Project Team

Figure 11.2.4 Transition to Establish the Tourism Coordination Committee of the QFZO

Clear demarcation of each department's responsibilities

Duplicate activities were conducted by the Cultural Heritage, Handicrafts and Tourism Department and the Geopark and Environmental Department. It is recommended that the Cultural Heritage, Handicrafts and Tourism Department be responsible for supporting and improving the quality of relatively large-scale investments, such as hotels and apartment hotels, while the Geopark and Environmental Department should be responsible for developing and improving ecotourism-related activities and involving local guest houses.

Tourism promotion

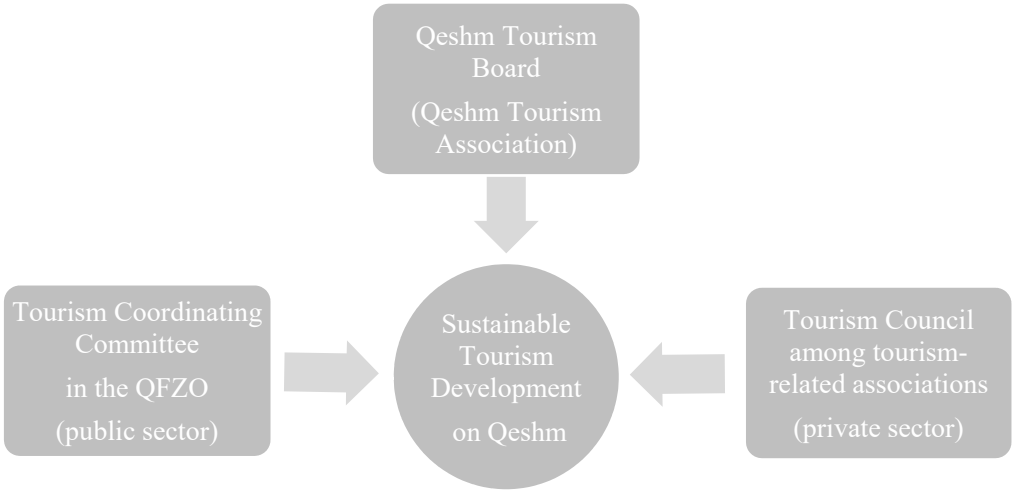
Tourism promotion should be kept separate from promoting the organization activities in which tourists are not interested. Tourism promotion should provide information that tourists require, such as access, accommodation facilities, attractions, restaurants, and available products and services. Therefore, it is

recommended for the Cultural, Social and Tourism Deputy to collaborate with the private sector to take over the responsibilities of promoting tourism on Qeshm.

2) QFZO and the private sector

The Qeshm Tourism Association, which consists of the QFZO and private-sector entities, was formed to tackle several issues that happen during the Nowruz holiday, the highest travel season on Qeshm. It is recommended for this association or a similar organizational setup to work regularly to discuss issues related to tourism and take measures to ensure the quality of tourism services, as well as enhance tourism on Qeshm. Meanwhile, it is also necessary for private-sector actors, such as the Qeshm Hotel Association, Travel Agency Association and the Guides Association to develop close communication and discuss tourism-related issues and recommended measures to be taken. They can pass on the compiled recommendations to the Qeshm Tourism Association.

The so-called Qeshm Tourism Association, which currently consists of representatives from public and private entities, will be upgraded to fulfill the roles of a tourism board and take responsibility for implementing tourism policy, including tourism promotion activities. In the long term, local tourism-related cooperatives can be a part of this body (Figure 11.2.5).



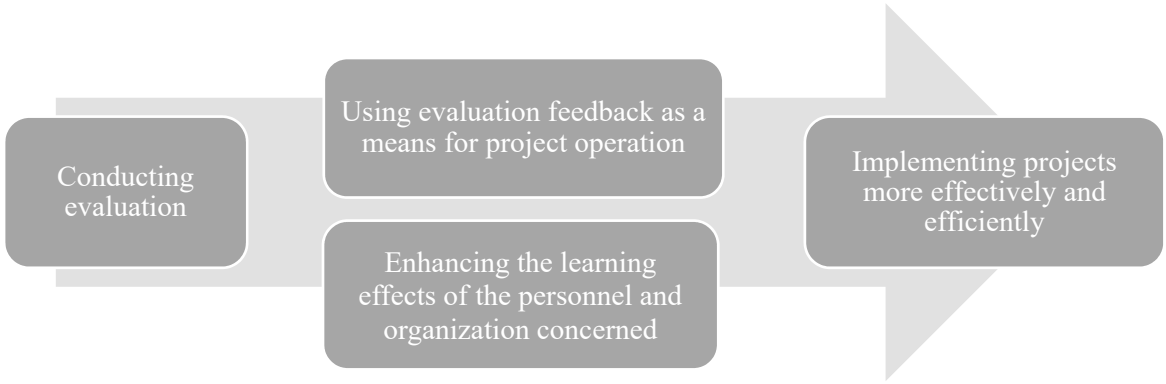
Source: JICA Project Team

Figure 11.2.5 Coordinating Organizations for Tourism on Qeshm in the Long Term

11.2.3 Follow-up mechanism for implementation in the tourism sector

(1) Project evaluation

It is important to evaluate the outcomes that a project achieves and provide feedback on the evaluation results, lessons and recommendations obtained to enable more effective and efficient project implementation. Two main objectives of the project evaluation are: 1) using evaluation feedback as a means for project operation and management; and 2) enhancing the "learning effects" of the personnel and organization concerned with a view to more effective project implementation. It is recommended that the QFZO practices PCM, which is currently lacking in the project implementation process of the QFZO.



Source: Modified from the Utilization of JICA's Evaluation Results, JICA Guideline for Project Evaluation, 2004

Figure 11.2.6 Effective Use of Evaluation Results to Improve Projects

(2) Further recommendation

One-stop shop (OSS) for business registration

An OSS for business registration will ease the entry of entrepreneurs and reduce the administrative burden. The concept of an OSS is to provide one location where relevant government agencies are located, coordinated and streamlined to provide prompt, efficient and transparent information to entrepreneurs. It has been pointed out that one of the issues that discourage local entrepreneurs is the absence of a clear procedure for starting new businesses and business registration, especially when they cannot reliably know how long the process would take. It is common for administrators to misdirect people. It is recommended to take these factors into consideration when establishing an OSS for business registration to enhance the local economy.

11.3 Action Plan for Fishery

11.3.1 Aquaculture development in local communities

(1) Implementation plan

1) Outline

This project consists of two subprojects, "FS 1-1: Market-based Aquaculture Development Plan" and "FS 1-2: Dissemination of Aquaculture to Local Communities". Objectives of the projects are as follows:

Objectives of FS 1-1 "Market-based Aquaculture Development Plan"

- To clarify domestic and international market needs
- To identify target species for aquaculture taking into consideration technical and economic feasibility
- To plan for the development of aquaculture among local communities

Objectives of FS 1-2 "Dissemination of Aquaculture to Local Communities"

- To promote the smooth commencement of aquaculture businesses in local communities as an alternative income source following the above-mentioned plan
- To increase aquaculture production through the participation of local communities
- To reduce pressures on fishery resources through the diversification of fishermen's livelihood

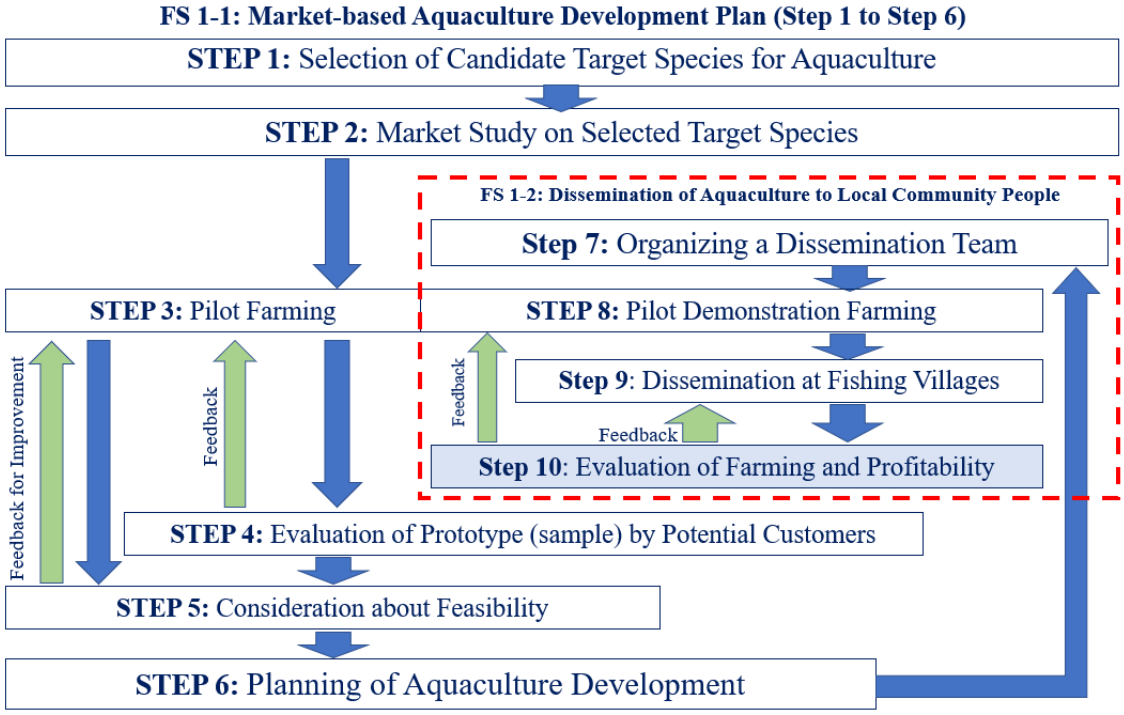
2) Concept

The project focuses on the activation of the local economy through the dissemination of technically and economically feasible aquaculture in local communities on Qeshm Island, utilizing coastal waters that

are located near fishing ports and villages.

3) Procedure and actions

Stepwise actions for implementation of the project are described in Figure 11.3.1 and Table 11.3.1.



Source: JICA Project Team

Figure 11.3.1 Stepwise Actions for Aquaculture Development in Local Communities

Table 11.3.1 Actions for an Aquaculture Development Plan in Local Communities

Procedure	Actions
FS 1-1 "Market-based Aquaculture Development Plan" (Steps 1 - 6)	
Step 1: Selection of candidate species	Candidate species for aquaculture in Qeshmi waters are chosen (see a preliminary list of potential species in Table 11.3.2).
Step 2: Market study on selected target species	A simple market study for a selected species is conducted by an expert or consultant to identify domestic and international markets. The study will include: a) listing of potential markets and buyers (wholesalers, processors, traders and/or retailers), b) required type of product, c) required quality standard, d) quantity demanded, and e) estimated selling price.
Step 3: Pilot farming	Pilot farming is conducted and a prototype (sample product) is produced. Information necessary for assessing the feasibility of farming is gathered through pilot farming. Pilot farming is conducted by experts from the QFZO and/or the IFO, or alternatively outsourced to an advanced farmer.
Step 4: Evaluation of prototype	The prototype produced through pilot farming is evaluated by potential customers. Method and operations of pilot faming are modified in such a way that the farming can create a prototype, which satisfies market demand. This step may be repeated until a desirable prototype is created.
Step 5: Feasibility consideration	Technical and economic feasibility of the farming is examined, taking into consideration: a) availability and price of seeds, b) grow-out techniques transferable to local people, c) availability of appropriate farming sites, d) profitable line of the farming business, and e) appropriate postharvest operations (transfer, processing and distribution of fish).
Step 6: Planning for aquaculture development	Aquaculture development plan for the selected species is prepared with the aim of disseminating the farming among local communities. Collaboration with a research institute, university, hatchery and/or private farms should be considered when planning. Items to be considered in the planning are listed in Table 11.3.3.
FS 1-2 "Dissemination of Aquaculture to Local Communities" (Steps 7 - 10)	
Step 7: Forming a dissemination team	An aquaculture dissemination team, consisting of staff from the QFZO and/or IFO, consultants, scientists from other organizations and/or advanced farmers, is formed.
Step 8: Pilot demonstration farm	Pilot demonstration farming is conducted for providing technical trainings to local people. The demonstration farming can be conducted on the same site as the pilot farming described in Step 3.
Step 9: Dissemination at local villages	The farming is disseminated in local villages. Seeds and a farming system (material and equipment) are supplied to the villagers for starting aquaculture, where appropriate. Useful information related to the farming, such as new technology, material costs, potential buyers, market price and marine environment data, is shared with farmers.
Step 10: Evaluation of farming	The disseminated farming practice is evaluated in terms of profitability and improved based on the evaluation.

Source: JICA Project Team

Potential target species of aquaculture development on Qeshm Island is listed in Table 11.3.2.

Table 11.3.2 A Preliminary List of Potential Target Species for Aquaculture in Qeshmi Waters

Group	English name	Scientific name	Group	English name	Scientific name
Seaweed	Ogo seaweed	*Gracilariopsis persica*	Finfish		
Shellfish	Scallops	*Chlamys ruschenbergerii*	Groupers	Orange-spotted grouper	*Epinephelus coioides, E. spp.*
	Oysters	*Saccostrea cucullata, Crassostrea sp.*	Snappers	Snappers	*Lutjanus spp.*
	Hard clams	*Callista umbonella* etc.	Seabreams	King soldier bream, silver seabream, yellowfin seabream	*Argyrops spinifer, Sparidentex hasta, Acanthopagrus latus*
	Pearl oysters	*Pinctada persica, P. radiata, Pteria penguin*	Emperors	Emperors	*Lethrinus nebulosus, Argyrops spp.*
	Abalone	*Haliotis mariae*	Threadfin salmon	Four-finger threadfin	*Eleuteronema tetradactylum*
Crustaceans	Mud crab	*Scylla serrata*	Tuna	Kawakawa	*Euthynnus affinis*
	White leg shrimp	*Litopenaeus vannamei*		Long-tail tuna	*Thunnus tonggol*
Echinoderm	Sea cucumber	*Holothuria scabra*	Cobia	Cobia, black kingfish	*Rachycentron canadum*
	Sea urchin	Species unknown	Seabass	Barramundi (Asian seabass)	*Lates calcarifer*

Source: JICA Project Team

Table 11.3.3 shows items to be considered in the aquaculture development plan.

Table 11.3.3 Items to Be Considered in the Aquaculture Development Plan for Local Communities

Item	Description
Requirements to select potential farming sites	・ Socioeconomic aspects of candidate sites/villages: status of fishery, local people's strong motivation to start farming, potential number of workers (farmers), available infrastructure (electricity, water, road etc.), facilities for storage, processing and packaging (where necessary) near candidate sites, and transportation. ・ Environmental aspects: basic physicochemical data on the marine environment, pollution and existence of protected areas near candidate sites. ・ Proximity to fishing ports and/or villages for ensuring better farm management.
Technical and financial aspects	・ Farming system (grow-out methods, facility and equipment), procurement of seeds, postharvest operations, processing, storage, transfer, distribution chain, domestic and international marketing, initial investment capital, potential customers, estimate of production and profitability, etc. ・ IMTA or combined farming of different trophic types of marine organisms (e.g., seaweed as primary producer, sea cucumber as detritivore, shellfish as suspension-feeder, and/or herbivorous fish) is considered, where possible, to promote aquaculture of low impact on the natural environment.
Promotion of aquaculture	・ Formation of a dissemination team, pilot (demonstration) farming, training programs for prospective farmers, information-sharing system on farming management and availability of microcredit, promotion of tie-up with fish-processing companies for value-chain enhancement.

Source: JICA Project Team

4) Implementation schedule

Step 1 can start immediately, while the implementation period for Step 2 through Step 6 will depend on target species. Step 7 should start upon approval of the aquaculture development plan, which is described

in Step 6.

(2) Institutional rearrangements for implementation

1) Implementation body and collaboration

Responsible organizations for the implementation and administration of the project are the Agriculture and Fishery Department (QFZO), and the Qeshm County Office of the IFO. Pilot farming and pilot demonstration farming can be outsourced to consultants or an advanced farming company if necessary.

Other organizations engaged in aquaculture research and development are potential collaborators, who can provide useful technical assistance to the project if close partnerships with them are established. The potential collaborators are Hormozgan University, the Biotechnology Institute of the Iranian Research Organization for Science and Technology, the Natural Resources Research Center, the Persian Gulf and Oman Sea Ecological Research Institute, the Iranian Fisheries Research Organization and private farming companies.

2) Formation of a technical dissemination team

It is recommended that a dissemination team be formed to provide constant technical assistance to local farmers. Pilot demonstration farming conducted by the team is a showcase for local people, which can be used as a capacity development tool for both dissemination team members and prospective farmers. Proposed team members are experts from the QFZO and/or IFO, hired experts and/or advanced farmers.

(3) Follow-up mechanism for implementation

1) Assisting farmers' efforts to become familiar with international standards of responsible aquaculture

In cases where farming is not appropriately managed, various adverse effects on socio-environmental conditions, such as water pollution and labor exploitation, occur. Nowadays, the promotion of socially and environmentally sound aquaculture is supported by increasing consumer awareness in many countries. The ASC is an international organization established to transform aquaculture in terms of environmental sustainability and social responsibility through the value chain. The ASC issues certificates to farms, processors, traders and supply-chain companies, which comply with ASC standards on responsible aquaculture. Certified supplying companies can sell the responsibly farmed products by showing the ASC logo (Figure 11.3.2). Thus, the products are clearly differentiated from other products and highly appreciated in international markets. As an example, procurement of ASC-certified seafood was supported as a mean of "sustainable sourcing" by the Rio Olympic Games in 2016; indeed, this support measure will continue at the Tokyo Olympic Games in 2020. Detailed information about the ASC can be found on its website, http://www.asc-aqua.org.

Aquaculture practices that meet such international standards can become a representative activity of the "eco-island". Therefore, it is recommended that the QFZO and/or IFO consider providing assistance to farmers and processing and supplying companies in understanding the ASC scheme and applying for certificates in the future. The main activities of this assistance could be the provision of seminars and training programs conducted by hired consultants or experts. Proposed subjects for the seminars and training events are procedures to obtain a) ASC farm certification (ASC responsible aquaculture), b) ASC supplier certification, known as "Chain of Custody" (CoC), and c) a license for ASC logo use (see also Figure 11.3.10).

Note: Top right: a panel explaining the ASC scheme placed on a showcase of fish at a supermarket. Bottom right: the ASC logo attached to a package of salmon imported from Norway. Left: an enlarged image of the ASC logo.
Source: JICA Project Team

Figure 11.3.2 ASC-certified Salmon Sold at a Supermarket in Japan

2) Use of nearshore sea areas by local people

The right to use sea areas for aquaculture should be balanced, in a coordinated manner, between fishermen's cooperatives, local people's groups and private farming companies. Local people generally do not have enough funds and knowledge for starting aquaculture. Therefore, their actions for participating in the aquaculture industry tend to be taken after the participation of cash-rich private companies. Granting the right to the priority use of nearshore sea areas for aquaculture to local people (including fishermen) who live in front of the areas, which is similar to the "demarcated fishing rights" granted to local fishermen in Japan, can facilitate cash-poor people's smooth participation in aquaculture. Possession of farming areas near a fishing port and/or village is advantageous for farm management and the transfer of harvested fish. Furthermore, the right significantly helps local people to autonomously protect the marine environment of the area, meaning that farmers should think about economic activities and marine conservation at the same time.

To increase aquaculture production is a national priority, which is stipulated in the Sixth Five-year Socioeconomic National Development Plan of the Islamic Republic of Iran. In coastal waters off Qeshm Island, sea areas of at least 384 has (as of 2016) have been designated for private fish-farming companies. Consideration about the use of nearshore sea areas by local people will also become more important for future aquaculture development on Qeshm.

3) Acceleration of permission procedures for starting aquaculture businesses

Those who are intending to start an aquaculture business need to obtain permission from the relevant government authorities. However, these procedures take several months or longer; thus, this has been a bottleneck to the smooth commencement of such business. A better system to speed up the procedures should be considered, where possible, through strong support from relevant governmental organizations.

4) Information-sharing system for local people and farmers

An information-sharing system for local farmers should be established, given that they do not have easy access to information related to aquaculture business. A dissemination team could be engaged in such a service. Useful information items are as follows:

- Availability and price of seeds
- New farming techniques
- New feed for farming
- New potential species for aquaculture
- New market and buyer information
- Market price and its trend
- Instruction manual of farming methods
- Available financial assistance scheme
- International standards of responsible aquaculture (such as ASC)
- Marine environment data on existing and prospective farming sites (e.g., temperature, salinity, dissolved oxygen, sea bottom conditions, harmful organisms, micro-algal bloom)
- Results of farming experiments conducted by scientists/experts in Qeshmi waters etc.

5) Facilitation of financing

Local people generally do not have sufficient initial investment capital for starting aquaculture. The use of a financing mechanism (microcredit), e.g., the Rural Job Scheme set up by Keshavarzi Bank or the Agriculture Bank of Iran (http://www.bki.ir/en/About-US/Social-Responsibilities/Rural-Job), can help local people to smoothly start their own business. Therefore, information about any available financial mechanism should be shared with local people who intend to start or extend their own aquaculture business as mentioned above.

Besides, farmers need to assess the profitability of their aquaculture business when they apply for a loan. The dissemination team can also play a role as a bridge between financing institutions and farmers by providing technical assistance related to financial management because the team should have substantial data from the economic analyses conducted during the implementation of pilot demonstration farming and dissemination in local villages (Steps 8 and 9 in Table 11.3.1).

11.3.2 Habitat rehabilitation

(1) Implementation plan

1) Outline

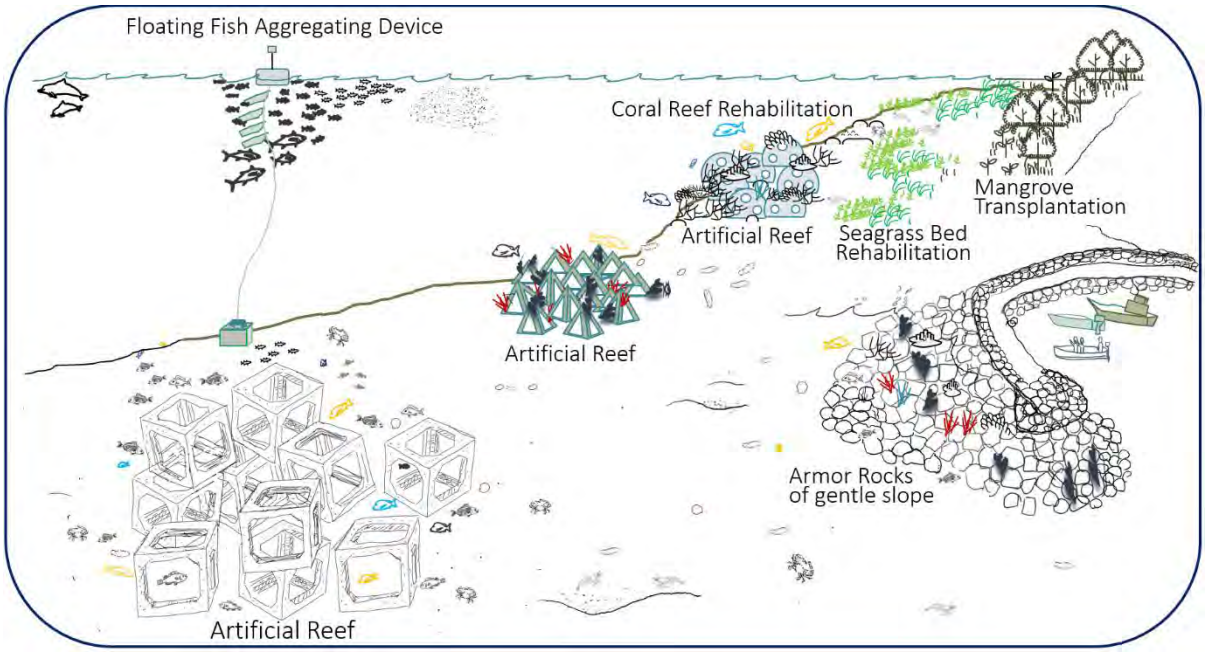
This project consists of the following components:

- Compiling and analyzing ecological information related to fishery resources
- Planning habitat rehabilitation for the enhancement of fishery resources
- Restoration and creation of habitats for the enhancement of fishery resources (implementation)

2) Concept

The concept of habitat rehabilitation consists of the following key features:

- *Satoumi* is a concept of coastal sea management and sustainable fishery as explained. Habitat rehabilitation is an integral part of the creation of *satoumi*, as shown in Figure 6.2.5.
- Figure 11.3.3 shows a conceptual drawing of habitat rehabilitation. Different habitat types are created and combined, while the placement of reef modules is designed to provide stepping stones to keep the seriality of biotopes, where possible. Shallow and deep areas are utilized with different modules to maximize effects of resource enhancement, for example, the utilization of a) a shallow area with armor rock modules with a gentle slope in the construction of breakwaters, and b) a deeper area with some artificial reef modules. The area near to the sea surface can also be utilized with a floating fish aggregating device as shown in Figure 11.3.3. Details about low-cost floating fish aggregating devices are described online at http://www.fao.org/docrep/005/Y4260E/y4260e0h.htm.



Source: JICA Project Team

Figure 11.3.3 A Conceptual Drawing of Habitat Rehabilitation

- Inexpensive materials (e.g., armor rock modules of breakwaters) are used for the rehabilitation.
- New technologies for the rehabilitation of coral reefs (Figure 11.3.5) and seagrass beds (Figure 11.3.6) are tested, where possible, for further resource enhancement.
- Rehabilitation operations, which are readily handled by local fishermen, are adopted.
- Collaboration with ongoing rehabilitation activities, such as mangrove transplantation and the placement of artificial reefs (e.g., Selakh and Souza), conducted by the Iranian Government and other organizations is promoted for the further enhancement of fishery resources.
- The rehabilitation project is conducted near or in front of villages where local people's self-motivated participation in planning, implementation and monitoring and evaluation is surely anticipated.
- Rehabilitated habitats will be utilized for a) stock enhancement (releasing fingerlings), b) community-based fishery management (management of fishing grounds and fishing activities), c) marine-related tourism for income improvement, and d) environmental education.
- Evaluation results of the project, including fishermen's opinions, are taken into full account when improving rehabilitation methods.

3) Procedure and actions

Stepwise actions for the habitat rehabilitation project are described in Table 11.3.4.

Table 11.3.4 Stepwise Actions for Habitat Rehabilitation

Procedure	Actions
Step 1 Gathering basic information	Basic information is gathered through a document review, a field survey etc. Information items to be gathered are the following: ・ Distribution of sandy, muddy and rocky areas, tidal flats, mangroves, seagrass beds, seaweed beds, coral reefs and artificial reefs. Habitat mapping (GIS processing) is conducted for better analysis and planning, if assistance from a GIS expert is available. ・ Ecological data: coral spawning season, the life history of seagrass species (*Halodule, Thalassia, Cymodocea* and/or *Syringodium*), including the seed production season, natural habitats, spawning season, areas of commercially important species, areas of high fishery production, etc. ・ If there is no accurate information on the seasons of coral spawning and seagrass seed production, the reproductive seasons should be studied, first, in collaboration with relevant scientists. ・ Environmental data (as many as possible): bathymetric data, tidal table, tidal current, water temperature, salinity, chemical oxygen demand, ignition loss and particle composition of the bottom sediment, turbidity, light intensity, the effect of river water flow, fluctuation in the sea bottom level by drift sand, inclination of the sea bottom ground, meteorological data, wave actions (height), etc. ・ Socioeconomic information: location of fishing grounds for each type of fishing, capture production of major fish species, income of fishermen, fishery resource management practices by fishermen (if any), protected areas, location of existing aquaculture farms, etc. ・ Guideline for habitat rehabilitation (if any)
Step 2 Selection of project site and formation of a working group	・ Selection of candidate sites (target fishing villages) based on the data gathered at Step 1. ・ Consultation meetings with local fishermen from the candidate sites to ask about the actual situation regarding fishery resources, as well as to confirm their motivation to participate in the project for habitat rehabilitation. ・ Preliminary examination about rehabilitation methods (types of habitats and modules, locations, etc.) and forms of local people's participation. ・ A priority site (target fishing village) is chosen by considering fishermen's motivation and commitment to positively participate in the project. ・ Formation of a working group (project team) as the project implementation body consisting of fishermen's cooperative members, experts from the QFZO and/or IFO, hired consultants/experts, and, if possible, representatives of local groups (e.g., school, women's group, NGO, council, dive operators etc.).
Step 3 Planning	Habitat rehabilitation plan is prepared by the working group based on the concept and information gathered. Items to be considered in the planning are the following: ・ Target area of rehabilitation ・ Target species for resource enhancement ・ Habitat types to be created ・ Spatial arrangement of artificial reefs and habitats ・ Methods of rehabilitation ・ Methods of monitoring and evaluation ・ Collaboration methods with local fishermen and other people in implementation, monitoring and evaluation to develop the community stewardship of fishery resources ・ Implementation schedule ・ Cost estimate ・ Funding source (e.g., funding agencies, international aid organization) ・ Rule-making (e.g., manner of utilizing the habitats, zoning plan; see Figure 11.3.7 and Table 11.3.11)
Step 4 Implementation	Habitat rehabilitation is implemented by the working group following the prepared habitat rehabilitation plan with the participation of local people.
Step 5 Monitoring, evaluation and maintenance	・ Monitoring and evaluation of rehabilitated habitats and the status of fishery resources is conducted in collaboration with local people and experts from relevant organizations, so that local people can learn about the importance of habitat rehabilitation. ・ Maintenance of the habitats is also conducted in a participatory manner. ・ (See examples of monitoring, evaluation and maintenance in the case of coral reefs and seagrass bed rehabilitation in Tables 12.3.5 and 12.3.6). ・ Results of the evaluation and fishermen's opinions are taken into full account when updating the habitat rehabilitation plan.

Source: JICA Project Team

4) A good example of habitat rehabilitation by the Iranian Government

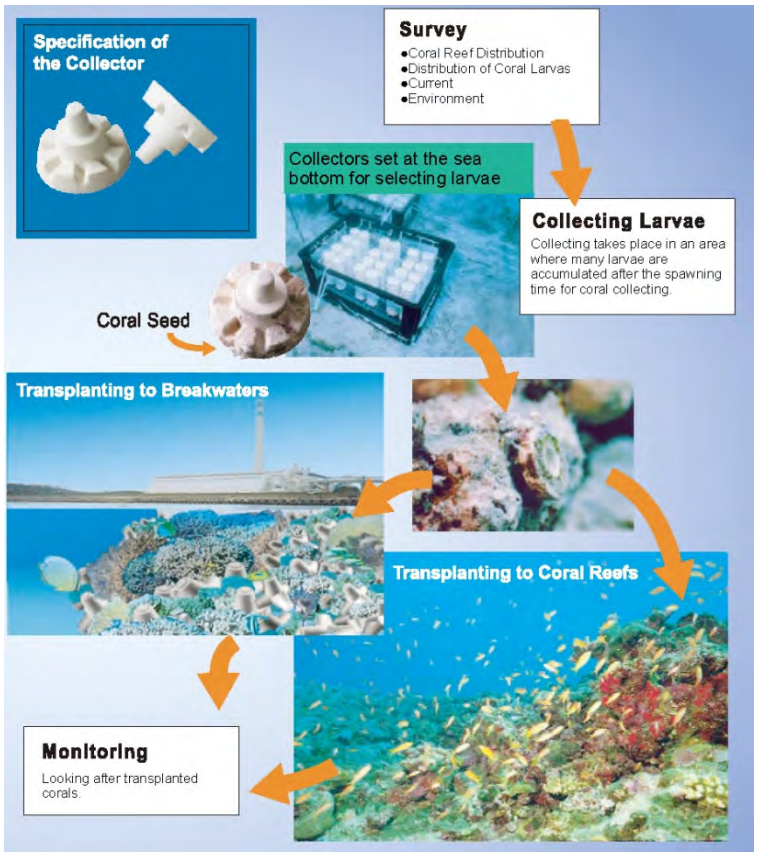
Figure 11.3.4 shows diversified communities of marine organisms, which are created on two dissimilar types of artificial reefs at two depth ranges. A variety of organisms, such as hard corals, coral reef fish and sea urchins feeding on algal mats, is dominant on armor rocks placed in shallow areas, while different types of fish and sessile communities, such as relatively larger reef fishes (e.g., groupers hiding in the crevice and schools of barracudas swimming occasionally above reef modules), ascidians, sponges, hydrozoans, bryozoans and seaweeds, are found in deeper reef areas. This is a good example of habitat rehabilitation conducted by the Iranian Government, which could be expanded to other coastal waters, where appropriate, coupled with a floating fish aggregating device and the rehabilitation of natural habitats such as mangroves, coral reefs or seagrass beds.

Source: JICA Project Team

Figure 11.3.4 Fish and Sessile Communities Growing On/Near Artificial Reefs Created at Different Depths by the Iranian Government

5) Examples of the rehabilitation of coral reefs and seagrass beds

Figures 12.3.5 and 12.3.6 show the rehabilitation of coral reefs and seagrass beds, as carried out in Japan. Items to be considered for the monitoring, evaluation and maintenance of rehabilitated coral reefs and seagrass beds are shown in Tables 12.3.5 and 12.3.6.



Source: IDEA Consultants, Inc.

Figure 11.3.5 Rehabilitation of Coral Reefs by Using Coral Seed Collectors Invented in Japan

Note: 1: seagrass community found in shallow areas off Hinase, Okayama Prefecture, 2: seeds of seagrass, 3: sowing of seagrass seeds with the participation of local people, 4: a handmade bag of gauze with seagrass seeds, sand and mud mixed inside (ready for seeding), Kagawa Prefecture.

Source: Pictures 1, 2 and 3 are provided by courtesy of Mr. T. Tanaka, Executive Director, Research Association for Satoumi Creation, and Mr. T. Amakura, Executive Director, Hinase-Cho Fishermen's Cooperative. Picture 4 is provided by JICA Project Team.

Figure 11.3.6 Seagrass Bed and Rehabilitation in Japan

Table 11.3.5 Monitoring and Evaluation Items for Rehabilitated Coral Reefs and Seagrass Beds

Monitoring items		Evaluation
・ Biomass growth (colony size) ・ Survival rate ・ Vitality (coral polyps and coenosarc) ・ CNP (chlornitrofen) contents of seagrass (where necessary) ・ Distribution and species composition of flora and fauna ・ Change in the quantity of fishery resources	・ Water temperature ・ Water movement ・ Turbidity ・ Sedimentation ・ Terrestrial soil runoff ・ Existence of organisms damaging corals and seagrasses (sea urchin, sea slug, seaweed, sea snails, herbivorous fish, corallivore fish, etc.) etc.	・ Appropriateness of site selection ・ Effectiveness of method and timing for coral transplanting and seagrass seeding ・ Monitoring period

Source: JICA Project Team

Table 11.3.6 Maintenance Items for Rehabilitated Coral Reefs and Seagrass Beds

Coral reefs	Seagrass beds
・ Removal of seaweeds ・ Protection from predators ・ Notification to fishermen and recreational divers about the location of transplanted corals to ask for their support in protecting and raising awareness of the importance of coral reefs etc.	・ Further seeding ・ Removal of drifting and deposited dead seaweeds/seagrasses from seeded sites ・ Removal of animals feeding on seagrass, other harmful organisms and competitors ・ Stabilization of the bottom level ・ Maintenance of the bottom quality etc.

Source: JICA Project Team

6) Preliminary cost estimate

The project cost largely depends on its scale, especially the area of rehabilitation. A preliminary cost estimate for the rehabilitation per hectare (ha) is shown in Table 11.3.7 as a reference.

Table 11.3.7 Preliminary Cost Estimate of Habitat Rehabilitation

Item	Cost (USD/ha)	Components
Artificial reefs	200,000	・ Fabrication and placement of two or three types of artificial modules (different types of artificial reefs and/or floating fish aggregating device) ・ Environmental survey ・ Monitoring and evaluation
Coral reefs	100,000	・ Procurement and placement of coral collectors (e.g., 120 collectors x 16 sets) ・ Placement of substrate for transplanting collectors with coral seeds ・ Environmental survey ・ Monitoring and evaluation
Seagrass beds	100,000	・ Collection and stocking of seeds ・ Seeding or transplantation ・ Environmental survey ・ Monitoring and evaluation

Source: JICA Project Team

7) Implementation schedule

The implementation schedule of the habitat rehabilitation project is shown in Table 11.3.8. With regard to the rehabilitation of coral reefs and seagrass beds, if there is no accurate information on seasons of coral spawning and seagrass seeds production, those reproductive seasons must be studied, first, in collaboration with relevant scientists before progressing to Step 2.

Table 11.3.8 Implementation Schedule for the Habitat Rehabilitation Project

Step	Year 1	Year 2	Year 3 to 5
1 to 3	*	*	*
4 and 5		*	*

Source: JICA Project Team

8) Institutional rearrangements for implementation

Organizations to be involved in the implementation of project are shown in Table 11.3.9.

Table 11.3.9 Organizations to Be Involved in the Habitat Rehabilitation Project

Activities	Organizations Involved
Information-gathering (Step 1 in Table 11.3.4)	QFZO, IFO, hired consultants, DoE (to gather environmental information), and/or scientists from universities and research institutions, e.g., Iranian Fisheries Research Organization (to gather ecological, environmental and socioeconomic information).
Habitat mapping (if possible)	GIS section of the QFZO, IFO or another collaborative organization.
Study on the season of coral spawning, seagrass seeds production and others (if necessary)	Relevant research institute, university or the IFO.
Planning and implementation (including monitoring and evaluation, and maintenance of rehabilitated habitats)	A working group (project team) is formed for each target village through consultations with local people, who are engaged in planning and implementation. The group consists of fishermen's cooperative members, staff from the QFZO and/or IFO, hired consultants, scientists/experts from external organizations and, if possible, representatives of other local groups (school, women's group, NGO, council, dive operators etc.).

Source: JICA Project Team

9) Follow-up mechanism

Continuous assistance from the QFZO and/or IFO is necessary to enhance local people's activities with the aim of realizing the wise use of rehabilitated habitats. Proposed assistance is as follows:

- Provision of seminars and training programs - Proposed training subjects are: a) rehabilitation methods, b) methods of monitoring and evaluation and maintenance of rehabilitated habitats, and c) wise use of rehabilitated habitats for economic activities (fishing and tourism) and environmental education.
- Holding commemorative events with the participation of the general public, such as seagrass seeding (Figure 11.3.6), coral seed transplanting and stock enhancement (e.g., releasing juveniles of fish, sea cucumber, shrimp etc.) for awareness-raising purposes (see also Figure 11.3.8).

11.3.3 Community-based fishery resource management

(1) Implementation plan

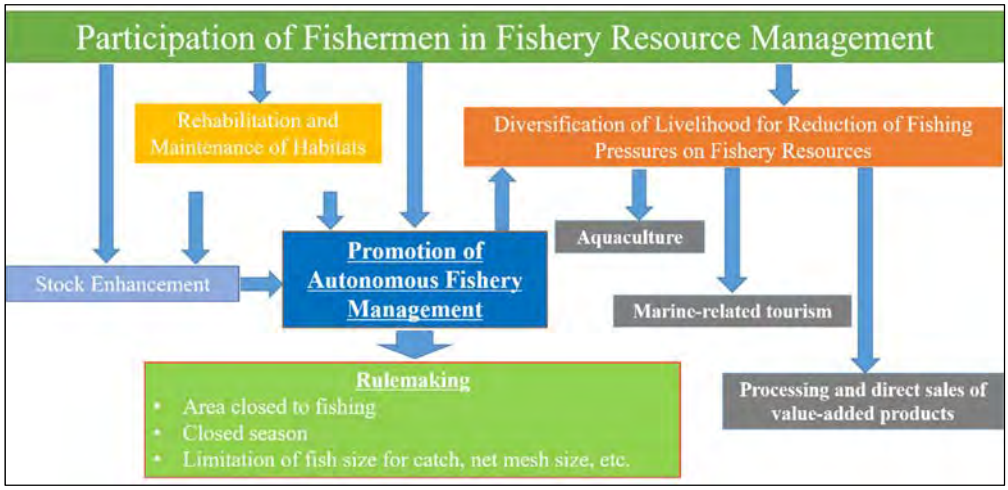
1) Outline

This project aims to: a) establish coastal fishery resource management in nearshore areas with the participation of local fishermen, and b) disseminate management practices throughout Qeshm Island.

2) Concept

The project supports the concept of "Code of Conduct for Responsible Fisheries" adopted by the FAO in 1995. Fishing villages that show a strong motivation towards the establishment of fishery resource management are chosen as pilot (model) project sites. This project is an extension of the Habitat Rehabilitation Project (Chapter 12.3.2). Wise use of rehabilitated habitats and stock enhancement of

selected species are promoted in a participatory manner in order to raise awareness of the need for habitat and resource management. An autonomous management system is established through the promotion of rule-making by fishermen themselves. Fishermen's livelihoods are diversified through the introduction of alternative economic activities, such as aquaculture (linked to Chapter 12.3.1), marine-related tourism (described in the tourism development plan), and processing and direct sales of value-added fishery products (linked to Chapter 12.3.4), in order to reduce pressure on fishery resources. Figure 11.3.7 shows a diagram of the project concept.



Source: JICA Project Team

Figure 11.3.7 Concept of Community-based Fishery Resource Management

3) Procedure and actions

Stepwise actions for the introduction of community-based fishery resource management are described in Table 11.3.10.

Table 11.3.10 Actions for Introduction of Community-based Fishery Resource Management

Step	Actions
Step 1: Designation of staff in charge	Designation of staff in charge of promoting fishery resource management (staff from the QFZO and/or IFO, consultants, scientists etc.).
Step 2: Preliminary evaluation of the status of fishery	Fishing villages with strong motivation and leadership to establish fishery resource management are identified and considered as candidate project sites. Preliminary evaluation of the status of fishery is conducted in the candidate sites through a) an information review of the socioeconomic and environmental conditions, and b) consultation meetings with fishermen's cooperative members and other interested local people.
Step 3: Formation of working group	Pilot project sites are selected based on the results of the actions in Step 2*. A working group for implementing the pilot project is formed for each site. The composition of group members is proposed in Chapter 12.3.3 (2).
Step 4: Planning	A draft of fishery resource management plan for a selected site is prepared by the working group. Items to be considered in the draft plan are described in Table 11.3.11.
Step 5: Pilot project	Pilot project(s) is/are implemented in accordance with the draft management plan(s).
Step 6: Monitoring and evaluation	The working group gathers key indicators through the implementation of the pilot project(s) for updating the management plan. Key indicators are: a) change in the amount of capture production, b) change in flora and fauna, c) fishermen's perception about recovery of fishery resources, d) degree of fishermen's compliance with rules that they set for resource management, e) fishermen's opinions about modification of the rules, f) the number of fishermen and other local people who participated in the project activity, g) the number of fishermen who diversified their livelihood etc.
Step 7: Update of plan and implementation	The fishery resource management plan is updated based on the results of Step 6 and implemented again. Step 6 and Step 7 are repeated until the resource management practices reach a certain level for dissemination (Step 8).
Step 8: Dissemination	Fishery resource management practices acquired through the pilot project(s) are disseminated in other villages according to the updated plan. Fishermen's autonomous resource management is strengthened with continuous assistance of governmental organizations; see Chapter 12.3.3 (3).

Note: * Northern and southern coastal waters of Qeshm Island have different characteristics in terms of marine ecology and types of fish captured. Therefore, it is recommended to select at least two pilot project sites, i.e., one from the north and the other from the south of the island.

Source: JICA Project Team

Items to be considered for planning the development of the community-based fishery resource management plan are listed in Table 11.3.11.

Table 11.3.11 Items for Planning Community-based Fishery Resource Management

Item	Activity
Resource management methods (see also in Figure 11.3.8)	・ Target species for resource enhancement and methods of habitat rehabilitation (see Chapter 12.3.3) and stock enhancement ・ Autonomous management (rulemaking) by fishermen: e.g., closed season, limitation of fish size for catch and net mesh size, prohibited fishing area, zoning plan of fishing areas designated for each type of fishing methods, etc. ・ Promotion of livelihood diversification in collaboration with other projects, i.e., introduction of aquaculture and marine-related tourism, and fish processing and direct sales by local fishermen and women themselves. ・ Awareness-raising among local people on conservation of the marine environment and coastal fishery resource management ・ Management of sea areas near fishing ports and villages by local fishermen with the goals of: a) protecting fishermen's economic activities; i.e., fishing, aquaculture and marine-related tourism, and b) promoting their autonomous actions for resource management and marine environment protection in the area.
Project management	・ Clarification of roles and activities of the working group ・ Implementation schedule and cost estimation ・ Monitoring and evaluation of the project activities for the improvement of resource management practices
Technical assistance and dissemination	・ Capacity building of fishermen's cooperatives on their autonomous management of fishery resources ・ Joint workshops for people from pilot sites and neighboring fishing villages for the dissemination of management practices in support of their future expansion throughout Qeshm Island

Source: JICA Project Team

4) An example of community-based fishery resource management

Figure 11.3.8 shows a JICA project for community-based fishery resource management, which was conducted in the Republic of Tunisia. This project was implemented with the participation of local fishermen and consisted of four main activities: a) conservation and rehabilitation of seagrass beds and artificial reefs placement, b) stock enhancement, c) elaboration of a livelihood diversification plan in cooperation with government officials, including the introduction of aquaculture and fish processing, and d) technical exchanges between neighboring countries for better regional fisheries management. The concept and methodology of the JICA project are similar to the current proposed project.

Note: 1: placement of lightweight artificial reef modules with additional function to prevent illegal fishing, 2: illegal fishing net entangled with the module, 3: fish gathering around artificial reefs, 4: seagrass transplantation, 5: stock enhancement with participation from children, 6: farming of clams on tidal flats.
Source: JICA Technical Cooperation Project: Sustainable Management of Coastal Fishery Resources in the Republic of Tunisia

Figure 11.3.8 A JICA Fishery Resource Management Project with the Participation of Local People

5) Implementation schedule

A brief implementation schedule of the project is shown in Table 11.3.12.

Table 11.3.12 Schedule of the Project for Community-based Fishery Resource Management

Step	Immediate	Within 2 years	Within 5 years and after
1 to 5	*	*	
6 to 8		*	*

Source: JICA Project Team

(2) Institutional rearrangements for implementation

The working group as the main body for the planning and implementation of the project should be formed as mentioned in Table 11.3.10 (Step 3). Core members are fishermen's cooperative members (fishermen), staff from the QFZO and/or IFO, hired consultants (where necessary), and scientists/experts from universities or research institutes. Collaboration with scientists/experts in resource management and ecosystem conservation is particularly essential for the appropriate planning, monitoring and evaluation of resource management practices. Participation by interested group(s) of residents, community leaders and locally rooted NGO(s) is welcomed. Group members are determined following the results of consultation meetings (Step 2 in Table 11.3.10).

(3) Follow-up mechanism for implementation

1) Continuous consultations and discussions

Continuous consultations with local fishermen and discussions among working group members are essential for the improvement of resource management practices.

2) Governmental support for the acquisition of international "Sustainable Fishery" certificates

Holding an international certificate that demonstrates commitment to sustainable fishery is advantageous when seeking to enhance the reputation of seafood. The Marine Stewardship Council (MSC) is an independent, global and nonprofit organization that promotes environmentally responsible

fishing practices through a certification and ecolabelling program. The MSC has adopted a fishery standard consisting of three principles: a) sustainable fish stocks, b) minimization of environmental impact, and c) effective fishery management. Any fishery that has met this standard is certified by the MSC as a "Sustainable Fishery", meaning that fish and seafood originating from this fishery can use the MSC logo for ecolabelling purposes. Thus, fishermen, processors, traders and fish supply-chain companies can attract more customers, while consumers can make informed purchasing decisions by finding the MSC logo attached to seafood.

The MSC certification program is open to all fisheries, regardless of size, scale, location and intensity. Therefore, it is recommended for fishermen from Qeshm to become familiar with the MSC program and to take preparatory actions to acquire certification to support future advancement, since this will directly contribute to the value addition of Qeshmi products as well.

In the process of the MSC program, fishermen should obtain the "MSC Sustainable Fishery" certificate. On the other hand, processors, traders and supply-chain companies need to acquire the "MSC CoC" certificate and the license for "MSC logo use" to ensure the traceability of MSC-certified products (described also in Chapter 12.3.4 and Figure 11.3.10). Detail information about the MSC program and procedures to acquire the MSC Sustainable Fishery and MSC CoC certificates and licenses for MSC logo use are described on the MSC website https://www.msc.org/.

Based on the aforementioned, establishing a governmental support system for the acquisition of MSC certificates and logo licenses should be an ideal to support the future development of the Qeshmi fishery sector. Providing seminars and training programs conducted by experts/consultants in fishery management and the MSC program will be of great help in this advancement. The fishermen who participate in the working group (Step 3 in Table 11.3.10) should be preferentially invited to the seminars and training as target people.

11.3.4 Development of value-added products

(1) Implementation plan

1) Outline

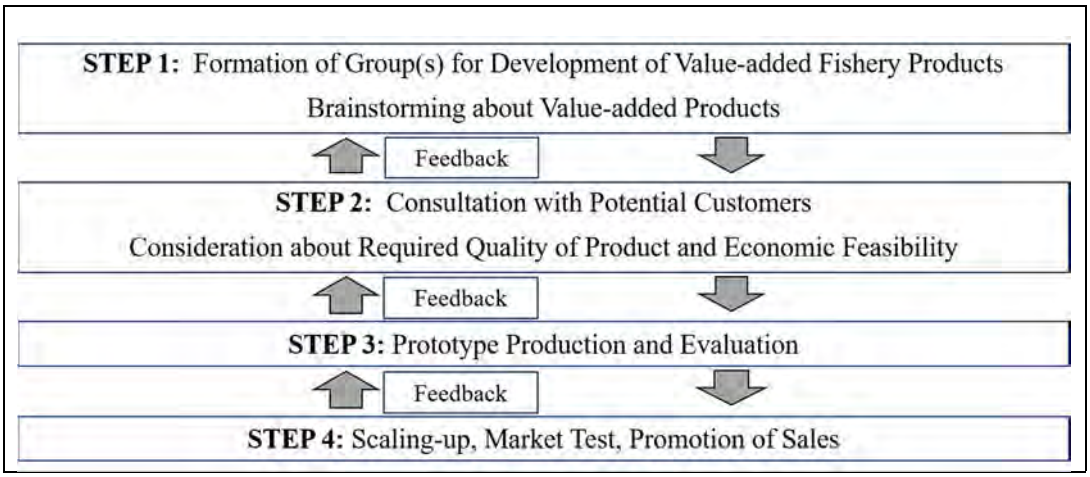
This project will promote the manufacturing of value-added products for the activation of the local economy through: a) brainstorming among stakeholders about the differentiation and commercialization of Qeshmi seafood, b) adopting better processing operations, c) improving facilities and equipment, and d) complying with international standards for sustainable fisheries and food safety.

2) Concept

The concept of the project involves a) the development of value-added seafood products by utilizing local resources and/or traditional knowledge, and b) commercialization with an emphasis on differentiating Qeshmi products.

3) Procedure and actions

Stepwise actions for developing value-added products are described in Figure 11.3.9 and Table 11.3.13.



Source: JICA Project Team

Figure 11.3.9 Stepwise Actions for the Development of Value-added Products

Table 11.3.13 Actions to Be Taken for the Development of Value-added Products

Step	Actions
Step 1: Formation of group(s) to develop value-added products	・ In the case of developing value-added traditional seafood by local people, it is recommended to form a group for traditional seafood improvement and commercialization including fishermen, fishermen's wives, and owners of guest houses and restaurants, in cooperation with fish processors and tourism operators. Brainstorming meetings are held with the group members to discuss a) preferences of tourists regarding local seafood, b) the concept and criteria of traditional seafood, c) improvements to taste and appearance, d) sales promotion, e) required operations to assure quality (freshness and hygiene), f) packaging, g) marketing, h) how to get business licenses (where necessary), etc. Feedback from potential customers (Steps 2), prototype evaluation (Step 3) and results of sales promotion (Step 4) are also considered in the discussion. ・ In the case of manufacturing value-added fishery products by private processing companies, a group (association) of processors is to be formed if necessary. Subjects for brainstorming are: a) the concept and criteria of value addition for Qeshmi seafood, b) improvements to appearance, taste and packaging, c) improvements in the cold chain, d) compliance with global standards, e.g., Hazard Analysis and Critical Control Point (HACCP), MSC/ASC CoC and ecolabelling, e) sales promotion, etc.
Step 2: Consultations with customers	・ Consultations with potential customers about market demand, prototype (sample) design including processing method and preferred packaging. ・ Consideration about the preliminary economic feasibility based on information obtained from the above activities.
Step 3: Prototype and evaluation	・ Prototype production. ・ In-house testing of prototype. ・ Evaluation by customers. ・ Improvement of the prototype based on feedback obtained through the above testing and evaluation. ・ Consideration of economic feasibility.
Step 4: Scaling up, market testing and promotion of sales	・ Scaling up production of improved value-added products. ・ Market testing at restaurants, souvenir shops, touristic places on Qeshm Island, pilot shops ("antenna shops" in Japanese) in large cities and Qeshm, etc. ・ Sales promotion, e.g., sales with a leaflet providing a product description and recipes (Figure 11.3.13). ・ Advertisement of products through a tie-up with tourism operations. ・ Economic feasibility analysis.

Source: JICA Project Team

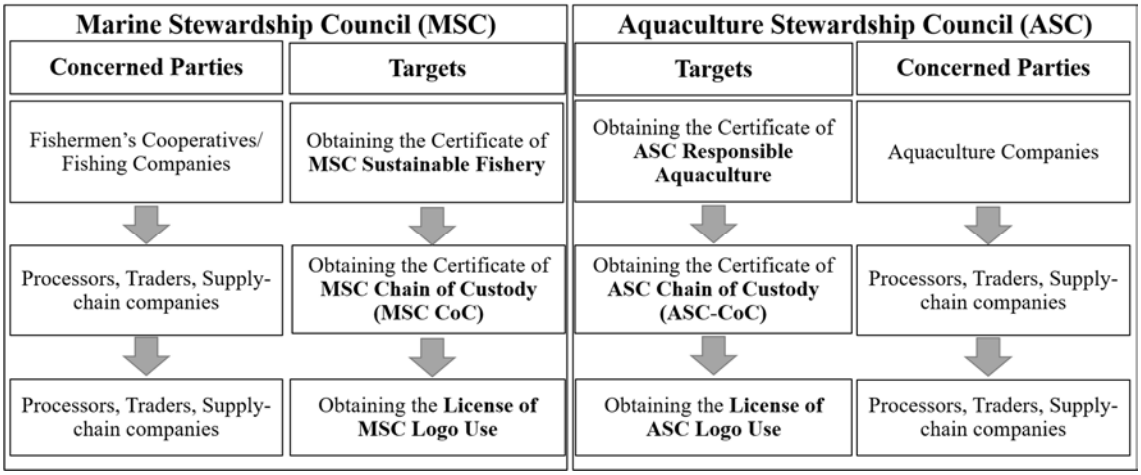
4) Recommendations for the implementation of the project

Improvement in cold-chain management

Improvement of the cold chain is among the most important challenges in value-chain enhancement in the fishery sector. However, inappropriate postharvest operations, for example, the transfer of captured fish without ice, the lack of refrigeration equipment in fishing boats and on land, and time-consuming unloading of fish from fishing boats, cause a quick degradation in fish quality, which makes it difficult for processors to manufacture high-quality seafood on Qeshm. Therefore, fishermen, processors and distributors, in cooperation, should ensure optimal refrigeration and a quick transfer system, e.g., improved fish-landing station, appropriate ice supply. Detailed recommendations are described in Tables 12.3.14 and 12.3.16, and in Chapter 12.3.5.

Compliance with international sustainability standard for value enhancement

Fish and seafood originating from a "MSC Sustainable Fishery" or an "ASC Responsible Aquaculture" business can enhance the reputation of these products as mentioned in Chapters 12.3.1 and 12.3.3. Consumers are attracted by finding logos (ecolabels) from the MSC or ASC attached to the certified seafood products because the products can a) demonstrate the commitment of fishermen, farmers and supplying companies to sustainability, b) make fish suppliers stand out from competitors, and c) make customers know that the products are from trustworthy sustainable sources, as shown in Figure 11.3.2. Therefore, it is recommended that fishermen, farmers, processors, traders and/or supply-chain companies on Qeshm become familiar with international standards with the aim of acquiring certificates in future. Figure 11.3.10 shows the procedures for the certificates and logo use licenses of the MSC and ASC. The MSC Sustainable Fishery and ASC Responsible Aquaculture certificates should be obtained first in the whole process of the schemes. Then, ASC and MS CoC) certificates and licenses to use logos should be obtained by processors, traders and/or supply-chain companies. Detailed information on the standards and concrete procedures are described on the following official websites: https://www.msc.org/ for the MSC and http://www.asc-aqua.org/ for the ASC.



Source: JICA Project Team

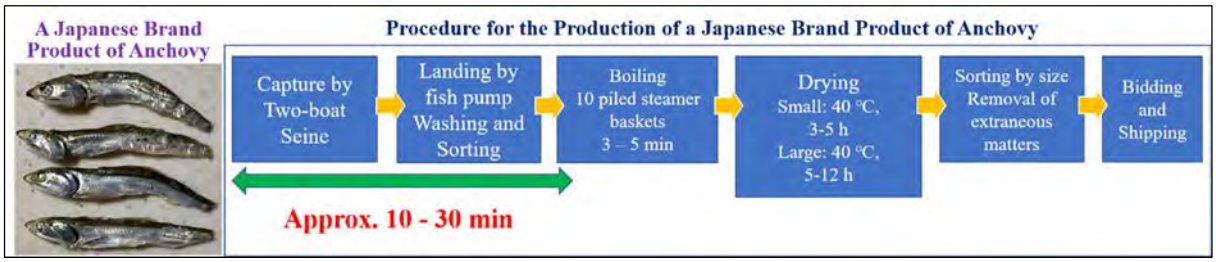
Figure 11.3.10 Procedures for the Certificates and Logo Use Licenses of the MSC and ASC

Development of value-added anchovy products for human consumption

Anchovy is the main species captured by small-scale fishermen of Qeshm Island. Capture production of anchovy accounts for over half of the total capture production of all fish species from Qeshmi waters. However, a large portion of the captured anchovy is sold to fish meal factories at low prices. Manufacturing value-added anchovy products for human consumption can help to increase fishermen's income because they are sold generally at better prices. This is especially the case with "boiled and dried" (Iriko in Japanese) and "dried only" (Suboshi in Japanese) anchovy products for human consumption, which have large international markets.

Figure 11.3.11 shows a processing procedure for a Japanese brand product of boiled and dried anchovy. Anchovies are landed, rinsed, sorted and then transferred to the next process, "Boiling", within 30 min after capturing. They are then sold as a Japanese brand product of a fishing village in Japan (Ibuki, Kagawa).

Only anchovies that are processed in this manner can be commercialized as the brand product. The brand product has a good taste and appearance with a shiny silver color and smooth skin (photo in Figure 11.3.11), and is sold at high prices (e.g., about USD 27.00/kg at a supermarket in Japan).



Source: JICA Project Team

Figure 11.3.11 Processing Procedure of a Japanese Brand of Boiled and Dried Anchovy (Iriko)

Challenges in the improvement of "boiled and dried" and "dried only" anchovy products are described in Table 11.3.14.

Table 11.3.14 Challenges in the Improvement of "Boiled and Dried" and "Dried Only" Anchovy Products

Subject	Challenges
Improvement in the cold chain	Operations Improvement in the cold chain: a) carrying a sufficient amount of ice to the fishing ground, b) storing captured fish immediately in insulated containers/rooms, c) quick movement to the landing station, and d) quick transfer of the fish from the station to the processing factory. Facilities and equipment Improvement in facilities and equipment to ensure appropriate refrigeration, e.g., allocation of processing factories adjacent to landing sites (see Figure 11.3.18), cold storage at -20°C, an ice machine and discharger, insulated fish containers, cold storage on fishing boats, transfer truck, extension/construction of fish-landing jetty, approach road for transfer truck, approach canal for fishing boats (in shallow area), fish pump, fish-sorting machine, crane, forklift, pallets.
Better processing methods and operations	Adjustment of boiling and seasoning procedures following customers' requests. Improvement in the drying method (handling, facility and equipment). Introduction of a drying machine. Improvement in the manual work in drying fish so as not to damage the quality and appearance of the anchovies.
Food hygiene	Assurance of hygiene safety, which meets standards of destination countries (for export)
Use of appropriate size for processing	Appropriate size range of fish should be chosen in line with the selected processing method to improve profit margins (see Table 11.3.15).

Source: JICA Project Team

The commercial value of anchovy products varies depending on the size of fish and type of processing. Table 11.3.15 shows the relationship between size, type of processing and value of the product.

Table 11.3.15 Relationship between the Size, Processing Type and Product Value of Anchovy

Size of fish	Type of processing and usage	Product value
Smaller than 3 cm in total length	Boiled (Shirasu* in Japanese) and boiled and dried (Chirimen* in Japanese) for human consumption.	Product value is the highest. Anchovies that are 3 cm or smaller have the best prices.
3 to 4 cm in total length	Boiled and dried (Iriko* in Japanese) and dried only (Suboshi* in Japanese) for human consumption.	Boiled and dried anchovies (Iriko) of this size have the best price among Iriko products of all sizes. (Sun-drying of anchovies of over 3 cm is not recommended because the inner part of fish body is not easily dried. A drying machine is used in Japan.)
4 to 5 cm in total length	Boiled and dried (Iriko) and dried only (Suboshi) for human consumption.	Dried only anchovies (Suboshi) of 4 to 5 cm or smaller have better prices than larger ones. Boiled and dried anchovies (Iriko) have larger international markets than dried only anchovy (Suboshi).
Over 5 cm in total length	Fishmeal, feed for fish/shrimp farming, and bait for line fishing. Boiled and dried (Iriko) and dried only (Suboshi) for human consumption. Fresh fish sold at fish markets for human consumption.	Commercial value of dried anchovies of over 5cm is generally low. Therefore, this size can be preferentially utilized for fishmeal. Alternatively, this size of anchovy can be used for the development of new value-added seafood to improve profit margins, e.g., marinated and salted and oiled fish (see also Figs. 12.3.12 and 12.3.13).

Note:* The names of anchovy products (*Shirasu, Chirimen, Iriko* and *Suboshi*) vary depending on the type of processing and the size of the anchovy.
Source: JICA Project Team

Value-added products other than boiled and dried and dried only anchovy

Sardines (*Sardinella spp.* and other similar species) are also among the major fish species captured in Qeshmi waters, which could be utilized for the creation of new value-added seafood, given that sardines are popular fish that are processed into many different types of seafood consumed in the world. Figure 11.3.12 shows various processed seafood products using sardine, which were created in local towns of Japan. These products are sold at retail stores, such as souvenir shops in local touristic places and pilot-shops in large cities for market testing. Sales promotion is conducted to attract consumers/travelers by selling the seafood together with useful information such as recipes and product descriptions in the form of leaflets.

Note: 1: marinated sardines produced by a fishermen's cooperatives association, 2: salted and oiled sardines produced by a local women group, 3: sardine burger sold in a small city, 4: sardine cracker (seasoned, pressed and heated), 5: sardine cracker (seasoned and dried), 6: grilled, seasoned and dried sardine, 7: salted and oiled sardines sold with a leaflet of recipes, 8: sardines in oil sold with a product description leaflet.
Source: JICA Project Team

Figure 11.3.12 Processed Sardine Products from Japan and Leaflets for Sales Promotion

Any new type of processed seafood is often created by utilizing local resources and traditions, which are then commercialized for the activation of the local economy in small towns of Japan. Figure 11.3.13 shows examples of seafood products that were recently invented in Japan.

Note: Left: burger (frozen) of ribbonfish meat, right: fish sausage flavored with basil and lemon.
Source: JICA Project Team

Figure 11.3.13 Examples of Recently Developed New Seafood (Vacuum-packed) in Japan

Spanish mackerel, silver pomfret, prawn/shrimp and solen (shellfish) are among the major, high-value and/or popular fishery products, which are consumed as traditional foods on Qeshm (see Figure 11.3.14). These foods and other Qeshmi seafood are popular in the island's touristic places as a result of collaboration with tourism operators. These typically traditional foods can also be used for the development of a Qeshmi brand (value-added seafood) by improving the quality, appearance and/or packaging.

Note: 1: meatballs made from Spanish mackerel (Selakh Village), 2: sautéed shrimp (Selakh Village), 3: fried silver pomfret (Baseidou Village), 4: fried solen (sold as a lunchbox item in Qeshm City)
Source: JICA Project Team

Figure 11.3.14 Traditional Seafood of Qeshm Island

Challenges to develop value-added seafood, except for anchovy products, are described in Table 11.3.16.

Table 11.3.16 Challenges to Developing Value-added Seafood Except Anchovy Products

Subject	Challenges
Cold-chain management (see also Table 11.3.14)	Assurance of food quality by improvements in postharvest operations, refrigeration facilities and equipment including ice machines, cold storage for land and sea transfer, cold warehouses, and refrigerator showcases at retail stores.
Development of a Qeshmi brand utilizing traditional cooking	Development of a Qeshmi brand involving the preparation of seafood utilizing traditional cooking (Figure 11.3.14). Sales promotion of traditional seafood in local guest houses, restaurants, hotels and supermarkets.
Compliance with global standards for value addition	Obtaining ASC and MSC CoC certificates and licenses for logo use (see Figures 12.3.2 and 12.3.10) and HACCPs (for food-processing companies).
Development of a quick delivery service of chilled and frozen fish	Very fresh fish (as value-added seafood) is preferentially used for international cuisine, such as Japanese, Italian and French food, and generally highly priced. The door-to-door delivery of fresh chilled and frozen fish to rich national and foreign residents in large cities who prefer fresh fish (e.g., delivery of fresh tuna for sashimi to Japanese restaurants and residents in Tehran) could be a niche business for Qeshmi fishermen to obtain better profits from their catch. This kind of business can be tested on a small scale in collaboration with an express delivery company.
Fish processing and direct sales by local fishermen and women	Fresh fish can be processed as value-added seafood by local fishermen and women themselves and sold to consumers and tourists at direct sales stores, as long as they hold business licenses. This activity will contribute to the improvement of fishermen's income.
Improvements to drying and packaging machines	Modernization of equipment for the development of value-added seafood, such as drying and packaging machines

Source: JICA Project Team

5) Implementation schedule

The implementation schedule for the development of value-added products is shown in Table 11.3.17. Steps 1 and 2 can be started immediately. Progress on the project will vary depending on the type of target product.

Table 11.3.17 Implementation Schedule for the Development of Value-added Products

Step	Immediate	Within 2 years	Within 5 years
1 and 2	*	*	*
3 and 4		*	*

Source: JICA Project Team

(2) Institutional rearrangements for implementation

Groups for manufacturing value-added fishery products are formed as described in Step 1 of Table 11.3.13. A support system for upskilling fish processers is essential for the development of value-added products. It is hoped that the QFZO and/or IFO provide various technical training opportunities to fish processors from local communities and private companies. The training should consist of hands-on training and visits to advanced food-processing factories as described below in Chapter 12.3.4 (3).

(3) Follow-up mechanism for implementation

1) Provision of training for upskilling group members

It is recommended that the QFZO and/or IFO provide training opportunities for upskilling fish processors, preferentially to the members of the group formed in Step 1 in Table 11.3.13. Training should be conducted by consultants or fish-processing experts from domestic or foreign organizations. Table 11.3.18 shows the training subjects that are proposed for the development of value-added seafood. The training should also promote an understanding and the acquisition of international certificates to enhance the value of seafood, such as MSC/ASC CoC certificates, licenses for the use of ecolabels and HACCPs.

Table 11.3.18 Proposed Subjects for Training on the Development of Value-added Seafood

Subject number	Proposed training subjects
Subject 1: Basic methods of fish processing and packaging (hands-on training for local people)	Figure 11.3.15 shows an example of similar training.
Subject 2: Modernization of postharvest (handling, cold storage and transfer) and food safety operations for supplying fresh and safe products	The trainer will be a HACCP consultant or fish-processing expert from a domestic or foreign company. Visits to advanced fish-processing factories are included (see examples of factory visits in Figures 12.3.16 and 12.3.17).
Subject 3: How to obtain MSC and ASC CoC certificates and licenses for logo use	The trainer may be an MSC or ASC consultant from a foreign organization. Visits to advanced fish-processing factories are included.
Subject 4: Enhancement of food safety through compliance with global standards, i.e., HACCPs, British Retail Consortium (BRC) and/or the International Featured Standards (IFS)	HACCPs represent a globally recognized standard. In addition, when export of seafood to Europe is intended, compliance with some more standards, such as the BRC and IFS, is required (Table 11.3.19). The trainer will be a HACCP, BRC and/or IFS consultant.

Source: JICA Project Team

Note: 1: training on dry fish processing, Shima, Mie Prefecture; 2: drying the processed fish with a low-temperature drying machine, Shima; 3: vacuum-packaging machine used in training, Shima; 4: small factory of a local sardine brand operated by a women's group in a small fishing village (Oku, Okayama Prefecture).
Source: JICA Project Team

Figure 11.3.15 An Example of a Basic Training Program on Fish Processing Conducted in Japan

Note: Left: Ikejime (draining blood from live fishes) just after harvesting "yellow tails" fish from fish cages. Central: transfer of the fish from the Ikejime site to a transfer truck by a lifting machine. Right: quick transfer of the harvested fish from the truck to the indoor fish-processing factory through a raceway mixed with ice.
Source: JICA Project Team

Figure 11.3.16 EU HACCP-certified Fish-processing Company (Imabari, Ehime, Japan)

Note: Left and central: EU HACCP-certified fish-processing factory (Imabari, Ehime). Right: fish-processing factory of a local sardine brand operated by the Fishery Association of Okayama Prefecture.
Source: JICA Project Team

Figure 11.3.17 Visit to Fish-processing Factories in Japan

Table 11.3.19 International Standards of Food Safety Adopted in Europe Except HACCPs

Name	Outline	Note
BRC	・BRC Global Standard for Food Safety ・BRC Global Standard for Consumer Products ・BRC/The Institute of Packaging Global Standard for Packaging and Packaging Materials ・BRC Global Standard for Storage and Distribution	UK standards at http://www.brcglobalstandards.com/ (an example of consulting firm that could run a seminar: http://www.pjr.jp)
IFS	・Standard to ensure food safety and quality requirements	German and French standards at https://www.ifs-certification.com/index.php/en/

Source: http://www.brcglobalstandards.com/ and https://www.ifs-certification.com/index.php/en/.

2) Acceleration of permission procedures for starting a fish-processing business

Procedures to get permission to start a fish-processing business involving government authorities, including land acquisition for the construction of a processing factory, are time consuming. This seems to be a bottleneck to the smooth commencement of a business. A better system to speed up the procedures should be considered, if possible, through strong support from the relevant governmental organizations.

11.3.5 Improvement in fish-landing facilities

(1) Implementation plan

1) Outline

Anchovy is the major fish species captured by fishermen in the southern waters off Qeshm Island. The fishermen, who, in many cases, do not carry ice to the fishing grounds, bring captured fish to fish-landing places and then transfer tons of anchovy from their boats to trucks by using buckets. Their fishing boats, transfer trucks and landing places are not equipped with sunshade, despite the hot climatic conditions of the region. Such operations cause a quick loss in the freshness of captured fish; consequently, the quality and commercial value of their end products become low. These situations often apply to other types of fishing conducted by small fishing boats as well.

This project intends to improve the quality maintenance of anchovy and other fish captured by fishermen, with the goal of supplying better products to markets through improved landing facilities and equipment at major fishing ports and/or fish-landing places on the coast of Qeshm Island, such as Selakh, Mesen, Ramchah and Souza.

2) Concept

The basic concept is to a) improve cold-chain management, and b) optimize the line of flow of captured fish in order supply a better quality of fish.

3) Procedure and actions

Stepwise actions for the implementation of the project are described in Table 11.3.20.

Table 11.3.20 Description of Actions for the Improvement of Fish-landing Facilities

Step	Actions
Step 1: Basic design for the improvement	Fishing villages that need to improve their fish-landing facilities are prioritized through a preliminary analysis of information about the status of fishery, fish-landing systems, fishing ports, socioeconomy of fishing villages etc. Facilities and equipment that could be needed for improvement are as follows: ・Jetty for the smooth unloading of captured fish from fishing boats (see an example of a fish-landing jetty in Figure 11.3.18) ・Cold storage chamber ・Ice machine ・Ice-loading system ・Insulated fish boxes ・Pallets ・Approach road for transfer trucks ・Approach canal to the fish-landing place for fishing boats (dredging on navigation course, where necessary) ・Fish pump ・Fish-sorting machine, ・Fish- and cargo-handling area (where necessary) ・Crane ・Forklift ・Transfer/refrigerator truck ・Belt conveyer ・Roller conveyer etc. (see machines used for the quick landing and transfer of anchovy to the processing unit in Figure 11.3.19, ice usage in Figure 11.3.20, and an example of facilities arrangement at a fishing port in Japan in Figure 11.3.21) A basic design is prepared (see Table 11.3.21).
Step 2: Implementation	Fish-landing facilities are improved following the basic design.

Source: JICA Project Team

Table 11.3.21 shows an example of items to be considered in the basic design.

Table 11.3.21 Items to Be Considered in a Basic Design for Improving Fish-landing Facilities

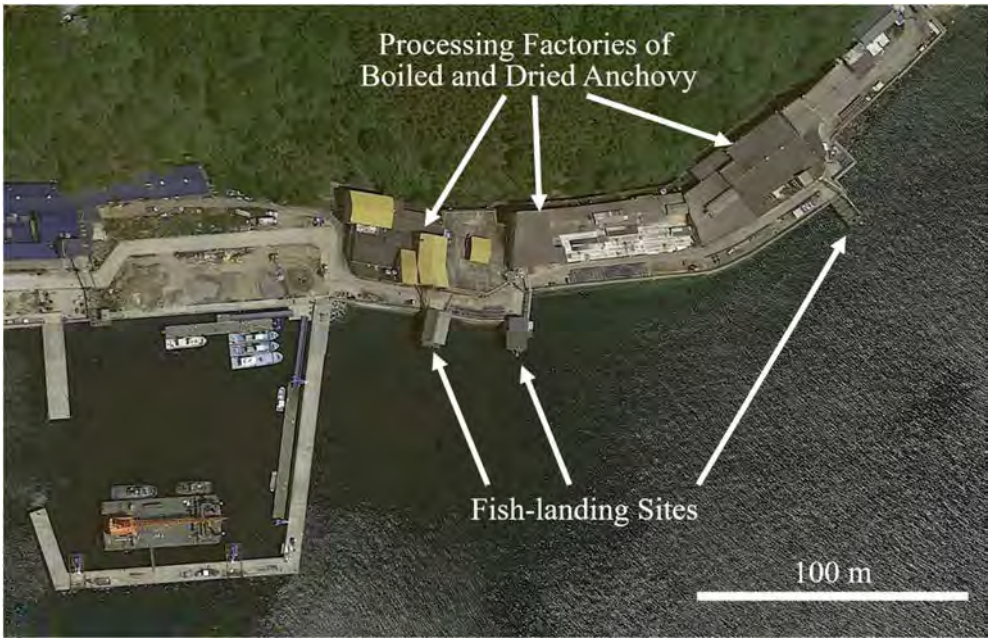
Main item	Items in detail
Status of fishery and fish-landing facilities at the selected priority site	・Number of fishermen and fishing boats ・Fishing methods used ・Fishing ground, ・Type of fish captured ・Amount of production (landing, ・Location and status of fish-landing facilities and equipment ・Stakeholders' opinions about the actual status of fish landing (via a consultation meeting) ・Cold storage and ice factory ・Type and amount of ice used for fishing and transfer ・Type of fish processing ・Distribution of products (means of transport, destinations) ・Administrative status of facilities by fishermen's cooperative etc.
Basic design	・Basic concept: improvement in cold-chain management, including the appropriate usage of ice (Figure 11.3.21), optimization of the line of flow of landed fish for quick operation. ・Implementation: construction and equipment plan, implementation structure and staffing, procurement plan for equipment and materials, basic design drawing, project cost estimate, laws and standards related to construction of facilities, environmental impact laws and regulations (where necessary), etc. ・Facility operation: costs for operation and maintenance, facility management by the fishermen's cooperative, regularization of facility operation, possibility of utilizing a private finance initiative (PFI) by a cash-rich private company for facility improvement and operation, e.g., build-transfer-operate, build-operate-transfer and build-own-operate.

Source: JICA Project Team

4) Examples of fish-landing facilities and fishing port facilities in Japan

Figure 11.3.18 shows a spatial arrangement of fish-landing jetties and factories for the processing of boiled and dried anchovy (Iriko) in a fishing village in Japan. Each factory is located on the coast and

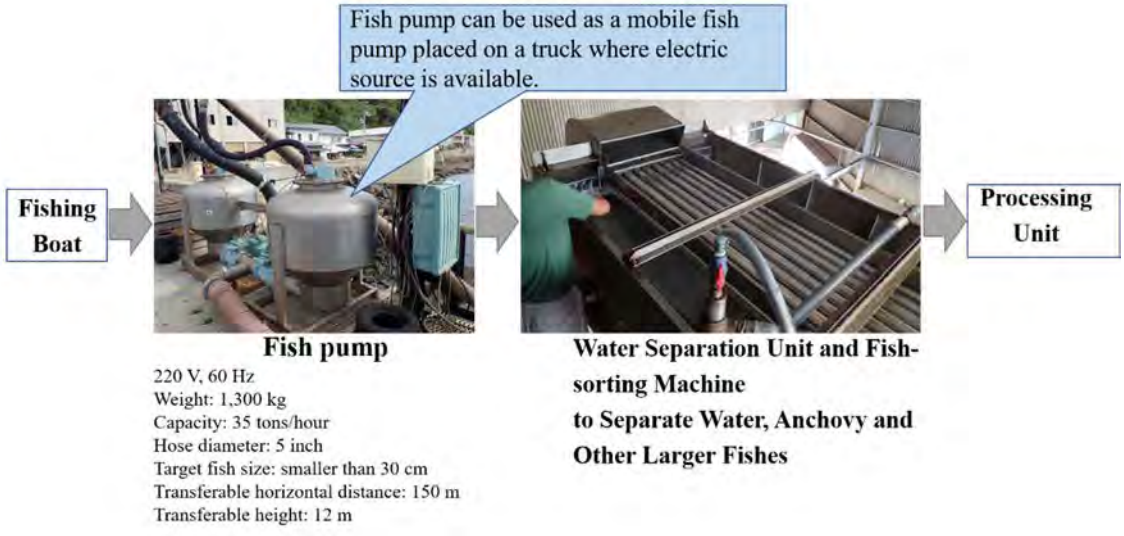
possesses its own jetty (fish-landing place) adjacent to the factory. Very fresh anchovies are unloaded from the boat at the jetty and quickly transferred to the processing factory by using a fish pump installed on the jetty (see Figure 11.3.19), by which fish processors can produce the Iriko brand, as shown in Figure 11.3.11.



Source: Google Earth for Imagery

Figure 11.3.18 Location of Fish-landing Jetties and Processing Factories for Boiled and Dried Anchovy (Ibuki Island, Kagawa, Japan)

Figure 11.3.19 shows the equipment used for the quick landing (by a fish pump) and preprocessing (water separation and fish sorting) of anchovy in a fishing village in Japan (Ibuki).



Source: JICA Project Team

Figure 11.3.19 Equipment Used for the Quick Landing of Anchovy and Its Transfer to the Processing Unit (Ibuki Island, Kawaga, Japan).

Figure 11.3.20 shows examples of ice usage at different stages of the value chain in Japan.

Source: JICA Project Team

Figure 11.3.20 Examples of Ice Usage at Different Phases of the Value Chain in Japan

Arrangement of fishing port facilities in a small fishing village in Japan is shown as a reference in Figure 11.3.21.

Source: Google Map for Imagery

Figure 11.3.21 An Example of the Spatial Arrangement of Ice-making Facility, Refrigeration Facility, Fish- and Cargo-handling Area, etc. at a Fishing Port in Japan (Ajiro, Iwami, Tottori Prefecture)

5) Implementation schedule

Implementation schedule of the project is shown in Table 11.3.22. The timing for project commencement depends on the budget allocation by the responsible government organizations. Alternatively, implementation via a PFI by a cash-rich trading or fish-processing company, which is mentioned in Table 11.3.21, can be considered.

Table 11.3.22 Implementation Schedule for the Improvement of Fish-landing Facilities

Step	Immediate	Within 2 years	Within 5 years
1	*	*	*
2		*	*

Source: JICA Project Team

6) Preliminary cost estimate

The cost of the project depends on the type and scale of facilities and equipment, which are to be determined in the basic design. Examples of a preliminary cost estimate for facilities and equipment are shown as a reference in Table 11.3.23.

Table 11.3.23 Preliminary Cost Estimate for Improving Fish-landing Facilities

Item	Estimate (USD)
Extension/construction of a fish-landing jetty, approach canal for fishing boats (e.g., dredging on the ship course), approach road for trucks	1,000,000
Cold insulation fish boxes	60,000
Fish- and cargo-handling area	200,000
Equipment for landing, handling and cargo (e.g., fish pump, sorting machine)	200,000
Ice machine and ice discharger	300,000
Cold storage chamber	300,000
Refrigerator truck	60,000
Total	2,120,000

Note: Soft components, such as a basic design study and execution management, are not included.
Source: JICA Project Team

(2) Institutional rearrangements for implementation

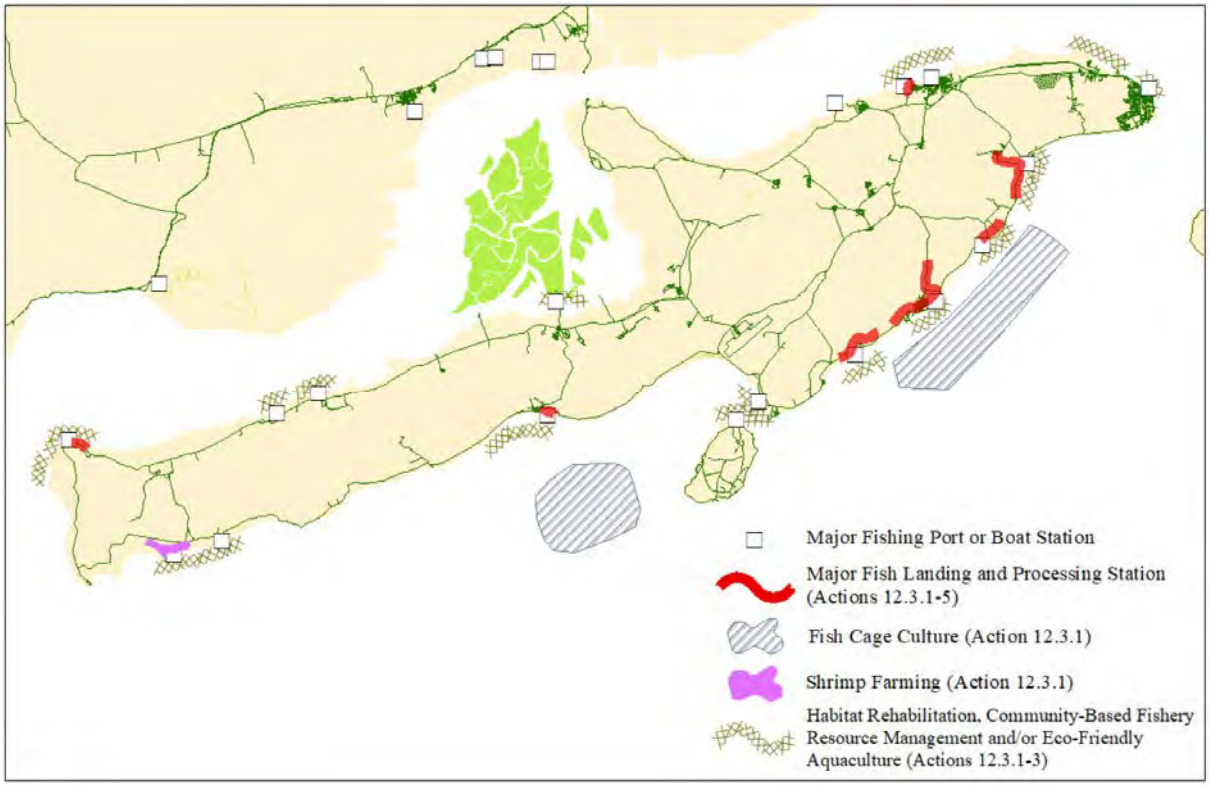
If landing facilities are planned to be managed by a fishermen's cooperative, it should be capable of properly operating and maintaining the facilities. Therefore, strengthening the organization (capacity building) is essential (see below).

(3) Follow-up mechanism for implementation

Technical assistance on the capacity building of fishermen's cooperatives to manage fish-landing facilities by providing training programs is recommended. Training should be conducted by experts or consultants appointed by the QFZO or IFO. Proposed training subjects are: 1) operation and maintenance of facilities and equipment, and 2) accountancy training for the better administration of fishing port/fish-landing facilities towards financial sustainability.

11.3.6 Expected effects through implementation of the Action Plan

Figure 11.3.22 shows a future distribution pattern of the actions described above, and Figure 11.3.23 shows the expected effects on the marine environment and fishery industry on Qeshm resulting from the achievement of the actions. The marine environment will be maintained under favorable conditions through reduction fishing pressure on nearshore fishery resources (Action 11.3.1), habitat improvement (Action 11.3.2), stock enhancement and management (Action 11.3.3), and reducing postharvest loss and water pollution (Actions 11.3.4-5). As a consequence of the integrated actions, aquaculture and fishing production will increase. Cold chain technology (handling, cold storage and transfer) and food safety operations for supplying fresh and safe products will be modernized (Actions 11.3.4-5). Producers, processors and suppliers will be able to comply with global standards for food safety and environmentally sound fishing and aquaculture practices, such as HACCP, MSC/ASC Chain of Custody and ecolabelling. Furthermore, the appearance, taste and packaging of Qeshmi fishery products will be improved to further meet customer needs (Action 11.3.4). With these solutions, the trading of Qeshmi fishery products will be highly promoted both in domestic and in foreign markets.



Source: JICA Project Team.

Figure 11.3.22 A Future Distribution Pattern of Actions

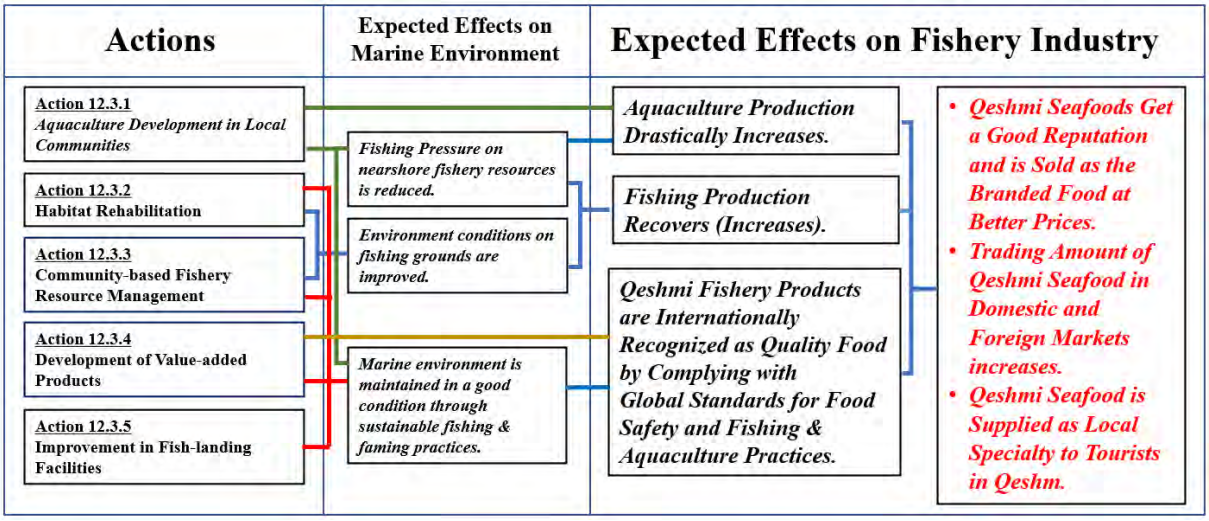


Figure 11.3.23 Expected Effects on Marine Environment and Fishery Industry Through the Implementation of Actions

11.4 Action Plan for Sewage Management

11.4.1 Implementation plan for priority projects in the sewage management sector

(1) Urban sewerage system

1) Urgent Plan for initial stage development of the Dargahan sewerage system

The development of a sewerage system covering Dargahan City and Holor Village is a top-priority project for sewage treatment on Qeshm Island. The Dargahan Sewerage Development Plan has been

concluded by HUWWC.

The stage development plan of Dargahan Sewerage System is described as three stages including "Urgent Plan" at the initial stage, "Alternative Plan" at the mid stage and "Overall Plan" at the final stage as shown in Table 7.3.12 in Chapter 7. To implement the project, the Urgent Plan for initial stage development areas and the corresponding facilities (sewer network, pumping station and STP) were selected from the perspective of cost-benefit performance.

Target zones to develop

Zones A, B and the northern part of Zone D (Zones D1, D3 and the north side of D4) were selected as initial stage development areas, while Zone C and other part of Zone D were added as mid stage development areas. The detail of the stage development plan by zones is shown in Table 11.4.1.

Table 11.4.1 Urgent Development Plan for Overall Plan by Zone

	Urgent Plan (Initial Stage) in 2021				Overall Plan (Final Stage) in 2041			
Zone Name	Area (ha)	Pop. (pp.)	Ave. flow (m^3/d)	Sewer (km)	Area (ha)	Pop. (pp.)	Ave. flow (m^3/d)	Sewer (km)
A1	25	1,300	173	5	25	2,000	330	5
A2	33	1,700	228	8	33	2,700	436	8
A3	40	2,000	276	9.5	40	3,200	528	9.5
A4	31	1,600	214	7.1	31	2,500	409	7.1
A5	21	1,100	145	5.8	21	1,700	277	5.8
Zone A	150	7,700	1,036	35.4	150	12,100	1,980	35.4
B1	43	1,800	255	13.2	43	2,800	456	13.2
B2	63	2,700	374	11.4	63	4,100	667	11.4
Zone B	106	4,500	629	24.6	106	6,900	1,123	24.6
Zone C	0	0	0	0	85	5,500	901	14.4
D1	6.5	300	45	1.1	6.5	500	86	1.1
D2	0	0	0	0	65.5	2,000	320	5.7
D3	15.2	800	105	4.3	15.2	1,200	201	4.3
D4	*16.0	*800	*111	*31.8	38.1	3,100	503	4.4
Zone D	37.7	1,900	261	7.2	125.3	6,800	1,110	15.5
Zone E	0	0	0	0	201	6,100	983	25.6
Stage-Total	293.7	14,100	1,926	67.2	667.3	37,400	6,097	115.5

Note; *: 800 people out of 1,900 people in 2021 is allocated in the D4.Source: JPT prepared based on the data from the Dargahan Sewerage Development Study.

Sewer network

As the Urgent Plan, the sewer network will be constructed in the initial stage development areas for collection of sewage from Zones A, B and the northern part of Zone D. The location of trunk sewer and main pumping station in the initial stage sewerage development is shown in Figure 11.4.1.

Source: Dargahan Sewerage Development Study

Figure 11.4.1 Trunk Sewer and Pumping Station Proposed in the Initial Stage Development

STP

Table 7.3.10 in Chapter 7 shows the design influent and effluent quality for STP planning. After technical and economical consideration, Anaerobic-Anoxic-Oxic (A2O) Process was proposed as the optimal sewage treatment process of Dargahan STP.

Table 11.4.2 shows the daily average sewage flow in STP planning and required STP capacity at each stage. The STP is scheduled to begin operation in 2021 (initial stage), when the sewage inflow is estimated to be about 1,926 m^3/d. Since the sewage network will be developed continuously, the amount of sewage will increase year on year over the following ten years, and is estimated to reach 3,117 m^3/d in 2031 (mid stage). Therefore, the initial stage development capacity is concerned with the STP targets for achieving the sewage inflow levels expected in 2031, which constitute more than half, and thus two-thirds of the total capacity will be required.

Table 11.4.2 Daily Average Sewage Flow and Capacity for STP

Year	2021	2031	2041
Stage	Initial	Mid	Final
Population for overall sewerage area (people)	21,600	26,000	37,400
Population for sewered area in each stage (people)	14,100	21,800	37,400
Sewage generation per capita (Lpcd)	124.2	130	148
Sewage flow per capita (Lpcd)	136.6	143	163
Daily average sewage flow for overall population (m^3/d)	2,951	3,718	6,097
Daily average sewage flow for sewered population (m^3/d)	1,926	3,117	6,097
Flow line of STP (capacity)	2 (4,066)	2 (4,066)	3 (6,099)

Note: Lpcd: liters per capita per day
Sewage flow per capita is estimated from generated sewage, leakage (-10%) and inflow (+20%)
Source: JPT prepared based on the data from the Dargahan Sewerage Development Study

2) Project cost of Urgent Plan for the Dargahan sewerage system

The phasing of proposed projects and the cost estimates are described in Table 11.4.3, which is the breakdown of the Table 7.3.16 in Chapter 7. Here, the Urgent Plan means proposed project implemented in the short term period.

Table 11.4.3 Project Cost for Facilities to be Developed in Each Term

Facilities to be developed	Phasing			Cost (in USD millions)			
	Short	Mid	Long	Short	Mid	Long	Total
Sewered population	14,100 pp	7,700 pp	15,600 pp	-	-	-	-
Sewer network area with sewer length	293.7 ha 67.2 km	139.9 ha 19.9 km	233.7 ha 28.4 km	11.6	3.5	3.5	18.6
Pumping station	1	1	1	0.5	0.3	0.4	1.2
Flow line of STP with capacity	2 4,066 m^3/d	0	1 2,033 m^3/d	5.2		2.2	7.4
Side cost				2.0	-	-	2.0
Total				19.3	3.8	6.1	29.2

Note 1: Short term in 2018~2021, middle term in 2022~2031, and long term in 2032~2041.
Source: JPT prepared based on the data from the Dargahan Sewerage Development Study

(2) Rural sewerage systems

The 9 rural sewerage systems in the following 9 villages, out of 57 villages, are recommended to be developed during the first stage on a priority basis: Mesen, Tabl, Selakh, Kouvei, Laft, Peyposht, Kousha, Tourion and Ramkon (refer to Table 7.3.14).

In this section, detailed consideration of sewer networks and STPs are described below for each rural sewerage system

Sewer network and STP site

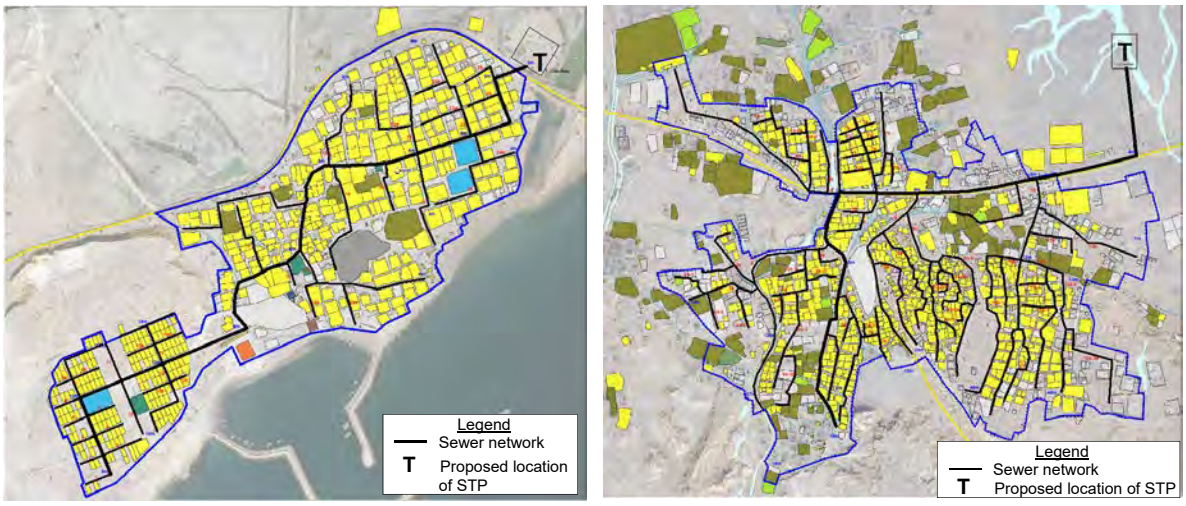
The sewer networks in each village were considered from several perspectives, such as land use plan, topography, elevation, road network and location of available land for the STP. In this consideration, the land use plans were based on the available land use maps and the population data based on the 2016. The final plan about the sewer networks of nine villages are indicated on the land use map as shown in Figures 12.4.2 through 12.4.6. The sewer length of each village is measured on the map and outlined in Table 11.4.4.

The location of an STP in each village was selected tentatively and proposed, based on a discussion with responsible officials in the villages with the exception of Kousha. It was difficult to find available land for an STP in Kousha.

Table 11.4.4 Sewer Length of Prioritized Rural Sewerage Systems for Nine Villages

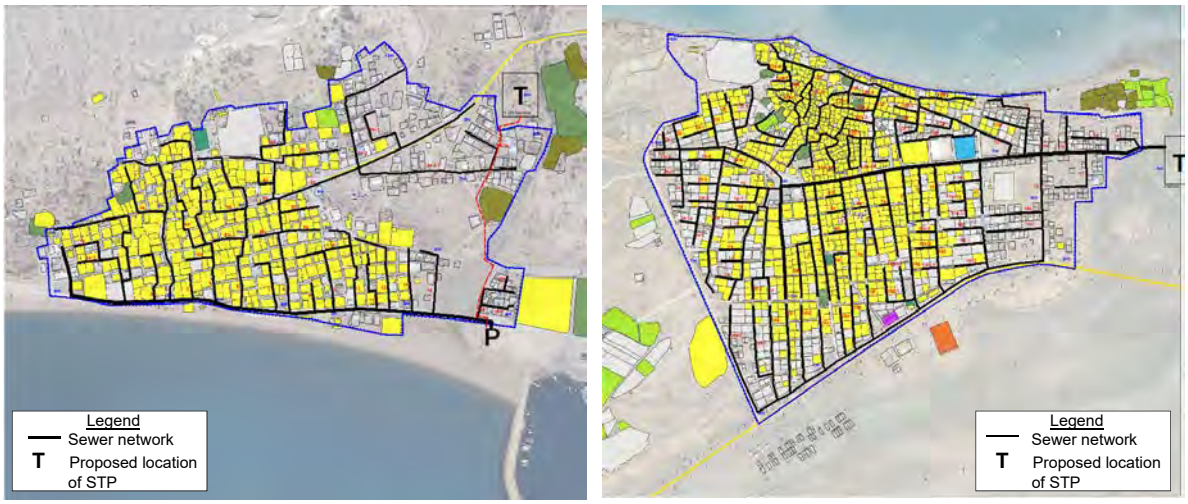
Village name	Sewer district area (ha)	Population in 2016 (people)	Average flow (m^3/d)	Sewer length (m)	Sewer density (m/ha)
Mesen	69.1	2,162	389	8,226	119
Tabl	178.6	4,069	732	20,258	113
Selakh	73.6	3.109	559	10,349	141
Kouvei	148.6	4,243	763	23,801	160
Laft	175.2	4,668	840	23,972	137
Peyposht	71.4	2,423	436	10,432	146
Kousha	53.2	2,193	395	10,868	204
Tourion	84.4	2,339	421	14,781	175
Ramkon	282.0	4,473	805	29,530	105

Source: JICA Project Team



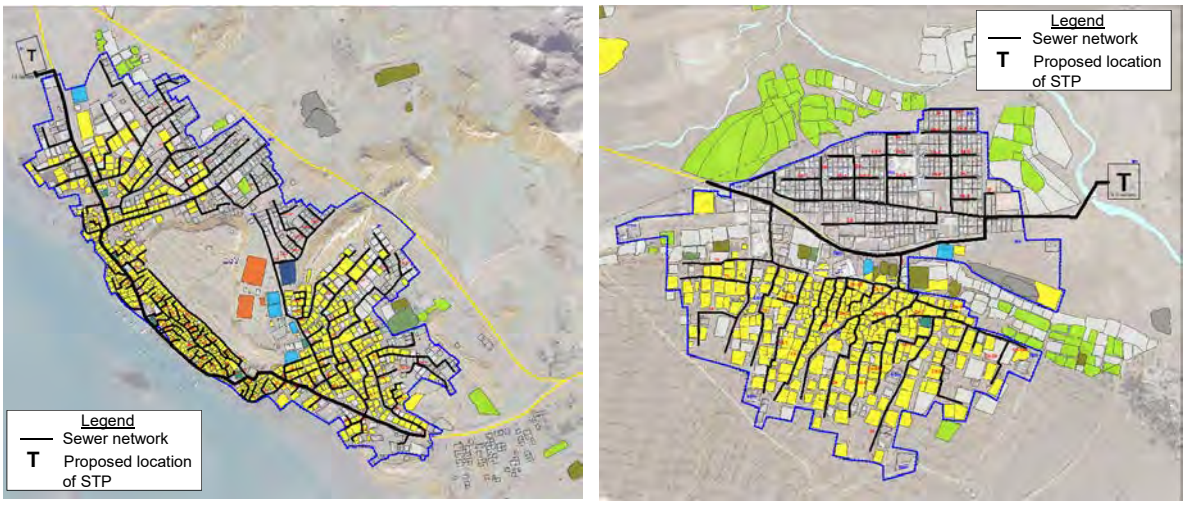
Source: JICA Project Team

Figure 11.4.2 Proposed Sewer Network with STP Location at Mesen (Left) and Tabl (Right)



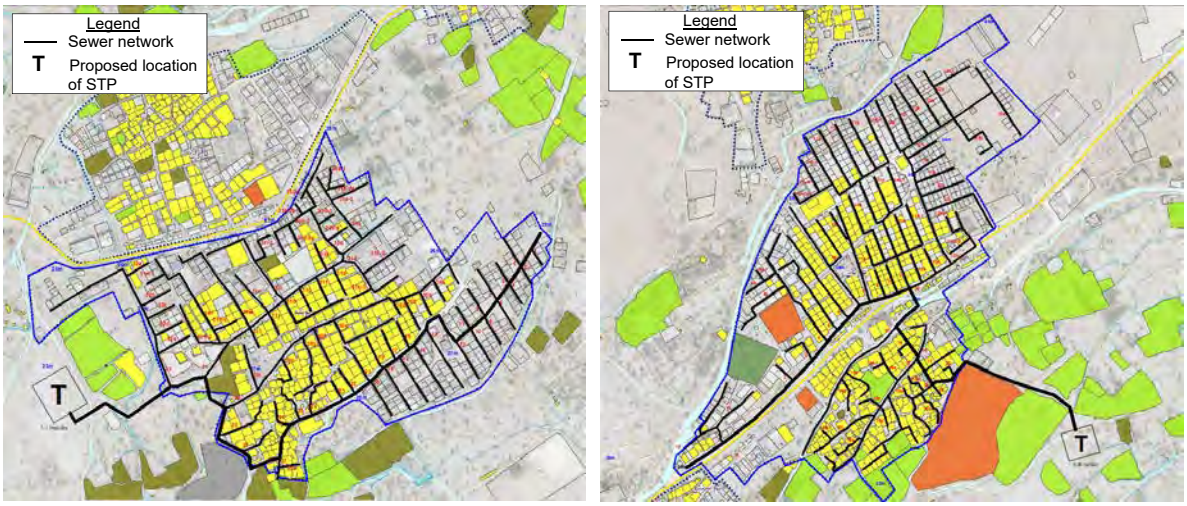
Source: JICA Project Team

Figure 11.4.3 Proposed Sewer Network with STP Location at Selakh (left) and Kouvei (Right)



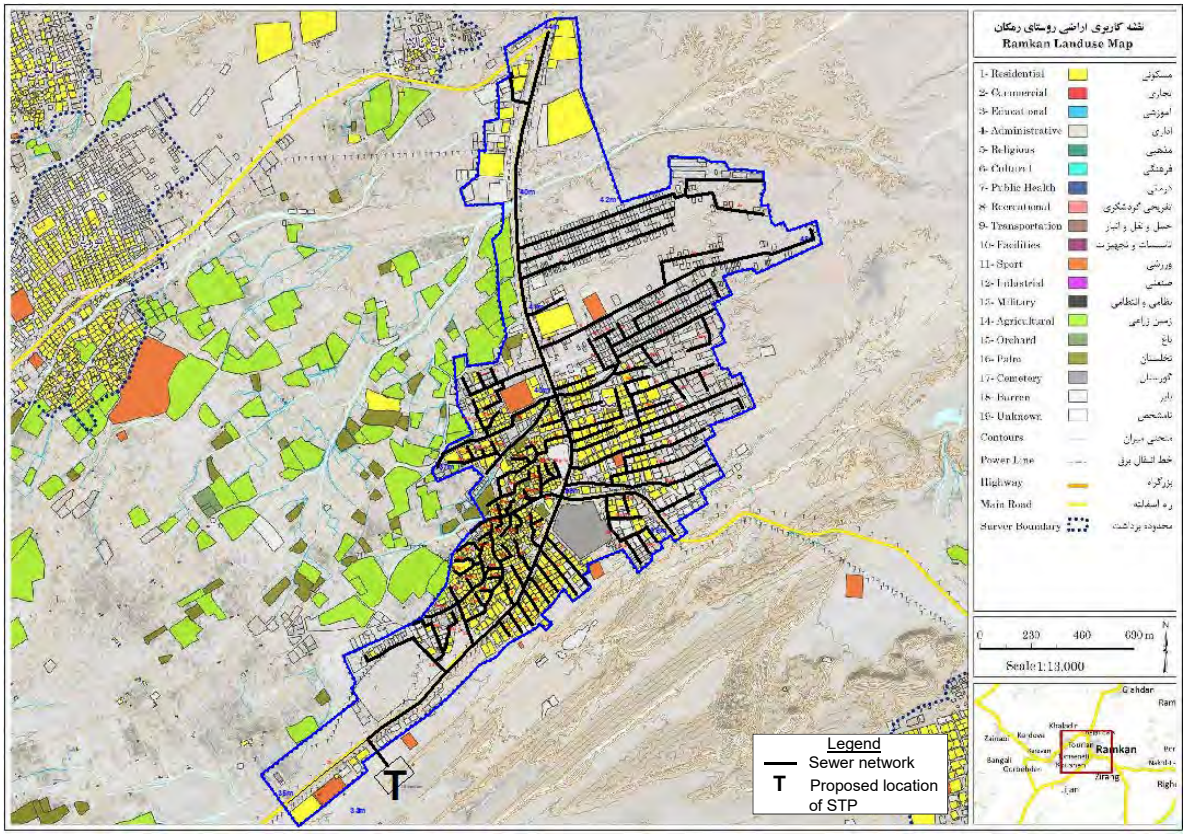
Source: JICA Project Team

Figure 11.4.4 Proposed Sewer Network with STP Location at Laft (Left) and Peyposht (Right)



Source: JICA Project Team

Figure 11.4.5 Proposed Sewer Network with STP Location at Kousha (Left) and Tourion (Right)

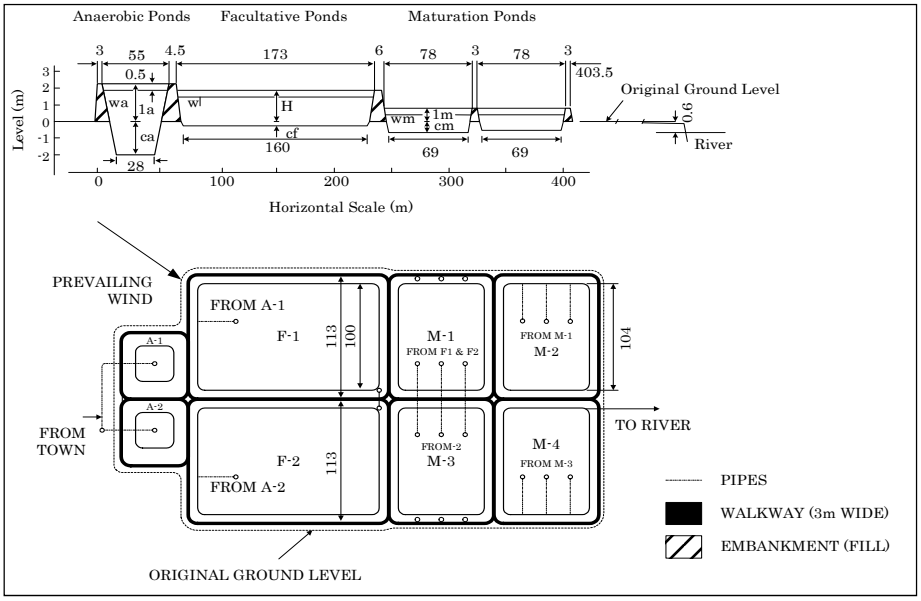


Source: JICA Project Team

Figure 11.4.6 Proposed Sewer Network with STP Location at Ramkon

STP

In the study of sewage treatment processes suitable for rural sewerage systems, the stabilization pond (SP) process was recommended in 7.3.5. The SP system can be expected to involve low cost and easy maintenance; however, its use requires a large land area. An example of an SP is shown in Figure 11.4.7.



Source: EHO EMRO Technical Publication No. 10, Wastewater Stabilization Ponds - Principles of Planning & Practice, WHO Regional Office for the Eastern Mediterranean, 1987

Figure 11.4.7 An Example of the Stabilization Pond Process

Preliminary process planning for an SP was conducted for nine villages, as follows;

- Population, district area and flow rate: based on the rural sewerage systems in 7.3.4
- Design parameters: as shown in Table 11.4.5.

Table 11.4.5 Design Parameters for Stabilization Pond Process Planning

Influent quantity	150 Lpcd
Influent quality	BOD 267 mg/l
Effluent quality	BOD 30 mg/l
Design temperature	18°C (average temperature in January on Qeshm)
Net evaporation rate	5 mm/day (assumption)

Note: BOD = biochemical oxygen demand.
Source: JICA Project Team

- Basic flow chart: pretreatment (i.e., screen, oil and grit separator) → (pump up) → anaerobic pond → facultative pond → maturation pond → rock filter → (disinfection)

Results of the preliminary SP process planning are as shown in Table 11.4.6:

Table 11.4.6 Retention Time and Other Parameters for Stabilization Pond Process Planning

Retention time and water depth	Anaerobic pond	1.03 days and 3.0 m
	Facultative pond	8.25 days and 1.5 m
	Maturation pond	2.2 days and 1.5 m
	Rock filter	1.0 day and 1.5 m
Effluent quality		BOD 28 mg/l <Design BOD 30 mg/l

Source: JICA Project Team

The surface areas of each pond were calculated from the daily flow, the retention time and water depth of each pond. The total surface area of each pond obtained by the above calculation is shown in Table 11.4.7. Finally, the required STP site areas were estimated based on the calculated surface area for nine villages using the SP process, as shown in the following table.

Table 11.4.7 Sewerage Treatment Plant Site Area for Prioritized Rural Sewerage Systems in Nine Villages

Village name	Population in 2036 (people)	Daily flow (m^3/d)	Surface area (m^2)	Tentative site area (m^2)	Tentative site area/ Surface area
Mesen	3,240	583	4,567	12,301	2.7
Tabl	6,374	1,147	8,985	19,516	2.2
Selakh	4,800	864	6,768,	15,896	2.3
Kouvei	5,547	998	7,817	17,610	2.3
Laft	7,210	1,298	10,167	21,238	2.1
Peyposht	3,477	626	4,904	12,851	2.6
Kousha	3,178	572	4,481	12,160	2.7
Tourion	3,983	716	5,608	14,002	2.5
Ramkon	9,686	1,744	13,661	26,325	1.9

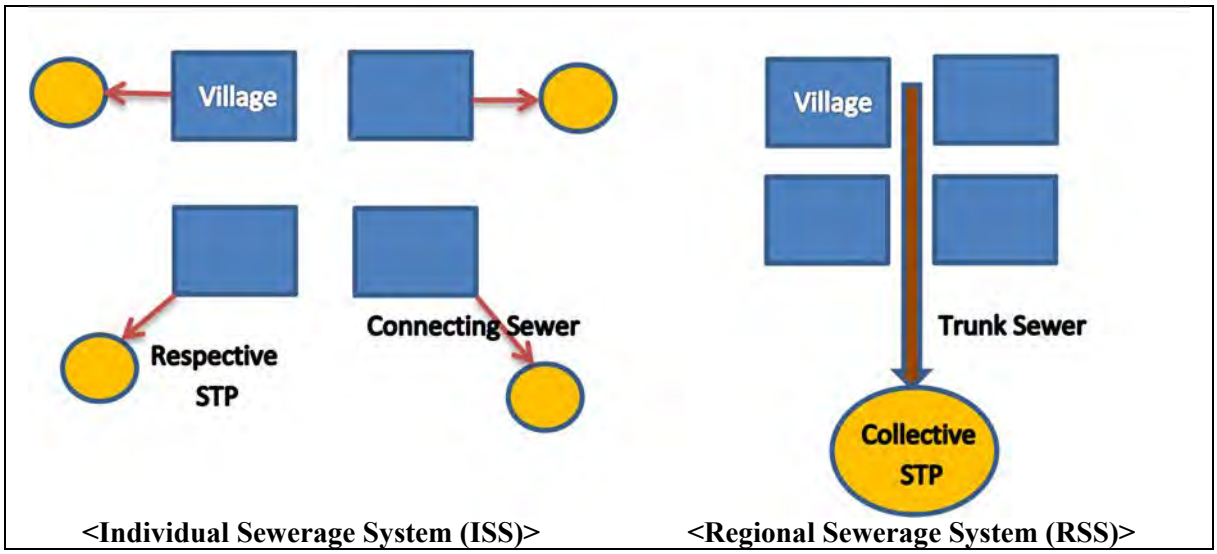
Note: Tentative site area (m^2) will be reconsidered.
Source: JICA Project Team

(3) Study on regional sewerage system in Central Ramkon

1) Study policy

Since several villages are adjacent to each other in the Ramkon District, it is more efficient and economical to collectively collect sewage and operate a sewage treatment plant (STP) in a wider area rather than it is to develop a sewerage system respectively in each village. In assessing whether the regional sewerage plan is appropriate or not, the construction cost of respective STPs and connecting sewers and the construction cost of collective STP and trunk sewer are compared. The trunk sewer of regional sewerage system transfers the sewage from each village to the collective STP.

The model image of individual sewerage system and regional sewerage system is shown in Figure 11.4.8. And the concept of cost comparison between individual and regional sewerage system is shown in Table 11.4.8.



Source: JICA Project Team

Figure 11.4.8 Model Image of Individual and Regional Sewerage System

Table 11.4.8 Concept of Cost Comparison between Individual and Regional Sewerage System

	Individual Sewerage System (ISS)	Regional Sewerage System (RSS)
Cost of main sewer	Total cost of connecting sewers (A)	Cost of trunk sewer (C)
Cost of STP	Total cost of respective STPs (B)	Cost of collective STP (D)
Total Cost of the system	(A) + (B)	(C) + (D)
Cost comparison	(A) + (B) ≷ (C) + (D)	

Source: JICA Project Team

2) Selection of model area for regional sewerage system in Ramkon District

The villages in Ramkon district can be divided into three groups from the distribution state, topography and road network, that is, East Ramkon (Bagh Bala, Ramkon and Jijiyon), Central Ramkon (Khaladin, Tourion, Tomsenati, Karavon, Kousha and Gorvodon) and West Ramkon (Peyposht, Zeinabi, Bangali and Kardova). Among these, the villages of Central Ramkon are close together and accumulated, thus the area is an optimal model to consider the economical and efficient implementation of a Regional Sewerage System.

3) Frame of regional sewerage system in Central Ramkon Area

Target villages for regional sewerage system are considered based on several factors, such as topography, surface gradient, road network, distance between villages, an available STP site, etc.

Topography in Ramkon Area

The topography of the Ramkon area is constantly inclined from northeast to the southwest. Thus it is natural for the sewerage system to collect sewage from northwest settlement by gravity and convey it to the STP at lower position on the southwest settlement side.

Rout of trunk sewer

The main road in the Central Ramkon passes through several villages which are close to each other from northeast to southwest, and these five villages, Khaladin, Tourion, Tomsenati, Karavon and Kousha, are developed in conjunction with this trunk road. The road gradient is constantly decreasing from northeast to southwest. Therefore it is most economical and efficient to lay the trunk sewer along this main road.

Potential site of collective STP

There are many farmlands on the southwestern side of the Karavon and Kousha and it is very difficult to find a suitable place for STP. Thus public land (not belonging to any village) along the main road to Zeinabi is recommended as a candidate site for the STP, which is located slightly northwest of the midpoint between Karavon and Gorvodon.

4) Target villages

Taking into account the topography, the surface gradient, road network, the distance between villages, the available STP sites, etc., Khaladin, Tourion, Tomsenati, Karavon and Kousha are natural and viable for integration within a regional sewerage system. In addition, Gorvodon and Kardova may potentially be integrated into the regional sewerage system. Since Gorvodon is close to the potential site of the STP, it should be considered to be included in the regional sewerage system. On the other hand, for Kardova, it is necessary to carefully consider the topography, distance to the STP and the beneficiary population as to whether or not to include it in the regional sewerage system.

Table 11.4.9 shows the base data of the above 7 villages for regional sewerage planning.

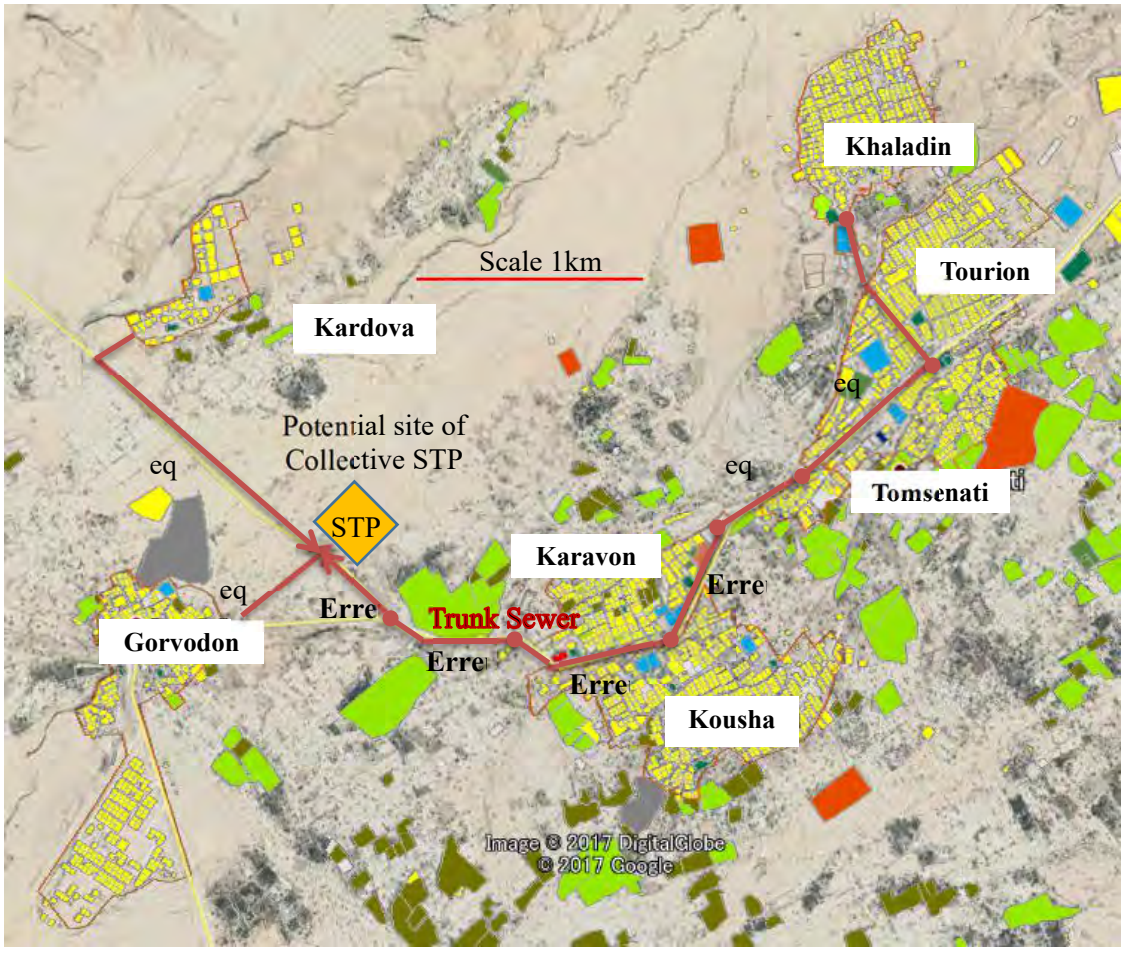
Table 11.4.9 Base Data of 7 Villages for Regional Sewerage Planning

Village Name	Sewer District Area (ha)		Population in (people)		Average Flow (m^3/d)		Hourly Peak Flow (m^3/d)		Sewer Length in village (m)	
	2016	*2036*	*2016*	*2036*	*2016*	*2036*	*2016*	*2036*	*2016*	*2036*
Khaladin	39.8	57.1	1,396	2,003	251	360	502	720	5,572	7,995
Tourion	84.4	143.7	2,339	3,983	421	716	842	1,432	14,781	25,151
Tomsenati	5.6	9.5	287	489	52	88	104	176	560	954
Karavon	28.5	43.0	952	1,436	172	258	344	516	3,990	6,019
Kousha	53.2	77.1	2,193	3,178	395	572	790	1,144	10,868	15,727
Gorvodon	49.4	70.3	1,100	1,579	198	284	396	568	6,916	9.928
Kardova	14.9	18.5	163	277	29	50	58	100	1,031	1,847

Source: JICA Project Team

5) Layout plan of regional sewerage system

Figure 11.4.9 shows a layout plan of the reginal sewerage system including the three trunk sewers and the potential collective STP. One trunk sewer transfers sewage from five villages to the STP and the other two transfer sewage from Gorvodon and Kardova separately to the STP. It is a force main from Gorvodon.



Source: JICA Project Team

Figure 11.4.9 Layout Plan of Regional Sewerage System in Ramkon Area

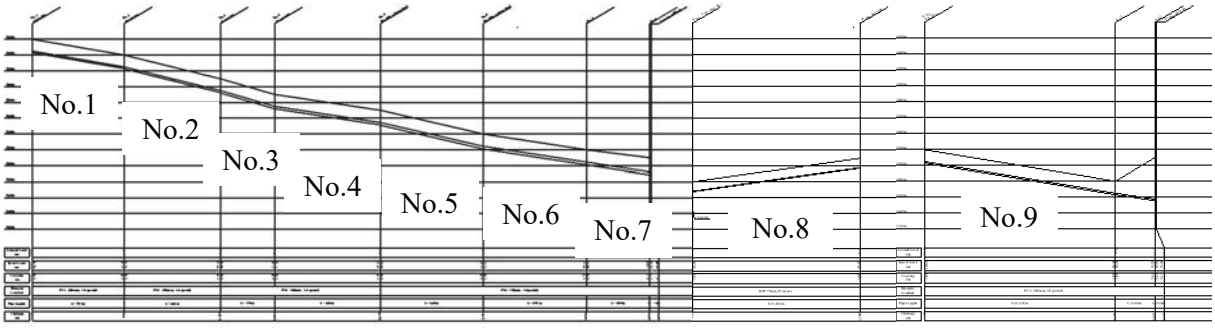
6) Longitudinal plan of trunk sewer

The longitudinal profile of the trunk sewers is made up based on the expected population by 2036, as shown in Figure 11.4.10. Table 11.4.10 shows the length, diameter, gradient and earth covering of trunk sewer.

Table 11.4.10 Data of Trunk Sewer from Longitudinal Profile

Sewer No.	No.1	No.2	No.3	No.4	No.5	No.6	No.7	Sub-T	No.8*	No.9
Length (m)	593	622	351	683	665	670	419	4,003	1,060	1,447
Diameter (mm)	200	250	300	300	350	350	350		75	200
Gradient (per mil)	3.0	3.0	3.0	3.0	3.0	3.0	3.0			3.0
Covering (Start, m)	1.50	1.50	1.50	1.50	1.55	1.50	1.51		1.50	1.50
Covering (End, m)	1.50	1.50	1.50	1.55	1.50	1.51	1.77		1.50	5.27

Note: * Force main
Source: JICA Project Team



Source: JICA Project Team

Figure 11.4.10 Longitudinal Profile of Trunk Sewer of Regional Sewerage System

7) Cost Comparison between Individual and Regional Sewerage Systems

The followings are the prerequisites for cost comparison, which refer to the experiences of Qeshm Sewerage:

- Sewer cost: 200 USD/m for 200 mm diameter of PVC pipe with laying cost
  300 USD/m is assumed as average sewer cost for trunk line No.1 to 7.
- STP cost: 2,000 USD/m^3/d or 1.0 MUSD at 500m^3/d
  1,800 USD/m^3/d or 1.8 MUSD at 1,000m^3/d
  1,600 USD/m^3/d or 2.4 MUSD at 1,500m^3/d (assumed)
  1,400 USD/m^3/d or 2.8 MUSD at 2,000m^3/d (assumed)

Table 11.4.11 shows a cost estimate in the case of an Individual Sewerage System;

Table 11.4.11 Cost Estimate in the case of an Individual Sewerage System (ISS)

Village Name	Population in 2036 (people)	Average Flow (m^3/d)	Sewer Length in village (m)	Connect. Sewer* Length (m)	Cost (million USD)				
					Sewer	Connect. Sewer	STP**	Sub-T*** (CS+STP)	Total
Khaladin	2,003	360	7,995	500	1.60	0.10	0.78	0.88	2.47
Tourion	3,983	716	25,151	700	5.03	0.14	1.35	1.49	6.52
Tomsenati	489	88	954	500	0.19	0.10	0.34	0.44	0.63
Karavon	1,436	258	6,019	500	1.20	0.10	0.61	0.71	1.92
Kousha	3,178	572	15,727	1,000	3.15	0.20	1.12	1.32	4.46
(5 villages)	11,089	1,994	55,846	3,200	11.17	0.64	4.19	4.83	16.00
Gorvodon	1,579	284	9,928	500	1.99	0.10	0.65	0.75	2.74
(6 villages)	12,668	2,278	65,774	3,700	13.15	0.74	4.84	5.58	18.74
Kardova	277	50	1,847	500	0.37	0.10	0.28	0.38	0.75
(6 villages)	11,366	2,044	57,693	3,700	11.54	0.74	4.47	5.21	16.75
(7 villages)	12,945	2,328	67,621	4,200	13.52	0.84	5.12	5.96	19.49

Note: * 500m is assumed a minimum length of connecting sewer
** Estimated using Cost Function
*** Sum of connecting sewer and STP cost only
Source: JICA Project Team

Table 11.4.12 shows a cost estimate in the case of a Regional Sewerage System;

Table 11.4.12 Cost Estimate in the Case of a Regional Sewerage System (RSS)

Village Name	Population in 2036 (people)	Average Flow (m^3/d)	Sewer Length in village (m)	Trunk Sewer* Length (m)	Cost (million USD)				
					Sewer	Trunk Sewer	STP**	Sub-T*** (TS+STP)	Total
(5 villages)	11,089	1,994	55,846	4,003	11.17	1.20	2.80	4.00	15.17
Gorvodon	1,579	284	9,928	1,060	1.99	0.14			
(6 villages)	12,668	2,278	65,774	5,063	13.15	1.34	3.02	4.36	17.52
Kardova	277	50	1,847	1,447	0.37	0.29			
(6 villages)	11,366	2,044	57,693	5,450	11.54	1.49	2.84	4.33	15.87
(7 villages)	12,945	2,328	67,621	6,510	13.52	1.63	3.06	4.69	18.22

Note: * Extracted from Longitudinal profile of trunk sewer
** Estimated using Cost Function
*** Sum of trunk sewer and STP cost only

Source: JICA Project Team

Table 11.4.13 shows cost comparison between Individual Sewerage System (ISS) and Regional Sewerage System (RSS);

Table 11.4.13 Cost Comparison between ISS and RSS

Unit: million USD

	5 villages		6 villages with Gorvodon		6 villages with Kardova		7 villages	
	ISS	RSS	ISS	RSS	ISS	RSS	ISS	RSS
Cost of main sewer	0.64	1.20	0.74	1.34	0.74	1.49	0.84	1.63
Cost of STP	4.19	2.80	4.84	3.02	4.47	2.84	5.12	3.06
Total Cost (increment for 5 villages)	4.83	4.00	5.58 (+0.75)	4.36 (+0.36)	5.21 (+0.38)	4.33 (+0.33)	5.96 (+1.13)	4.69 (+0.69)
Cost comparison	4.83>4.00		5.58>4.36		5.21>4.33		5.96>4.69	
(Reduction ratio)	4.00/4.83=82.8%		4.36/5.58=78.1%		4.33/5.21=83.1%		4.69/5.96=78.7%	

Source: JICA Project Team

As indicated by the cost comparison, in any combination of 5, 6 and 7 villages, the RSS is more economically advantageous than the ISS. Among these options, the case of 6 villages with Gorvodon is the most economical, followed by the case of 7 villages. On the other hand, the case of 6 villages with Kardova is almost no difference economically, compared to the case of 5 villages.

If Gorvodon is to participate in the regional sewerage system, it can be developed at about 50% of the investment cost required for the individual sewerage system (+0.36 vs 0.75 million USD). This is a great merit for Gorvodon. On the other hand, there is no large economic difference whether Kardova participates in the regional sewerage system or develop their own individual sewerage system separately (+0.33 vs 0.38 million USD).

8) Unit Cost Comparison regarding village participation in the Regional Sewerage System

Table 11.4.14 shows unit cost comparisons in the cases of 5, 6 and 7 villages, in order to judge whether there is merit for village participation in the Regional Sewerage System.

Table 11.4.14 Unit Cost Comparison regarding village participation

Village Group	Population in 2036 (people)	Average Flow (m^3/d)	Cost (million USD)			Unit Cost (USD/people)	
			Trunk Sewer	STP	Sub-T	STP/Pop.	Sub-T/Pop.
5 villages	11,089	1,994	1.20	2.80	4.00	253 (100%)	361 (100%)
6 villages with Gorvodon	12,668	2,278	1.34	3.02	4.36	238 (94%)	344 (95%)
6 villages with Kardova	11,366	2,044	1.49	2.84	4.33	250 (99%)	381 (106%)
7 villages	12,945	2,328	1.63	3.06	4.69	236 (93%)	362 (100%)

Source: JICA Project Team

The unit cost comparison indicates that there is a merit to the Regional Sewerage System only in the case of 6 villages with Gorvodon. This means the participation of Gorvodon benefits not only itself but also the 5 villages of regional sewerage system as well. On the other hand, the participation of Kardova is not beneficial to the 5 villages of regional sewerage system due to the long distance of the trunk sewer to STP. Unit cost for STP in the Table shows advantage of scale regarding STP of regional sewerage system.

11.4.2 Capacity development for implementation in the sewage management sector

(1) Existing issues for implementation of the sewerage project

1) Strengthening of implementing structure

As shown in Table 7.3.1, there are 12 staff members in the HUWWC responsible for waterworks on Qeshm Island and other islands, while only 5 people in the HRWWC are responsible for waterworks in rural areas of Qeshm Island.

To promote the development of the above urban sewerage system, rural sewerage system and reuse of treated sewage effluent, it is imperative to strengthen the institutional resources in Qeshm Branch of HUWWC and HRWWC in the field of sewerage system development. In this case, in accordance with the strengthening of the branch offices, effective and efficient support from the experienced headquarters to the branch offices should be considered.

2) Coordination among related organizations

The HUWWC has already concluded the Dargahan Sewerage Development Study, covering 1,073 ha with the population of 37,400 people in 2041 in the areas of Dargahan City and Holor Village. Regarding the sewer network of Dargahan's sewerage system, an interceptor, which is 3 km in length, was constructed along the coastline in 2013 and 2014, however, the construction of sewerage system for Dargahan City and Holor Village is currently suspended.

In order to promote the development of Dargahan Sewerage System, conscious coordination and cooperation among related organizations are imperative.

In addition, regarding rural sewerage development, there has been no progress for Qeshm Island despite the necessity of development, recent population increase and sanitary and environmental problems.

For these issues, it seems that it is necessary to prepare development policies of sewerage systems throughout the Qeshm Island and a sharing plan for the sewerage development through consultation among related organizations, such as QFZO, QUC, HUWWC and HRWWC, and to implement the sewerage development by each organization based on the sharing plan.

3) Securement of financial sources

Although it is commonplace, it is most important to secure the financial resources for HUWWC, HRWWC and QUC to promote sewerage systems in Qeshm Island.

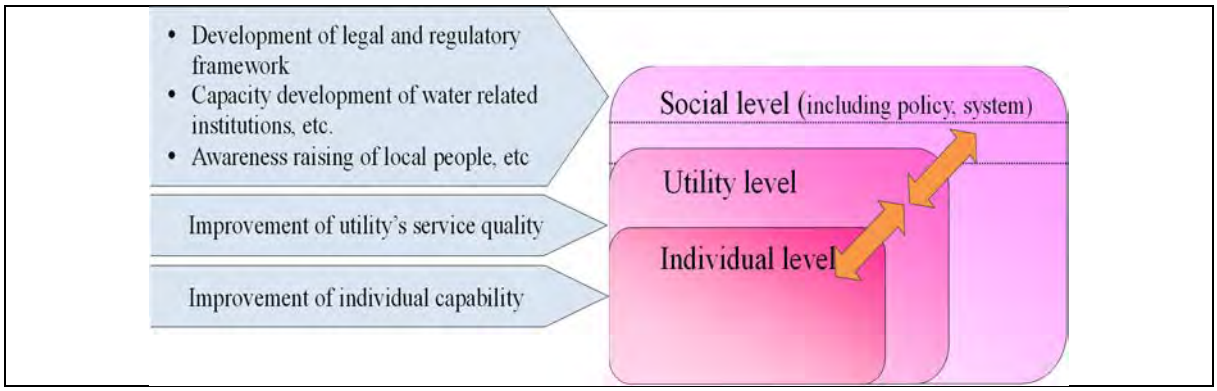
(2) Capacity development to promote the sewerage system

In the same manner, it is important to consider the capacity development of utilities, in order to improve above issues and to promote the sewerage system, as follows;

1) Concept of capacity development

Capacity development is defined by JICA as "the process by which individuals, organizations, institutions, and societies develop abilities to perform functions, solve problems and set and achieve objectives". Capacity development not only in technical aspects but also in overall organizational aspects including management and financial issues is essential for water and sewerage utilities to operate their organization and infrastructure facilities on sustainable basis. In order to support this, capacity

development at individual and social level also plays a crucial role (refer to Figure 11.4.11).



Source: Capacity Assessment Handbook, JICA (2008)

Figure 11.4.11 Concept of Capacity Development

Capacity development should follow a utility's basic policy for human resource development and a result of needs assessment. The three main methods of capacity development are the following: (a) OJT (on-the-job training), (b) Off-JT, and (c) self-development. OJT enhances capacity development of necessary technology and capability through a form of training on practical works and trial and error in a normal working situation. Off-JT is a form of training received from external lectures or education either inside or outside of utility. Self-development is a form of training to develop one's own capability by individual learning.

2) Areas of capacity development

Capacity development at all levels such as individual, utility and society are essential for improvement of the sewage treatment situation. Organization related to sewerage development should put the priority on (a) institutional development, (b) development of legal and regulatory frameworks, (c) public awareness aiming at development of sewerage facilities and environment conservation. In addition, (d) development of business management basis, (e) improvement of operation and maintenance, and (f) strengthening financial management are important. From the above, capacity development in various areas of technical, managerial and financial ability are required in sewerage field, considering successful results 5 to 10 years later.

3) Activity targets of capacity development

The six priority areas mentioned above (a) to (f) for capacity development and the activity targets are summarized in the following table.

Table 11.4.15 Activity Targets of Capacity Development

Areas for Capacity Development	Activity Targets
Development of Institutional arrangement	・ Formulation of responsible sections for preparing high level policies, strategies and business plans for sewerage development ・ Formulation of responsible sections for sewerage system development from planning to implementation and O&M ・ Formulation of customer service and public relation sections ・ Securing and development of human resources ・ Promotion of private sector investment
Development of Management Bases	・ Formulation of development policies/plans of sewerage systems throughout Qeshm Island and sharing plan in short, middle, and long term ・ Setting of key performance indicators (PIs) and the targets for the short, middle and long term ・ Implementation of regular monitoring and reporting based on key PIs (monthly, annually)
Enhancement of Financial Management	・ Securing and development of financial resources, such as subsidy, tariff, business revenue and so on ・ Consideration on setting policy for water and sewerage tariff collection ・ Management of customer information database ・ Consideration on treated sewage utilization business ・ Cost analysis of water and sewage works, and revenue/expenditure projection
Strengthening of Public Awareness Activities	・ Formulation of action policy/plan for customer service and public relation ・ Development of materials regarding public awareness on public health, management of leaching pit and/or septic tank, development of sewerage system and sewage service charge system ・ Implementation of household awareness survey
Improvement of Operation and Maintenance (O&M) Capability	・ Research and establishment of sewerage assets database (treatment plant, pumping station, sewer network etc.) ・ Preparation and management of O&M records ・ Formulation of O&M manual ・ Formulation of management manual and guideline for O&M company ・ Training for improvement of O&M works
Compliance with Legal System and Regulatory Framework	・ Formulation of sewerage ordinance on establishment and management of sewerage facilities ・ Formulation of regulation on discharge criteria into the urban sewerage system and the monitoring system ・ Formulation of structural criteria and management manual of collective treatment facilities and individual septic tank/leaching pit

Source: JICA Project Team

(3) Capacity development to promote the water pollution control

Along with the progress of the development of Qeshm Island from now on, urbanization will proceed due to population increase and industrial plants to operate will also be expected to increase more and more. Due to this situation, the environment load on the surrounding nature will increase, especially it is concerned that water environments in inland and enclosed coastal seas are getting worse. For that reason, it is necessary to develop a system and measures to prevent water pollution at an early stage before pollution becomes noticeable.

That is to say, industrial wastewater in the Industrial Park should be treated by an individual or collective WWTP in compliance with the criteria for discharge into public water bodies, and domestic sewage should be also treated by public sewerage system or individual treatment facility (septic tank or leaching pit).

Another pillar of the measures is strengthening regulation of industrial wastewater effluent and the

monitoring system, which is strongly urged by capacity development of the existing regulatory organization, DOE of QFZO and the other related organizations.

The following system and measures are considered for capacity development to promote water pollution control in public water bodies:

(a) Strengthening regulation of industrial wastewater effluent and the monitoring system
- ✓ Industrial wastewater discharge in compliance with the criteria into public water bodies
- ✓ Strengthening the monitoring system by means of reporting obligations and on-site inspection with wastewater sampling etc.

(b) Strengthening water quality monitoring system of water environment
- ✓ Setting regular spots for water quality observation around Qeshm Island
- ✓ (e.g., offshore area of Qeshm City, Towla, Dargahan, Laft, Doulab, Baseidou, Selakh, Souza, and Direston Gulf, Mangrove forest, Khoran straits,)
- ✓ Periodic sampling at the regular spots and water quality analysis to accumulate water quality data around Qeshm Island
- ✓ Strengthening the system of water quality analysis, or establishing laboratory

(c) Increasing number of DOE staff for capacity development

11.5 Action Plan for Solid Waste Management

Most of the priority projects can be realized for solid waste management based on the skills and experiences that currently exist on Qeshm Island. However, the construction of sanitary landfills is exceptional. Therefore, this action plan focuses on the priority project of sanitary landfilling at Towla, which can be applied to the development of another landfill in the Central Area.

11.5.1 Outline of the priority project

(1) Objectives

The priority project aims to offer a new direction in landfilling for appropriate waste disposal on Qeshm Island. It is also expected that the project will become a model for the Central Area and other cities in Iran, which have similar problems to the island in the management of waste disposal.

(2) Schedule

The priority project is planned to be carried out in 2018.

(3) Design concept

The landfill design presented here is just a model to give an impression of what is meant by a sanitary landfill and how it is developed, given that a site for construction has not been fully determined. Once such a site is defined, surveys and studies should be carried out to check the design conditions below and other design factors.

Based on the request from the QFZO, this model design is made on a site with an area of approximately 1.0 ha (100 x 100 m).

(4) Design conditions

The following are basic landfill design conditions:

(a) Location: Towla Disposal Site at latitude 26º57' north and longitude 56º09'
(b) Climate: desert, Koppen climate classification - BWh
(c) Temperature: mean monthly temperature between March 2011 and January 2014

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Low (°C)	16.3	17.3	19.5	23.1	26.4	29.3	31.3	31.0	29.7	27.0	22.2	17.8
High (°C)	23.3	24.1	27.1	31.2	35.3	37.5	38.2	37.2	36.4	34.1	29.1	25.3

(d) Mean rainfall: mean monthly rainfall between March 2011 and January 2014

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
mm/month	22.7	13.0	13.1	8.0	0.0	0.0	0.0	0.0	0.3	5.7	18.6	7.0

(e) Maximum rainfall: maximum rainfall 54.2 mm/day on March 26, 2014 (between March 2011 and January 2014 for which daily rainfall data are available)
(f) Geology: marlstone
(g) Groundwater: below 3.0 m, intrusion of seawater (according to the QFZO)
(h) Waste amount: 90 tons/day (90 m^3/day after compaction)
(i) Waste composition: kitchen 70%, paper 10%, plastic 5%, metal 2%, textile 3%, and others 10%

(5) Type of landfill

The design here shows two types of landfill, i.e., a controlled disposal site and a sanitary landfill. The actual disposal method at the Towla Disposal Site, i.e., the trench approach, should be transformed at least into a controlled disposal site or a sanitary landfill if possible.

The sanitary landfill designed here applies the semi-anaerobic approach, which accelerates the decomposition of waste, reduces the amount of landfill gas and improves leachate quality compared to a conventional landfill.

(6) Designing flow

The table below shows a typical flow for designing a landfill. This model design corresponds to a part of the basic design and the detailed design. Once a site is determined, this model design should be reviewed according to the flow below.

Table 11.5.1 Landfill Design Flow

Flow	Works
Basic plan	A comprehensive plan for solid waste management, similar to a master plan, which is prepared based on the following works: • Forecast of waste amount to be disposed of in the future • Consideration of candidate site(s) for future landfill(s)
Basic design	The basic design is often carried out as one of the works of the basic plan. The design contains the following works: • Collection of information about conditions at the candidate site, such as temperature, rainfall, wind direction, geological feature, type of soil available, groundwater, rivers, vegetation, land use. • Boring survey, topographic survey etc. • Preliminary design of a landfill, such as capacity, area, final height, structure, leachate treatment, landfill gas treatment.
Site selection	Site selection is technically carried out in the process of preparing the basic plan and/or the basic design. However, the most important action is to legally secure the site for the construction and operation of a landfill. For this purpose, the following works are usually required: • Consultation with landowner(s) and residents • Environmental impact assessment • Alteration of land use etc.
Detailed design	A detailed design prepares the documents for the construction of a landfill. Works to be carried out are as follows: • Additional survey(s) if necessary, such as a boring survey • Design of facilities such as a lining system, leachate collection and treatment • Preparation of a construction work plan, operation plan, maintenance plan, closure plan etc. • Estimation of costs
Construction	The landfill is constructed according to the detailed plan.

Source: JICA Project Team

11.5.2 Facility design

This section presents the facility design of the controlled disposal site and the sanitary landfill. The term "controlled disposal site" is usually used for a disposal site, which is improved from an open dump site

in terms of operation and management, rather than facility or structural requirements. On the other hand, a sanitary landfill is an engineered disposal facility, which aims to minimize impacts on public health and the environment.

In this model design, the term "sanitary landfill" means almost the same as mentioned above. However, the term "controlled disposal site" is similar, but different from the meaning above. The most important point here is that the controlled disposal site in this design has an engineered structure. The table below shows a comparison between the controlled disposal site and the sanitary landfill in this model design.

Table 11.5.2 Facilities of the Controlled Disposal Site vs. the Sanitary Landfill

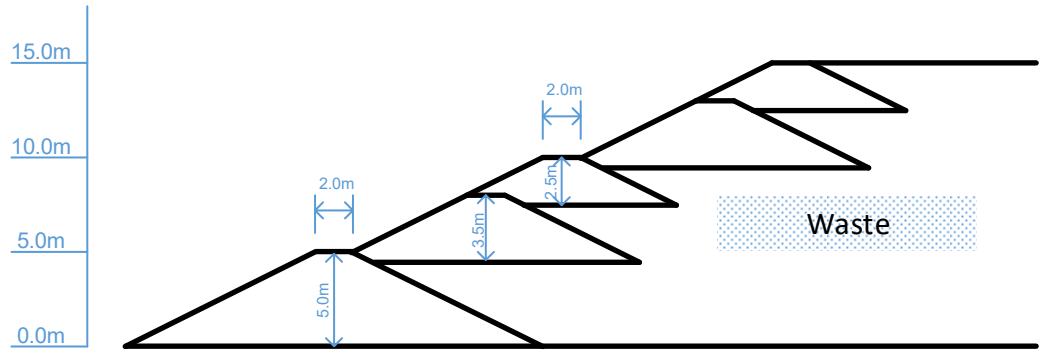
Facilities	Controlled disposal site	Sanitary landfill
Solid waste retaining structure	• Earth-filled dam type, 15 m divided in 3 steps	• Same as on the left
Lining system	• A 1.0m-thick clay soil layer, which should have less than 1 x 10^{-6} cm/s permeability	• Impermeable plastic, i.e., high-density polyethylene (HDPE), liner on the 1.0 m-thick clay soil
Leachate collection and treatment	• Inclination of the clay soil liner, 1.0% • Circulation of leachate by pump	• Inclination of the clay soil liner, 1.0% • Leachate collection pipe • Circulation of leachate by pump • Leachate evaporation pond
Landfill gas collection and treatment	• Vertical gas removal pipe	• Vertical gas removal pipe connected to the leachate collection pipe
Surface water drainage	• U-shaped drainage around the landfill	• Same as on the left
Groundwater drainage	• No consideration because it is assumed that there is no groundwater up to a depth of 3.0 m	• Same as on the left
Others	• Access road to the landfill • Maintenance road • Groundwater monitoring well • Weighbridge • Gate, fence etc.	• Same as on the left

Source: JICA Project Team

(1) Solid waste retaining structure

The solid waste retaining structure applies the earth-filled dam approach. The total height is 15.0 m and consists of three steps. The first step is constructed with one bund having a height of 5.0 m. The second and third are made up two bunds, 3.5 m and 2.5 m, respectively, as shown figure below.

The landfill has a capacity of 80,065 m^3 for receiving waste.



Source: JICA Project Team

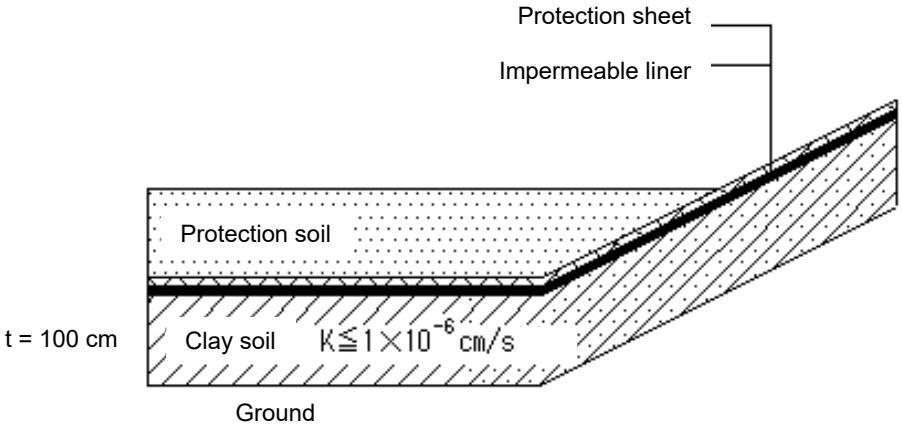
Figure 11.5.1 Solid Waste Retaining Structure, Earth-filled

(2) Lining system

The lining system is to prevent leachate from seeping into soil and groundwater under the landfill. Therefore, it should have a certain level of impermeability to perform its function. It is advisable to

comply with the minimum standard in Japan at a coefficient of permeability of 1 x 10^{-6} cm/s or less.

In this model design, it is assumed that a 1.0 m-thick clay liner offers such impermeability. This clay liner is applied to the controlled disposal site. In addition, an impermeable plastic liner is placed on the clay liner for the sanitary landfill.



Source: JICA Project Team

Figure 11.5.2 Lining System for the Sanitary Landfill

(3) Leachate collection and treatment facilities

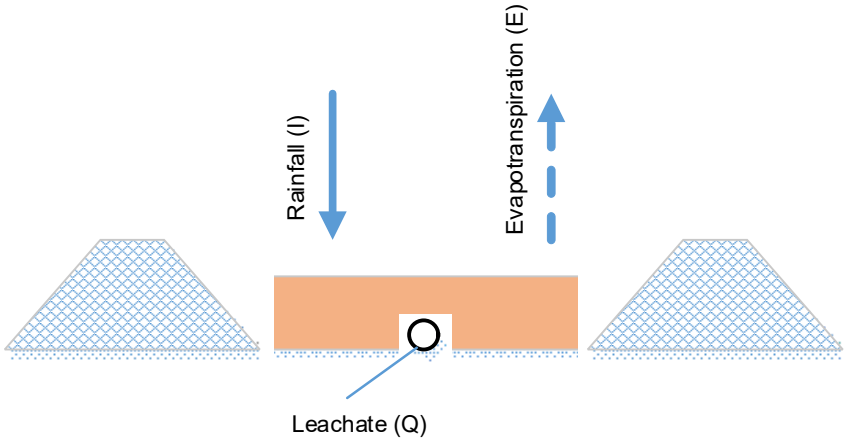
1) Leachate generation amount

Water balance

Water balance in the landfill can be expressed as follows:

Rainfall: I mm
Evapotranspiration: E mm
Area: A m^2
Leachate: Q m^3

$$Q = \frac{(I-E)}{1000} A$$



Evapotranspiration

Evapotranspiration (actual) is usually expressed as follows:

$$E = kcETo$$

where

E:	evapotranspiration (actual)
ETo:	potential evapotranspiration
kc:	coefficient, 0.6

As for kc, 0.6-0.7 is applied in Japan, while 0.3-0.7 is applied for a "no cropped surface" in FAO-24[3]. In this estimation, 0.6 is applied.

Potential evapotranspiration is obtained according to the modified Blaney-Criddle equation, as presented in a research paper[4].

$$ETo = (a + 8.13bP) + (0.46bP)$$

$$Teff = \frac{1}{2}k(3Tmax - Tmin)$$

where

a:	variable for Bandar Abbas presented in Table IV of the research paper
b:	variable for Bandar Abbas presented in Table V of the research paper
P (%):	mean annual percentage of day time hours, according to FAO-24, Table 1
Teff (°C):	effective monthly temperature
Tmax (°C):	mean monthly maximum temperature
Tmin (°C):	mean monthly minimum temperature
K:	coefficient for Bandar Abbas presented in Table II of the research paper

Calculation of Teff:

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Tmin (°C)	16.3	17.3	19.5	23.1	26.4	29.3	31.3	31.0	29.7	27.0	22.2	17.8
Tmax (°C)	23.3	24.1	27.1	31.2	35.3	37.5	38.2	37.2	36.4	34.1	29.1	25.3
k	0.81	0.83	0.81	0.75	0.71	0.69	0.71	0.72	0.70	0.68	0.70	0.75
Teff	21.7	22.8	25.0	26.4	28.2	28.7	29.6	29.0	27.8	25.6	22.8	21.8

Calculation of ETo:

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
a	-2.10	-2.37	-3.22	-3.93	-4.41	-4.43	-4.48	-4.34	-3.81	-3.26	-2.65	-2.37
b	1.10	1.14	1.38	1.59	1.77	1.77	1.71	1.76	1.66	1.65	1.30	1.15
P	0.24	0.26	0.27	0.29	0.30	0.31	0.31	0.29	0.28	0.26	0.25	0.24
ETo (mm/day)	2.7	3.2	4.1	5.4	6.8	7.3	7.0	6.6	5.9	5.3	3.4	2.6
No. of days	31	28	31	30	31	30	31	31	30	31	30	31
ETo (mm/month)	83.0	88.3	127.0	162.5	210.9	218.2	218.4	205.2	177.4	163.6	102.0	81.9

Note: P: as Bandar Abbas is located at a latitude 27°13' north, the values for latitude 25° north in Table 1 of FAO-24 are applied.

Calculation of E (E=kcETo):

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
E (mm/month) kc=0.6	49.8	53.0	76.2	97.5	126.6	130.9	131.0	123.1	106.5	98.2	61.2	49.2

Leachate generation amount

As the table below shows, evapotranspiration always exceeds rainfall. No leachate generates according

[3] FAO-24 is a paper: Doorenbos and Pruitt. 1977. Guidelines for Predicting Crop Water Requirements. FAO Irrigation and Drainage Paper, No.24.

[4] Foolmand and Ahmadi. 2009. Monthly Spatial Calibration of Blaney-Criddle Equation for Calculating Monthly ETo in South of Iran.

to the calculation based on the monthly metrological data.

Calculation of Q:

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
I (mm/month)	22.7	13.0	13.1	8.0	0.0	0.0	0.0	0.0	0.3	5.7	18.6	7.0
E (mm/month)	49.8	53.0	76.2	97.5	126.6	130.9	131.0	123.1	106.5	98.2	61.2	49.2
Q = I-E	-27.0	-40.0	-63.0	-89.5	-126.5	-130.9	-131.0	-123.1	-106.2	-92.4	-42.6	-42.2

2) Leachate collection facility

The calculation above, based on the monthly data, results in no leachate generation. However, it may happen that intense rainfall over a short time infiltrates to a considerable depth and becomes leachate. Actually, a small amount of leachate is generated in the disposal site in Bandar Abbas. According to officials managing the disposal site, leachate appears in the winter and dries up in the summer. Therefore, this model design assumes that small amount of leachate will be generated, such that a leachate collection facility is necessary.

On the controlled disposal site, the bottom of the site has an inclination of 1.0%. Thus, leachate will flow to the lowest place where a water pump is installed.

The sanitary landfill has leachate collection pipes on the inclined bottom surface. The leachate collection facility consists of a main pipe and branch pipes. The main pipe has a diameter of 400 mm and the branch pipes have a diameter of 200 mm.

3) Leachate treatment facility

On the controlled disposal site, the collected leachate is pumped up and sent back to the gas removal pipes. It is expected that this leachate circulation accelerates the decomposition of waste, the reduction of the amount of leachate and the improvement in leachate quality.

The main leachate collection pipe of the sanitary landfill is connected to a leachate pond. There, the end of the main pipe is to exposed to the atmosphere in order to allow air to get into the landfill through the pipe. This air accelerates the decomposition of waste, the reduction of methane gas and the improvement in leachate quality. This system is called a semi-aerobic-type landfill.

Furthermore, the sanitary landfill has a water pump, which sends the leachate to the gas removal pipes. In addition, it is expected that leachate in the pond evaporates during the summer. The volume of the leachate pond is designed by taking into consideration the maximum daily rainfall in recent years, i.e., 54.2 mm/day on March 26, 2014.

(4) Landfill gas collection and treatment facilities

Both the controlled disposal site and the sanitary landfill have vertical gas removal pipes. The pipes have a diameter of 200 mm and are exposed to the atmosphere. This system relies on the difference in natural pressure between the inside and the outside landfill and/or the concentration gradient of landfill gas. This is called passive landfill gas collection or removal.

(5) Surface water drainage facility

Although the site gets very little rain, U-shaped drainage is to be installed around the landfill in order to avoid occasional intense rain damaging the dike and the maintenance road.

(6) Groundwater drainage facility

It is assumed that no groundwater exists up to a depth of 3.0 m. Therefore, a groundwater drainage facility is not considered.

(7) Other facilities

A maintenance road is to be constructed around the landfill. A gate and fence are to be installed,

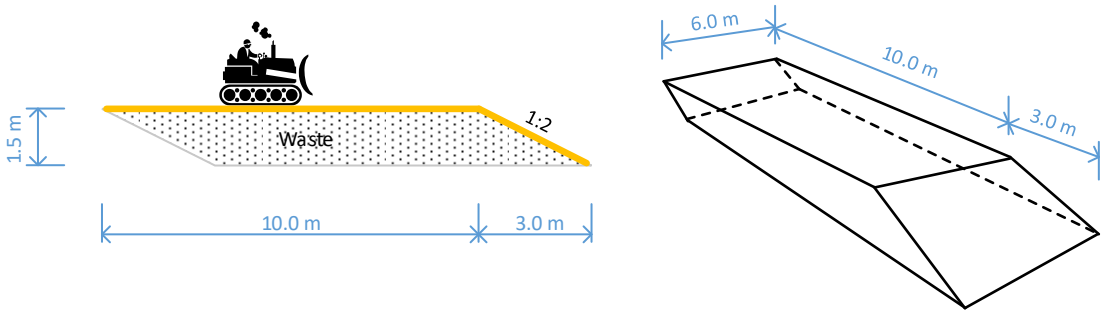
depending on the actual condition of site, while a weighbridge is essential. Furthermore, a storage house, parking, staff house etc. may be necessary.

11.5.3 Operation plan

(1) Daily operation

Unloaded waste is to be appropriately compacted every 0.5 m by heavy equipment. After the waste reaches a height of 1.5 m, it is covered with 10 cm-thick soil at the end of each day. This method uses the landfill space efficiently, as well as minimizes odor, the proliferation of vermin, the scattering of waste etc. This is known as a cell method.

If the landfill receives 90 tons of waste a day, the dimension of the cell will be as below (10 x 6 x 1.5 m = 90 m^3). Here, it is assumed that 90 tons of waste becomes 90 m^3 after compaction.

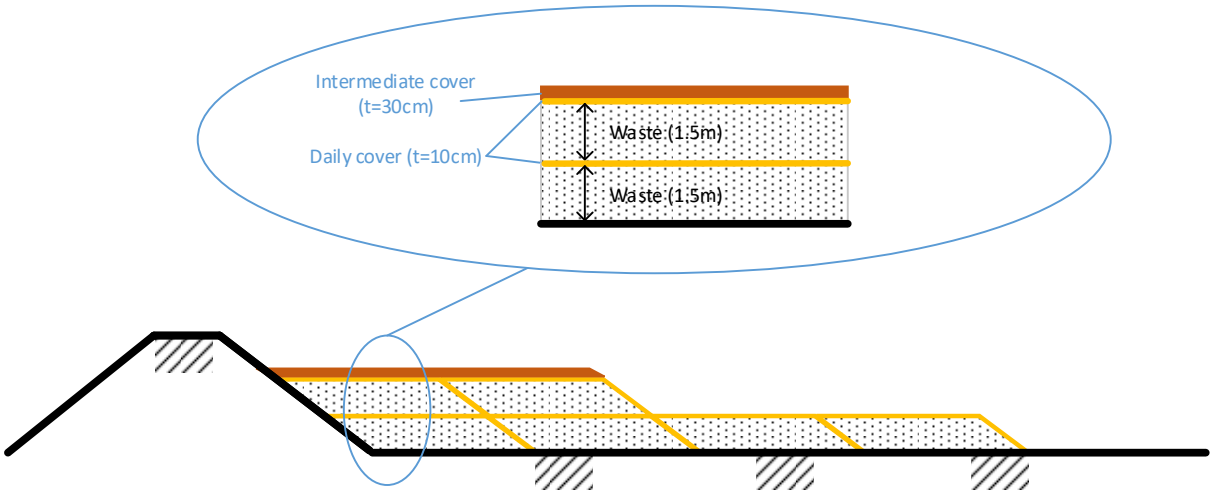


Source: JICA Project Team

Figure 11.5.3 Daily Operation, Cell Method

(2) Intermediate cover

If waste is left for a certain period, such as six months or one year, the waste is to be covered with 30 cm-thick soil. This is called an intermediate cover, which prevents uncontrolled landfill gas emissions, fires and rainfall infiltration. This model design assumes that the intermediate cover is applied at every two daily cells, at approximately every 3.0 m of height.



Source: JICA Project Team

Figure 11.5.4 Intermediate Cover

11.5.4 Maintenance and monitoring plan

(1) Facilities

The following facilities have to be periodically checked for any damage:

(a) Slopes of the solid waste retaining structure
(b) Leachate pumping facility
(c) Leachate pond
(d) Landfill gas removal pipes
(e) Surface water drainage
(f) Maintenance road
(g) Fence, gate etc.

(2) Waste scattering

Scattered waste has to be collected every day. It is advisable to install fence(s) around the workface where waste is unloaded and compacted.

(3) Landfill gas

It has to be periodically checked whether landfill gas is being emitted from somewhere other than the gas removal pipe, if there is any danger of fire etc.

(4) Groundwater

Groundwater has to be monitored at monitoring wells, which are installed in the upstream and in the downstream of the landfill. Monitoring items are listed in the table below. However, the influence of seawater has to be carefully taken into account in case seawater actually intrudes onto the site.

Table 11.5.3 Groundwater Monitoring Items

Frequency	Monitoring items
Monthly	• Groundwater level • Water temperature • pH • Electric conductivity • Total organic carbon • Chloride ion
Yearly (or when any abnormality is found in the monthly monitoring)	Items required in line with Iranian standards

Source: JICA Project Team

(5) Weighbridge

Calibration has to be carried out every year.

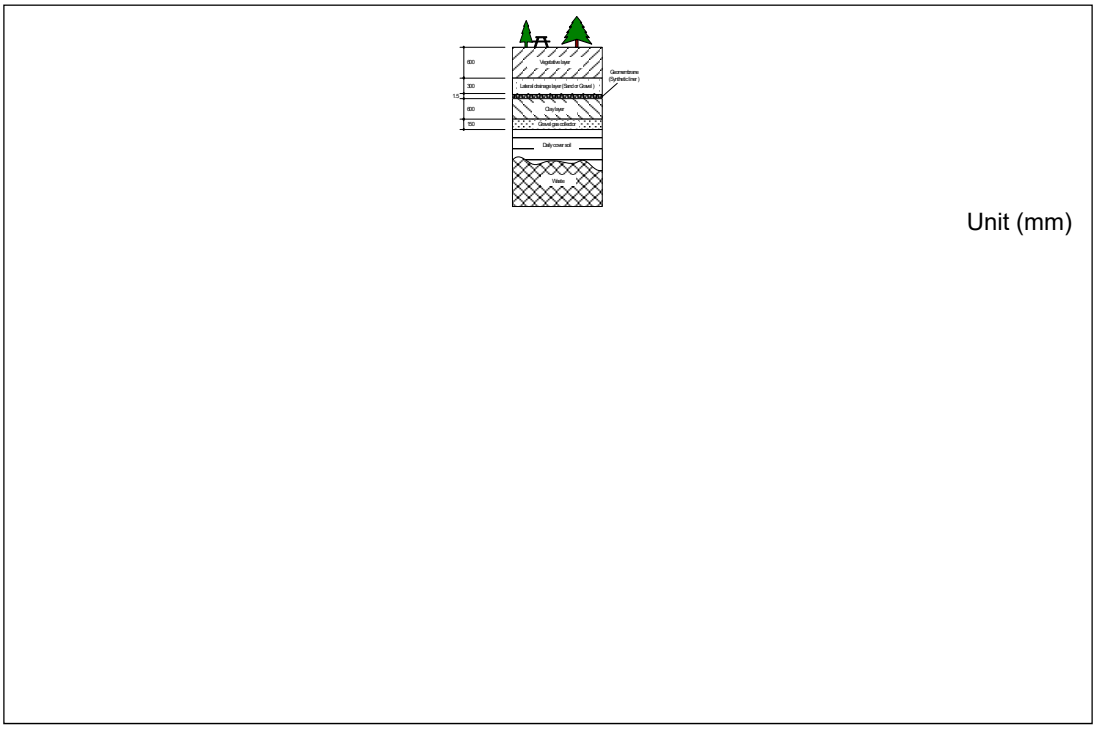
(6) Gate control

Vehicles and persons going in and out have to be recorded at the gate. Unknown visitors should not be allowed to enter the landfill.

11.5.5 Closure and postclosure plan

Once the landfill is occupied with waste, it should be properly closed. The figure below shows the composite final cover, which prevents rainfall infiltrating into the waste, releases landfill gas safely and improves the landscape.

After closing the landfill, the surface of the final cover, the facilities, the landfill gas, the groundwater, etc. have to be monitored periodically as mentioned in Section 12.5.4.



Source: JICA Project Team

Figure 11.5.5 Closure Plan, Final Cover

11.5.6 Preliminary cost estimate

The costs of the sanitary landfill and the controlled disposal site are estimated as follows:

(a) Japanese unit prices are applied, while total amounts in Japanese yen are obtained.
(b) In August 2016, the QUC estimated the cost of the controlled disposal site by applying local prices. The result was that their cost was slightly higher than the previous one. Therefore, no conversion from the cost in Japanese yen to that in Iranian rials was applied.
(c) Thus, the exchange rate, USD 1.00 = JPY 100 as of August 2016, is applied.

The estimated costs are as follows.

Table 11.5.4 Cost Estimate of the Controlled Disposal Site and the Sanitary Landfill

Type of landfill	Total amount (USD)	Unit cost per capacity (USD/m^3)
1) Controlled disposal site	610,946	7.63
2) Sanitary landfill	2,399,770	29.97

Note: Capacity is 80,065 m^3.
Source: JICA Project Team

(1) Controlled disposal site

The table below shows the preliminary cost estimate of the controlled disposal site in detail.

Table 11.5.5 Preliminary Cost Estimate of the Controlled Disposal Site

No.	Work item	Specification	Quantity	Unit	USD
	Direct cost				
1	Solid waste retaining structure				57,346
11	Embankment				
111	Material		0	m^3	
112	Spreading		19,634	m^3	23,561
113	Compaction		19,634	m^3	5,890
12	Slope shaping				
121	Slope shaping		7,970	m2	27,895
2	Lining system				315,372
21	Clay liner				
211	Cutting	Inc. transport	17,972	m^3	26,958
212	Spreading		17,972	m^3	21,566
213	Compaction		17,952	m^3	5,386
22	Impermeable liner				
221	Bottom impermeable liner	HDPE, t=1.5 mm		m^2	0
222	Bottom protection sheet	Nonwoven fabric, t=10.0 mm		m^2	0
223	Slope impermeable liner	HDPE, t=1.5 mm		m^2	0
224	Slope protection sheet	Nonwoven fabric, t=10.0 mm		m^2	0
23	Protection soil				
231	Soil material		6,453	m^3	227,146
232	Spreading		4,840	m^3	34,316
3	Leachate collection and treatment				500
31	Collection pipe				
311	Main perforated pipe	HDPE, dia. 400 mm		m	0
312	Main unperforated pipe	HDPE, dia. 400 mm		m	0
313	Branch perforated pipe	HDPE, dia. 200 mm		m	0
314	Connecting box	500 x 500 x 500 mm		Amount	0
32	Lechite evaporation pond				
321	Cutting	100 x 10 x 0.5 m		m^3	0
322	Impermeable liner	HDPE, t=1.5 mm		m^2	0
323	Protection sheet	Nonwoven fabric, t=10.0 mm		m^2	0
33	Lechite circulation pump				
331	Leachate circulation pump	3.7 kW	1	Amount	500
4	Landfill gas collection and treatment				14,040
41	Vertical gas removal pipe	Steel, dia. 200 mm	12	Amount	14,040
5	Surface water drainage				40,045
51	U-shaped drainage	300 x 300 mm	425	m	34,000
52	Gabion	1200 x 2000 x 500 mm	4	Amount	445
53	Connecting box	600 x 600 x 500 mm	4	Amount	5,600
6	Others				14,000
61	Groundwater monitoring well		2	Amount	14,000
a	Direct cost				441,303
b	Common temporary facilities	b=a*5%			22,065
c	Construction cost	c=a+b			463,368
d	Site management	d=c*7.5%			34,753
e	Total construction cost	e=c+d			498,121
f	Administration cost	f=e*11.5%			57,284
g	Project cost	g=e+f			555,405
h	Physical contingency	h=g*10%			55,541
i	Total project cost	i=g+h			610,946

Source: JICA Project Team

(2) Sanitary landfill

The table below shows the preliminary cost estimate of the sanitary landfill in detail.

Table 11.5.6 Preliminary Cost Estimate of the Sanitary Landfill

No.	Work item	Specification	Quantity	Unit	USD
	Direct cost				
1	Solid waste retaining structure				57,346
11	Embankment				
111	Material		0	m^3	
112	Spreading		19,634	m^3	23,561
113	Compaction		19,634	m^3	5,890
12	Slope shaping				
121	slope shaping		7,970	m^2	27,895
2	Lining system				1,332,508
21	Clay liner				
211	Cutting	Inc. transport	17,972	m^3	26,958
212	Spreading		17,972	m^3	21,566
213	Compaction		17,952	m^3	5,386
22	Impermeable liner				
221	Bottom impermeable liner	HDPE, t=1.5 mm	9,680	m^2	568,216
222	Bottom protection sheet	Nonwoven fabric, t=10.0 mm	9,680	m^2	125,840
223	Slope impermeable liner	HDPE, t=1.5 mm	4,506	m^2	264,502
224	Slope protection sheet	Nonwoven fabric, t=10.0 mm	4,506	m^2	58,578
23	Protection soil				
231	Soil material		6,453	m^3	227,146
232	Spreading		4,840	m^3	34,316
3	Leachate collection and treatment				275,483
31	Collection pipe				
311	Main perforated pipe	HDPE, dia. 400 mm	104	m	46,800
312	Main unperforated pipe	HDPE, dia. 400 mm	27	m	12,150
313	Branch perforated pipe	HDPE, dia. 200 mm	486	m	136,080
314	Connecting box	500 x 500 x 500 mm	1	Amount	333
32	Leachate evaporation pond				
321	Cutting	100 x 10 x 0.5 m	500	m^3	750
322	Impermeable liner	HDPE, t=1.5 mm	1,100	m^2	64,570
323	Protection sheet	Nonwoven fabric, t=10.0 mm	1,100	m^2	14,300
33	Leachate circulation pump				
331	Leachate circulation pump	3.7 kW	1	Amount	500
4	Landfill gas collection and treatment				14,040
41	Vertical gas removal pipe	steel, dia. 200 mm	12	Amount	14,040
5	Surface water drainage				40,045
51	U-shaped drainage	300 x 300 mm	425	m	34,000
52	Gabion	1200 x 2000 x 500 mm	4	Amount	445
53	Connecting box	600 x 600 x 500 mm	4	Amount	5,600
6	Others				14,000
61	Groundwater monitoring well		2	Amount	14,000
a	Direct cost				1,733,422
b	Common temporary facilities	b=a*5%			86,671
c	Construction cost	c=a+b			1,820,093
d	Site management	d=c*7.5%			136,507
e	Total construction cost	e=c+d			1,956,600
f	Administration cost	f=e*11.5%			225,009
g	Project cost	g=e+f			2,181,609
h	Physical contingency	h=g*10%			218,161
i	Total project cost	i=g+h			2,399,770

Source: JICA Project Team

11.5.7 Drawings

The following drawings are presented on the next pages.

(1) Plain views

(a) Controlled disposal site (completion status)
(b) Sanitary landfill (completion status)
(c) First layer (bottom) of the controlled disposal site and sanitary landfill
(d) Second layer of the controlled disposal site and sanitary landfill
(e) Third layer of the controlled disposal site and sanitary landfill
(f) Leachate collection system of the sanitary landfill
(g) Overview of the whole disposal site

(2) Vertical cross-sectional views

(h) Controlled disposal site
(i) Sanitary landfill

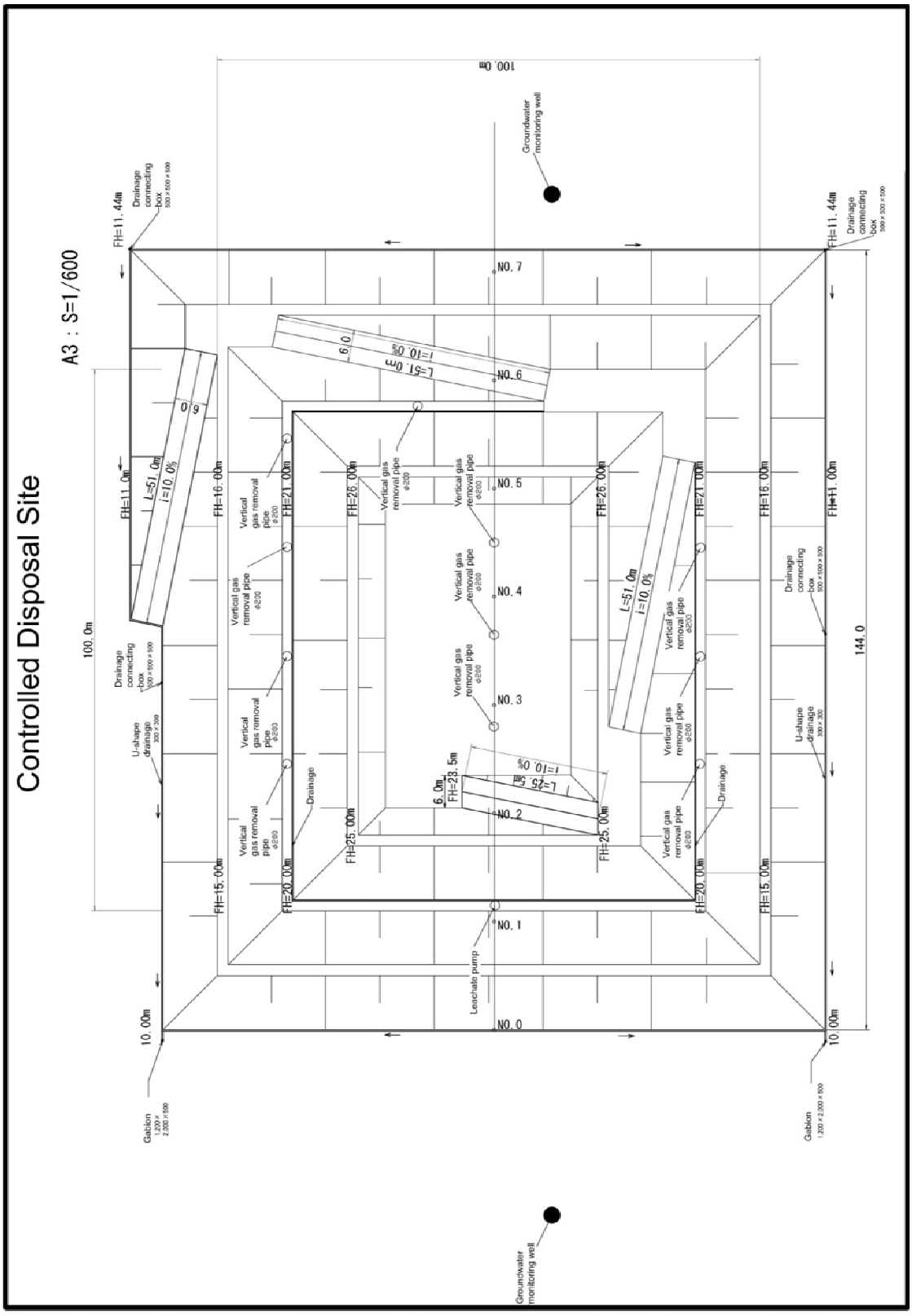
(3) Cross-sectional view

(j) Sanitary landfill and controlled disposal site

(4) Typical cross section

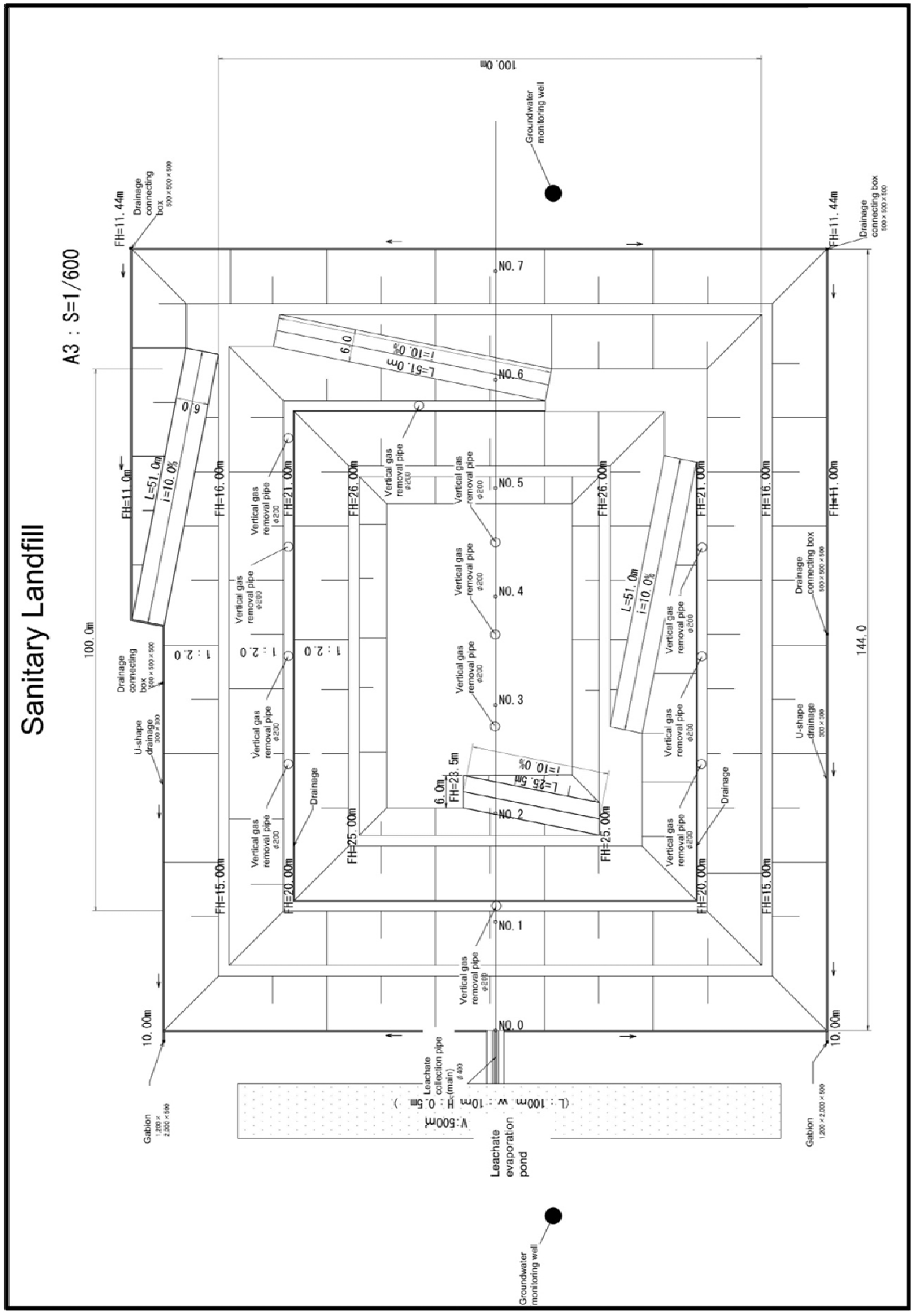
(k) Leachate collection facility

The calculation of landfill capacity using the average cross-sectional area method is shown in Table 11.5.7.



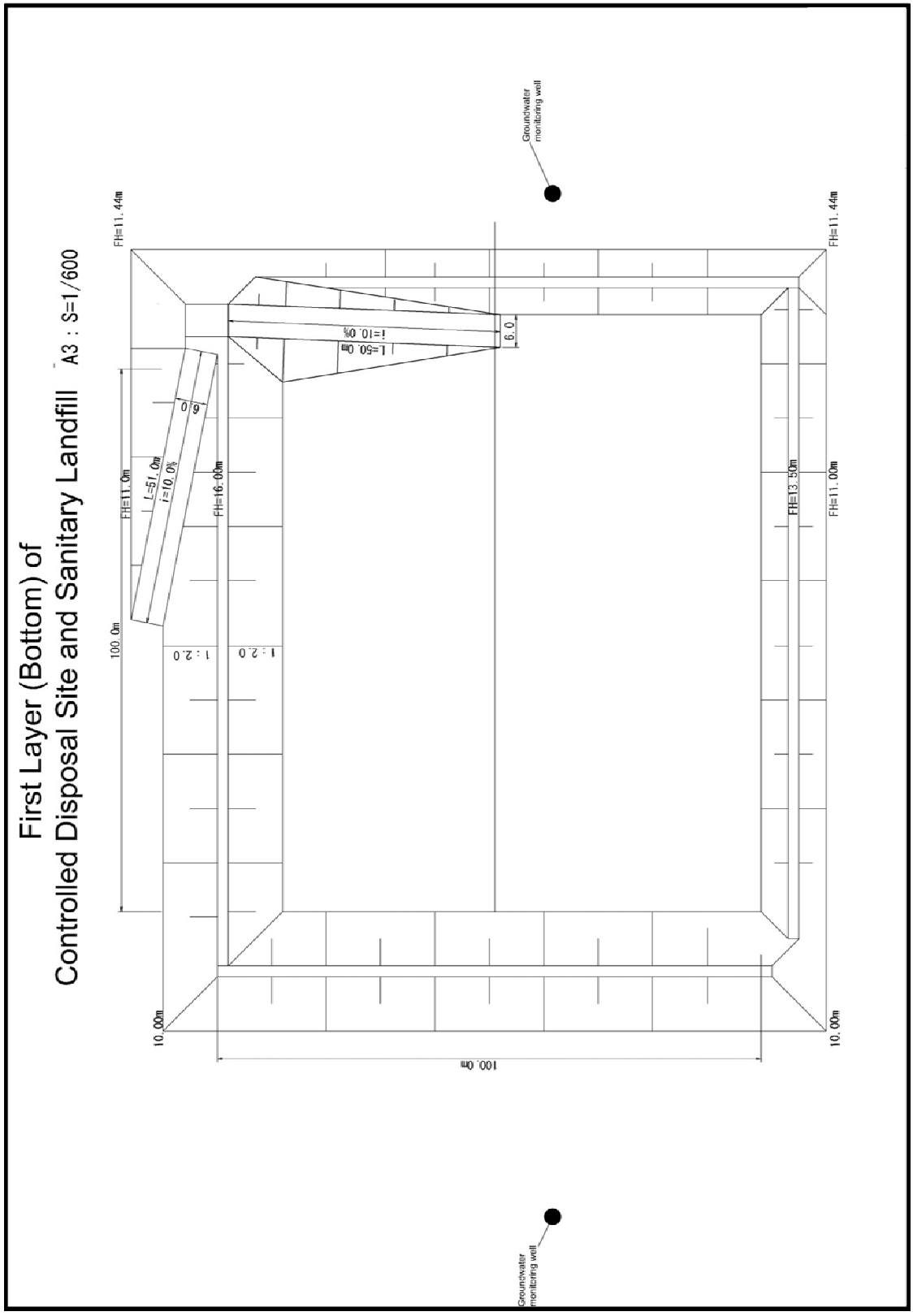
Source: JICA Project Team

Figure 11.5.6 Plan View of the Controlled Disposal Site (Completion Status)



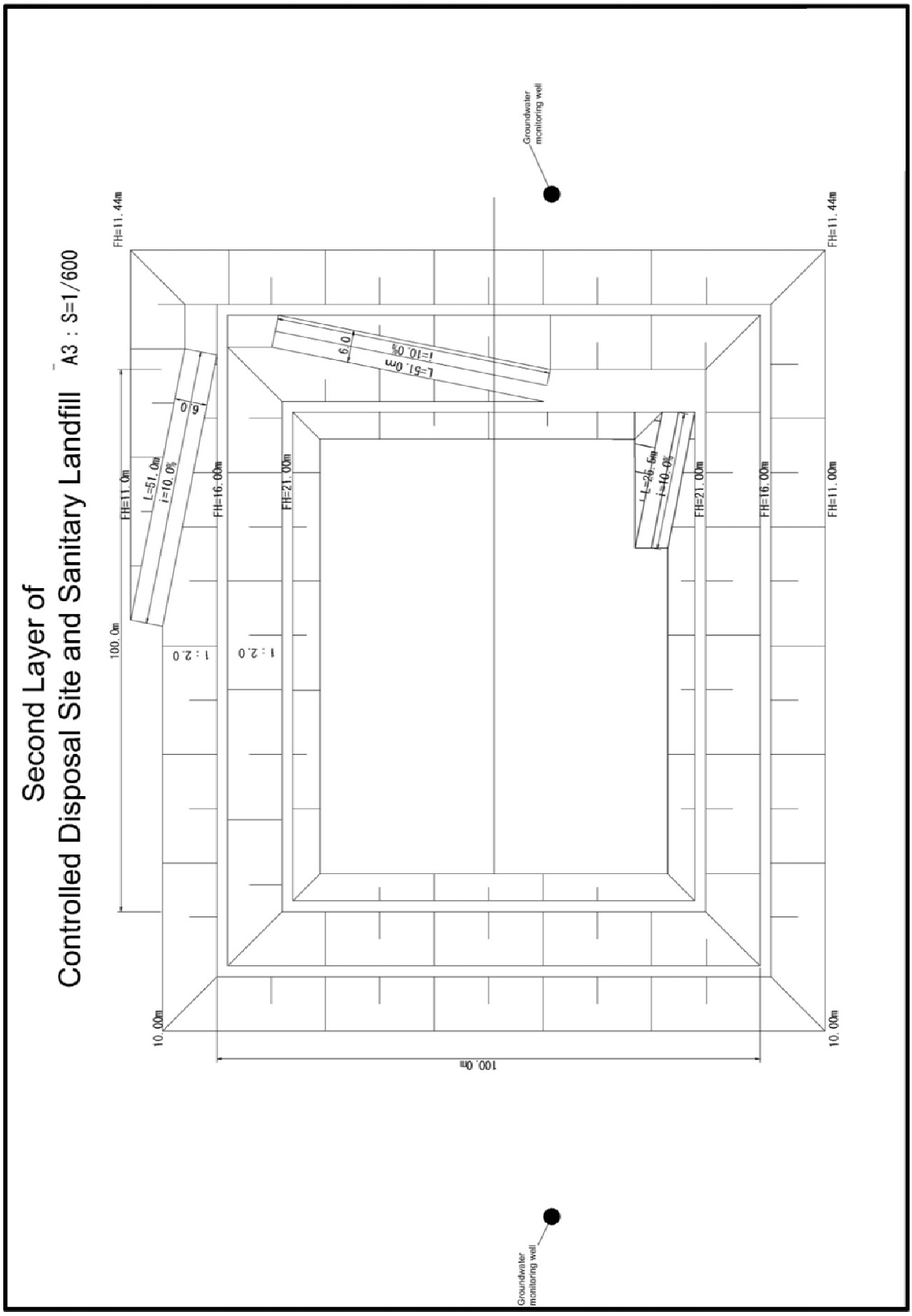
Source: JICA Project Team

Figure 11.5.7 Plan View of the Sanitary Landfill (Completion Status)



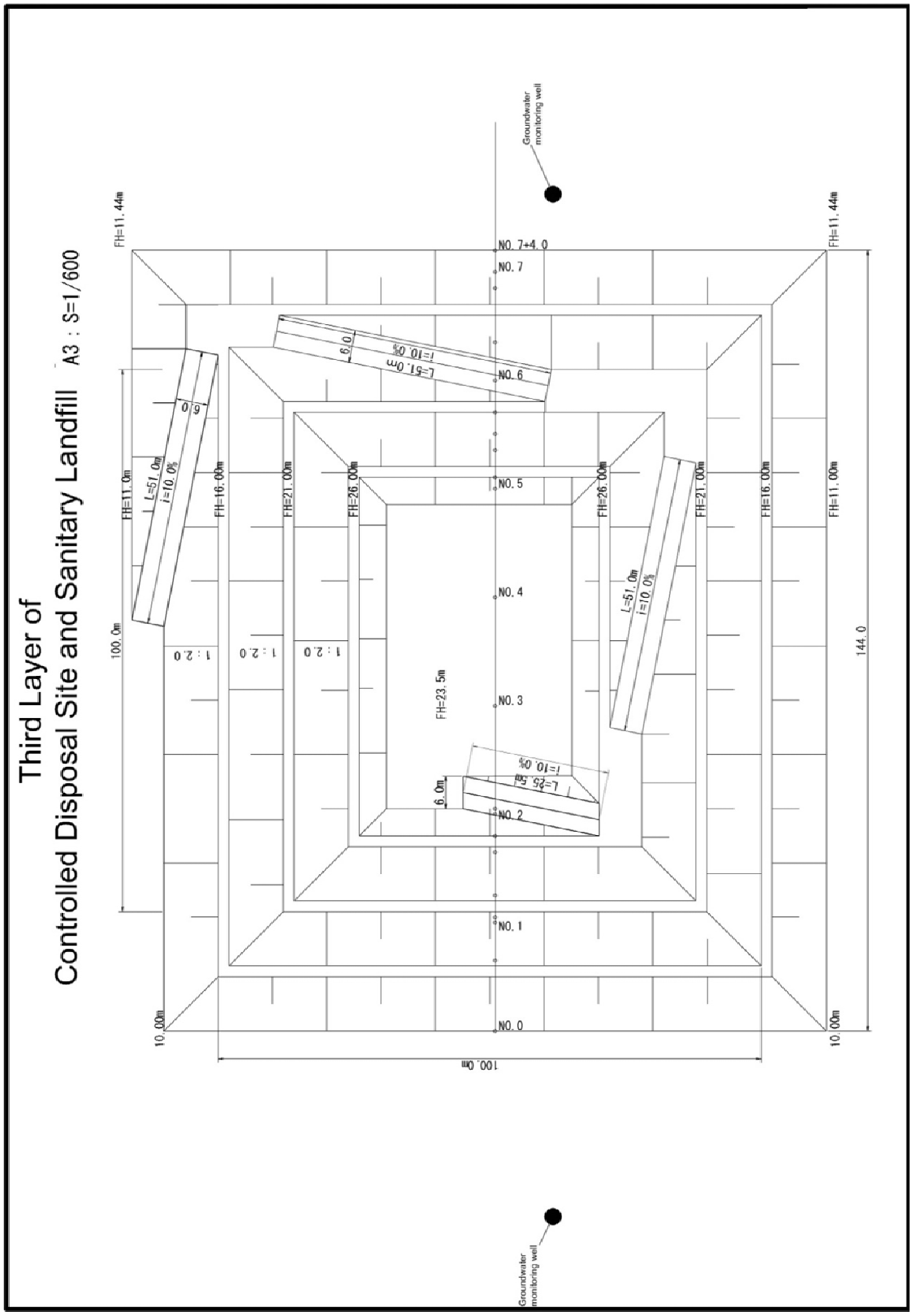
Source: JICA Project Team

Figure 11.5.8 Plan View of the First Layer (Bottom) of the Controlled Disposal Site and Sanitary Landfill



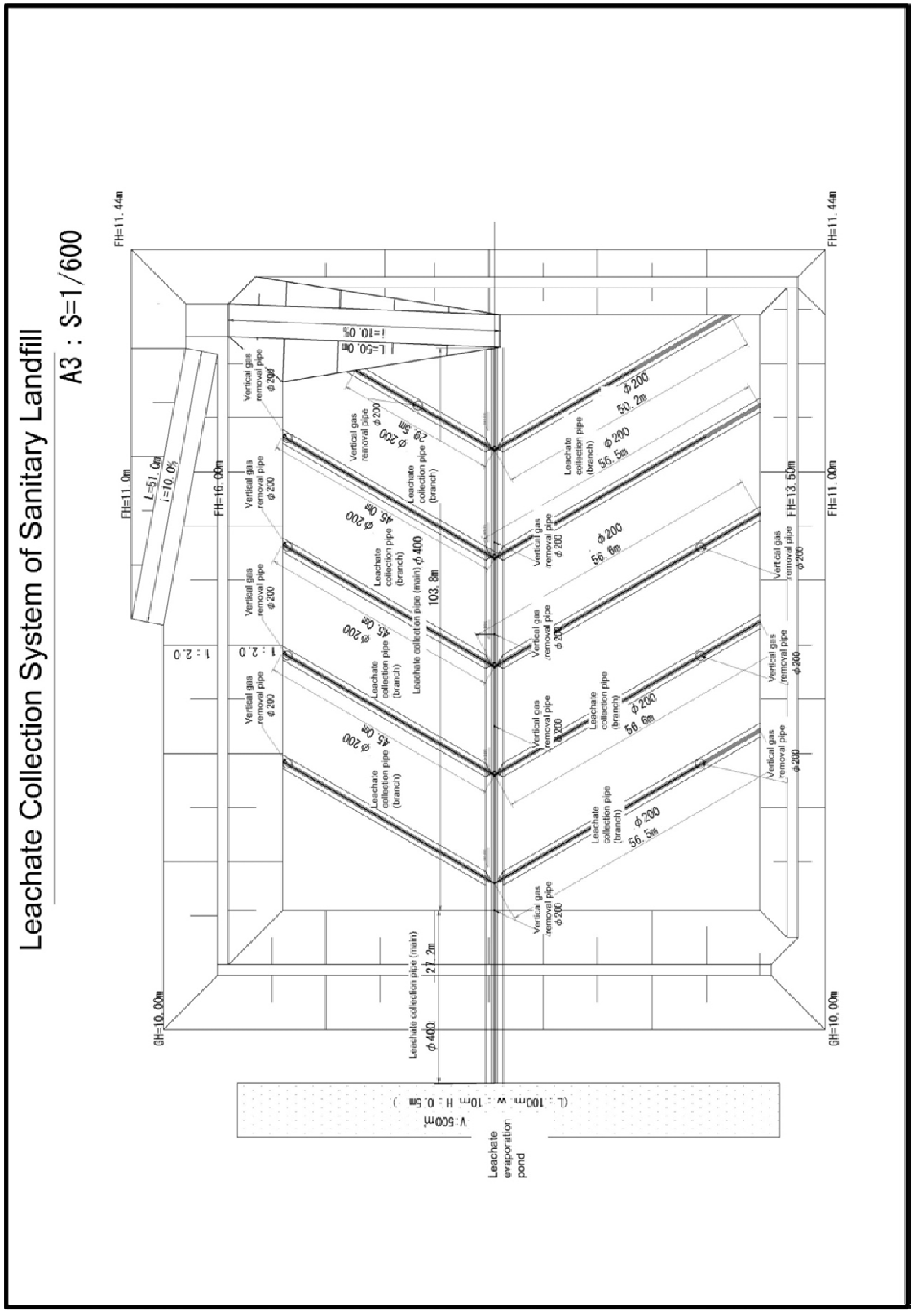
Source: JICA Project Team

Figure 11.5.9 Plan View of the Second Layer of the Controlled Disposal Site and Sanitary Landfill



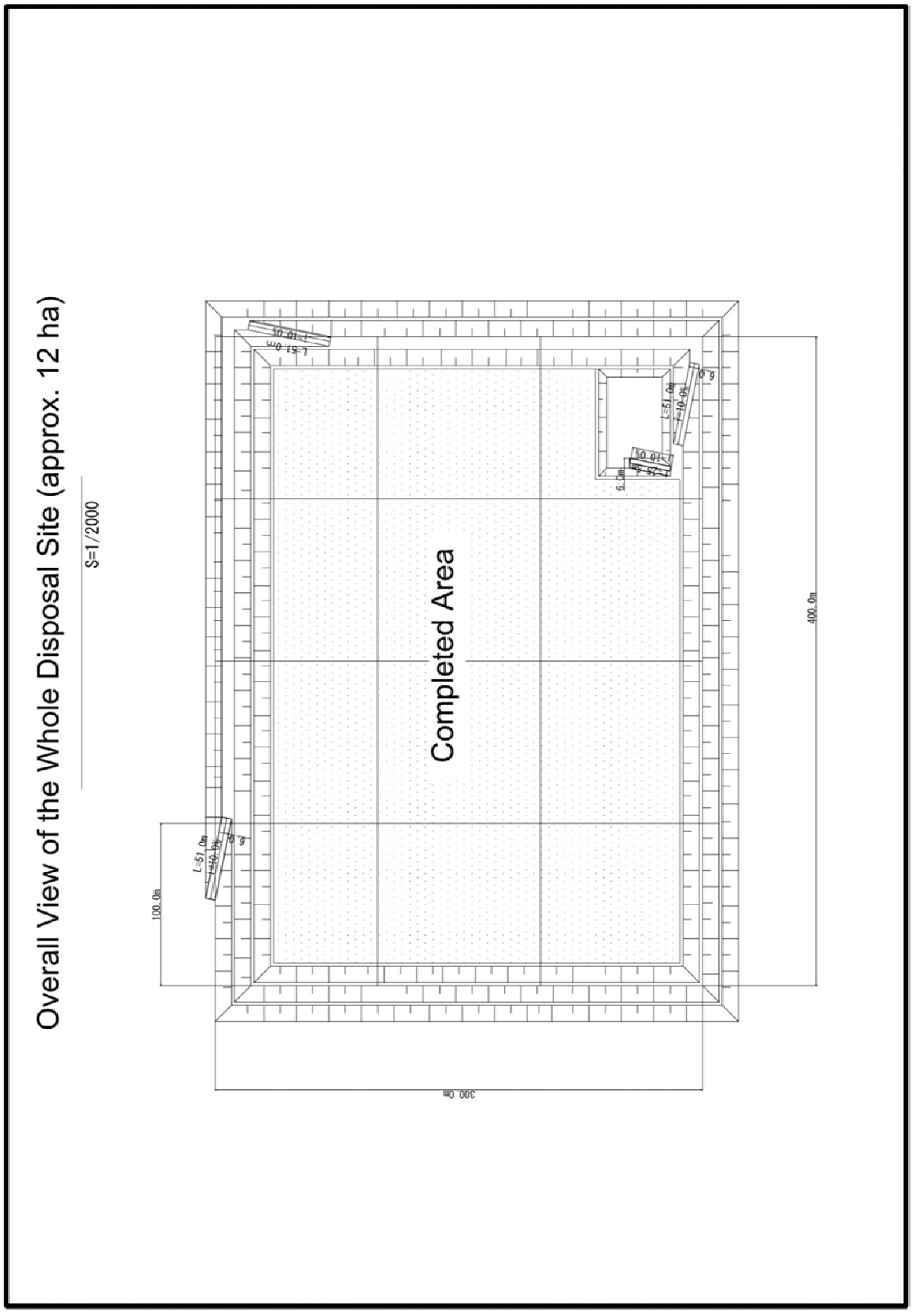
Source: JICA Project Team

Figure 11.5.10 Plan View of the Third Layer of the Controlled Disposal Site and Sanitary Landfill



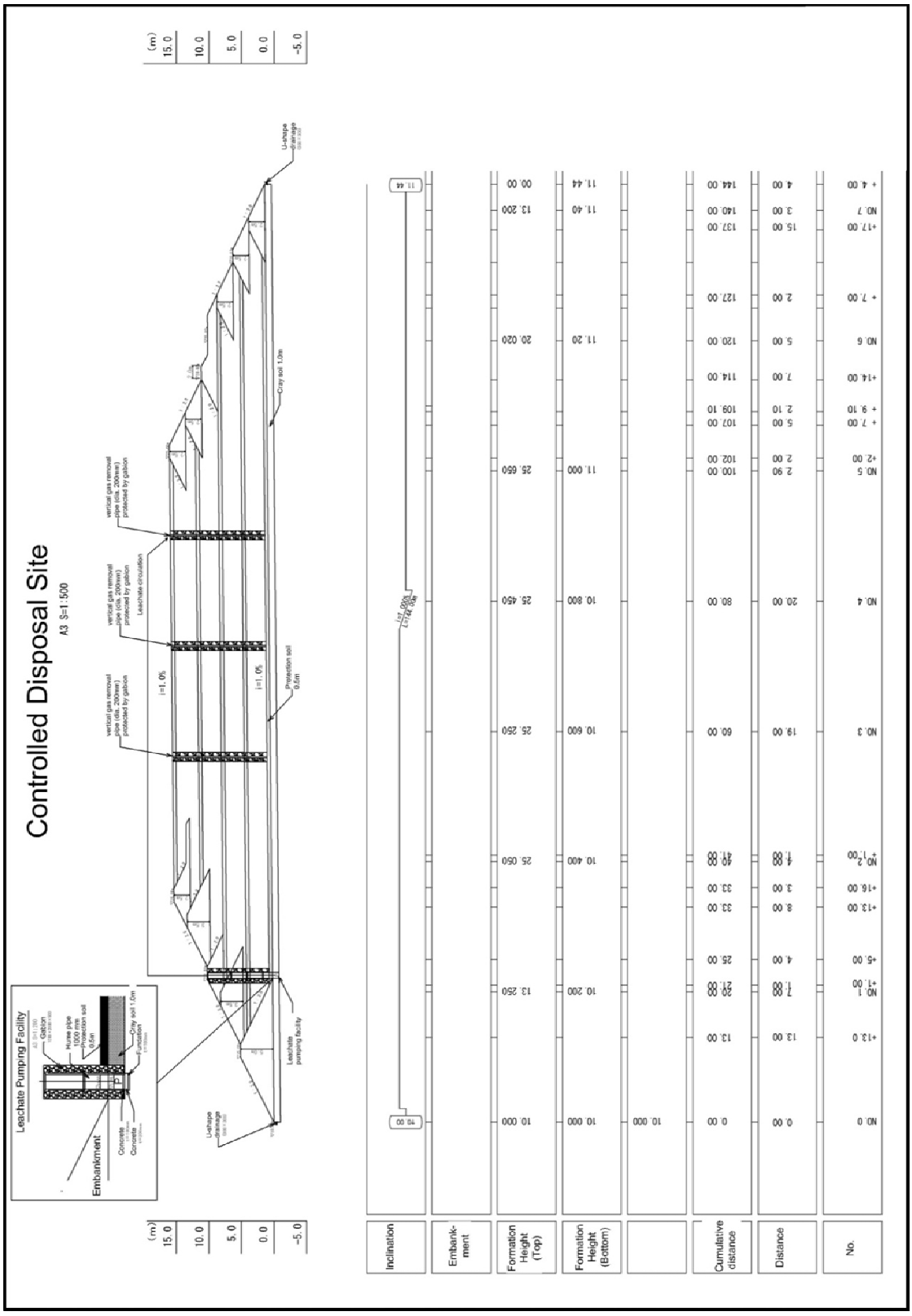
Source: JICA Project Team

Figure 11.5.11 Plan View of the Leachate Collection System of the Sanitary Landfill



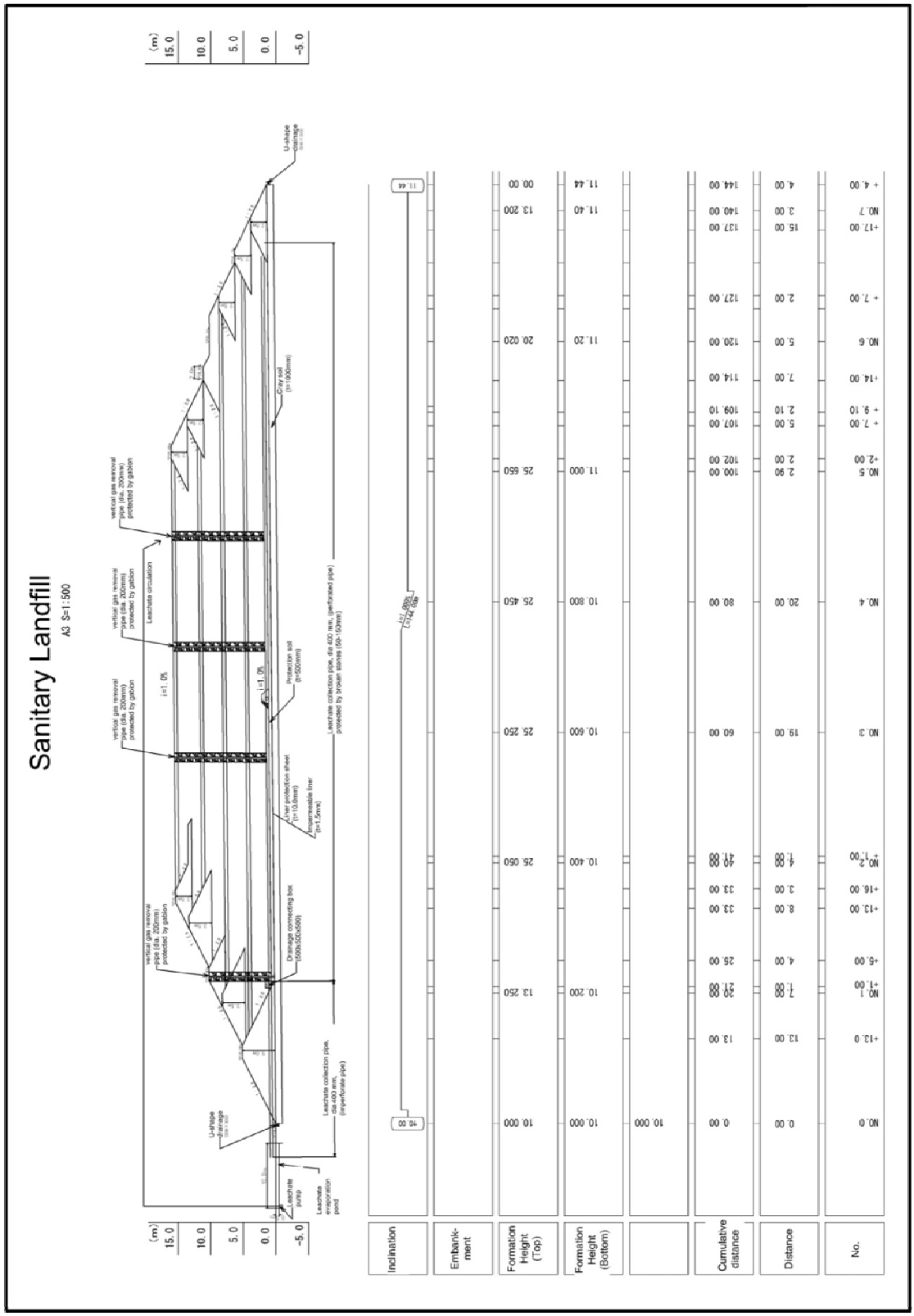
Source: JICA Project Team

Figure 11.5.12 Plan View of the Overview of the Whole Disposal Site



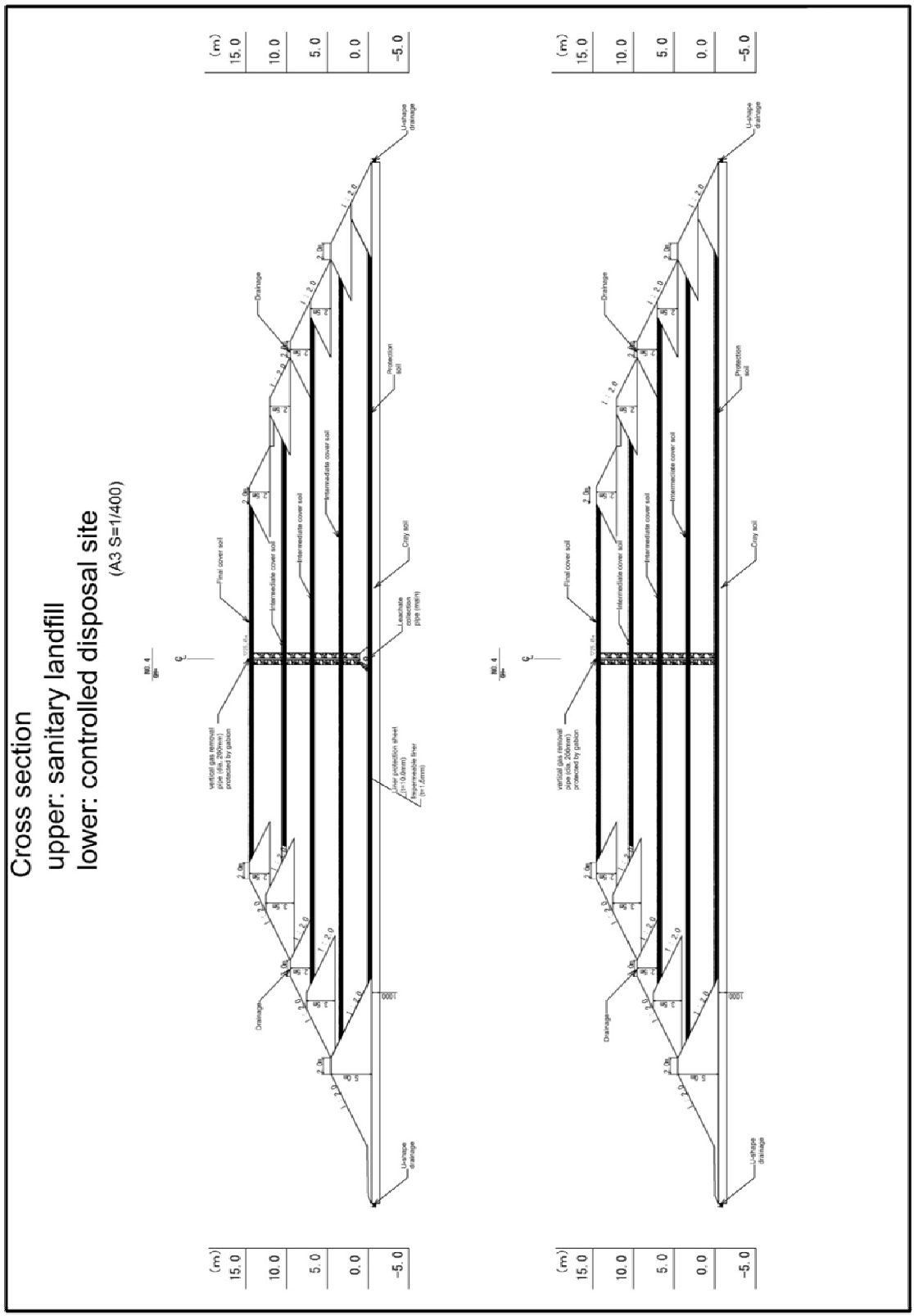
Source: JICA Project Team

Figure 11.5.13 Vertical Cross-sectional View of the Controlled Disposal Site



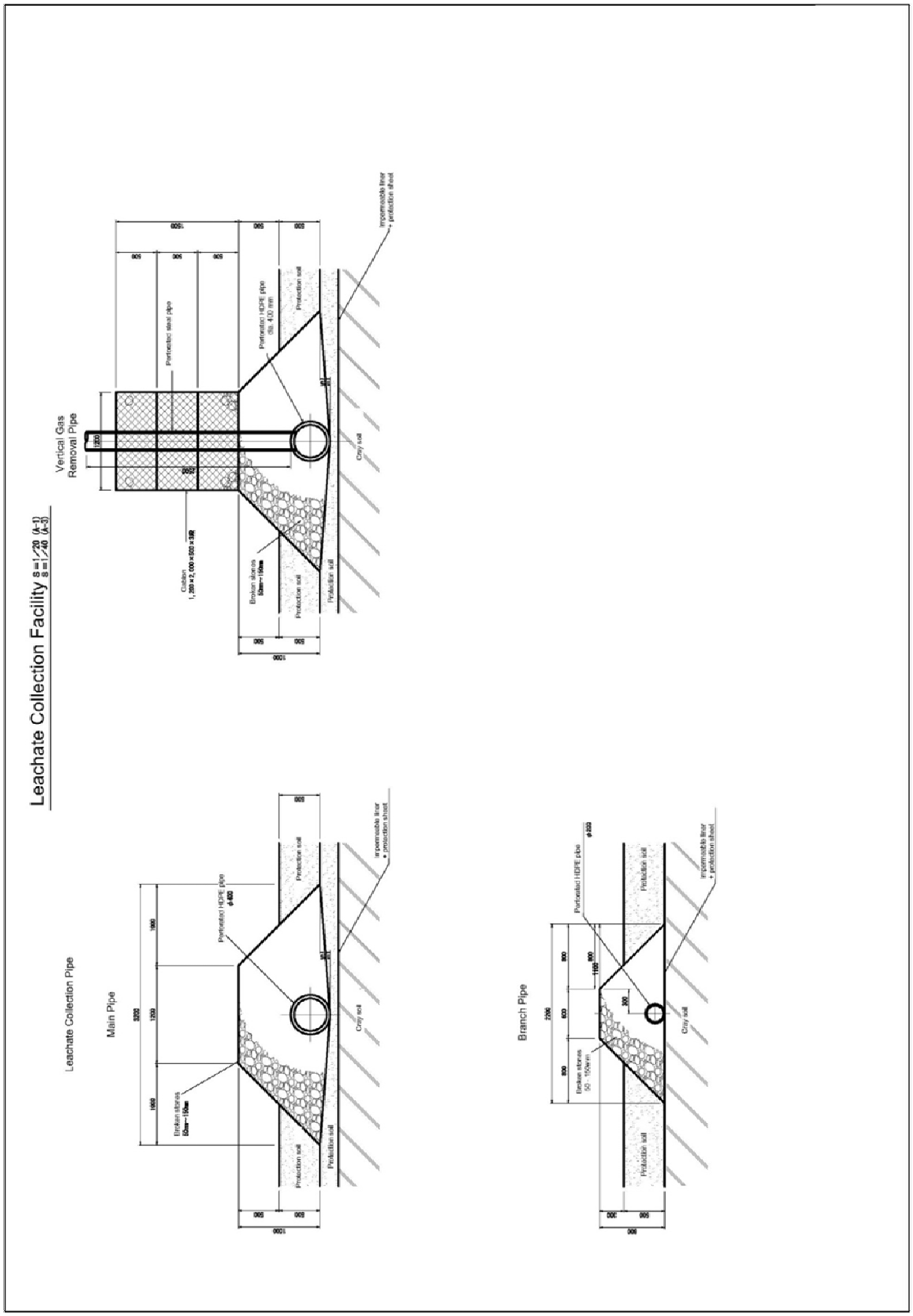
Source: JICA Project Team

Figure 11.5.14 Vertical Cross-sectional View of the Sanitary Landfill



Source: JICA Project Team

Figure 11.5.15 Cross-sectional View of the Sanitary Landfill and Controlled Disposal Site



Source: JICA Project Team

Figure 11.5.16 Typical Cross Section of the Leachate Collection Facility

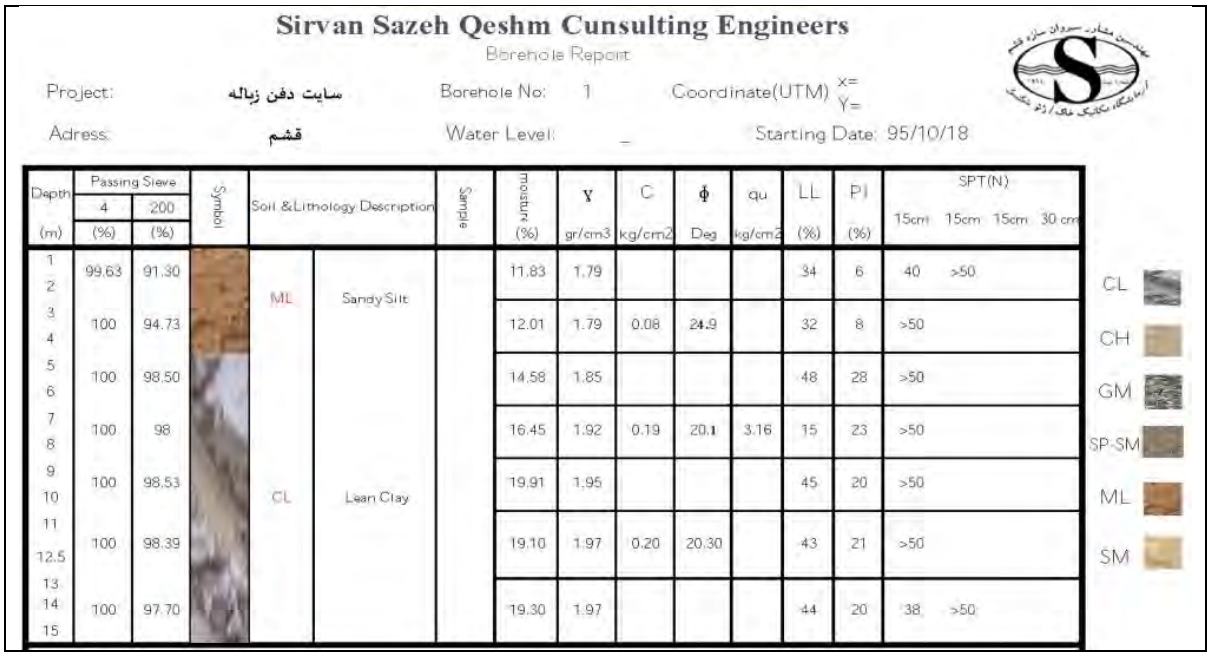
Table 11.5.7 Calculation of Landfill Capacity (Average Cross-sectional Area Method)

No.	Distance	Waste			Cover soil			Embankment			Total
		Area m^2	Avg. m^2	Vol. m^3	Area m^2	Avg. m^2	Vol. m^3	Area m^2	Avg. m2	Vol. m^3	Vol. m^3
0	0										
0 + 13	13.0	0.0	0.0	0.0	0.0	0.0	0.0	869.0	434.5	5,648.5	5,648.5
1	7.0	266.0	133.0	931.0	95.0	47.5	332.5	609.0	739.0	5,173.0	6,436.5
1 + 1	1.0	320.0	293.0	293.0	95.0	95.0	95.0	590.0	599.5	599.5	987.5
1 + 5	4.0	655.0	487.5	1,950.0	143.0	119.0	476.0	252.0	421.0	1,684.0	4,110.0
1 + 13	8.0	655.0	655.0	5,240.0	143.0	143.0	1,144.0	480.0	366.0	2,928.0	9,312.0
1 + 16	3.0	734.0	694.5	2,083.5	143.0	143.0	429.0	453.0	466.5	1,399.5	3,912.0
2	4.0	825.0	779.5	3,118.0	168.0	155.5	622.0	320.0	386.5	1,546.0	5,286.0
2 + 1	1.0	834.0	829.5	829.5	189.0	178.5	178.5	325.0	322.5	322.5	1,330.5
3	19.0	859.0	846.5	16,083.5	191.0	190.0	3,610.0	274.0	299.5	5,690.5	25,384.0
4	20.0	858.0	858.5	17,170.0	190.0	190.5	3,810.0	265.0	269.5	5,390.0	26,370.0
5	20.0	826.0	842.0	16,840.0	188.0	189.0	3,780.0	316.0	290.5	5,810.0	26,430.0
5 + 3	2.0	788.0	807.0	1,614.0	167.0	177.5	355.0	365.0	340.5	681.0	2,650.0
5 + 7	5.0	691.0	739.5	3,697.5	142.0	154.5	772.5	434.0	399.5	1,997.5	6,467.5
5 + 11	4.0	691.0	691.0	2,764.0	142.0	142.0	568.0	529.0	481.5	1,926.0	5,258.0
5 + 14	3.0	519.0	605.0	1,815.0	142.0	142.0	426.0	374.0	451.5	1,354.5	3,595.5
6	6.0	332.0	425.5	2,553.0	142.0	142.0	852.0	519.0	446.5	2,679.0	6,084.0
6 + 7	7.0	226.0	279.0	1,953.0	102.0	122.0	854.0	537.0	528.0	3,696.0	6,503.0
6 + 17	10.0	0.0	113.0	1,130.0	0.0	51.0	510.0	423.0	480.0	4,800.0	6,440.0
7	3.0	0.0	0.0	0.0	0.0	0.0	0.0	236.0	329.5	988.5	988.5
7 + 4	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	118.0	472.0	472.0
	144.0			80,065.0			18,814.5			54,786.0	153,665.5

Source: JICA Project Team

11.5.8 Modification of model design for controlled disposal site

The QFZO conducted a boring survey to investigate soil strata at the selected landfill site in the east of the island. The results of the boring survey revealed a clay layer that is deeper than 4 m from the surface, while no groundwater table was found from the surface up to a depth of 15 m (Figure 11.5.17). Therefore, an artificial impermeable layer is not required for the new landfill design at the selected site.



Sirvan Sazeh Qeshm Cunsulting Engineers

Borehole Report

Project: سایت دفن زباله Borehole No: 1 Coordinate(UTM) X= Y=

Adress: قشم Water Level: _ Starting Date: 95/10/18

Depth (m)	Passing Sieve 4 (%)	Passing Sieve 200 (%)	Symbol	Soil &Lithology Description		Sample	moisture (%)	γ gr/cm3	C kg/cm2	ϕ Deg	qu kg/cm2	LL (%)	PI (%)	SPT(N) 15cm	15cm	15cm	30 cm
1	99.63	91.30		ML	Sandy Silt		11.83	1.79				34	6	40	>50		
2																	
3	100	94.73					12.01	1.79	0.08	24.9		32	8	>50			
4																	
5	100	98.50					14.58	1.85				48	28	>50			
6																	
7	100	98					16.45	1.92	0.19	20.1	3.16	15	23	>50			
8																	
9	100	98.53		CL	Lean Clay		19.91	1.95				45	20	>50			
10																	
11	100	98.39					19.10	1.97	0.20	20.30		43	21	>50			
12.5																	
13																	
14	100	97.70					19.30	1.97				44	20	38	>50		
15																	

CL
CH
GM
SP-SM
ML
SM

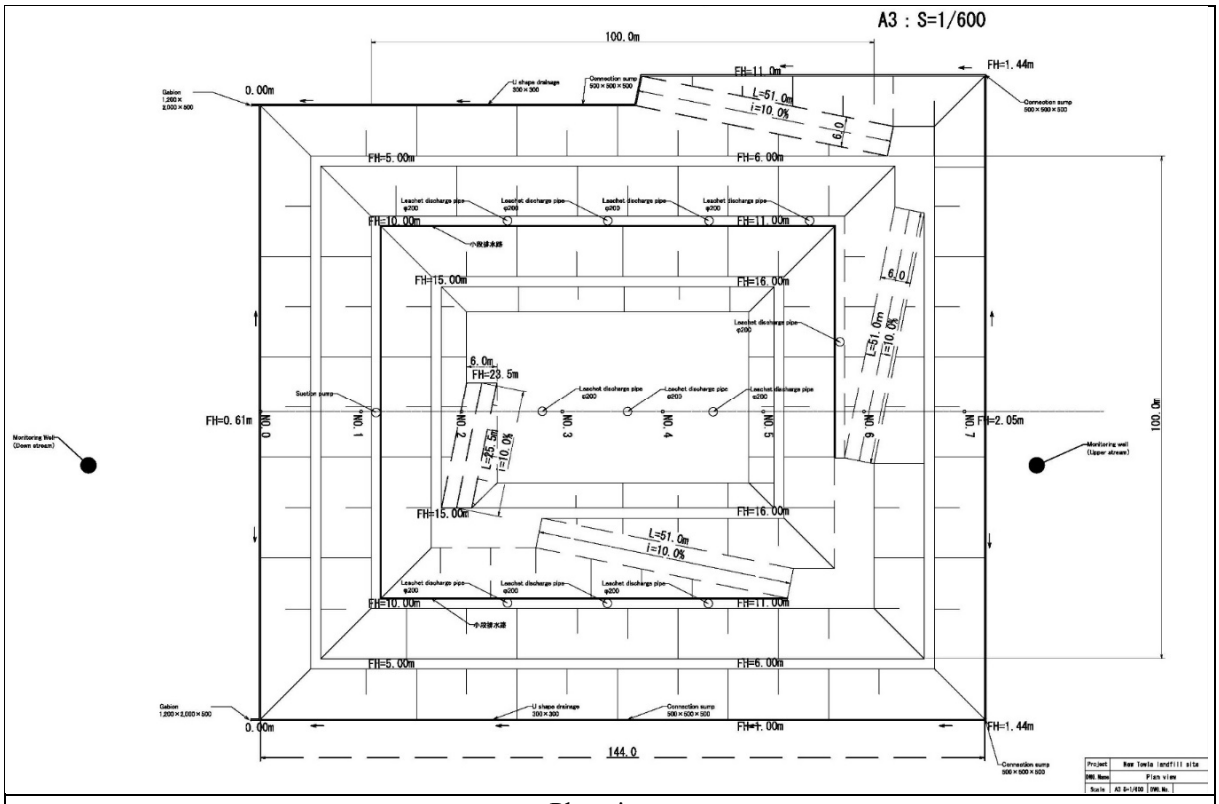
Source: Qeshm Free Zone Organization.

Figure 11.5.17 Results of the Boring Test

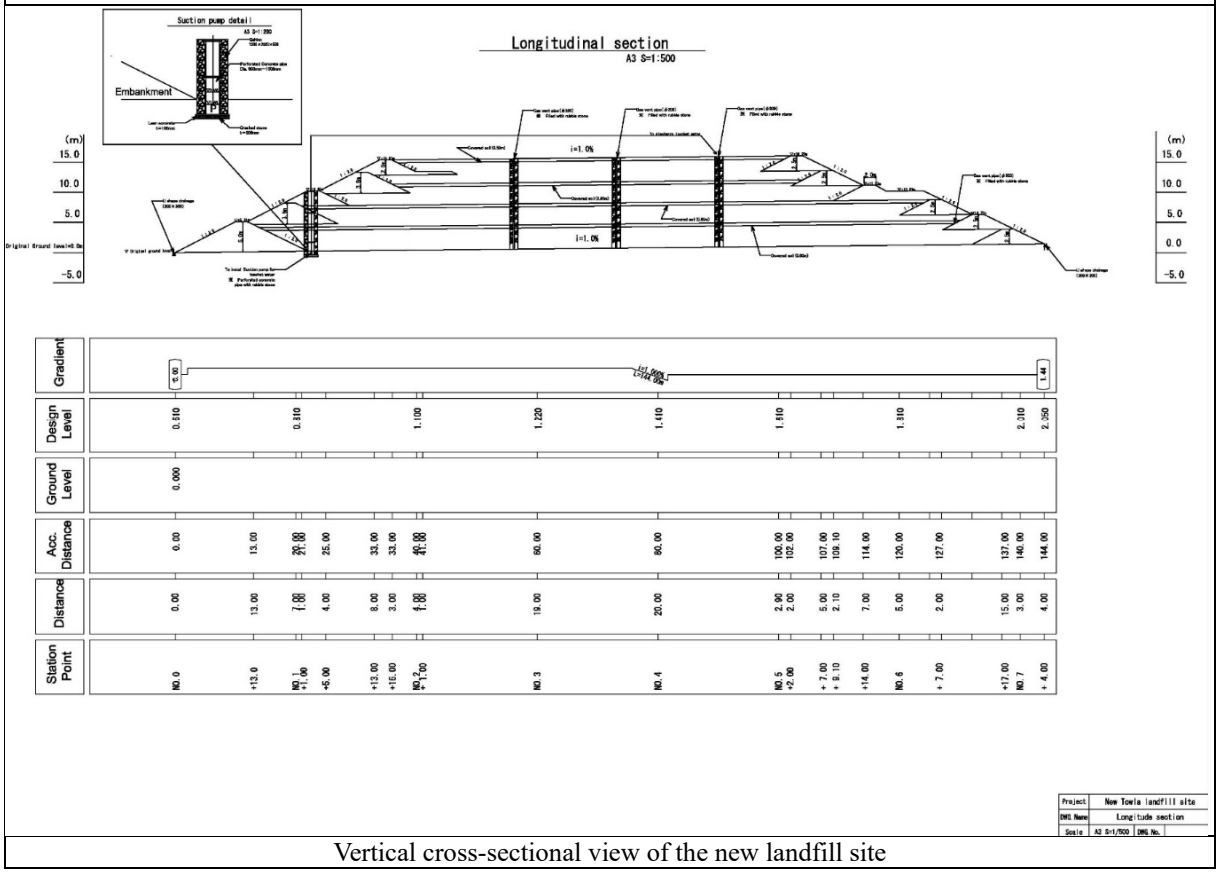
The model design of the landfill site was revised to cover the following items. The cost of the new landfill site is revised to 174,341 USD.

- The type of landfill is a controlled landfill
- Protection soil was removed from the design
- The clay soil layer was removed from the design
- A leachate collection facility was removed from the design
- The landfill volume is maintained as per the model design

Figure 11.5.18 shows the plan view and vertical cross-sectional view of new land fill site.



Plan view



Vertical cross-sectional view of the new landfill site

Source: JICA Project Team.

Figure 11.5.18 Plan View of the Landfill Site

CHAPTER 12 PILOT PROJECT IMPLEMENTATION

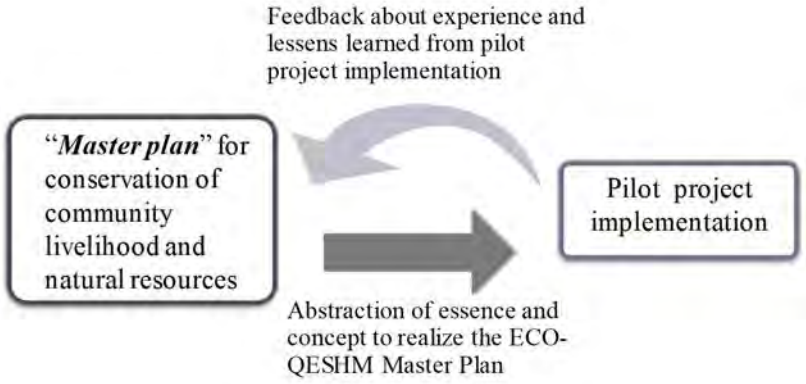
12.1 Formulation of the Pilot Project

12.1.1 Objectives of the pilot project

The objectives of the pilot project implementation are as follows:

(a) To respond to the imminent needs expressed by local residents
(b) To demonstrate the effectiveness of priority projects in improving the livelihood of local residents and the conservation of natural resources
(c) To experiment with the procedure and mechanism of a participatory approach to regional development based on bottom-up processes or local initiatives

The implementation of the pilot projects will help to clarify the effectiveness and necessary improvements to the ECO-QESHM Master Plan. The pilot projects must be formulated in line with the vision and objectives proposed in the ECO-QESHM Master Plan and the sector development plans. The interaction between the pilot project implementation and the ECO-QESHM Master Plan is depicted in Figure 5.1.1.



Source: JICA Project Team

Figure 12.1.1 Interaction between the Pilot Project Implementation and the ECO-QESHM Master Plan

In the process of formulating and implementing the pilot project, a participatory approach was adopted. The reasons for adopting a participatory approach are as follows:

(a) To properly comprehend the needs of the residents in rural areas
(b) To enhance the possibility for improving the living conditions of the local residents
(c) To demonstrate a new development model on Qeshm Island
(d) To strengthen the institutional capability for community development, which contributes to operation and maintenance in the long term

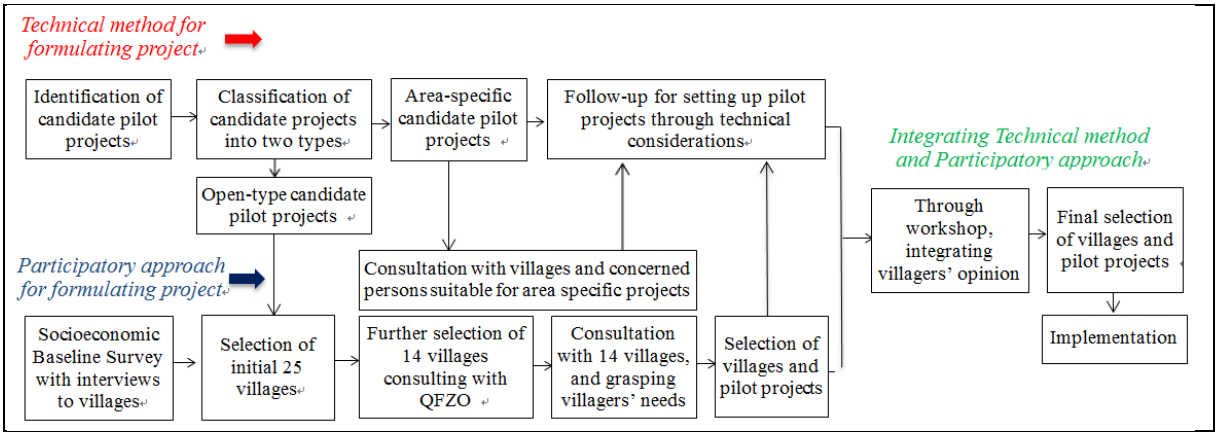
12.1.2 Procedure for pilot project formulation

A socioeconomic baseline survey was carried out by the JPT in all the villages to collect information from and identify the needs of villagers. The outcomes of the survey revealed the issues currently faced by villagers, as well as those relating to the future, if no action is taken to resolve the problem factors. The JPT conducted site visits, interviews and workshops with experts from the appropriate departments of the QFZO and Qeshm Country. The JPT has been in discussions with knowledgeable persons, such as university professors, environmental experts and those who are informed about the local conditions.

Firstly, the JPT identified the candidate pilot projects based on the baseline survey, field surveys and discussions. Those pilot projects were examined with a view to meeting the needs of local residents and identifying the technical issues for environmental conservation and livelihood improvement. Secondly, the candidate projects were classified as either an area-specific or an open-type project from the point of view of approaches towards formulating the pilot projects. Since the former has concrete conditions for implementing the pilot projects, due to the content of the project activities, the candidate village is very limited. For example, an ecotour in Hara's mangrove forests must be carried out on site and in the surrounding villages. The latter has fewer requirements when it comes to selecting the villages than the area-specific type. For example, souvenir promotion can be promoted in villages with local cultural treasures, which ordinary people are currently unaware of.

Thirdly, 14 candidate villages for the open-type project were selected out of 57 villages, based on the outcomes of the baseline survey and discussions between the JPT and the QFZO. A supplemental baseline survey was carried out on the 14 selected villages to evaluate the effects of pilot project implementation. The open-type candidate pilot projects were presented to the villagers, with new ideas for the pilot projects collected in the supplemental survey.

The procedure for pilot project formulation is shown in Figure 12.1.2.



Source: JICA Project Team

Figure 12.1.2 Procedure for Pilot Project Formulation

12.1.3 Pilot project selection

(1) Area-specific pilot projects

The area-specific candidate pilot projects are shown in Table 12.1.1. The table includes all candidate pilot projects suggested by the JPT and the QFZO, informed by experience and knowledge relevant to each area of expertise. Needless to say, all the candidates were considered to meet the needs of local people, as well as reflect the eco-island concept. Among these candidates, priority is given to those that meet the following conditions:

(a) Technical validity and maturity in implementing pilot projects
(b) Replication of the successful pilot projects in other villages
(c) No overlap with other projects implemented by the QFZO and the UNDP-GEF Small Grants Programme
(d) Interest expressed by local residents
(e) The QFZO's willingness to implement the pilot projects on its own initiative

Regarding the above conditions, the priority pilot projects are marked with * in the table.

Table 12.1.1 Candidate Pilot Projects Using the Area-specific Approach

Project name	Objectives	Project site	Activities
1. Tourism promotion sector			
1.1 Ecotourism package*	Preservation and efficient utilization of nature	Hara Mangrove Reserve and its surrounding areas	(i) Infrastructure (wood deck, bird-watching tower), (ii) ecotour route development, (iii) traditional and cultural tour route development, (iv) ecotour guide training, (v) environmental education and awareness-raising (waste management etc.)
1.2 Gouron Traditional Museum*	Preservation of traditional shipbuilding technology	Gouron	(i) Exhibition of shipbuilding process, (ii) exhibition of traditional shipbuilding devices and tools
1.3 Laft ecovillage urban design competition*	Creation of an ecological village development model	Laft	(i) Introduction of Japanese culture-oriented development experiences and workshops to explore a desirable future image, (ii) ecovillage urban design competition, (iii) follow-up to implement the proposed action plan
1.4 Tourism information center	Provision of comprehensive tourism information to tourists	Sohil	(i) Provision of information on cities, such as Qeshm and Dargahan, roads, hotels, geosites, guest houses, restaurants and guided tours, (ii) introduction of visitor records, (iii) souvenir sales, (iv) provision of miniature traditional farming and herb farming, (v) training for tourism-related business
1.5 Guideline preparation for dolphin tourism	Realization of sustainable dolphin tourism	Offshore, Hangom	(i) Training of tour guides, (ii) establishment of rules for dolphin tourism, (iii) experimental application of the rules
1.6 Conservation of turtle nesting sites	Enhanced preservation of turtle nesting sites	Shibderaz	(i) Identification and visualization of nesting and feeding areas of sea turtles, (ii) undertake study tours to understand the importance of the nesting areas and preservation policy, (iii) provision of training for tour guides, (iv) preparation of a preservation plan
1.7 Culture Center in Qeshm City	Preservation and enhancement of traditional values	Qeshm City	(i) Establishment of an atelier for making the oud (traditional musical instrument), (ii) regular oud concerts and other traditional performances, (iii) display of the Lenji boat (traditional boat) and Iranian handicrafts, (iv) educational program for students on Qeshm
1.8 Tourist signage installation	Installation of signage in a strategic manner	Geosite locations	(i) Preparation of a signage installation plan, (ii) clarification of characteristics at each geosite and preparation of a tourist attraction plan, (iii) installation of signage
1.9 Geopark locavore cafe network	Enhancement of the attractiveness of geosites via high-quality services to tourists	Stars Valley, for example (close to a geosite)	Establishment of outdoor locavore cafes with small gardening area supplying locally grown fruit and vegetables
1.10 Geopark biking trail	Promotion of a slow-moving pace in beautiful landscapes	Between G1 and G2 geosites	(i) Preparation of plan, design and construction, (ii) simple duplicability in other geosites as the island is narrow and long enough (for use from September to April)
1.11 Improving the existing guest house buildings	Protecting cultural heritage	Laft	(i) Restudy the existing guest houses on the island, (ii) plan, redesign and prepare an operation action plan, (iii) create a high-level standard guest house, (iv) grade in line with national obligations
1.12 Implementing a new rural community center	Maximizing discussions with villagers	Direston and East Chahou	(i) Assist women to engage in formal community activities, (ii) fund the construction costs, (iii) prepare a management plan
1.13 Historical site improvement	Protection of tangible heritage	Qeshm City (Kulaghan)	(i) Improve the protection method of tangible heritage, (ii) improve the pattern for many similar sites on the island in terms of tourism assets
1.14 Special boats for Qeshm (two types)	(i) Protection of natural resources, (ii) facilitation of safe and enjoyable visits,	Specially for visiting the Hara Mangrove Area/southern	(i) Design by a professional boat designer in Japan, (ii) produce one sample of each in Japan, (iii) promote the boats to be produced on Qeshm Island, (iv) encourage locals to change their boats to the new models

Project name	Objectives	Project site	Activities
	(iii) improvements for local boaters	coastline	
2. Fishery sector			
2.1 Development of new marine products (processing of sardines) and marketing	Development of new processed fish products	All possible villages	(i) Creation of working groups consisting of fishermen's cooperative members and fish-processing companies, (ii) development of new product prototypes, (iii) improvement of fish handling, (iv) market study and experimental marketing by marketing experts in Iran, surrounding countries and Asia
2.2 Artificial reef installation	Preservation of marine resources and increase in rearing areas	A few villages including Selakh	(i) Installation of artificial reefs, (ii) formulation of fishermen groups, (iii) monitoring of the artificial reefs, (iv) experimental fish catching, (v) preparation a manual
2.3 Slurry ice technology	Activation of fishing industry by introducing a new freshness preserving technology	Qeshm Island	(i) Installation of a compact slurry ice machine and supply of slurry ice to fishermen, (ii) monitoring of quality improvement, sales price rises and market area expansion, (iii) verification of the advantages (initial costs, running costs and economic benefits for fishermen)
2.4 Packing machine installation	Proper sanitary management of marine products	Selakh and Baseidou	(i) Planning, design and building construction, (ii) installation of machines, (iii) expansion of distribution network
3. Environmental sector			
3.1 Traditional ecological knowledge compilation	Recording, preservation and application of traditional ecological knowledge	All villages interested in ICCAs	(i) Support communities in identifying potential ICCAs, managing the existing ICCAs and establishing new ICCAs, (ii) presentation by communities on traditional knowledge (herb, food, handicrafts), (iii) application of traditional knowledge to tourism, (iv) registration with the World Database of Protected Areas
3.2 Geopark seminar	Enhanced understanding of QFZO officers on the UNESCO GGN	QFZO	Seminar on the UNESCO GGN by a UNESCO officer and discussion
3.3 Improvement of sanitary facilities at tourist spots	Contribution to the upgrading of the tourist industry	Villages where problems are severe	(i) Improvement in the operation and maintenance of existing public toilets, (ii) installation of public toilets and/or temporary toilets, (iii) collection of graywater from the souvenir shop and restaurant to be treated at a septic tank to be installed before discharge (e.g., Sohli Jetty)
3.4 Nature-focused school support	Enhancement of students' awareness of the environment	Nature School in Tourgon	(i) Improvement of facilities, (ii) preparation of curriculum and implementation of training
3.5 Plastic recycling project	Improved living environment (removing plastic trash from the villages) by prioritizing plastic waste	Possible villages	(i) Build four machines with the collaboration of universities and mechanical engineers, (ii) develop a collecting system throughout the village, (iii) assign a place and human resources to the operation and maintenance of the machines
4. Agricultural sector			
4.1 Mangrove honey production	Income generation	Villages around Hara's mangrove forest	(i) Increase the number of farmers engaged in apiculture via technical workshops, and distribution and rental of beekeeping materials, (ii) sales of honey at visitor centers
4.2 Fodder crops production	Provision of quality fodder and prevention of devastation by overgrazing	Possible villages	(i) Establishment of fodder crop fields with arborous/perennial Fabaceae, (ii) construction of composting plants
4.3 The School of Agriculture	Promotion of specific agriculture according to its history and new relative advantages	Ramkon	(i) Provision of classes on farming technologies, (ii) training people from a wide age range, (iii) experimental farming, (iv) laboratory services to villagers, (v) promoting sustainable (low consumption) agriculture, (vi) studying new crops and herbs

Project name	Objectives	Project site	Activities
	as an FZ		
5. Other sectors			
5.1 PV power generation*	Spearhead introduction of renewable energy	Chahou Geosite	(i) Installation of PV system, (ii) experiment with PV power generation, (iii) measurement of various effects by analyzing the data collected by energy management, (iv) information dissemination toward increased use of renewable energy
5.2 Beautification of Western Qeshm City	Activation of towns' socioeconomy by creating attractive urban spaces	Village in the western part of Qeshm Island	(i) Identification of beautification projects (public squares, pavements, rest areas, historical buildings, tourist information boards), (ii) reutilization of historical buildings (cafes, restaurants, souvenir shops, event venues etc.), (iii) implementation
5.3 Village book compilation	Preparation of an electronic database for community development	All villages	(i) Preparation of village books containing basic information, results of stakeholder analysis, problem analysis and SWOT analysis, village maps etc., (ii) training from village book experts and guidance from JPT experts in the preparation process

Note: Projects with * have a high possibility of implementation.
Source: JICA Project Team

(2) Open-type pilot projects

In an open-type pilot project, the activity is more focused on the participation of villagers than is the case for area-specific projects regarding the process of selection, formulation and implementation of the projects. Following the outcomes of the socioeconomic baseline survey, the JPT selected 25 villages as candidate villages, considering livelihood conditions and environmental awareness. The villages specifically expressing a high demand in terms of job opportunities and income generation, as well as a high level of awareness of environmental issues, were selected. Fourteen out of 25 villages regarded livelihood improvement as their first priority. Fifteen villages showed an interest in environmental issues. Four villages expressed a high concern for job opportunities and environmental management. Table 12.1.2 shows the selected 25 villages.

Table 12.1.2 Needs Regarding Livelihood Improvement and Environmental Management in the 25 Selected Villages

Rural district	Village	Development needs (improvement in livelihood criteria)			Environmental management (environmental criteria)		
		First priority (%)	Second priority (%)	Third priority (%)	Interest in environment (%)	Existence of environmental issue (%)	Type of environmental issue
Doulab (4)	Konar Sia	Job and income (90)	Water supply (10)	-	60	-	-
	Aysheh-Abad	Agriculture (33)	Education (22)	Job and income (22)	78	-	-
	Tomgez	Job and income (78)	Water supply (11)	Agriculture (11)	78	-	-
	Chahou West	Job and income (60)	Education (20)	Water supply (20)	80	-	-
Rural district average		Job and income (36)	Healthcare (35)	Water supply (13)	20	-	-
Howmeh (4)	Kouvei	Job and income (33)	Healthcare (33)	Education (33)	75	33	Air pollution, bad smell
	Giadon	Healthcare (50)	Job and income (17)	Education (17)	92	-	-
	Laft	Water supply (100)	-	-	100	-	-
	Holor	Healthcare (50)	Education (25)	Job and income (17)	100	25	Bad smell
Rural district average		Water supply (44)	Healthcare (31)	Education (23)	53	-	-
Ramkon (8)	Gordian	Job and income (40)	Water supply (20)	Education (20)	90	70	Air pollution, bad smell, bad water quality
	Peyposht	Job and income (45)	Healthcare (36)	Education (9)	73	-	-
	Khaladin	Job and income (64)	Healthcare (18)	Education (9)	73	-	-
	Karavon	Job and income (80)	Education (10)	Healthcare (10)	50	-	-
	Kardova	Job and income (89)	Education (11)	-	56	-	-
	Bagh Bala	Healthcare (56)	Education (33)	Water supply (11)	100	100	Air pollution, bad smell
	Tomsenati	Job and income (44)	Education (44)	Water supply (11)	56		
	Tourion	Water supply (64)	Education (27)	Healthcare (9)	91	64	Air pollution, bad smell
Rural district average		Healthcare (28)	Others (28)	Education (21)	53	-	-
Selakh (5)	Dehkhoda	Education (30)	Healthcare (30)	Job and income (10)	90	100	Air pollution
	Sohil	Healthcare (45)	Others (27)	Water supply (18)	100	100	Air pollution, bad smell, bad water quality
	Haft Rangou	Water supply (80)	Healthcare (10)	Others (10)	90	100	Air pollution, bad smell, bad water quality
	Selakh	Job and income (33)	Education (33)	Healthcare (22)	73	-	-
	Noghasha	Job and income (43)	Water supply (43)	Education (14)	86	-	-
Rural district average		Water supply (42)	Healthcare (21)	Others (16)	79	-	-
Souza (4)	Shibderaz	Water supply (60)	Job and income (30)	Others (10)	90	-	-
	Mesen	Job and income (50)	Healthcare (25)	Education (17)	58	100	-
	Borka Khelaf	Water supply (90)	Job and income (10)	-	90	100	-
	Direston	Job and income (64)	Healthcare (27)	Agriculture (9)	91	64	Bad smell
Rural district average		Water supply (47)	Job and income (29)	Healthcare (18)	67	-	-
Total village average		Water supply (27)	Healthcare (27)	Job and income (19)	67	64	-

Source: JICA Project Team

The results of the socioeconomic baseline survey were used to select the 25 villages as an initial step. Since the baseline survey did not address important information, such as the impact on neighboring villages and development priorities in the west of the island, which were not included in the questionnaire, additional criteria were included in order to review the selected villages. The additional criteria are as follows:

(a) Potential for tourism development
(b) Potential for fishery development
(c) Contribution to developing the western part of the island
(d) Less development
(e) Effects on neighboring villages

These criteria reflect income generation, a spatially well-balanced development on the island and the possibility to replicate the experiences in other villages. The 25 candidate villages have been narrowed down to 14 villages, including additional villages, as shown in Table 12.1.3.

Table 12.1.3 Fourteen Candidate Villages for Open-type Pilot Projects

Rural district	Village
Doulab (3)	Kani
	Baseidou
	Chahou East
Selakh (5)	Gouron
	Haft Rangou
	Noghasha
	Selakh
	Sohil

Rural district	Village
Howmeh (2)	Kovarzin
	Laft
Souza (3)	Mesen
	Borke Khalaf
	Shibderaz
Hangom (1)	Hangom

Source: JICA Project Team

The characteristics of the 14 selected villages are shown in Table 12.1.4.

Table 12.1.4 Characteristics of the 14 Candidate Villages for Open-type Pilot Projects

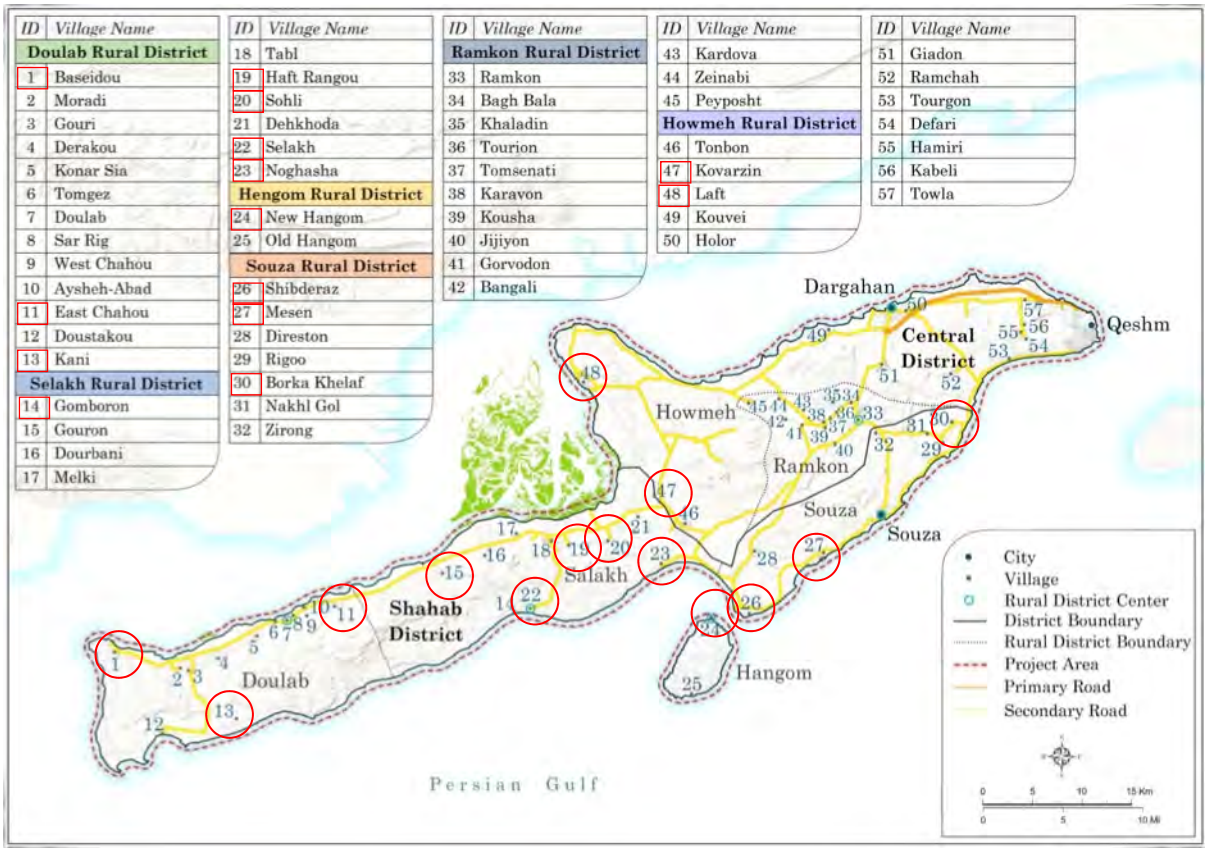
Rural district	Village	Population	Lifestyle								Environmental conditions			Development needs		
			Main livelihood	Intention to change job (%)	Sufficiency of income (%)	Sufficiency of food (%)	Land ownership (%)	Quality of life improvement in last 20 years			Interest in environment (%)	Existence of environmental issues (%)	Type(s) of environmental issue	First priority	Second priority	Third priority
								Improved (%)	Same (%)	Deteriorated (%)						
Doulab (3)	Baseidou	337	Office work, fishing	9	36	100	91	63	0	36	36	0	-	Healthcare	Job opportunity	Education
	Kani	2,158	Fishing, farm labor	20	0	100	50	100	0	0	40	0	-	Healthcare	Water supply	Education
	East Chahou	1,040	Livestock, farm labor	64	45	91	55	18	18	64	73	0	-	Water supply	Job opportunity	Healthcare
Rural district average		-	-	20	31	98	62	73	0	27	56	1	-	-	-	-
Selakh (5)	Sohil	1,950	Office work, hunting	45	9	55	100	73	0	27	100	91	Air pollution, water pollution	Healthcare	Other	Water supply
	Haft Rangou	692	Office work, livestock	60	10	50	10	80	0	20	90	100	Air pollution, water pollution	Water supply	Healthcare	Other
	Gouron	1,510	Fishing, office work	64	0	45	91	64	0	36	82	100	Air pollution, water pollution	Water supply	Healthcare	Job opportunity
	Selakh	3,012	Fishing, hunting	82	0	55	82	60	0	40	73	100	Air pollution, water pollution	Education	Other	Healthcare
	Noghasha	114	Fishing, office work	86	29	0	100	71	0	29	86	100	Air pollution, water pollution, offensive odor	Water supply	Other	Education
Rural district average		-	-	67	10	45	88	61	0	40	79	99	Air pollution, water pollution	-	-	-
Howmeh (2)	Kovarzin	1,697	Office work, forest production	0	27	100	27	91	0	9	36	0	-	Healthcare	Job opportunity	-
	Laft	4,914	Office work, farm labor	55	0	45	0	0	0	100	100	0	-	Water supply	-	-
Rural district average		-	-	30	31	75	21	52	14	34	53	27	Air pollution, water pollution, offensive odor	-	-	-
Souza (3)	Shibderaz	507	Farm labor, fishing	100	0	80	30	10	40	50	90	0	-	Water supply	Job opportunity	Other
	Mesen	2,157	Fishing, livestock	67	8	67	33	8	42	50	58	8	Offensive odor	Job opportunity	Healthcare	Education
	Borka Khelaf	329	Fishing, livestock	50	10	40	10	33	44	22	90	0	-	Water supply	Job opportunity	-
Rural district average		-	-	62	14	32	21	25	32	42	67	18	Offensive odor, air pollution	-	-	-
Hangom (1)	Hangom	487	Fishing, office work	10	40	100	60	100	0	0	20	0	-	Job opportunity	Water supply	Education
Rural district average		487	-	10	40	100	60	100	0	0	20	0	-	-	-	-
Total village average		-	-	43	24	76	58	62	8	30	64	35	-	-	-	-

Source: JICA Project Team

The location of the 14 candidate villages is shown in Figure 12.1.3. A relatively large number of candidate villages has been selected from the west and the south, while villages are presently concentrated on the east and north sides of the island.

Five villages in the Selakh Rural District were nominated as candidates from the south. As shown in Table 12.1.3, these villages face low income levels and insufficient food provision. These villages are located near famous geosites, which have the potential to attract many tourists. Three candidate villages in Doulab have the potential to be developed, if proper support and activities are initiated.

The main form of livelihood in the candidate villages in Souza is fishing. Since fishing is considered to be the major form of livelihood on Qeshm Island, implementing the pilot projects will offer a good opportunity to improve the livelihood situation. Positive outcomes will increase the possibility of sustainable development for the island.



ID	Village Name
Doulab Rural District	
1	Baseidou
2	Moradi
3	Gouri
4	Derakou
5	Konar Sia
6	Tomgez
7	Doulab
8	Sar Rig
9	West Chahou
10	Aysheh-Abad
11	East Chahou
12	Doustakou
13	Kani
Selakh Rural District	
14	Gomboron
15	Gouron
16	Dourbani
17	Melki

ID	Village Name
18	Tabl
19	Haft Rangou
20	Sohli
21	Dehkhoda
22	Selakh
23	Noghasha
Hengom Rural District	
24	New Hangom
25	Old Hangom
Souza Rural District	
26	Shibderaz
27	Mesen
28	Direston
29	Rigoo
30	Borka Khelaf
31	Nakhl Gol
32	Zirong

ID	Village Name
Ramkon Rural District	
33	Ramkon
34	Bagh Bala
35	Khaladin
36	Tourion
37	Tomsenati
38	Karavon
39	Kousha
40	Jijiyon
41	Gorvodon
42	Bangali

ID	Village Name
43	Kardova
44	Zeinabi
45	Peyposht
Howmeh Rural District	
46	Tonbon
47	Kovarzin
48	Laft
49	Kouvei
50	Holor

ID	Village Name
51	Giadon
52	Ramchah
53	Tourgon
54	Defari
55	Hamiri
56	Kabeli
57	Towla

Source: JICA Project Team

Figure 12.1.3 Location of the 14 Candidate Village for Open-type Pilot Projects

It is difficult for villagers to consider the content of the pilot project by themselves. The JPT and the QFZO suggested six pilot projects that are suitable for open-type projects. The JPT and the QFZO held meetings with key informants and ordinary residents from each village to measure their interest and willingness to participate in the pilot projects, with a view to ensuring successful implementation. Participation in project formulation is important. The pilot projects should be implemented not only by the JPT, but also in the form of residents' active participation. The support from the QFZO is vitally important if the objectives regarding the implementation of the pilot projects are to be achieved.

Table 12.1.5 Candidate Pilot Projects Using the Open-type Approach

Project title	Objective	Activities
(1) Traditional culture experience tour	(i) Income generation, (ii) communication between tourists and villagers	(i) Arranging activities for tourists to experience traditional fishing, embroidery, accessory making, fishnet-making, celestial observation, cooking etc., (ii) training the villagers to undertake these activities
(2) Souvenir promotion	Income generation	(i) Training on computers, T-shirt-making using computer applications and traditional embroidery, (ii) participation in T-shirt and traditional clothes competitions, (iii) experimental production and sales of T-shirts and traditional clothes in Qeshm City for competition prizewinners
(3) Demonstration gardens for traditional herbs	Income generation	(i) Creation of a demonstration garden for traditional herbs at/near visitor centers, (ii) sales of harvested medical plants, (iii) workshop for farmers in the surrounding area interested in growing herbs
(4) Control of *P. juliflora* and other invasive alien tree species	Better environmental management	(i) Identification of distribution, ecological effects and utilization methods, (ii) survey on vegetation, and utilization of alien species and indigenous species in candidate areas, (iii) survey on awareness of local residents, (iv) participatory planning of flora management, (v) implementation and monitoring of flora management
(5) Dissemination of seaweed farming for the future development of IMTA	Income generation	(i) Seaweed farming in cooperation with a seaweed farmer (by contract), (ii) two to six cycles of seaweed farming, with three workshops (lasting three days) in each farming cycle, (iii) possible testing of shrimp farming and grow-out of shellfish species, such as hard clams and rock oysters (if a shrimp farm is cooperative), (v) preparation of instruction manual about seaweed farming for people in the local community
(6) Preservation and revival of urban agriculture in villages as a natural heritage	(i) Environmental protection, (ii) income generation	(i) Identification of cultivated areas (gardens, orchards etc.) inside and nearby the village, their surface, typology, history, past and current crops, method of irrigation, status (active or inactive), ownership and biodiversity, (ii) survey on awareness of local residents, (iii) workshop with famers on the past, present and future potential of agricultural activity in the village

Source: JICA Project Team

12.1.4 Pilot project formulated for selected villages

(1) Open-type approach selection

Regarding the open-type pilot projects, the consultation meetings were held in the 14 candidate villages. Essential information in order to make the pilot project sustainable has been collected from the residents. The information includes residents' eagerness, motivation and willingness to contribute to the success of the pilot project.

In the process of selecting the target villages, the JPT have focused on transparency and objectivity, along with the concept of the pilot project, especially the participatory approach. This is because bottom-up processes and local initiatives are the key to successfully complete all the pilot projects and widely disseminate the implementation methods and lessons learned to other villages. Therefore, the JPT and QFZO have selected the villages that have a high possibility to implement the project successfully through a participatory approach. In the consultation meeting with candidate villages, the JPT collected information on and observed the character of each village and its villagers in terms of proceeding with the project, such as attitudes of the project leader, motivation to participate among all leaders, and the unanimity of villagers. As the result, six villages with six projects were selected, as shown in Table

12.1.6.

In the first selection stage, Noghasha Village was selected as one of the target villages. Its villagers, including the village leader, demonstrated their eagerness to the JPT for the implementation of a *P. juliflora* management project in the consultation meeting. Through the workshop and several meetings, however, it turned out that the implementation structure in the village could not cope with the formulation and implementation of the project. In addition, the villagers conveyed a negative attitude about the project to the JPT. Therefore, the JPT abandoned the implementation of the project in Noghasha and changed the target village to Selakh, without changing the content of the project. Selakh Village has already begun work of *P. juliflora* elimination to promote agrotourism as their own efforts. Thus, the JPT and QFZO judged that Selakh Village was more appropriate than Noghasha Village for this project.

East Chahou Village was also considered as one of the target villages for the souvenir improvement pilot project, since the villagers expressed their wishes to implement the project in the consultation meeting. In the process of formulating the project, however, it turned out that the souvenir improvement pilot project overlapped with a similar project supported by the UNDP. Thus, the JPT and QFZO decided to change the target village from East Chahou to Mesen.

Table 12.1.6 Selected Pilot Projects Using the Open-type Approach

Location	Activities	Implementation entity	Contract date
Laft	Traditional culture experience tour	Laft Women's Committee	July 30, 2017
Mesen	Souvenir improvement	Mesen Woman Cultural Committee	February 15, 2017
Kovarzin	Traditional herb demonstration garden	Banafshe Gostare Qeshm Cooperative	April 18, 2017
Selakh	*P. juliflora* management	Sepehr Selakh Qeshm Cooperative	October 4, 2017
Southern coast	Training on seaweed farming (Baseidou, Kani and Hangom)	Mazrae Dayayi Zaron Qeshm	January 30, 2017
Haft Rangou	Traditional garden revival	Sahel Haft Rangou Qeshm Cooperative	August 15, 2017

Source: JICA Project Team

(2) Area-specific approach selection

The area-specific approach has been mainly led by the JPT experts and QFZO members. The reason is that it was necessary for sectoral experts to formulate the content of the pilot projects. The criteria for selection corresponded to the concept in the ECO-QESHM Master Plan, which is to improve the living conditions of the local residents and conserve the natural environment. Similar to the open-type approach, consensus formation among relevant stakeholders was conducted carefully and intensively through several meetings and workshops. As a result, three villages with three projects were selected; later on, another project, the Qeshm City Souvenir Shop Project, was formed to enhance marketing effectiveness and promote good quality at reasonable prices. This project is related to other pilot projects, whose activities include making agricultural products and types of souvenirs in the course of the pilot project implementation.

In the early stage of selecting the target projects, a PV power generation project for the Chahou Geosite and an apiculture promotion project in the Hara Mangrove Area were considered, with a high possibility for implementation. However, both projects turned out to be unsuitable as pilot projects after the field survey by the JPT experts and the consultation with the QFZO identified technical and financial constraints.

The JPT experts and the QFZO officials have discussed the possibility of implementing a graywater reuse pilot project since the beginning of the formulation of this project. The JPT experts calculated the construction and maintenance costs and selected the candidate villages. The JPT conducted a survey to collect information and confirm the willingness of villages' representatives to participate in a graywater

reuse project. The results of the survey revealed that representatives are interested in the concept of graywater reuse; however, they are not ready to bear the maintenance costs. The system of graywater reuse, which consists of a treatment plant and collection pipes, involves high costs. The JPT and the QFZO decided not to implement the project after their discussions given that local residents were not ready to maintain the graywater reuse equipment due to prohibitive costs. The results of the survey, however, can be used as materials to formulate a sector plan and an action plan for sewage management.

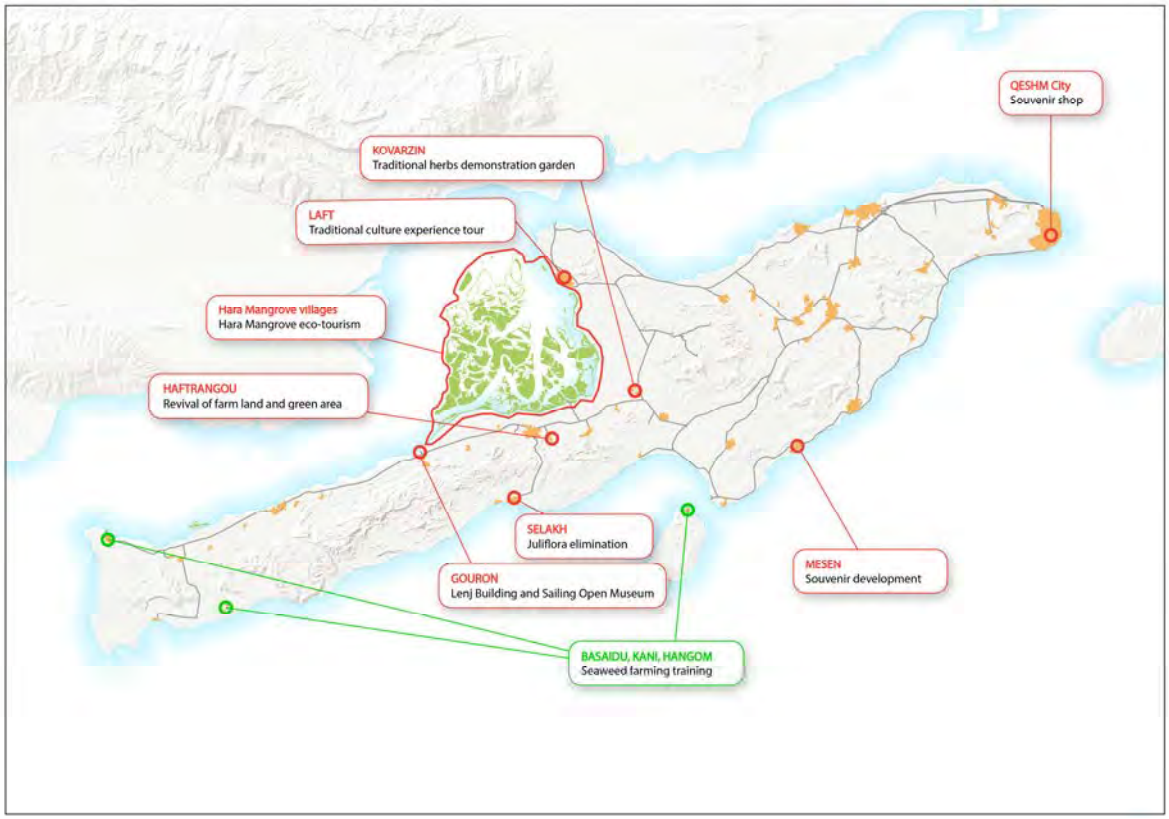
Table 12.1.7 Selected Pilot Projects Using the Area-specific Approach

Location	Activities	Implementation entity	Contract date
Gouron	Lenj Building and Sailing Open Museum	Gouron Cooperative	March 13, 2017
Hara Mangrove area	Hara mangrove ecotourism	Bootman Cooperative (Kovarzin, Sohli and Tabl)	August 6, 2017 (Only training of trainers)
Qeshm City	Qeshm City souvenir shop	Joint committee consisting of villagers, QFZO and JPT	January 22, 2017 (Only interior work by private company)

Source: JICA Project Team

(3) Location of selected villages for the pilot projects

Nine pilot projects have been selected for implementation, including the open-type approach, as shown in Table 12.1.6, and the area-specific approach, as shown in Table 12.1.7. The location of nine pilot projects is shown in Figure 12.1.4.



Source: JICA Project Team

Figure 12.1.4 Location of the Nine Pilot Projects

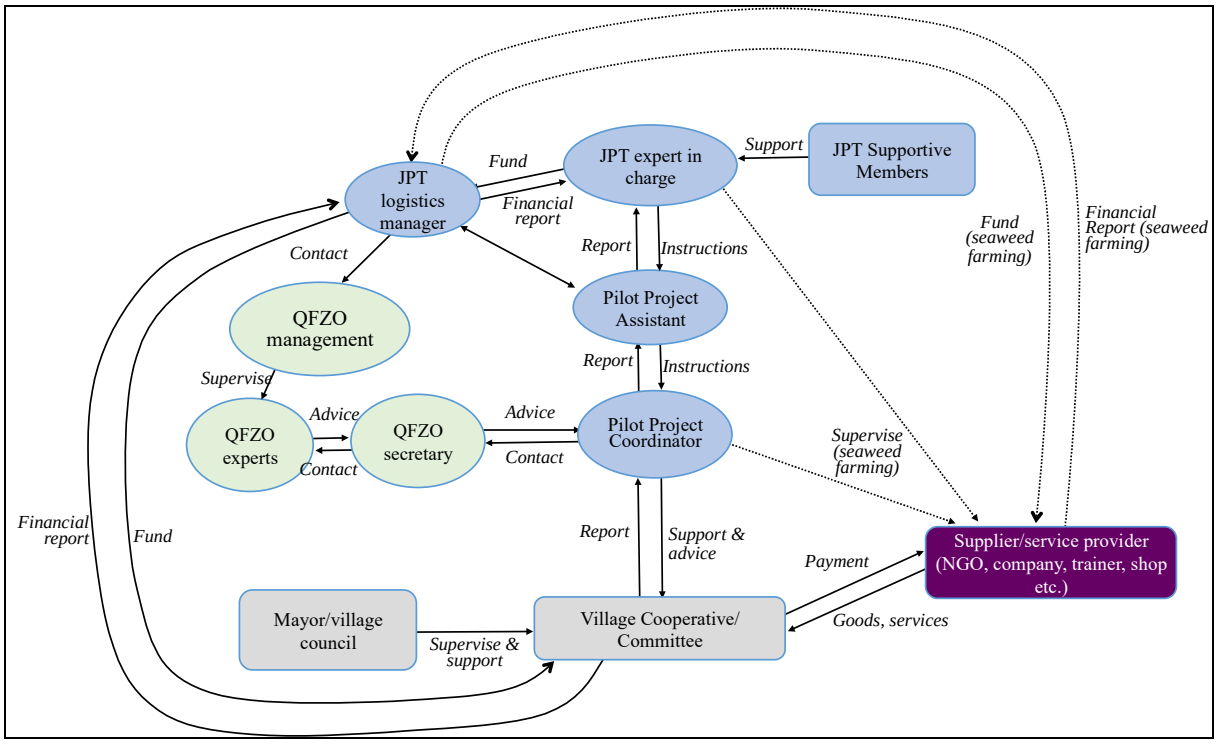
12.2 Management and Reporting System for the Pilot Projects

12.2.1 Management structure

In line with the participatory approach, the management structure was created so that the pilot projects can be managed directly by villagers themselves. A reporting system was established in such a way that progress on the pilot projects could be accurately monitored by all parties in a timely manner. The management of and reporting on the pilot projects, which are subcontracted to local companies and non-governmental organizations (NGOs), are performed in a simple manner, in which the JPT and the QFZO supervise the works undertaken by local companies and NGOs. The overall management structure is explained below.

Management structure

The management structure of the pilot projects directly managed by villages is presented in Figure 12.2.1.



Source: JICA Project Team

Figure 12.2.1 Management Structure of the Pilot Projects Implemented by Villages

The functions of each party are summarized as follows.

- Village cooperative/committee: implement all the activities utilizing the budget provided by the QFZO and the JPT including procurement of goods and services
- Village council/mayor: support the activities by the village cooperative/committee
- Pilot project coordinator: support the activities by the village cooperative/committee, receive reports from them and report on the activities to the JPT and QFZO experts
- Pilot project assistant: help smooth communication between pilot project coordinators and JPT experts by translating information from Farsi into English and vice versa
- JPT expert in charge: Receive information from pilot project coordinators, make decisions and provide instructions to the village cooperative/committee via the pilot project assistant and pilot project coordinators
- JPT supportive members: support the JICA experts in charge on a technical basis
- JPT logistics manager: support all the activities relating to logistics and supervise financial management by the village cooperative/committee

- QFZO secretary: transfer information between the pilot project coordinator and QFZO experts
- QFZO experts: support and supervise all the activities in cooperation with JPT experts and the pilot project coordinator
- QFZO management: supervise all the activities by QFZO experts and support the activities by the village cooperative/committee in cooperation with JPT experts

12.2.2 Reporting system

Reporting system (monthly)

A reporting system was established to report on the project activities of the pilot projects, which are directly managed by villages, on a monthly and a quarterly basis.

The monthly report is prepared by the village cooperative or committee for each pilot project and submitted to QFZO experts, JICA experts, the pilot project coordinator and the pilot project assistant. The monthly report contains progress updates on the pilot projects, utilizing the formats specified in the contract agreed between the village cooperative or committee, the JPT and the QFZO, as follows:

- Monthly report: outline of activities undertaken in the previous month, detailed information, challenges and problems faced, activities planned in the next month and photos
- Progress monitoring format: a table, which sets out the planned schedule and actual periods of each activity undertaken, ~~assists in~~ thus clarifying whether the respective activity is behind or ahead of the planned schedule
- Budget monitoring format: a table, which compares the budget and consists of expenditure items and actual expenses in each month, thus showing ~~in determining~~ whether the estimated expenditure is sufficient to cover the actual expense without changes to the budget

Reporting system (quarterly)

A quarterly meeting was established to bring together participants from all the pilot projects in one place so that they could appreciate the approaches and experiences of the pilot projects conducted in other villages.

As the first occasion, the kick-off meeting was held in the Incubation Center in Qeshm City on February 9, 2017. Nearly 60 villagers gathered and representatives of each pilot project gave a presentation, following opening remarks by the QFZO, which discussed how it was supporting the initiatives of the selected villages. An MoU was signed to define the roles of three of the villages, the QFZO and the JPT at this event.

Source: JICA Project Team

Figure 12.2.2 Kick-off Meeting Held on February 9, 2017

Regarding the next endeavor, the first quarterly meeting was held on July 16, 2017, in the QFZO's conference room. Those villages that had already commenced activities (Gouron, Mesen, Kovarzin, Laft and Haftrangou) reported on their progress, along with the contractor responsible for the Seaweed Farming Pilot Project. The second quarterly meeting was held on November 26, 2017 in the Hara Mangrove Information Center at Sohli Jetty. All villages who were implementing pilot projects at that time presented on their activities including achievements and challenges to date. The third quarterly meeting was held on May 14, 2018, in the QFZO's conference room. Representatives of all the pilot projects, except for the Seaweed Farming Pilot Project, gave presentations on the lessons learned and challenges. Some of the villages focused on the importance of teamwork during the meeting, while

others presented on the improvements in their products and the possibility of livelihood enhancement.

First quarterly meeting

Second quarterly meeting

Third quarterly meeting

Source: JICA Project Team

Figure 12.2.3 Quarterly Meeting

12.3 Achievement and Way Forward of Pilot Project

The achievements of each pilot project are described below. Detailed information on the pilot project is given in Appendix 8.1.

12.3.1 Traditional culture experience tour in Laft

(1) Background

The QFZO has been supporting Laft to develop itself as a touristic center through renovating old structures and building new facilities. It was recognized that more involvement from villagers would add momentum to these support efforts. At the consultation session with the JPT held in August 2016, Laft's leaders selected experience tourism as the first priority of its pilot project.

(2) Objectives

The objectives of the Laft Traditional Culture Experience Tour Development Pilot Project are defined as follows:

- To diversify sources of income among the villagers, especially women
- To encourage both hosts and guests to recognize the value and foster a sense of confidence and conservation regarding Laft's own traditional culture
- To generate a synergistic effect by combining the traditional culture experience tour with existing cultural heritage sites rehabilitated by the QFZO, such as Naderi Castle and the Laft Museum and Culture Center (under construction)

(3) Issues recognized before the project

1) Lack of awareness concerning potential

The villagers in Laft did not fully recognize that their rich resources offer huge potential in terms of enhancing their income. It seemed that villagers could not envisage gaining income directly through tourism activities. As such, they did not pay much attention to the enhancement of the tourism sector.

2) Internal friction and negative attitude

Through a series of meetings and discussions with the villagers, the JPT realized that there existed several issues, such as internal friction and women's negative attitude toward working outside, going back a long way.

(4) Achievements

1) Awareness of the potential of tourism

Unfortunately, the strong leader who led the group had to leave due to illness. Consequently, the group

members faced difficulties in continuing their planned activities based on their own capacity. However, their activities affected the other villagers including men. One of the biggest outcomes was that villagers became aware of the potential of tourism in Laft. People observed the achievements made by the Laft Women's Committee during the Iranian New Year by offering their services to tourists at the ecomuseum. As a result, more than 15 men joined the local guide training program, which is currently ongoing.

2) Importance of team working

While the Laft Women's Committee faced a great deal of internal interference from within the village during the implementation of the pilot project, its members offered traditional culture experience opportunities to tourists on two occasions during the Iranian New Year in 2017 and 2018. Through those experiences, these members obtained the provisional right to utilize ecomuseum as a place to run their activities and realized the importance of team working.

3) Importance of team working

While the Laft Women's Committee faced lots of internal interferences within the village during the implementation of the pilot project, they offered traditional culture experience opportunities to tourists two times during the Iranian New Year in 2017 and 2018. Through those experiences, the members of the women's committee gained the provisional right of utilizing ecomuseum as a place of their activities and realized the importance of team working.

Bread-making and -tasting experience after the kick-off meeting in February 2017
Source: JICA Project Team

Ecomuseum opening ceremony in March 2018

Bread-making demonstration before Nowruz 2018

(5) Way forward

One of the challenges is the lack of leadership to organize those who are interested in tourism. Strengthening leadership is therefore very important in Laft. The second challenge is how to conquer social barriers existing in Laft. For instance, it is difficult for women to work with men who are not family members in such a conservative village as Laft. Since the capacity of the Women's Committee is still limited, it is necessary to discuss how to improve the current situation among the stakeholders including in terms of social aspects.

12.3.2 Souvenir development in Mesen

(1) Background

Mesen villagers have possessed unique skills for making handicrafts for a long time. However, this capacity had not been fully utilized to enhance their livelihood. The village representatives expressed that their first priority for the pilot project would be souvenir development at the consultation meeting with the JPT, held in September 2016.

(2) Objectives

The objectives of the Mesen Souvenir Development Pilot Project are defined as follows:

- Enhancement of the livelihood of the Mesen Village population through increasing the sales of embroidery products by providing various training events and strengthening marketing

- A Qeshmi brand is expected to be created in collaboration with Mesen, other villages and the QFZO

(3) Issues recognized before the project

1) Variance in the quality of products

Before starting training on the pilot project, the women of Mesen had been active at individual levels, rather than at the group-working level. Therefore, the quality of products and the women's skill levels for making handicrafts varied greatly. For instance, some women had excellent skills for embroidery, while others had sewing skills.

2) Lack of promotion and advertisement

There has been no promotion and advertising for their products. Nor was there any awareness among the women of the importance of pursuing such activities.

3) Sharing skills and information

No cooperation existed among the women in terms of offering products to each other. In view of providing high-quality products in a stable manner, the women needed to enhance their awareness of the importance of transferring skills to others and mutually sharing information as well as upgrading their technical capabilities.

(4) Achievements

1) Stable quality and variety of products

Members of the Mesen Women's Cultural Committee have gained skills in designing, embroidery, pyrography and sewing. By combining them, they are now able to offer new design products to customers. The outcome of the training is shown as follows:

Bag design workshop

Work by Mesen women, which applies the pyrography technique

Training on embroidery

Source: JICA Project Team

Table 12.3.1 Increase in Skilled Trainees Due to Training

Training course	Number of Participants	Number of Skilled Trainees After Training
Sewing	12	9
Embroidery	15	10
Designing	7	3
Sewing bag	5	5
Pyrography	5	4

Source: JICA Project Team

2) Importance of advertisement

They acknowledged that the best type of advertising is offering optimal results, such that more people

could be attracted to their products if they can offer high-quality and attractive products that match customers' tastes.

3) Establishment of their own products/brand

They are now able to produce their own designs with different characters compared to products from other regions/villages. It is somewhat a mixture of traditional art and new and modern ideas.

4) Enhancement of team working

The women from Mesen visited handicraft shops in other villages such as Borka Khalaf and East Chahoo, during and after the training. They recognized the importance of strengthening the information-sharing structure and producing better-quality products through this experience. They also learned about the importance of team working in the course of the training and other activities jointly with other women members. In addition, they acquired more confidence about their products.

(5) Way forward

In the next stage, they would need additional training to develop their work and add strength, because their goals for the future are to become a big productive workshop and a more well-known brand.

12.3.3 Traditional herb demonstration garden in Kovarzin

(1) Background

Originally, herb products were used as "traditional herbal medicine" in Iran. Products made in Iran have been exported to the international market, therefore the product value of herbs is already recognized as a whole. In Kovarzin, agriculture products including herbs have been popular for a long time ago. However, lower precipitation and climate change in recent decades have caused a decline in this traditional culture. As a result of the consultation meeting held on August 2016 and the subsequent assessment, the JPT and the QFZO judged that Kovarzin Village was qualified to undertake the Herb Demonstration Garden Pilot Project.

The harvests from the demonstration garden can be collected, not only from the garden plots but also the backyards of neighboring farmers, once the practice is disseminated, and then sold as "island-made herbal products" at souvenir shops in the village. Technical workshops on basic cultivation and simple processing methods will be held for field workers in the demonstration gardens and neighboring farmers who wish to promote and disseminate herbal products.

(2) Objective

The objectives of the herb demonstration garden pilot project are the following:

- To exhibit traditional herbal trees and crops of the nation and Qeshm Island to visitors
- To highlight water-saving agriculture technologies to neighboring farmers
- To contribute to the enhancement of livelihoods in the village population
- To establish a tourist attraction facility

(3) Issues recognized before the project

1) Deterioration of agricultural business

The villagers have keenly wanted to revitalize the agricultural business through the introduction of Japanese advanced techniques, especially water-saving irrigation technologies. The demand for medicinal herbs is required to sustain herb cultivation. However, marketing takes some time to reach the level of certain customer numbers. An approach more stable than depending on marketing is to cultivate a program for demonstrating traditional and cultural aspects. The respect for tradition and culture will substantially contribute to promoting herbs in the long run.

2) No proper implementation organization

With regard to the implementation organization, there was no cooperative in Kovarzin that could represent a group of young men interested in the pilot project and act as the implementation body. Organizational arrangements were necessary.

(4) Achievements

1) Development of new methodology and connections

The villagers who have been responsible for this project have learned a lot, such as about water-saving cultivation technology, the knowledge of herb production and construction management. From the beginning of this project, they have been able to collaborate with some experts, designers and government staff. These connections should contribute to the development of this village in the short and long term. Especially, as one of the water-saving irrigation technologies, they became familiar with the principle of drip irrigation and its management. As a next step, advanced technology such as a hydroponic system could be developed.

2) Dissemination within the village and to other villagers

This garden would be expected to be a demonstration garden for the dissemination of traditional agriculture activities, which prevailed in this village a long time ago. Through the project, modern and useful technologies, such as a hydroponic system and drip irrigation, would be disseminated as well. Not only other villagers in Kovarzin, but also the villagers in nearby villages can learn from the outcomes of this project. Basically, herbs are regarded as more adaptable to soil conditions in view of a wider range of acidity, dryness and physicality, compared with other commercial crops. Through the outcomes of the project, adaptability to soil could be confirmed in detail. It will also be easier to disseminate the practice to other areas in the village or other villages.

3) Variety of herbs planted

Rosemary and other herb species were planted in the northern part of the garden. Especially, rosemary is a herb that is popular in the garden, as it prefers a place that is mild, dry and well drained. Once planted, its resulting stock will increase and can be enjoyed all year round. It is also a high-value crop product in the market.

Layout Plan of the Traditional Herb Demonstration Garden

Guest service facilities

Herb tree garden with drip irrigation

Central garden

Source: JICA Project Team

(5) Way forward

1) Networking

In terms of tourism promotion, they should more positively collaborate with tour agencies and the Social and Tourism Department of QFZO after the completion of this pilot project. Networking with them would be most important for tourism promotion. This garden would also be expected to become a core site for children and young people's education on traditional herbal production and modern/traditional agriculture technology.

2) Enhancement of organization

They have enjoyed good cooperation with the Banafsheh Gostare Qeshm Cooperative so far. As they are planning to increase the number of active members, establishing a new cooperative would be necessary.

3) Strategic marketing

Another challenge would be to properly evaluate the long-term cost benefits of planting and selling herbs in the course of current and future livelihood activities.

12.3.4 *Prosopis Juliflora* management in Selakh

(1) Background

P. juliflora is an invasive alien tree species on Qeshm, although the timing of its introduction and by whom are not clear. In rural areas of Qeshm, indigenous tree species, represented by *P. cineraria, Acacia tortilis, A. nilotica, A. ehrenbergiana, Ziziphus spina-christi* etc., have been replaced partly by *P. juliflora*, with some plantations of dates and other trees having been destroyed by its invasion.

Selakh Village, located in the west of Qeshm, is one of the villages that has suffered from an invasion of *P. juliflora*. According to the census conducted in 2011, Selakh Village is located in the Selakh rural area of Shahab District, with a population of 2,740 (1,338 females and 1,402 males) and 619 households covering an area of 74 ha.

(2) Objective

The objectives of the *Prosopis Juliflora* Management Pilot Project are defined as follows:

- *P. juliflora* to be removed from the project site
- A watering facility to be installed in order to promote native and useful plants replacing *P. juliflora*
- Alternative tree species to be planted where possible, which are economically promising
- A set of technologies to control *P. juliflora* to be evaluated and published in order to extend their application

(3) Issues recognized before the project

1) Lack of knowledge of *P. juliflora* elimination and maintenance of the land

Some villages on Qeshm Island including Selakh have been invaded by *P. juliflora* since its introduction. Unless *P. juliflora* is eradicated at the root, it will soon regenerate. The depth of the roots extends as much as 20 to 30 m, growing to a greater depth when in search of water. The villagers in Selakh have learned about methodology for the elimination of *P. juliflora* and the prevention of its regeneration. Previously, the villagers were unfamiliar with the way to remove naturally grown *P. juliflora* efficiently, while methodology to maintain the land where *P. juliflora* grew had not been established.

2) Selection of alternative species

The villagers have realized that planting other species replacing *P. juliflora* would be a good way for the conservation of vegetation and the natural environment. Moreover, agritourism promotion would also be important for villagers' livelihood. However, they did not know which species were suitable alternatives to *P. juliflora.*

(4) Achievements

1) P. juliflora management

P. juliflora did not regenerate on the project site during the project period. Plant species with the potential to replace *P. juliflora* vegetation have been identified, such as *Opuntia ficus-indica*, *Moringa oleifera*, *Hibiscus sabdariffa*, *Aloe vera*, *Paulownia sp.*, *Ziziphus spina-christi* and *P. cineraria*. The survival and growth of the above species replacing *P. juliflora* were observed during the project period.

2) Establishment of the basement of agricultural business

All planned outputs (formulation of an implementation, removal of *P. juliflora*, installation of the drip irrigation system, plantation of the alternative species, evaluation of the introduced technology) were mostly produced.

3) Demonstration of alternative species

A total of seven species were planted in the target area. They offer considerable benefits not only as crop products but also in enhancing the environment and vegetation. The characteristics of five of them are shown below.

Participatory workshop with residents and government officials

Removal of *P. juliflora* in the target area and installation of drip irrigation

Planting alternative species ① (*Aloe vera barbadensis miller*)

Planting alternative species ② (*Opuntia ficus indica*)

Planting alternative species ③ (*Hibiscus sabdariffa*)

Planting alternative species ④ (*Moringa oleifera*)

Source: JICA Project Team

Table 12.3.2 Characteristics of Alternative species

Name of plant	Characteristic of plant
Aloe vera barbadensis miller	This plant, with its low water requirements, compatibility with the island's climate, easy maintenance and resistance to diseases, is an appropriate option for farmers on Qeshm Island. One of its main uses in the production of gels using leaf extract, beverages and cosmetics that moisturize the skin and provide sunscreen.
Opuntia ficus indica	This plant is resistant to dehydration and requires minimal water (about 1 l/week for each plant) and heat resistance. The option is highly suitable for farmers who have a large amount of land but with little water for farming. *Opuntia* (a type of cactus) is planted for use as edible fruits and leaves. Leaves, in addition to forage, can also be used in human oral consumption.
Hibiscus sabdariffa	The positive growth of this plant on the pilot project indicates that it is suitable for cultivation on the island. Therefore, the Selakh farm used this experiment to test working on other plants that are theoretically suitable to be planted on the island. The application of this plant is made using dried flower baskets to produce red tea and syrup, which are popular in some countries.
Moringa oleifera	This plant is rich in vitamins, amino acids and minerals required by the human body at high levels in its leaves, which has made this miracle plant known as the most useful tree in the world. After picking the leaves, they are dried in the shade or a drying machine and then turned into powder. This powder can be added to salad and put into in capsules as a supplement. The leaves and fruits are also used in cooking as vegetables.
Moringa oleifera	This tree can resist 3-10 l of water per day and so is a suitable tree for forestry. One of the usages of this tree is as wood that can be picked up at age five, during which time 0.7 m^3 of trunk timber can obtained per tree. This wood, which is light in weight and high in strength and quality, has an average price of 400 USD/m^3. Since a leafy tree is used, its leaves are used as animal forage, while its abundant flowers can also create an appropriate space for bees for three months of the year.

Source: JICA Project Team

(5) Way forward

1) Monitoring and verification

Due to the limited project duration, the survival and growth of the planted species in the long-term and the economic benefits from their products have not been confirmed. The most suitable species as alternatives to *P. juliflora* has not been confirmed either. Therefore, the villagers and QFZO officials should monitor the regeneration of *P. juliflora* and the cultivation situation of transplanted species for at least six months.

2) Water supply

Water supply has been dependent on a water tank truck arranged by QFZO to date. Independence should be facilitated through establishment of a piping or reverse osmosis system, for example.

3) Electricity license

The project implementer (Bagh e Agritourism e Chahrubari Cooperative) could not obtain permission from the electricity company to supply electricity from the power grid in order to operate the irrigation system during the scheduled project period. Thus, the project period had to be extended until the end of September 2018. The cooperative needs to continue to push the power company to accept the application and establish a sustainable electric system.

4) Establishment of agritourism

This project would be part of a larger-scale project such as the promotion of agritourism. In fact, the cooperative (project implementer) has tried to establish an agritourism space in this area (much wider than the project area). Through monitoring and verification of these alternative species, the activities

would be expected to be enhanced as much as possible.

12.3.5 Training on seaweed farming in three villages (Hangom, Baseidou and Kani)

(1) Background

Gracilariopsis persica, a seaweed species, is naturally distributed in the coastal waters of Hormozgan Province and utilized as a raw material of agar, for which international demand has been increasingly growing. The promotion of farming, such as seaweed farming, in the coastal areas of Qeshm has the potential of improving rural livelihoods. However, the farming of the seaweed is still at a predevelopment stage and has not spread out to local communities on Qeshm. Following requests from the villagers of Hangom, Baseidou and Kani for technical assistance, the present pilot project was launched to disseminate seaweed farming techniques in those villages through on-the-job training (OJT).

(2) Objective

The objectives of the training on seaweed farming are defined as follows:

- Participants of training programs to become interested in starting seaweed farming in their villages
- Some groups of local people in Qeshm will intend to start seaweed farming on larger or commercial scales in their village(s) in the next farming season
- Through the trainings, alternative livelihood activities could be promoted

(3) Issues recognized before the project

The following is an example from Baseidou. The number of those who are engaged in fishery in Baseidou has increased in the past few years. However, they cannot make a stable income. Thus depends, to some extent, on the temperature or sea conditions in each year and season. Therefore, diversification of income sources is needed, not only in fishery or existing industries.

(4) Achievements

1) Technical transfer

The participants from the three villages proactively participated in the training. A lecture was given to the participants by using a seaweed farming manual prepared by the Mazrae Daryayi Zarin Qeshm company. Then, OJT for technical transference was conducted at the company's laboratory and on the coastline of each village. Test farming was conducted in each village by providing seedlings and materials for the farming system to the participants. The test farming sites in Hangom, Baseidou and Kani were repeatedly visited by Mazrae Daryayi Zarin Qeshm and JPT experts, while supplementary technical guidance was given to the participants. In turn, the participants acquired knowledge and skills for seaweed farming and saw how seaweed was growing in their own villages. This was an efficient way to engage participants and other interested residents in the villages.

2) Enhancement of villagers' awareness of seaweed farming

The growth of seaweed during the test farming in Baseidou was so positive that the participants became highly motivated to conduct further test farming and apply for permission to practice commercial seaweed farming to the QFZO and Shilat (Iranian Fisheries Organization) during the next farming season.

The result of the test farming in Hangom was also positive; but the villagers need to involve wider areas for commercial-scale farming by repeating more test farming in different places, since the potential areas for seaweed farming are geographically dispersed. On the other hand, test farming in Kani was affected by siltation and grazing by herbivorous animals. More suitable farming sites need to be found where less grazing and siltation are expected. That said, the participants from Hangom and Kani also showed interest in conducting test farming in their villages during the next season.

Lecture

Commencement of test farming

40 days after commencement

Harvested seaweed during the training

Source: JICA Project Team

(5) Processing and market

Harvested seaweeds (*Gracilariopsis persica*) are cleaned of epiflora and fauna, sun-dried, packed and sold to buyers. The seaweeds are used as raw material for the extraction of agar in the factory. Agar is used as an ingredient in desserts in Asia and as a solid substrate for microbiological testing. Agar can be used as a laxative, an appetite suppressant, a vegetarian substitute for gelatin, a thickener for soup, in fruit jelly, ice cream and other desserts, as a clarifying agent in brewing, and for sizing paper and fabrics. One likely buyer on the mainland, at present, would be a cosmetic-producing company in Bandar Abbas, while expected export markets are agar-producing companies in Italy, according to the contractor, Mazrae Daryayi Zarin Qeshm. There are some importing companies in Indonesia according to the market survey conducted by the JPT in November 2016.

(6) Way forward

The necessary actions for post-OJT activities are suggested as follows.

- It is essential for villagers to ensure a stable supply of seedlings by communicating with seedling suppliers
- Additional tests are necessary to find suitable farming sites in Kani and Hangom
- It is better to present successful farming examples (e.g., farming in Baseidou) to other villagers in order to promote seaweed farming on Qeshm.
- Some selected participants on the present OJT programs can be utilized as human resources for technical dissemination on Qeshm.

12.3.6 Revival of a traditional date palm Garden in Haft Rangou

(1) Background

In general, Qeshm Island is not necessarily suitable for cultivating agricultural products due to its climate with high average temperatures. Therefore, plants or trees with high temperature resistance are valuable as both crop products and vegetation from an environmental perspective.

Tourism activities are popular in the village. There are two guesthouses in the village, while about 30 private houses are rented to tourists by their owners. During the Nowruz holidays, about 150 tourists visit Haft Rangou per day, while only 50-60 tourists visit the village at other times of the year.

At the consultation meeting with the JPT, held in September 2016, representatives of Haft Rangou stated that their first priority for a pilot project was the revival of a traditional date palm garden.

(2) Objective

The objectives for the revival of a traditional date palm garden are defined as follows:

- To revive a traditional date palm garden in Haft Rangou as an important part of the identity, culture and tradition of Qeshm Island and Iran as a whole
- To establish a tourist attraction by exhibiting the traditional date palm garden to visitors
- To contribute to the enhancement of livelihoods among the village population

(3) Issues recognized before the project

1) Promotion of the attractiveness of the village

Historically, Haft Rangou has great potential to promote date palm products considering that there is a long tradition and broad knowledge among locals in date palm tree growing. However, date palm trees alone cannot enhance livelihoods or attract visitors. It would be necessary to make the most of the tradition of date palm trees and Haft Rangou's geographical advantage.

2) Resilience to water shortage condition

There had been problems with water shortages for a long time. Less precipitation and poor water supply had prevented the cultivation of useful plants, meaning that agricultural traditions have deteriorated in just a few decades.

(4) Achievements

1) Establishment of organization structure

On this project, a traditional date palm garden was revitalized via the participatory approach adopted from the formulating stage to implementation. At the beginning of this project, cooperative members were not organized properly; however, in the process of implementation, they tried to enhance their organizational capabilities and successfully completed this project. At the end of the project, the cooperative members should have gained the skills and experience needed to enhance traditional palm production and manage the palm garden sustainably.

2) Promotion of activities with a synergistic effect

This is also expected to attract tourists through a synergistic effect with other pilot projects around the Hara Mangrove Area. The village has unique local products made of/relating to the date palm tree, while this project aimed to utilize those products for income generation among villagers from the early planning stages. It seems that some products have already been developed (they are sold at the souvenir shop in the garden).

3) Diversification of products

Date palm is mainly consumed as a fruit or processed food. The seeds of date palm are utilized as feed for animals, such as camels, while oils can be taken from the seeds for use in soap and cosmetics. In view of the diversification of products, there is high potential for producing crops. The palm garden has wooden furniture made of date trees. From the eco-island perspective, the Haft Rangou date palm garden could be a theme park celebrating nature/humanity with date palm trees as the theme.

Layout plan


Palm garden


Playground


Wind catcher

Source: JICA Project Team

(5) Way forward

The challenges are as follows:

- Further improvements on the quality and quantities are required
- How to promote this garden to other villages and tourists is a challenge
- It will be necessary to keep this garden in a good condition and even enrich it with more trees and plants in the future
- It will be necessary to establish methods for selling products produced in this garden
- It will be necessary to improve the qualities of date palm-related products originating from the village

12.3.7 Lenj building and sailing open museum in Gouron

(1) Background

Gouron has a long history of building Lenj, a traditional type of wooden boat for long-haul sailing. Lenj building in the Persian Gulf was registered as an "Intangible Cultural Heritage" by UNESCO in 2011. This pilot project was originally proposed by Gouron villagers, supported by the Geopark Office of the QFZO with the aim of preserving traditional Lenj building techniques and enhancing the livelihood of Gouron people by introducing Lenj building traditions to tourists. The QFZO and the JPT judged that the project concept proposed by Gouron villagers matched the goals of Qeshm development, including the preservation and revival of the natural environment and traditional assets and the promotion of livelihood development.

(2) Objective

The objectives of the Lenj Building and Sailing Open Museum are defined as follows:

- To conserve traditional techniques for building and sailing Lenj and other types of boats
- To enhance the livelihood of the Gouron Village population by promoting tourism linked to the Lenj building tradition

(3) Issues recognized before the project

1) Conservation of traditional culture

The villagers in Gouron had been keen to preserve their unique skills for the construction of traditional

wooden Lenj, their original and unique asset. However, the lack of a budget and expertise impeded preservation and they had been concerned about the gradual extinction of this precious tradition as former sailors and Lenj-building masters grow older year by year.

2) Promotion of tourism activities

They hoped to enhance tourism activities through promoting and advertising their tradition of building wooden Lenj and making handicrafts. A virtuous cycle could be created in such a way that the vitalization of the Lenj building tradition would lead to tourism development and the enhancement of livelihoods for Gouron people, with interested investors placing an order to build new Lenj, while demonstrating the building process for actual Lenj could bring in a larger number of tourists to Gouron.

(4) Achievements

For a long time, the villagers in Gouron had been wanting to promote their tangible heritage, such as Lenj, and realize a plan that could make the most of their traditional culture and natural environment as tourist attractions. However, the plan was vague and unrealistic. On the other hand, The ECO-QESHM Master Plan could focus on the conservation of the natural environment and sustainable livelihood improvement by the villagers themselves. From these viewpoints, the outcome of this pilot project is shown in the following respects.

Layout plan

Emergency management training

Commemorative Lenj

Lenj model built by villagers to be placed in a playground

Source: JICA Project Team

1) Establishment the foundations for protecting their assets

This village has boasted famous heritage-based assets, such as Lenj, and traditional techniques, such as making handicrafts; therefore, villagers strongly wanted to protect these assets. The pilot project was at least able to establish a foundation on which the villagers themselves could develop a museum as a major tourist destination in Iran and in the region by capitalizing on their traditions.

2) Environmentally friendly water transportation

The natural environment such as the Hara Mangrove Area should be managed properly by indigenous residents with qualified knowledge and experience. The pilot project indicated the possibility to apply an environmentally friendly water transportation mode, such as Lenj, Tartari and other traditional boats in place of engine-driven speed boats for cruising around the Hara Mangrove Forest.

3) Improved livelihood

The high potential to attract tourists would improve their quality of life. The pilot project verified the effectiveness of the approach to combine traditions with tourism development for livelihood improvement.

4) Networking

The JPT consists of several experts who can support villagers to become involved in this project through tourism promotion, conservation of the natural environment, architectural input and organizational consideration. Therefore, the JPT could provide technical input and budgets, as well as institutional support and structural networking. The pilot project experience highlighted the collaborative support provided by the JPT and the QFZO to Gouron. The QFZO could continue supporting Gouron by taking on the JPT role as well after the JICA project is completed.

(5) Way forward

1) Preparation of future plans

This project could be a bigger scale compared to other pilot projects. Therefore, it is necessary to set up future plans, such as five-year plans, or the so-called "Action Plan", to manage and supervise the activities undertaken. Since August 2018, villagers in Gouron have been preparing the Action Plan, while receiving support from QFZO officials and JPT experts. This momentum should be maintained in the future without JICA support. In order to keep them motivated, the Action Plan must be pragmatic and developed by the villagers themselves.

2) Generation of a synergistic effect

This pilot project has high potential to affect not only this village, but also the entire island. The important point is to disseminate this achievement to other villages and cities on Qeshm Island. This would in turn generate a synergistic effect among other tourism spots, such as the Geopark, the Hara Mangrove and other pilot project sites.

12.3.8 Hara mangrove ecotourism in three villages (Kovarzin, Sohli and Tabl)

(1) Background

The Hara Mangrove Protected Area is designated as a UNESCO Biosphere Reserve, a Ramsar site, and a national protected area of Iran. It is also one of the geosites (G20) in the Qeshm Geopark, for which an application was submitted in order to join the UNESCO GGN in February 2016 and was officially listed on May 5, 2017. Being registered as a national protected area means that is under the control of the DoE in Tehran. Through a series of discussions and site surveys, the following issues were identified:

- Multiple designations of the Hara Mangrove Area as domestically and internationally protected areas are creating an overlap of the functions of the relevant authorities for conservation and management
- A management plan has not been approved
- Jetties and access roads have been developed for tourism promotion in response to requests from many villages, without a long-term management plan of the protected area

This pilot project has been formulated and proposed in consideration of the need to tackle these issues and from the perspective of promoting ecotourism.

(2) Objective

The objectives of the Hara Mangrove Ecotourism Pilot Project are defined as follows:

- To develop a sustainable management system to utilize and conserve the ecosystem of the Hara Mangrove Area

- To generate more opportunities related to economic activities for villagers
- To improve the quality of existing activities in Hara, according to international ecotourism standards

(3) Issues recognized before the project

1) Lack of a promotion method

The tour guides in the target villages did not recognize an appropriate method for welcoming tourists and making the most of the natural heritage assets, such as the Hara Mangrove Area, and the historical heritage assets. In the past, several training programs have been run for enhancement of tour guide skills. However, there were limitations in terms of sustainability and consistency in maintaining the improved guiding practices.

2) Ecosystem and vegetation conservation

The conservation of the Hara Mangrove Area has an been important issue for tourism promotion, as well in protecting the ecosystem and vegetation. This pilot project was commenced in order to secure compatibility between tourism promotion and the conservation of the Hara Mangrove Area.

3) Unhealthy competition

One of the observed issues surrounding the Hara Mangrove Protected Area was that unhealthy competition between villages was disturbing the ecosystem due to the development of jetties and access roads at each village.

(4) Achievements

1) Agreement on rules and regulations

"Rules and regulations" for boat trips in the Hara Mangrove Protected Area and a common tourist feedback system were agreed as the results of discussions among the trainees. The "training the trainers" training was organized by inviting boat operators from all three active villages. It gave them an opportunity to have a dialogue in order to find a common goal in conserving their environment.

2) Realization of tourism assets

An educational trip to advanced ecotourism sites gave them an opportunity to understand the process of defining existing resources and utilizing them as tourism assets. They have deepened their understanding of the potential outputs of ecotourism.

3) Sustainable training system

The "train the trainers" training has fostered local trainers in each village, i.e., Kovarzin, Sohli and Tabl. The QFZO can provide advanced trainings to these trained local trainers instead of providing training to all the local boat operators. A sustainable training system can be developed by utilizing these local trainers.

4) Establishment of a tourism information center

The establishment of a tourism information center within the compound of the tourism vocational school would provide the opportunity for practical training for students on how to welcome tourists. They could learn about tourists' requirements through practice.

Preparatory meeting

Survey during the 2017 Nowruz

Renovated information center in the vocational school

Presentation on Nowruz activities by the students of the vocational school

Source: JICA Project Team

(5) Way forward

1) Developing a zoning plan

There needs to be a way forward in terms of proceeding with the memorandum of understanding (MoU) between the DoE in Tehran and the DoE of the QFZO. Although the MoU was signed in August 2017, it will not be feasible to implement related activities, including the hard components, without a zoning plan specifying allowable activities by zone. Further activities will require time to implement, which means that the time frame of the project will be exceeded. How to apply the MoU in reality should be discussed and agreed. Developing a zoning plan for the Hara Mangrove Protected Area is an especially crucial issue for future ecotourism activities.

2) The establishment of an ecotourism committee within the QFZO:

A tourism officer with the Geopark Department in the QFZO has been trying to form an ecotourism committee within the QFZO, whose objective would be to coordinate several activities for developing ecotourism on Qeshm among the departments under the remit of the Cultural, Social and Tourism Deputy. The previous deputy agreed to the establishment of such a committee; however, he was replaced. It is necessary to discuss the matter with the new deputy and the department heads of the Tourism, Geopark and Environment Department.

3) Continuous training

The expected outcome of the current training for local guides and boat operators is to foster trainers who can provide training to other cooperative members. The final goal of the training is to achieve the initial objective: improve the quality of current boat trips. To continue the training is indispensable if the final goal is to be achieved. Strong input from the DoE of the QFZO and three cooperatives is mostly required.

12.3.9 Qeshm City souvenir shop

(1) Background

The numbers of visitors to Qeshm Island was 3,988,000 and 3,731,000 in 2014 and 2015, respectively. The majority of visitors visit Qeshm to shop for goods sold at lower prices, due to Qeshm's Free Zone status. Other tourists visit major touristic spots on Qeshm, such as the Hara Protection Area, Shibderaz

(for watching sea turtles) and Hangom (for watching dolphins). Qeshm's villages have a long tradition of producing traditional embroidery works for their own consumption and selling these to other villages. Although efforts have been made to link the production of these traditional handicrafts with the tourist market, in order to upgrade the income level of villagers, they have been sporadic and limited to individual village-based approaches, thus failing to produce a substantial effect. There has been no attempt to promote Qeshm's traditional handicrafts together under a Qeshmi brand. The Qeshm Souvenir Shop Pilot Project is formulated with three key terms: "marketing", "exposure" and "good quality at reasonable prices".

(2) Objective

The objectives of the Qeshm city souvenir shop pilot project are defined as follows:

- To make a breakthrough for expanding Qeshm's souvenir market by tapping into the shopping visitors' market, which has been untapped until now
- To encourage village women to realize the importance of marketing by exposing them
- To create a system of continuously supplying souvenir products both to shopping visitors and to tourists interested in the nature and culture on Qeshm for the benefit of villagers

(3) Issues recognized before the project

1) Consolidation necessary

The women in some villages, such as Mesen and Borka Khelaf, have strong skills in producing handicrafts. However, they have not had many opportunities to advertise or promote their products. Even when there were such opportunities, they remained as individual efforts rather than group activities. The consolidation of small efforts by individual villages and promoting the Qeshm brand under one umbrella is needed.

2) Lack of a marketing strategy

There was no marketing strategy, for example, relating to the types of commodities that tourists might like, acceptable price levels, quality requirements and promotion activities. Efforts have been limited to sporadic efforts by individual villages. The creation of a marketing outlet and the preparation of a marketing strategy are required.

(4) Achievements

1) Improvement in income level and economic diversity

There has been some level of improved income resulting from increased sales at the Qeshmineh souvenir shop. By tailoring handicrafts to better reflect the needs of potential customers in a careful manner, the chances of generating more income will be great. The shop has already enabled the diversification of economic activities. That is because many kinds of products are offered in the shop: not only clothes, but also bags, model ships and other handicrafts are sold.

2) Networking

The participating women had a chance to work together with women from other villages, which was a new experience for them. This underlined the potential for Qeshm women to network, which is the basis for creating a Qeshm brand.

3) Establishment of a Qeshm brand

The handicrafts sold at the Qeshmineh shop were appealing to customers, indicating the strong potential for Qeshm handicrafts to become major brand items of Iran, preferably associated with high quality and high prices.

4) Improvement in awareness

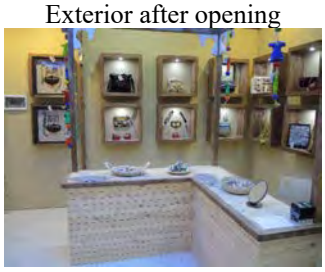
The women had a chance to be exposed to the market and realized the severe reality of selling products. While they had tended to expect tourists to buy whatever they made at any cost, they realized this was not the case. This opportunity opened the eyes of some of them to the need to more seriously think about marketing.

5) Diversity of the marketing system

Two methods for establishing a system in which handicrafts made by village women can reach customers through the Qeshmineh shop were tried. One is the system by which the Qeshmineh shop places an order for handicrafts, purchases them and sells them at the shop, while the other is the one by which the handicrafts made by village women are displayed in the Qeshmineh shop and money from sales is transferred to them based on the products sold at the shop. Which system works better is yet to be determined.

Exterior after opening

Exterior after opening



Interior after opening

Opening ceremony

Source: JICA Project Team

(5) Way forward

1) Sophisticated marketing strategy

There were varied views from customers regarding the price levels of the handicrafts, including some saying they were too expensive. A pricing strategy, as part of a marketing strategy, needs to be prepared so that prices are acceptable both to customers and to producers. In addition, since the activities under the pilot project were experimental in nature, no profit margin for the shop was included, meaning purchase prices and selling prices were the same. In the future, prices will have to be determined based on the financial management principle of recovering costs and generating profits.

2) Further promotion

Due to the time constraint for preparation, marketing activities were limited to the preparation of leaflets, information dissemination via the QFZO and JPT websites, and public events, such as the opening ceremony. A marketing strategy, which is effective enough to attract visitors on Qeshm to the Qeshmineh shop, will be required.

3) Capacity enhancement

Capacity enhancement of participating women is required, especially in terms of nurturing awareness of the importance of teamwork. This is especially important because producers of handicrafts are from different villages and are not used to working with women from other villages. Without continuous and

steady efforts to change their mindset, village women will continue to behave individualistically, which will be a big obstacle in creating a Qeshm brand.

4) Continual support by the QFZO

The immediate need for sustaining the Qeshmineh shop involves continued support from the QFZO, especially in terms of bearing the costs for hiring Qeshmineh shop employees. Since the Qeshmineh shop is like a new born baby, it is not possible yet to bear the costs for running it. The QFZO's continued support will be necessary at least for the next few years as an incubation period.

5) Road map for the future

It is necessary to prepare a road map for the Qeshmineh shop for the future, such as the next three to five years. This road map will confirm the target state of the Qeshmineh shop, which is a financially independent status, and a set of actions required to attain such a state. The steps allowing the QFZO to gradually step aside will be also shown.

12.3.10 Action plan and networking

(1) Action plan

Action plans were prepared for each pilot project except for the seaweed farming project, for which QFZO will support the three villages when the procurement of seaweed seedlings becomes possible. The objective of the action plans is to clarify the activities to be undertaken by each village for a period of five years after the present project ends. The action plans contain the following factors.

- General goal,
- Activities,
- Schedule,
- Activities to be undertaken by villages, and
- Supports required from outside

For tourism-oriented projects, the actions plans are useful in confirming the activities to take place immediately for the next new year in March 2019. The prepared action plans are shown in Table 12.3.3 to 12.3.10.

(2) Networking

Networking of all the stakeholders in Qeshm is an important issue for the future development of Qeshm Island. The villagers who participated in the pilot projects should unite and integrate their efforts to promote further development of their pilot projects. They should expand their network with other villages and the private sector as well. With their coordinated efforts, they will be able to mobilize resources effectively and disseminate information on Qeshm to outside efficiently, thus contributing the creation of Qeshm brand.

With this prospect in their mind, the leaders of the eight pilot projects decided to establish a cooperative. The registration was made with QFZO in November in 2018 and the name was decided to be "Eco-Qeshm Sustainable Development Cooperative (QDC)". The objectives of QDC are defined as follows.

- To create a unified channel of consultation with QFZO, Qeshm County and any other possible supporting organizations to further develop the pilot projects,
- To jointly promote dissemination of information on Qeshm Island to outside as a collective effort rather individual efforts,
- To jointly negotiate with the private sector with stronger bargaining power, and
- To cooperate with QFZO and Qeshm County in disseminating the participatory approach throughout Qeshm Island.

Table 12.3.3 Action Plan for Laft

General Goal	How to achieve it?	Schedule					Requirements (Laft's action)	Who will help us?
		1397	1398	1399	1400	1401		
1. Creation of organizational structure	(2) Clarification of the organizational structure						(1) Continue internal meeting (3) Follow tourism organization (5) Membership fee to hire someone temporarily	General Goal 1: council members, mayor, people related with tourism business
	(3) Management of resources and planning for next Nowrooz by committee							
	(4) ID cards for tour guides							
	(5) Management of tourism related businesses to avoid unhealthy competition							
	(6) Create an office with staff permanently stationed							
2. Promotion of public participation to improve culture of Laft	(1) Transfer traditions from Laft people to tourists						(1) Hold different/traditional festivals	(1), (2) QFZO
	(2) Create traditional activities to raise awareness of locals on tradition							
3. Continue training	(1) Swimming training for tourists and locals						(1) Consider specific places for swimming training & hire trainer (2) Hire English teacher (3) Discuss with tourism organization to hold handicraft training (4) Discuss with tourism organization to hold geo-tour leader training (5) Hold continuous meetings to evaluate their activities	(1) Train locals & use school as venue (2) English & French teacher (Mr. Mohamadi) (3), (4) Tourism Department of QFZO (7) Follow experienced people (Mr. Malahi, Mar. Safari)
	(2) English and other foreign languages							
	(3) Traditional handicrafts							
	(4) Local guide and geo-tour leader							
	(5) Improve education on tourism to next stage							
	(6) Cooking training by trained women to other women							
	(7) Transfer traditional knowledge from elderlies to younger generations							
	(8) Educational trip to domestic and overseas destinations							
	(9) Rescue training							

4. Conserve and revive cultural & natural heritages	(1) Identify fauna and flora in & around Laft (2) Revival of sailing ceremony/festival (voyage departure in autumn & return in April/May) (3) Revival of old assets: abandoned (150 years ago or more) houses, graveyard in the outskirts of Laft, old castle, gold wells (4) Revival of Lenj building tradition (5) Support people renovating old buildings (6) Keep the mangrove forest clean						(1) Study existing sources for all species (2) Internal coordination & design event (4) Coordinate with Lenj workshop at Gouron & Peyposht (6) Coordinate with council/mayor	(1) QFZO (2) Experienced people in sailing (3) QFZO, Cultural and Heritage Organization, village council, Mr. Safari (cooperative member) (4) Discuss with experts on building Lenj & workshop owners (6) Council, boatmen, fishermen
5. Introduction & promotion of Laft	(1) Introduce Laft to leaders and travel agencies (2) Advertisement and media support (3) Hold cooking and photography festival						(1) Coordinate with travel agencies & tour leaders (3) Create committee for holding different festivals	-
6. Create information content & offer to the public	(1) Install signboards for traditional heritages (2) Promote elderlies to become story tellers (3) Prepare Laft tourism map showing all the attractions (4) Use modern technology to attract tourists (media content)						(1) Follow mayor office to make sure they do it as soon as possible (2) Discuss with experienced people of Laft (3) Make a list of places to be added on the map (4) Create content (social media, Instagram etc.)	(1) Village council (3), (4) architect
7. Create & improve infrastructure	(1) Aquatic activities like water entertainment (2) Create an information center at jetty						(1) Prepare fresh water shower, get permission to star activity, buy equipment (2) Get permission, make brochure & map	(1) Investor, QFZO (2) Tourism committee member
8. Attract investors	-	-	-	-	-	-	-	-

Note: 1397 in the Iranian calendar starts on March 21, 2018 and ends on March 20, 2019 and likewise for the following years.
Source: JICA Project Team

Table 12.3.4 Action Plan for Mesen

General Goal	How to achieve it?	Schedule					Requirements (Mesen's action)	Who will help us?
		1397	1398	1399	1400	1401		
1. Advertising development	(1) Preparing journal						(1) Preparation of quality products (3), (4), (5) Communication with the right and most appropriate people (7) Provide quality samples and effective presence	1) Photographer & designer (2) Advertising consultant (6) Advertising consultant (7) Tourism, Cultural heritage & handicraft organization
	(2) Preparation of samples (restaurant, hotel, school uniforms)							
	(3) Advertising at tourist sites (mangrove forest, turtles beach, ports)							
	(4) Advertising through travel agencies, guesthouses, boat cooperatives							
	(5) Online advertisement							
	(6) Advertising by individuals or companies specializing in attracting major orders							
	(7) Participating in different exhibitions in order to sell the products							
2. Branding	(1) Providing quality products from Mesen village to the whole country							(3) DoE & Natural resources organization
	(2) Producing the best handicrafts & making Mesen a brand							
	(3) Producing different products for different tastes							
	(4) Differentiate Mesen products in Qeshm Island							
3. Employment & strengthening team work	(1) Coordinating with other villages to produce high quality handicrafts						Organize regular meetings between handicrafts activists (2), (3), (4) Organize regular meetings between handicrafts activists (5) Preparation of necessary documentation in cooperation with Geopark expert	
	(2) Allocate orders among villages based on production quality							
	(3) Precision in timely delivery of orders							
	(4) Holding training courses in order to promote knowledge & ability created in Mesen ladies							
	(5) Make a formal arrangement like signing contract with cooperative members to strengthen their commitment and loyalty for a long time							

4. Establishment of a manufacturing workshop	(1) Assigning suitable space for the construction of a workshop in cooperation with various organizations (2) Creating an raw material's store to provide all the necessary supplies (3) Getting a loan with appropriate repayment terms (4) Getting major orders from restaurants, hotels, hospitals, …)							(1) Submit a request to the manager of the JICA Qeshm project (Mr. Baniamerian) (2) Submit a request to the manager of the JICA Qeshm project (Mr. Baniamerian) (3) Provide Feasibility Study plan to Department of labor, welfare& social affairs of QFZO	(1) QFZO, Mayor & council members (3) Department of labor, welfare& social affairs of QFZO

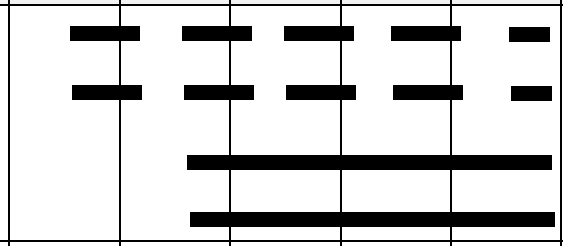
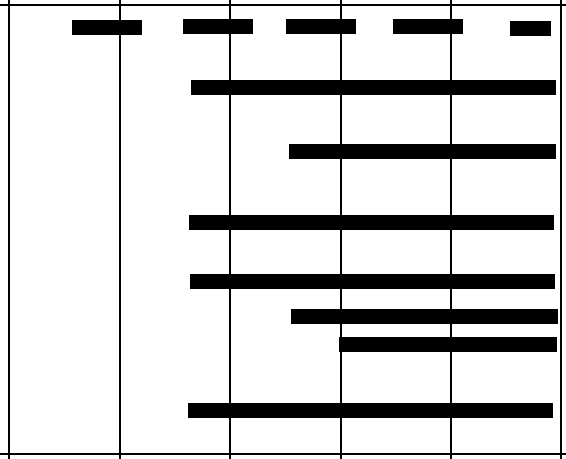
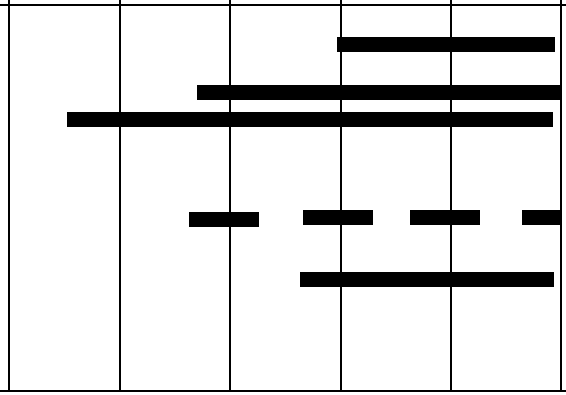
Note: 1397 in the Iranian calendar starts on March 21, 2018 and ends on March 20, 2019 and likewise for the following years.
Source: JICA Project Team

Table 12.3.5 Action Plan for Kovarzin

General Goals		How to achieve it?	Schedule					Requirements (Kovarzin's activity)	Who will help us?
			1397	1398	1399	1400	1401		
1.	Establishment of tourists resort complex & specialized center	(1) Advertisement & promotion (2) Increase types of herbs & introduce fruit trees (3) Prepare a leaflet on herbs (4) Train herb guides for tourists (5) Grow herbs by hydroponic system (6) Serve local cuisines & drinks using herbs to tourists (7) Hold training courses for students						(1) On-line advertisement (2) Cooperative member will take care (3) Prepare content of leaflet (5) Solve financial problem of cooperative & make hydroponic system work	(3) Need support in design & preparing content (4) Need somebody to train herb guide
2.	Create local jobs	(1) Offer original tours (camel riding, mangrove visit, tartari tour etc.) (2) Charge tourists visiting the garden (3) Provide services that will satisfy the tourists (4) Selling handicrafts							(1) Cooperation with villagers (e.g. those with camels) (4) Cooperate with
3.	Selling products to all over the country	(1) Villagers from Kovarizn and other villagers start growing herbs in their farm lands (2) Find market & sell (3) Herb industry is established in Qeshm						(1) Invite people from other villages to see their activities to encourage them to grow herbs (2) Find target market	(2) Need someone to promote their products

Note: 1397 in the Iranian calendar starts on March 21, 2018 and ends on March 20, 2019 and likewise for the following years.
Source: JICA Project Team

Table 12.3.6 Action Plan for Selakh

General Goals		How to achieve it?	Schedule					Requirements (Salekh's action)	Who will help us?
			1397	1398	1399	1400	1401		
1.	Eco-tourism development	(1) Create a coastal site for sport & local games (2) Holding music festival & Ritual activities (3) Building massage rooms using local oils (4) Creating ladies beach						(1), (2) , (3) ,(4) Building toilets	
2.	Agri-tourism development	(1) Green cultivation in a local way (2) Create greenhouses & Greenhouse cultivation (3) Breeding deer, peacock and ornamental birds (4) Hydroponic & aquaponic farming (5) Breeding livestock & poultry (6) Local herbs cultivation (7) Aloevera cultivation in 100 ha area (8) Planting flowers & flower export						Sepehr Selakh Qeshm cooperative can do & support these activities	(3) DoE & Natural resources organization
3.	Chahroobari farm development	(1) Development of arable land up to 100 ha (2) Install desalination system (3) Establishment of nursery for the production and export of seedlings (4) Create Aloevera processing factory (5) Drying & packing herb plants with native knowledge						Sepehr Selakh Qeshm cooperative Can do & support these activities	(2) QFZO

4.	Aquaculture activities	(1) Aquaculture (fish, shrimp, sea cucumber, ….) (2) Seaweed cultivation						Sepehr Selakh Qeshm cooperative can do & support these activities	(1) Fishery Organization (2) Fishery Organization
5.	Human resource development	(1) Providing training fishing net making (2) Holding training courses for drying fish with local knowledge (3) Training local community about Juli flora elimination & research for alternative species (4) Holding training courses for students						Sepehr Selakh Qeshm cooperative can do & support these activities	

Note: 1397 in the Iranian calendar starts on March 21, 2018 and ends on March 20, 2019 and likewise for the following years.
Source: JICA Project Team

Table 12.3.7 Action Plan for Haft Rangou

General Goals		How to achieve it?	Schedule					Requirements (Haft Rangou's action)	Who will help us?
			1397	1398	1399	1400	1401		
1.	Upgrading the existing date palm tree garden	1.1 Increasing greenery by planting more trees 1.2 Installing liter bins 1.3 Installing lighting within the garden 1.4 Installing lighting along the access road 1.5 Establishing a handicrafts gallery (45 m^2) 1.6 Improving the site plan						1.1 by cooperative 1.2 by cooperative 1.3 by cooperative (within the garden) 1.5 to be supported by Mr. Afshin (architect)	1.3 Installing lighting for the access road→ require financial support for 10 million Tomans 1.4 10 million Tomans
		1.7 Installing a new water reservoir (100m^3) 1.8 Dining hall (40 m^2) 1.9 Providing camp site for students for educational purpose						1.7 simple dining hall by cooperative	1.6 25 million Tomans 1.7 full scale at 20 million Tomans 1.8 Purchasing 10 big tents (10 million Tomans) 1.9 space preparation for 20 million Tomans
		1.10 Creating a small zoo 1.11 Improving the existing training rooms (in association with 1.7) 1.12 Installing rooms for tourists (5 rooms)						1.10 training rooms renovation by cooperative	1.11 100 million Tomans for 5 guest rooms
2.	Other activities	2.1 Expanding animal husbandry 2.2 Promoting port activities for women	-	-	-	-	-	-	-

Note: (1) Cooperative: Sahel Haft Rangou Qeshm Cooperative (2) 1397 in the Iranian calendar starts on March 21, 2018 and ends on March 20, 2019 and likewise for the following years.

Source: JICA Project Team

Table 12.3.8 Action Plan for Gouron

General Goals	(Activity (how to reach the goal)	Schedule					Requirements (what should we do?)	Who will help us?
		1397	1398	1399	1400	1401		
1) Improving the infrastructure	1-1 Improving the current jetty (installation of bridge, panthon and shade)	■					(a) Renovation of Tartaris and acquiring permits (b) Collecting the palm tree trunks and leaves (c) Procurement of seedlings and planting them in the site	(a) PMO (bridge and panthon are done) (b) Fishery Office (c) Planning and Budget (d) Private Investor
	1-2 Establishment of a tourist campsite (like the ones found around Qeshm Island)	■	■	■			(a) Visiting the existing camps (b) Volunteer work by people, like building served by hand (c) Ordering the plan (d) Contacting QFZO (e) Holding meetings for brainstorming	(a) Planning and Budget (b) Cooperative Members (c) Consulting company for preparing the master plan (d) QFZO Tourism Office (e) Village Officials
	1-3 Providing light especially during summer			*Not able to tell*			(a) Submitting to QUC and follow up by cooperative, council, QFZO (b) Negotiation and task differentiation between mayor and council	(a) QUC and QFZO Tourism Office (b) Village Officials
	1-4 Improving the greenery		■				(a) Knowing the water and soil of the location (b) Request from greenery company (c) Meeting with donors	(a) QFZO Greenery Dept. (b) QFZO Urban and Rural Affairs (c) Villagers and donors (d) Mayor
	1-5 Construction of museum's main building		■	■	■		(a) Follow up for completion of the masterplan (b) Follow up for the budget of the main building	(a) QFZO Tourism Office (b) Geopark Office QFZO
	1-6 Planning for Chah Kavir tours and dam visit		■	■	■	■	(a) Meeting with Geopark manager and experts to discuss ideas	(a) Geopark Office QFZO
2- Increasing the income of the cooperative, the people	2-1 Increasing the stay length of tours		■	■	■	■	(a) Meeting with experts and visiting similar locations (b) Continuous tour guide training (c) Holding different trial tours (d) Displaying the build and repair of small lenj	(a) Lenj builders after training (b) Local guides and others interested (c) Tourism experts and children's tourism subjects (d) Qeshm, an Island for Children project

and lenj builders	2-2 Diversification of tours						(a) Designating cooperative members for this task (b) Designing different tours and including different male and female students (c) To have discounts or even free days	(a) Cooperative Members (b) Tourism Experts (c) Local guides
	2-3 Introducing the museum to the tourism agencies						(a) Designing different tours (b) Negotiation with travel agencies and tour leaders (c) Finding bloggers and popular Instagram users (d) Negotiation with billboard owners	(a) Tourism and Geopark offices of QFZO (b) Tourism agencies (c) Web content producers (d) Environmental ads
	2-4 Creating a new market and designing different vessels for the island						(a) After discussion with local experts, the designs will be submitted to the PMO (b) Providing water and power to lenj repairing site	(a) Hara boat operators (b) JPT Experts (c) Professional carpenters (d) PMO experts
	2-5 Increasing Gouran's share in Lenj repairs						(a) Major promotions by cooperative company	Mayor, PMO, Local carpenters, Owners of current lenjes
	2-6 Changing the old lenjes uses						(a) Follow up by cooperative and captains (b) Identifying potential investors and offering them the plan	(a) PMO registration office (b) Creative investors
3- Educational workshops	3-1 Carpentry training for the village youth						(a) Holding regular theoretical and practical trainings for the youth	(a) Local carpenters
	3-2 Travelling to similar areas						(a) Dedicating part of the cooperative income to this (b) Preparing the educational environment with the help of mayor and council	(a) Tourism office of QGZO (b) JPT Experts
	3-4 Acquiring experience from local masters						(a) Official request from QFZO	(a) Continuing discussions with local masters
	3-5 ESL training						(a) Contacting similar websites for sharing knowledge (b)	(a) QFZO managements including geopark management

			JPT Experts
	3-6 Product quality enhancement training for ladies		
	3-7 Establishing the museum library	(a) Meeting with local donor (b) Iran's library ORG and QFZO	
	3-8 Marketing and sales training	(a) Conducting the first step in JICA contract	
4- Increasing the satisfaction level of tourists	4-1 Designing one day sea trips	(a) Providing tourist lenjes with required facilities (b) Equipment and renovation of current Tartaris	(a) Captains (b) Tourism agencies
	4-2 Preservation and promotion of traditional local music and arts	(a) Official letter and follow up to the related organization (b) Purchasing the instruments necessary (c) Increasing the inner strength	(a) Public affairs QGZO (b) IRIB
	4-3 Adding more attractions (including vessels)		(a) QFZO through purchasing worn out lenjes
	4-4 Promotion of respecting the tourist's behavior among locals	(a) Discussion with school principal for training courses (b) Discussion with prayer imams	(a) Prayer Imams of villages (b) Gouron schools
	4-5 Creating a special hook fishing site near the shore	(a) Coordination with DoE (b) Coordination with Fishery Office	
	4-6 Creating a statistics, evaluation and feedback system	(a) Reminding people about tourist rights	
5- Cooperation for preserving the environment	5-1 Teaching the proper fishing methods to the locals	(a) Designating fishing spots (b) Insisting on sending government official (c) Training of tourist through the guide (d) Holding fishing tours (for their income generation)	(a) Fishery Office (b) Experts (c) Tourists (d) Locals, including lenj owners, lenj builders and fishermen

	5-2 Protection of ecosystem (mangrove jungles and…)								(a) Requesting experts support from the government	(a) DoE QFZO
6- Respecting the local knowledge and assets	6-1 Preventing the valuable assets from exiting the village								(a) Negotiation with the owners for displaying their assets for distribution of the income.	(a) Locals (b) Cultural heritage office (c) Mayor (which means council)
	6-2 Keeping the local clothing style								(a) Emphasizing on the local clothing for people and museum personnel (b) Sewing workshop with new methods (c) Informing the locals (d) Holding classes for understanding the importance of the subject	(a) Locals (b) Village school students (c) Private Investor
	6-3 Building a boom for public display								(a) Creating links in other websites to ourselves (b) Encouraging people to use this capacity	(a) Donors (b) International organizations like JICA, UNESCO and…
	6-4 Transferring these feelings and ideas to the next generation								(a) Periodical training course for students held by the cooperative company	(a) Students, school managers
	6-5 Collecting traditional items of the locals									Locals, mayor
	6-6 Designing and construction of two vessels for tourism									PMO, JICA
7- Increasing advertisement and promotion	7-1 Informing the UNESCO office about the progress								(a) Requesting the council for frequent information distribution	(a) Geopark office (b) National commission of UNESCO (c) UNESCO regional office Tehran

	7-2 More promotion of wooden lenjes						(a) Promotion in the internet by ourselves (b) Sending promotional videos for travel agencies (c) Improving and constant updating of the cooperative website (d) Promotion in the local and national papers	(a) Tourism and cultural heritage office QFZO (b) Public affairs QFZO (c) PMO (d) Public media like tv, papers and…
	7-3 Introduction to travel agencies							Social Media
	7-4 Holding regular lenj launching ceremony						(a) To give discounts or even free service in these days!	(a) Cooperative members and villagers
	7-5 Creating a photo library							Mr. Arman
	7-6 Improving the hosting quality							Tourism experts
8- Improving the managerial system	8-1 Creating a permanent brainstorming room						(a) Inviting, village, county, province and national level experts for brainstorming (b) Holding different meetings with people (c) Holding regular public gatherings (d) Frequent meeting of board of directors (e) Hiring a full-time assistant (f) Hiring a part time accountant	(a) Related experts (b) JPT Experts (c) Geopark office and related organizations (d) Geopark office and related organizations (e) Villagers (f) Cooperative members
	8-2 Creating the statute and organizational document						(a) Having an active office for the cooperative	
	8-3 Creating professional committees within the cooperative						(a) Committees like Fishery, marketing, carpentry, handicrafts and so on…	(a) Cooperative Members
	8-4 Creating a tourism roadmap for the Gouran village						(a) How to use Chah Kavir, salt road or mountain climbing tours	(a) Geopark Office

Note: 1397 in the Iranian calendar starts on March 21, 2018 and ends on March 20, 2019 and likewise for the following years.
Source: JICA Project Team

Table 12.3.9 Action Plan for Ecotourism (Tabl, Sohli and Kovarzin)

General Goal	How to achieve it?	Schedule					Requirements (Sohli & Kovarzin's action)	Who will help us?
		1397	1398	1399	1340	1341		
1. Garbage control	(1) Control & fine for garbage throwing (2) Boat for collecting garbage (3) Awareness raising and installing trash bins						(1), (2) Coordination between boatmen & cooperatives	(1), (2) DoE, mayors, boat cooperative (3) Authority will designate locations and install garbage bins
2. Diversify tourism activities	(1) Bird watching with correct principles (2) Camel riding (3) Organizing local ceremonies (e.g. mangrove blossom event) (4) Local games for the public (local & traditional games) for Kovarzin (5) Offering eco-tours (fishing, swimming, Huri tour, mangrove honey tour) (6) Water & mud therapy place (7) Weekly markets (8) Presenting and holding night fishing tours (9) Local drinks & food promotion (10) Offer children games/recreation activities		*2 weeks after Nowrooz*		*Kovarzin →*		General Goal 2: Formation of the Planning Committee (1), (2) Villagers themselves will take care. (3) Villagers will initiate them (women cooking and bring handicrafts, huri competition with prizes etc.) (4), (5), (6), (7), (8), (9), (10) Coordination between boatmen	General Goal 2: tourism organizations, boat cooperatives, travel agencies (3) Need financial, technical and promotion support from authority (mayor, council, QFZO) (3), (4), (5), (6), (7), (8), (10) mayors, boat cooperative, DoE
3. Training courses/awareness raising	(1) Training for boatmen and villagers (2) Training for tour leaders (3) Training for locals to sell products (4) English training course (5) Awareness raising (stop chasing birds like pelican) (6) Training for other villages (Melki, Gouran, Dourab) (7) Promote education for students to protect mangrove						(1) They will encourage other boatmen to participate in the training. Prepare venue, equipment and materials (1), (2) Understanding with Geopark on venue & training courses (4) English teacher	(1) Announcement by authority will be necessary. Support in equipment like projector and payment to trainers will be needed (*QFZO is ready to support them*) (1),(2) DoE, tourism organizations, boat cooperatives, mayors & council members, Geopark office (4) Tourism organization, Geopark, boat cooperatives

4. Equipment & facilities	(Sohli & Kovarzin) (1) Creating bird watching places (2) Facilities for tourists (3) Information center & interpretative boards (4) Modification of existing structures at the jetty by local design (5) Using modern & yet simple equipment in boats and ports (6) Place for ladies to sell their products (7) Painting boats (8) Provide & monitor safety devices such as life jacket (9) Preparing & presenting equipment like binocular & booklet (Tabl) (10) Install lighting around mangrove (11) Replace boats with traditional boats (12) Create guidance room (13) Secure mooring space for boats (14) Floating restaurant (15) Resting place for tourists in front of the jetty (16) Create space for women at seaside		(1) Securing budget and planning (3) Designing and locating interpretation boards. Villagers will undertake activities. (4) Negotiate with boatmen & cooperatives (6) Create Women's committee for Soheili & negotiate with them (9) Compiling new content for the booklet, using binocular & rules and regulation card in ticket booth for tour guides	(1) DoE , Geopark (2) Mayors & council members (3) Geopark, DoE, tourism organization, Planning & Budget department (4) Geopark, DoE, tourism organizations, Planning & Boat cooperatives (6) Mayors & council members (9) Ebrahim-Obeid-Sattar (Scientific group for the preparation of materials) (10) Authority will build the structures and install equipment
5. Management & supervision	(1) Establish an association to protect mangrove forest (2) Establish borders between villages and prepare rules (3) Strong management system (4) Prioritizing boatmen who received training (by providing card etc.) (5) Improve ticketing system (increase ticket price, 3-types tickets, different tickets for different activities etc.) (6) Control the number of boats to the bearing capacity of mangrove forest (e.g. 100 to 50 in Tabl) & increase the capacities of each boat	***Experimen*** ***Official*** ***Sohli***	(4) Help to create the association (5) Meeting for pricing with Sarzamin Talaei syndicate & discussion between cooperative managers (6) Conduct internal meetings to determine capacity & ordering specially about Soheili village (8) Boat provided by villages	(1) Geopark, tourism organization, DoE (5) Tourism organization (6) Cooperative managers, trainers & cooperative members (8) Operation cost expected to be borne by QFZO or PMO

	(7) Uniform & local dress for boatmen (8) Patrol boat							
6. Promotion & research activities	(1) More advertisement (2) Research on species in mangrove forest						(1) Design and publish a joint website for the villages close to mangrove forest (2) Seek support by Dr. Ranjbar of Hormuzgan University	(1) Association for the protection of mangrove forests (2) Hormozgan University, DoE
7. Broader activities	(1) Stop trawl fishing and other environment damaging fishing methods (2) Stop cutting mangrove branch tips (3) Change boat oil carefully (4) Stop taking camels to mangrove at low tide (limit to high tide time)	-	-	-	-	-	-	(1) Sea border guard command, Fishery organization, DoE

Note: (1) 1397 in the Iranian calendar starts on March 21, 2018 and ends on March 20, 2019 and likewise for the following years. (2) Two draft action plans, one for Tabl and the other for Sohli and Kovarzin prepared separately, were merged.

Source: JICA Project Team

Table 12.3.10 Action Plan for Qeshmineh

General Goal	How to achieve it?	Schedule					Requirements (Qeshmineh's action)	Who will help us?
		1397	1398	1399	1400	1401		
1. Financial management	(1) Hiring a part-time accountant (2) Creation of a clear financial system to ensure sharing of information with all members (3) Collection of sales information so far						(1) Need computer system, accounting staff	(1) QFZO, accountant on a part-time basis
2. Marketing	(1) Finding international customers for wholesale and retail (2) Selling products in neighboring countries (e.g. UAE, Oman) (3) Application to sell products in mainland (4) Negotiation with shop owners to sell Qeshmineh products (5) Getting orders from different organizations (schools, governments)						(3) Application to QFZO	(3) QFZO
3. Improvement of sales	(1) Participation in national and international exhibitions (2) Preparation of journal of products (3) Advertisement at hotels, restaurants, travel agencies etc. (4) Changing the location of Qeshmineh (5) Discount packages (6) Improving the quality of packing (7) Holding different events (8) On-line advertisement						(2) Collection of samples of products, preparation of photos and contents (3) Preparation of show cases and negotiation with hotels, restaurants etc.	(2) photographer and designer
4. Training	(1) Training for sales team (2) Study tour for sales clerks in big cities in Iran (3) Training for producers						(1) Finding a trainer and venue (3) Holding meetings regularly	(1) QFZO (2) QFZO
5. Production	(1) Production of items with different tastes (2) Production of useful products (3) Upgrading production quality (4) Establishment of a material shop (5) Increasing the amount of production						(3) Rent or buy a shop by loan	(4) Banks

	and speed (6) Production of small and low price products (7) Nurturing trust among producing women							
6. Delivery	(1) Delivery on time (2) On-line sales (3) Finding solutions to deliver the products to customers						(2) Negotiation with on-line shops, launching their own web-site (3) Negotiation with postal office and transportation company	(3) Postal office and QFZO
7. Business plan	(1) Business plan preparation for application to bank						(1) Need budget ($60)	(1) JICA

Note: 1397 in the Iranian calendar starts on March 21, 2018 and ends on March 20, 2019 and likewise for the following years.
Source: JICA Project Team

12.4 Evaluation of the Pilot Projects

12.4.1 Evaluation method

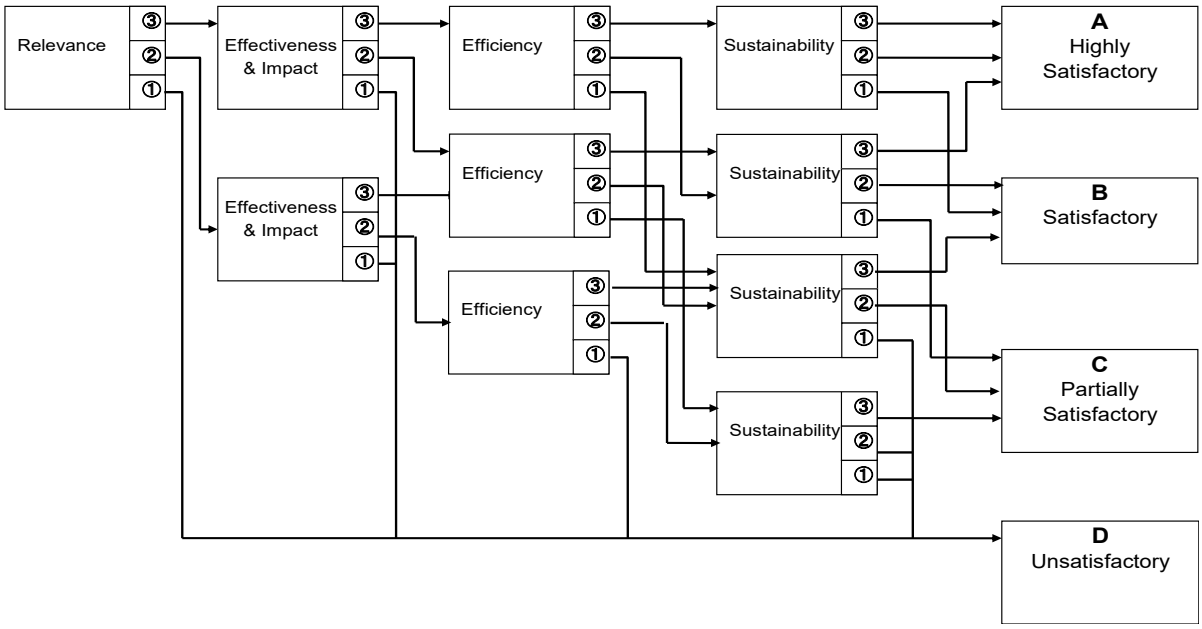
At the middle and end of the pilot projects, they have to be evaluated. The main purposes of evaluation are to improve future activities and aid policy, programs and projects through feedback on lessons learned, and to ensure accountability including the provision of information to the public.

An evaluation of an ongoing or completed project, program or policy, and its design, implementation and results, should be conducted as systematically and objectively as possible. Projects are evaluated to determine relevance, effectiveness, developmental efficiency, impact and sustainability. They should provide information that is credible and useful, enabling the incorporation of lessons learned into the decision-making process of both recipients and donors.

When evaluating programs and projects, it is useful to consider the following DAC criteria, as laid out in the DAC Principles for the Evaluation of Development Assistance:

(a) RELEVANCE: The extent to which aid activity is suited to the priorities and policies of target groups, recipients and donors.
(b) EFFECTIVENESS: A measure of the extent to which aid activity attains its objectives.
(c) EFFICIENCY: Efficiency measures the outputs (qualitative and quantitative) in relation to the inputs. It is an economic term, which signifies that specific aid uses the least costly resources possible in order to achieve the desired results. This generally requires comparing alternative approaches to achieving the same outputs to see whether the most efficient process has been adopted.
(d) IMPACT: This concerns the positive and negative changes produced by a development intervention, either directly or indirectly, intended or unintended. This involves the main impacts and effects resulting from the activity in relation to the local social, economic, environmental and other development indicators. The examination should be connected with both intended and unintended results and must also include the positive and negative impact of external factors, such as changes in terms of trade and financial conditions.
(e) SUSTAINABILITY: Sustainability is concerned with measuring whether the benefits of an activity are likely to continue after donor funding has been withdrawn. Projects need to be environmentally as well as financially sustainable.

An evaluation flow chart from subratings for relevance, effectiveness and impact, efficiency and sustainability to an overall rating is shown in Figure 12.3.1.



Rating: ① = low; ② = fair; ③ = high
Source: JICA Project Team

Figure 12.3.1 Evaluation Flowchart from Subratings to Overall Rating

12.4.2 Evaluation results

The overall goal of all the pilot projects is established as follows: "improvement in livelihoods and conservation of the natural environment are promoted through the implementation and formulation of the project".

All the pilot projects must be evaluated in a proper manner. Therefore, the JPT set up the index and method to evaluate the projects from the perspectives of the five criteria mentioned above. The overall ratings of all the pilot projects are presented in Table 12.3.1. The evaluation of each project is mentioned in Appendix 8.2 of this project report. After the implementation of the project, the implementation entity, such as the cooperative, committee or counterpart in the village, has to continually monitor and supervise the trend and changes in the situation at the project site. These activities should ensure the sustainability of the effect of the project and the dissemination to other villages about the lessons learned gained by the project.

Table 12.3.1 Overall Rating of the Pilot Projects

Village	Project title	Relevance	Effectiveness and Impact	Efficiency	Sustainability	Rating
Laft	Traditional Culture Experience Tour	3	2	2	2	Partially satisfactory
Mesen	Souvenir Development	3	3	2	2	Satisfactory
Kovarzin	Traditional herbs demonstration garden	3	3	3	2	Highly Satisfactory
Selakh	Prosopis Juliflora Management	3	3	2	3	Highly Satisfactory
Three villages*1	Training on Seaweed Farming	3	3	2	2	Satisfactory
Haft Rangou	Revival of the traditional date palm garden	2	2	2	2	Partially Satisfactory
Gouron	Lenji Building and Sailing Open Museum	3	3	3	3	Highly Satisfactory
Three villages*2	Hara Mangrove Ecotourism	3	3	2	3	Highly satisfactory
Qeshm City	Qeshm City Souvenir Shop	3	3	2	2	Satisfactory

Rating: 1 = low; 2 = fair; 3 = high
*1 Hangom, Baseidou and Kani
*2 Kovarzin, Sohli and Tabl
Source: JICA Project Team

12.4.3 Overall recommendations and lessons learned

(1) Participatory approach for community development

The experiences of the pilot projects in the current JICA project verified the effectiveness of the participatory approach. The participatory approach, however, is not a panacea for all kinds of problems. There are cases where participatory development is the best approach, whereas there are other cases where it plays only a supplementary role, such as in large-scale infrastructure development and investments. The participatory approach can be applied most effectively to the livelihood development of the public because their motivation and effort are the basis for exploring and developing the potential of a region, thus leading to a rise in their income level. It is the public who know the problems and solutions best. Human-oriented development is defined as a key concept in the master plan, based on this idea.

The participatory approach requires cooperation from the public and the local authority on an equal footing. It is not based on one-way communication either from the top or the bottom, but rather a two-way communication both from the top and from the bottom. While the public's initiative is the driving force of the activities, they need support from government in various ways, such as in the form of technical support and administrative procedures. The government, on the contrary, will be able to achieve its goal of realizing economic development by paying close attention to the needs and potential of a region through the eyes of the people.

BOX. Importance of investing in people for successful and sustainable activities

The most important factor concerning activities for community development and town management is to develop the human resource of the core people who provide the foundation on which to sustain those activities. The biggest effort in the pilot project is to open the minds of people involved in it and create a positive feeling. As people continue with the activities, outcomes are improved and matured.

It takes time to create a positive feeling by creating changes in the way participants think. On the Project, it took three years to select the village and the target project and formulate the pilot projects in order to create ownership on the residents' side. Activities have included numerous individual meetings, quarterly meetings and visiting cases in Japan and Iran.

Lessons learned from the pilot projects are to understand that changing how people feel takes time. In the village of each pilot project, the essence of the core people came out. At the moment, it is possible to imagine that a fulfilling future can be achieved by continuing the activities. It is necessary to think about the project period, which should be determined from a long-term perspective such as 10 years or longer.

(2) NGOs and social groups

It was found at the preparation stage of the pilot projects that there are no NGOs in Qeshm that could play an intermediary role between the villages and the QFZO or Qeshm County. Only as few social welfare groups were identified on Qeshm. In other countries, it often happens that the participatory approach is applied with the participation of NGOs that are familiar with the problems of the people and various requirements from the government due to experiences of working on participatory development projects. For the QFZO and Qeshm County to promote a wider application of the participatory approach on Qeshm in the future, they should create an environment in which the public and social groups are motivated to form NGOs on a non-profit basis. Once they become active, they will be able to support the government in providing various services to the public in an attentive manner, as well as addressing their most important needs and encouraging the government to adjust its courses of actions by responding to these needs.

It is not necessarily true that initiatives such as NGO formation are totally absent on Qeshm. There are groups such as social welfare groups, women groups, youth groups and elderly groups on Qeshm. Their activities, at present, are however mostly still on a small scale, subject-specific and not formally organized. They could still be the foundations for developing NGOs with a level of capacity required to play an intermediary role between the people and the government with support from the QFZO and Qeshm County.

(3) Roles of-QFZO and Qeshm County

The roles of the QFZO and Qeshm County in promoting the participatory approach on Qeshm should be defined and agreed. It is proposed that the QFZO be responsible for managing the overall procedure and supervision, while Qeshm County should provide technical expertise as required given the present circumstances. In the long run, however, this division of the roles may be modified as circumstances change.

In the QFZO, it will be necessary to establish a section to be responsible for community development. This section will take a lead in replicating the experiences of the JICA project and applying the participatory approach to other villages with a long-term view of serving all the villages on Qeshm. The QFZO officer who actively participated in the whole pilot project processes should head this new section. Qeshm County will provide its expertise in such areas as agriculture and fishery as requested by the QFZO and villages, such as in the case of the Kovarzin Demonstration Herb Garden Pilot Project.

The following figure shows the assumed division of roles.

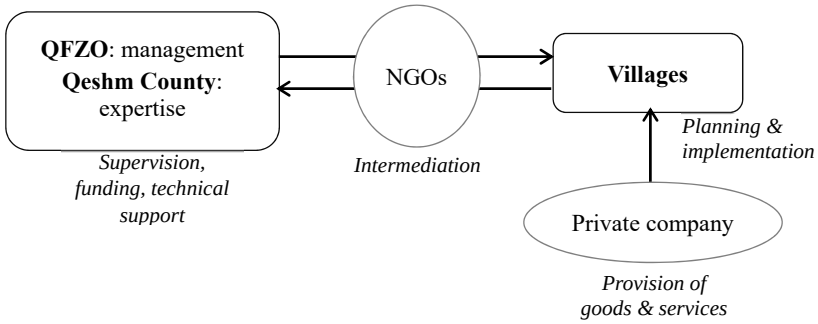


Figure 12.3.2 Relationship Between Actors

(4) Networking

Networking among the villages and related industries is an important issue to be promoted. Individual efforts by different villages would generate larger impacts if their experiences are shared and better ways are found. Selling the Qeshm brand to the outside will become possible if the villages are united and combine their efforts. Not only among villages, but networking with related industries, such as tourism and fishery, would be equally important. Tourism-related organizations, such as hotels and guesthouses, travel agencies and transportation companies, play an important role in transferring information on the villages to tourists and encouraging them to visit. Networking is, thus, needed to generate maximum impact for individual initiatives by consolidating them.

(5) Development planning at village level

The promotion of participatory development planning at the village level is recommended. On the pilot projects, the JPT has been supporting the preparation of an action plan for each of them for the next five years as a step forward after the JICA project is over. This work is still ongoing and the action plans of all the pilot project villages will be prepared by October 2018. The essence of this effort is to nurture a sense of independence or self-help efforts on the part of villagers who tend to have a dependency mindset, expecting handouts from the government. Now that many villagers have gained confidence in their capabilities through successfully implementing the pilot projects, the next step would be for them to think about their own future by themselves, find what they are able to undertake on their own and identify external support that is truly needed.

This initiative for the pilot project could be developed as an initiative for the village as a whole. The momentum created by the pilot project could engage a larger number of villagers in the process and the issues concerning all the villages, rather than limited to the one addressed by the pilot project, could be discussed. Thus, participatory development planning could be a new development tool for the villages on Qeshm. Appropriate guidance and support should be provided by the QFZO and Qeshm County to realize this possibility.

(6) Marketing and promotion

The villagers need to enhance their awareness of the importance of marketing and promotion. Although there appear to have been some improvements since the experience of the 2018 Nowruz, they still tend to think that tourists will visit their villages once they are ready with their facilities or products, then just sitting back and wait for them to come. There are actions that villagers themselves can undertake, such as positively disseminating information via the Internet and social media, not only before the high season, but also in the low season. Of course, promotion and marketing of Qeshm as a whole should be promoted by the QFZO, with each village joining it. These two approaches should be undertaken simultaneously.

(7) Dual administration issues

The dual administration system should be resolved as soon as possible. Overlapping functions and the unclear demarcation of the roles of the QFZO and Qeshm County are causing inefficiency in many respects. Some difficulties faced during the pilot project implementation, such as the long time required to obtain a license for an electricity connection and land ownership issues, could be affected by the dual

administration system.

(8) Land use planning

When planning physical structures for the participatory approach, it is important to refer to existing macro plans, such as the land use plan by Boynyad Maskan Housing Foundation of the Islamic Revolution, because the selected location of facilities can affect the natural and living environment of the village. The location of new facilities should be carefully selected in consideration of the environmental impacts. It would be desirable if all the key players in the village defined their own desirable future and convert this into a physical plan, such as a land use plan.

12.5 Evaluation on the Methodology of Pilot Projects Implementation

12.5.1 Evaluation method

A survey called the Pilot Project Final Evaluation Survey (hereafter "the Survey") was conducted from mid-May to early August in 2018. Its objectives were to collect information on the views of village representatives and their colleagues, village council heads and mayors, managers and officers of the QFZO and Qeshm County and the JPT Iranian staff engaged on the pilot projects concerning the achievements of the pilot projects.

(1) Survey for all pilot projects

The Survey for all pilot projects was undertaken in the form of interviews with the following.

- Village representatives and members: 11 villages (14 projects)
- QFZO and Qeshm County: 14 managers and officers
- JPT experts and Iranian staff: Eight experts and staff

The following questions were asked:

- Was the participatory approach the right approach for implementing the pilot project?
- What was the role of the pilot project in building the foundations of the future project?
- What was the future goal of each project?
- Was the pilot project design appropriate?

This fact-finding exercise was conducted to evaluate the outcome of tourism-oriented projects objectively. The result of the comparison between last year (2017) and this year (2018) during the Nowruz period is presented in Attachment A8.1 of Volume 5 of this report.

(2) Survey for the souvenir shop pilot project

The objective of the Souvenir Shop Pilot Project was to create an outlet for Qeshmi handicrafts so as to build a new market, mainly comprising tourists and shopping visitors, as a means to develop village women's livelihoods. The souvenir shop was named "Qeshmineh", meaning "belongs to Qeshm".

The Survey was undertaken in the form of interviews with the following:

- Village women participating in Qeshmineh: 10 village women
- QFZO and Qeshm County: Three managers and officers
- JPT experts and Iranian staff: Four experts and staff

The following questions were asked:

- What was the objective of the Souvenir Shop Pilot Project?
- Evaluate the location of the Qeshmineh shop
- What were the attitudes of the village women participating on this pilot project?
- Describe the publicity campaign for Qeshmineh

12.5.2 Final evaluation results

The results of the Survey are summarized and interpreted below. The comments from each village are given in Attachments A8.1 and A8.2 (showing the comparison between last year and this year), as well as A8.3 (results of the survey on the project design conducted among each village) and A8.5 (results of the survey conducted among each village on the project design for the Qeshmineh shop), as found in Volume 5 of this report.

(1) Evaluated of all pilot projects

1) Judgment of the participatory approach

Table 12.4.1 below shows the assessment findings concerning the appropriateness of the participatory approach.

Table 12.4.1 Judgment of the Participatory Approach

Answer	Villagers	QFZO and Qeshm County managers/officers	JPT Iranian experts/staff	Total
Yes, very much	9 (69%)	10 (71%)	4 (57%)	23 (68%)
Yes, to some extent	4 (31%)	4 (29%)	3 (43%)	11 (32%)
No, it was not the right approach, top-down approach is better	0 (0%)	0 (0%)	0 (0%)	0 (0%)
I do not know	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Total	13 (100%)	14 (100%)	7 (100%)	34 (100%)

Source: JICA Project Team

Overall, 68% of the interviewees think that the participatory approach was the right approach for implementing the pilot project. *Yes, very much* scored the highest among the QFZO and Qeshm County managers/officers at 71%.

The reasons why they think the application of the participatory approach to the pilot projects was positive vary. Representative reasons are as follows. The original expressions given in the interviews are preserved as much as possible to give a feel of the various ideas put forward by the stakeholders.

Villagers

- The plan was prepared by the village itself, attracted public participation and increased people's enthusiasm.
- Villagers know better what their problems are.
- We need to consult and follow up with the authorities. Problems should then be reported and discussed. This can be arranged by negotiating about the problems. This kind of coordination should exist.
- A comparison of last year and this year shows that we have seen a lot of differences in the development of rural tourism.
- People know their needs better than government executives. It is better to ask us what we need and consult with us, and then we will be supported by the government.
- It contributes to the goal of income generation for islanders and helps the local economy.
- Yes, it is the right way, and it should be that we comment and express our demands and support should come from above.
- This cooperative vision is very practical if implemented.
- In the system from top to bottom, the project usually remains in the hands of the government and its main revenue is not distributed among the people.

- With the participatory system, people are encouraged to carry out a project, and it will motivate people.
- It has been a good way to attract women's participation and increase the presence of women in the community.
- If the coordination between the members was very good, this approach could be good.

QFZO/Qeshm County managers and officers

- Collaborative development encouraged an understanding of the importance of implementing a project by villagers.
- The strength of the JICA was based on the use of local specialist forces.
- The Japanese were popular in the minds of the Iranian people, and the leadership of the JICA team was very good and well connected with the people.
- The people were sure that the JICA's work was serious and compassionate.
- Attracting people's participation is critical in advancing the goals of a project
- The sense of distrust among the villagers in the Free Zone has somewhat disappeared~~,~~ and bringing about the self-sufficiency and independence of rural people has been very useful.

JPT Iranian experts and officers

- Yes, such an approach would certainly work in the local community.
- There are many benefits of the participatory system.
- I think its impact on the countryside was very high, but its influence on the Qeshm Free Zone State Administration was less, but this experience was excellent for Qeshm.
- It is the nature of the pilot project and, until the end, it cannot be said what the outcome is. But it is certain that these pilot projects can be a good example for the people of the island.
- Pilot projects are not 100% ideal, but it is good to start and make a change.
- Using local experiences is very useful and increases the passion for continuing work; but, because our experience in participatory discussions is low, it can waste time and money.
- This is a community-based project and you need to partner with the local community to run your pilot project.
- This method and perspective are very interesting and have been successful on this project.
- There have been people who have asked to continue this process, so that they can realize their ideas through the implementation of this view.

32% of interviewees think this approach is good to some extent with the highest response from JPT Iranian experts/staff at 43%. The reasons why they think the participatory approach had limited, rather than full impacts, vary. Representative reasons are shown below:

- There are some uncertainties, especially in land and land ownership issues, which is a huge nuisance when trying to continue projects.
- Before starting and implementing the system, training should have been undertaken.
- This is because of the new experience. There is a number of weaknesses in terms of how projects are carried out, which requires further training.
- The other reason is the cultural differences in different villages, which make the projects different from each other. This has led to completely different partnerships in villages, even on joint projects. Therefore, educational needs were felt in some villages.
- As they were pilot projects with a limited time, the outcomes have not been observed yet.

2) Help in building foundations

Table 12.4.2 below shows the interviewees' reported views on help in building foundations through the implementation of the pilot projects. This issue was addressed to villagers, QFZO/Qeshm County managers and officers and JPT Iranian experts/staff.

Table 12.4.2 Help in Building Foundations

Answer	Villagers	QFZO and Qeshm County managers/officers	JPT Iranian experts/staff	Total
Yes, very much	12 (92%)	7 (50%)	3 (43%)	22 (65%)
Yes, to some extent	1 (8%)	6 (43%)	4 (57%)	11 (32%)
No, it was not the right approach, top-down approach is better	0 (0%)	1 (7%)	0 (0%)	1 (3%)
I do not know	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Total	13 (100%)	14 (100%)	7 (100%)	34 (100%)

Source: JICA Project Team

Those who think that the pilot project helped villagers in building the foundations of the project they expect to achieve in the future accounted for 97%, including 100% of villagers, 93% of QFZO/Qeshm County managers and officers, and 100% of JPT Iranian experts/staff.

The view *No, it was not the right approach* was expressed by one person from among the QFZO and Qeshm County manager/officers, saying that: "The projects that the JICA has done is not very successful. We still have not received a significant outflow of these projects. Perhaps they have not succeeded in choosing the project or the people or the place where the projects were carried out. We have done good work in the fisheries and tourism discussions."

The following are the observations and comments

Villagers

- The training is adequate and people are happy.
- It created a lot of enthusiasm for women on this project. But their mentality is wrong and they think the museum should always be crowded so that they can participate.
- The pilot project generated motivation and confidence to implement new projects.
- As training was provided, the field was provided for the project. Now the growth of algae has increased, the motivation and confidence of the villagers is rising.
- The JICA has created this incentive to develop our work.
- The level of interest in this project has increased.
- There was an obvious change. At first, nobody believed, but there is a growing tendency to grow plant species and even grow livestock.
- Links were created between the participants, and we learned from each other and arrived at a general conclusion. Now we can even be trained to use our capacities.
- Trained people have the ability to transfer their experiences to others. A great deal of enthusiasm is especially evident among young people.
- This confidence can be found in our own countryside and in the neighboring villages. Jobs were created during this period.

QFZO/Qeshm County managers and officers

- The enthusiasm and support of the rural people were enormous.
- We see that, in addition to the villages supported by the project, other villages are eager to enter the phase of the pilot projects.
- The project in the village has given a double boost even to the extent that the neighboring villages are eager to implement the project.
- Some villages have somewhat enhanced their capacities.
- The initial infrastructure for future projects is provided.
- The willingness of the villagers and their eagerness to carry out the pilot project clearly illustrate this.

- Villagers showed a great deal of passion for the continuation of the project, and these tutorials were very helpful.
- The desire and eagerness of villagers and even villages not involved in pilot projects are very tangible.

JPT Iranian experts and officers

- Yes, this mentality has been created for the villagers. It is now welcoming and very enthusiastic, especially in the field of agriculture.
- The rural teams that worked with us have developed very well in terms of self-confidence.
- On some projects, this is very evident and it is a very good starting point to run pilot projects.
- It is certain that these pilot projects can be a good example for the people of the island.
- This mentality has been created for the villagers. It is now welcoming and very enthusiastic, especially in the field of agriculture.
- Even in the neighboring villages, they were longing for a project to be defined for them.

3) Future goal of project

Table 12.4.3 below shows the responses from the interviewees with regard to the views of village representatives and their colleagues, village council heads and mayors about the future goals of projects.

Table 12.4.3 Future Goals of Projects

Village (project)	Answers
Haftrangou (Palm Garden)	Reviving traditional palm gardens, attracting tourists, creating a nature school, teaching local games and reviving handicrafts.
Kovarzin (Tour Guide)	Given the conditions of our Free Zone Organization, we have no clear future. The current income of each captain on the boat is negligible.
Tabl (Tour Guide)	Introducing new tours, using Hori (a kind of traditional boat), floating docks, fishing at night, birdwatching, and offering new products and tourism packages.
Gouron (Open Museum)	In the future, the project will achieve its goals. Pilot projects should take at least five years to complete. In the meantime, we must expand the museum with other Lenj boats. Our motto is that we want to implement the art of longevity and revitalization of sailing. In the future, we will have an appropriate tourism-level package on the island offering different recreational tours and indirect education.
Baseidou (Algae Culture)	Establish a cooperative company and find the target market for exports.
Kovarzin (Herb Demonstration Garden)	Obtaining tourist permits for accommodation, conducting activities in the field of tourism to visit the Hara forests, the sale of plants and seeds, the sale of irrigation supplies and services, running summer classes for leisure, and providing training for planting medicinal plants.
Soheili (Tour Guide)	The people's views have increased and we would like to form a cooperative company. Our biggest problem is the lack of a cooperative company. We gave suggestions to the authorities about this, but this did not work.
Tabl (Information Center)	To make money from tourism by welcoming tourists and providing tourist accommodation, and holding tourism classes.
Selakh (Plant Culture)	Creating jobs through planting plants, setting up a cactus oiling plant, cultivating algae, and teaching in other villages.
Kani (Algae Culture)	Since we were at the pilot stage, we have not thought about the future of the project. But, in the future, the potential for creating employment for 10 to 15 people per farm cultivating algae would be our goal.
Mesen (Tailoring Workshop)	When the training classes are completed, we can take orders from outside Qeshm or even export them to our schedule. And we are thinking of setting up our own cooperative company.
Laft (Ecomuseum)	I think if we go ahead in the current way, it will probably stop working. (The women participating in the Laft project believe that the cooperation between them is highly insignificant; and, if such conditions continue, the project will soon be stopped.)
Hangom (Algae Culture)	If the planting time is appropriate and it has the right seeds, people will come to work and this will be used as a source of income.

Source: JICA Project Team

4) Project design appropriateness

The design of each pilot project was assessed. A number of important parameters including budgets, activities, location and any other elements was investigated.

Table 12.4.4 below shows the assessment results concerning the appropriateness of the design for the pilot projects.

Table 12.4.4 Project Design Appropriateness

Answer	Villagers	QFZO and Qeshm County managers/officers	JPT Iranian experts/staff	Total
Yes, very appropriate	11 (85%)	4 (29%)	2 (28%)	17 (50%)
Yes, appropriate to some extent	2 (15%)	8 (57%)	4 (58%)	14 (41%)
No, it was not appropriate	0 (0%)	2 (14%)	1 (14%)	3 (9%)
I do not know	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Total	13 (100%)	14 (100%)	7 (100%)	34 (100%)

Source: JICA Project Team

Overall, 91% of the interviewees think that the pilot projects were designed appropriately, with 50% saying *very appropriate* at 50% and 41% saying *appropriate to some extent*. The response *very appropriate* was highest among villagers at 85%.

The reasons why the interviewees think the design of the projects was appropriate vary. Representative reasons are as follows. The original expressions given in the interviews are preserved as much as possible to give a feel for the various ideas put forward by the stakeholders.

Villagers

- Both the design and the budget were appropriate. The project timing was short because work on agricultural land is time-consuming.
- We are satisfied with the support and training classes.
- The training was appropriate for the coaches and complementary to the knowledge we had acquired already and experimentally.
- The design has been good so far. In the future, the path to the museum must be expanded. Training should be continuous and appropriate. The JICA's goal is to get people involved with the projects and make them reach a level of awareness enabling them to continue on their path. The design is good for this purpose. Planning is good and we have the right budget.
- The pilot project was designed and implemented appropriately by the village team and supervised by the JICA.
- The training is very good and has left lasting effects in our work. It was very helpful for us to discuss the training as we determine the time and place.
- Yes, a proper location design and budget.
- The design was good in terms of location and action, but we need more technical experts.
- The training has been enough. Diversity in this project has made people enthusiastic.

QFZO/Qeshm County managers and officers

- Yes, I think the design and the chosen location are suitable for this project
- Yes, it was right. The design and selection of the project site was completed after a year of study.

JPT Iranian experts and officers

- Yes, the designs are very suitable. The selected areas have been tailor-made for the JICA program and tailored to the potential of the island.
- In the plans I was involved in, the topics of the budget and the location of the projects were appropriate.

The following are the major reasons as to why the project design was appropriate to some extent.

Villagers

- After each educational and practical course, we need to retrain and remind ourselves that what we have learned should not be forgotten. Training was adequate and practical training was very useful.
- Lacking access to the appropriate crop for algae suspension delayed the pilot project somewhat.
- The budget has not been commensurate with this project. We have a problem with electricity and water supply to the project site.

QFZO/Qeshm County

- I was expecting a different place to be selected, but the budget for the project was decent.
- In general, the design has not been appropriate. The locations are good, but the main issue is that the entire island of Qeshm was not covered.
- To a certain extent, we did not recognize the involvement of the local community. Prior to these activities, participation was limited to family gatherings. With the knowledge that has been created now, they would have to carry out a redesign. They must surely reduce the number of projects, but increase the amount of activity on each project.
- Somewhat of a fit. Both in the selection of projects and in the budget debate, it was better to study and evaluate more.
- This was the first time that collaborative village-based projects were implemented so it could not be complete and accurate. But the experience was a great classroom for the future.
- The lack of innovation and the use of advanced technology have been the biggest flaws in the design and implementation of projects.

JPT experts and officers

- I think the good character of the Japanese is reflected in the widespread study presented before the show. Given the expertise they have, I think the choices are accurate. There may be some flaws, but since the pilot is normal, some of them are not a good result. The budgets were very good for training
- The design has been somewhat appropriate. Appropriate budgets have been allocated, but the place for project implementation has not been appropriate because none of the initial ideas put forward by JICA was implemented. Pilot projects should last for at least five years. These JICA projects are more like a workshop than an executive pilot.
- According to my experience, the design was relatively good; but, in terms of the choice of villages, other villages could have been selected. In the budget discussion, I think some projects did not fit and did not match the practical content of the project. Of course, these choices were based on the needs of the villages; but, now that we are at the end, I think it could have been more accurate.
- Overall, the design was poor. The most important aspect of the budget discussion was that the ratio of the budget to the project was not an appropriate number and did not provide the necessary requirements to some projects. Some projects were not selected in terms of location, and I think some projects were rushed.
- If we had more time, we would have made better designs. The project time was low.
- In choosing the place and the villages, I also think it would be more appropriate to have chosen less-favored villages. On some projects, the effects of practical and educational measures are not so obvious.
- In general, somewhat appropriate, but could have been better. Projects could have more root causes, such as the production of sustainable fresh water, and then in the next step, the use of water in agriculture.

The three views concerning *No, it was not appropriate* were expressed by some respondents among the QFZO and Qeshm County managers/officers and JPT Iranian experts/staff, stating that the design was poor.

5) Support assessment

Tables 12.4.5, 12.4.6 and 12.4.7 below show the interviewees' views on the support provided by the JPT, the QFZO and Qeshm County. This issue was addressed to villagers, QFZO/Qeshm County managers and officers, and JPT Iranian experts/staff.

Table 12.4.5 Assessment of JPT Support

Answer	Villagers	QFZO and Qeshm County managers/officers	JPT Iranian experts/staff	Total
Yes, it was sufficient	12 (92%)	11 (73%)	6 (85%)	29 (83%)
No, it was not sufficient	1 (8%)	4 (27%)	1 (15%)	6 (17%)
I do not know	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Total	13 (100%)	15 (100%)	7 (100%)	35 (100%)

Source: JICA Project Team

The following are the observations and comments about JPT support:

Villagers

- Support and training courses were adequate and appropriate.
- There was good educational support but there was no financial support.
- Intellectual support was adequate and sufficient. And they were like a counselor with a rural team.
- The JICA took a lot of time to complete this project both in the design and in the implementation section. They also provided training and explanations.
- It was good support, especially when we were having trouble with the village authorities. The JICA helped us a great deal.
- The JICA made a lot of effort and showed a lot of patience, restoring order in this group when team members were really frustrated.

QFZO/Qeshm County managers and officers

- The JICA's compassionate approach has created trust among the villagers, which means support has been sufficient.
- The JICA studied all the villages and negotiated with the villages they had selected. They encouraged the villagers to participate in the pilot projects, and this was the real support.
- They have had enough support and always been with the rural people.
- I think that the JICA provided more funds than needed. This financial issue caused challenges among rural people. I think the JICA should have paid step by step. But, during this time, no government agency was giving as much support as the JICA to the people. This is a fact.

JPT Iranian experts and officers

- JICA support was adequate, and even included suggestions during the implementation of the project.
- On the projects I was involved with, management of the use of various government agencies was not carried out properly; but, in general, the JICA's support for the villages was sufficient.
- Yes, support has been enough to handle their affairs. If there is no direct support from the JICA, these projects would not continue.

The three views concerning *No, it was not sufficient* were expressed by QFZO/Qeshm County managers/officers and JPT Iranian experts/staff, stating that the support from the JPT was poor. Representative reasons are as follows.

QFZO/Qeshm County managers and officers

- The JICA has paid a great deal for this project, and it is great that villagers were able to concentrate on the activities without worrying about the financial aspect. But the lack of recognition of the JICA among the villages was problematic. I did not see any technical support, and I only met a technical expert just once and did not have a continuous relationship with him. We expected to see them on these projects. Given the technologies available in Japan, we expected to see them applied to these projects.
- Project consultants such as the Environmental Office, the Free Trade Area and the Geopark, in my opinion, were even more positive about the JICA team.

JPT Iranian experts and officers

- The important thing is to sufficiently consider the complexity of the project and possible problems that might happen at the beginning. The JICA's approach was not sufficient in this aspect. Support activities were affected by an inadequate study at the beginning.

Table 12.4.6 Assessment of the QFZO Support

Answer	Villagers	QFZO and Qeshm County managers/officers	JPT Iranian experts/staff	Total
Yes, it was sufficient	4 (30%)	11 (73%)	0 (0%)	15 (43%)
No, it was not sufficient	9 (70%)	4 (27%)	7 (100%)	20 (57%)
I do not know	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Total	13 (100%)	15 (100%)	7 (100%)	35 (100%)

Source: JICA Project Team

The following are the observations and comments about the QFZO's support:

Villagers

- It was a good experience to have contract with the JICA and experience a different way of implementing projects with this group. As a result of these transfers, the Free Zone Organization and the villagers have a better relationship.
- Educational support and training courses have been designed and introduced by the Qeshm Free Zone Organization.
- Yes, this project has progressed through the Free Zone Organization.

QFZO/Qeshm County managers and officers

- One of the reasons for the success of the JICA was that they collaborated with loving and experienced people from the Free Zone Organization. And so, the organization stood with the JICA.
- For the part I was working on, our support for the project was excessive.
- Yes, to the extent possible, the Free Zone Organization helped to implement projects. Perhaps, in some cases, legal and structural problems created obstacles to the cooperation of the Free Zone Organization with this project, but those obstacles have not had much effect on the process of carrying out the projects.
- The Free Zone Organization has provided all the facilities and financial support as much as possible.
- Yes, on the Gouran project; since the QFZ Organization was also involved with the Geopark administration, it was fully backed up.

The three views concerning *No, it was not sufficient* were expressed by villagers, QFZO/Qeshm County managers/officers and JPT Iranian experts/staff, stating that support from the QFZO was poor.

Representative reasons are as follows.

Villagers

- The support was not enough; we expected the QFZO to help us to obtain licenses issued by the organization.
- No, their support was not enough, in terms of expertise and commitment to honoring the promises they have given. For example, after finishing the training courses, the QFZO was supposed to issue a valid certificate for trainers, but this did not happen quickly. Or they were supposed to build a waiting room on the pier, but they still failed and caused distrust.
- The support was fairly good, but administrative affairs and bureaucracy were long and tedious.
- We have not seen any special support.

QFZO/Qeshm County managers and officers

- We did not do well. Rural participation in the organization has not been institutionalized. Some organizations like the Geopark and the Environment Office have this belief; but, in the whole organization, there is no belief in popular participation, which can motivate villagers in this way. The JICA project has not brought about big-scale investments, despite the QFZO management's expectation. The small sizes of the pilot projects have not satisfied them.
- I can say that some support was enough. The support on our side (QFZO) could not be sustained in the same way as the JICA, perhaps because of our previous mentality or because of existing pessimism or because of being very busy with other issues. Perhaps financial problems led to a reduction in the efficiency of work. Of course, some associates did not believe in the impact of these projects until making a conclusion.
- Experts from the QFZO just visited the project site without offering any technical support. We did not see technical assistance from them.

JPT Iranian experts and officers

- In some cases, the Free Zone Organization was not enough to support us, and perhaps structural and legal problems hindered their adequate support. Creating an effective and productive relationship with other government agencies is one of the tasks of the Free Zone Organization; and, if this relationship does not exist, it is a weakness of the organization. In many cases, the Free Zone Organization was watching from a distance, while the same projects could have provided an opportunity to complete the work and promote the development of the island for the Free Zone Organization.
- The projects varied in terms of QFZO support. Some management, such as the Environment Office and the Geopark, supported us very well, but others did not offer such support.
- The Free Zone Organization could have helped much more. The expert organization had a steady presence; but actual support was very weak in supporting the implementation of the pilot projects. This lack of support was unfortunate in the case of infrastructure issues, such as land ownership and water utilities.
- No, support from the organization was not enough. The JPT's relation with QFZO managers varied depending on the JPT member and the QFZO manager.
- The accompanying experts were supportive of the projects, but management was much weaker.

Table 12.4.7 Assessment of Qeshm County Support

Answer	Villagers	QFZO and Qeshm County managers/officers	JPT Iranian experts/staff	Total
Yes, it was sufficient	1 (8%)	7 (47%)	3 (43%)	11 (32%)
No, it was not sufficient	11 (84%)	3 (20%)	4 (57%)	18 (51%)
I do not know	1 (8%)	5 (33%)	0 (0%)	6 (17%)
Total	13 (100%)	15 (100%)	7 (100%)	35 (100%)

Source: JICA Project Team

The following are the observations and comments about Qeshm County support:

Villagers

- No, we did not see anything.
- No one has been referred to us from government departments and helped us on the project.
- Unfortunately, government departments did not provide proper support for this project.
- Other than launching the floating docks, they have not done anything. We demanded the renovation of boats and the receipt of loans and bank facilities, but none of them was carried out.
- We are not satisfied with any of the government organizations on our project.
- They have provided technical support but this has not come into effect.
- Unfortunately, there is no coordination between government agencies. For example, a tourism license is under the supervision of several management bodies. If coordinated, many problems would be solved.
- We have not seen any practical support at this time.

QFZO/Qeshm County managers and officers

- We had regular attendance at all meetings and training courses and during project implementation.
- Yes, it was enough. At the same time, they have supported the existing capabilities. They have always been with the people technically.
- We have had meetings with government departments, but we have not started any close cooperation.
- We did not see Qeshm County supporting projects.
- We were pleased with the Fisheries and Agriculture Departments and their support.
- Support from some government departments was limited due to legal and structural problems, as well as a lack of familiarity with the pilot projects. It is much easier for them to work with a company than working with a rural group. In many cases, the existing rules were cumbersome in order to obtain licenses
- Yes, as much as possible, and in terms of the available facilities.
- In the fisheries sector, we have had a close relationship with both the organization and the JICA.
- The natural resources, fisheries and the environment organizations have been cooperative.

JPT Iranian experts and officers

- On my projects, experts from government offices were more like guests and invited to meetings or visits. But, personally, I did not see any serious practical cooperation or real support; sometimes, even their presence prevented them from continuing.
- Perhaps it would be better to give separate answers to different departments, because some agencies offered more support, and others less.

- Government departments were very bad, and their support, in many cases, was a hindrance to the progress of the work. And it was strange for us. Although we had introduced them to projects from the beginning, they have not been a good companion against our expectations. The lack of continuous attendance at meetings and visits and delays in performing assigned tasks meant a lot of work was left undone.

6) Intention after the JICA project

Table 12.4.8 below shows the interviewees' reported views on the villagers' intention to continue the pilot project and the intentions of the QFZO and Qeshm County to continue supporting the pilot projects' implementation. This issue was addressed to villagers, QFZO/Qeshm County managers and officers, and JPT Iranian experts/staff.

Table 12.4.8 Intention of Villagers and the QFZO to Continue the Pilot Project

Answer	Villagers	QFZO and Qeshm County managers/officers	Total
Yes, definitely	10 (77%)	5 (36%)	15 (55%)
We are not sure	3 (23%)	9 (64%)	12 (45%)
No, we will not	0 (0%)	0 (0%)	0 (0%)
Total	13 (100%)	14 (100%)	27 (100%)

Source: JICA Project Team

The following are the observations and comments about Qeshm County support:

Villagers

- Yes, we plan to plant fruit trees and palm trees and create more greenery and beautification.
- Yes, we are sure we can find seaweed seeds for the desired species.
- Yes, of course, because of the interest we have; and, of course, to make money through tourism and add services to the current collection.
- If we have good market products and the right seeds, we will definitely continue.

QFZO/Qeshm County managers and officers

- Yes, we will definitely continue; indeed, we are now planning to continue the projects.
- If these projects do not go on, it will be a disaster and so they should certainly continue. These projects are newborn and the main problem is the budget, but projects are not costing much at the moment.
- Sure. In our section, we have actively participated in pilot selection, and we will continue doing so.

Some views concerning *We are not sure* were expressed by villagers and QFZO and Qeshm County managers/officers, stating that they are not sure about continuing the pilot projects. The reasons why they are not sure vary. Representative reasons are as follows.

Villagers

- The existing boat operators' cooperative is not functioning properly because it is not serving everyone. They are more interested in making profit rather than developing the village.
- It depends on the market for these products. If the economy for this project exists, we will definitely continue.
- Women in the village of Laft believe that, if they reach an agreement with each other, they will definitely continue the project.

QFZO/Qeshm County managers and officers

- I am not sure. The conditions may change, but we must make sure the JICA does not fail to succeed.
- I am not sure because of managerial changes.
- I am not sure. It may be possible for support for these projects to stop due to the lack of management stability and the lack of belief in such an approach.
- Personally, I would like to continue this project, but I do not know if the Free Zone Organization will.
- I am not sure if support will be given. What are the policies of the Free Zone Organization with government departments and their goals in the coming years?

7) Measures for the continued success of pilot projects

In order to evaluate the effectiveness of measures to ensure the continued success of pilot projects, views from the villagers, QFZO/Qeshm County managers/officers, and JPT Iranian experts/staff were invited. Table 12.4.9 summarizes the results of this evaluation.

Based on the results summarized in Table 12.4.9, 100% of villagers considered the measure of *promotional and advertising activities* to be the most important for the success of the projects. While *very important* received the highest score for the four measures of *quality, diversity, QFZO support and village leadership,* in terms of *price*, *important* scored highest at 46%.

The largest proportion of QFZO and Qeshm County managers considered the four measures of *promotion, quality, diversity, QFZO support and village leadership* to be the most important. For *price*, the largest proportion said this was *important*.

The highest scores were given to all five measures by the JPT Iranian experts and staff, ranging from 57% for *diversity* and *price* and 86% for *promotion* and *QFZO support*.

Table 12.4.9 Importance Level of Measures

Measures	Villagers (key representatives)			QFZO or Qeshm County managers/officers			JPT Iranian experts/staff		
	Very important	Important	Not very important	Very important	Important	Not very important	Very important	Important	Not very important
Promotion	100%	0%	0%	72%	28%	0%	86%	14%	0%
Quality	92%	8%	0%	92%	8%	0%	71%	29%	0%
Diversity	70%	15%	15%	50%	36%	14%	57%	43%	0%
Price	30%	46%	24%	43%	50%	7%	57%	43%	0%
QFZO support	92%	8%	0%	72%	28%	0%	86%	14%	0%
Village leadership	61%	15%	24%	92%	8%	0%	71%	29%	0%

Source: JICA Project Team

8) General comments

The following are some of the general comments made in the survey:

Villagers

- We expect the JICA team to stay on the island and continue serving the pilot projects. During this time, the village and its residents have been making good progress. If tourism continues, tourism will be strengthened in the villages.
- During this project, our indigenous knowledge has been transformed by the JICA team into a regular package and delivered to us so we can use it.
- There is a need for applied research on medicinal plant species for subsequent cultivation and this research should be done on Qeshm Island. I also recommend that regular project leaders meet regularly after the departure of the JICA team from Qeshm.
- The algae farming site can also be used for tourism. If this happens, there will be double income generation in this area. We need constant access to experts, both in the cultivation and in the marketing discussions.
- Assistance from the authorities, the Free Zone and the government bodies is essential in launching and continuing the project financially and in providing the facilities and technical advice during the project.
- We thank and appreciate the JICA.

QFZO/Qeshm County managers and officers

- These projects were very good from the start and should be continued.
- The Free Zone Organization welcomes the formation of popular companies and facilitates the issuance of loans and facilities.
- I think that, with the success of the JICA group and the motivation that rural communities have put in, it is in our interest to persuade the JICA to continue working with us.
- If it were not for the JICA, the Free Zone Organization would never have done this kind of project alone. One reason is that the managers of the Free Zone cannot work as a team. Secondly, the JICA was appealing to local people, who noticed that the JICA was interested in the advancement of local people, which was attractive to locals. The QFZO had not been successful in both aspects. The JICA even allowed the Free Zone Organization to recognize some of its forces better and make more use of them. It should also be borne in mind that the JICA's program, which brought the experts from the Free Zone Organization to Japan for training, was very effective in changing the mentality of QFZO officers and reducing opposition to the pilot projects. And, of course, I am worried that trained rural people will be abandoned. We need to have laws for the Free Zone Organization to continue working. The training process should be continuous.

JPT Iranian experts and officers

- I wish you were studying and evaluating the pilot projects more. The problem that the Japanese succeeded in overcoming concerned the transition from tradition to modernity, which I think we had not experienced before.
- The whole story and the project have been a good thing and a good start has taken place, and it is up to the managers and the enthusiasm of the villagers. It has often happened that villagers are eager to start a project supported by the QFZO or the county, but they soon become discouraged because of the lack of consistent support. I think there is a need for more focus to continue, and it might be best to create a new unit in the QGZO responsible for the pilot projects.
- I hope that the projects will not stop; and, in the villages, I hope people will forge more partnerships and end the conflicts between themselves.
- Unfortunately, we do not have good leadership in the villages, and this is the biggest problem when executing pilot projects.

(2) Evaluation of the Qeshmineh shop

1) Attainment of the original objective

Table 12.4.10 below shows the assessment results concerning the objective for the Qeshmineh shop. The comments by each village are shown in Attachment A8.5 (results from the survey on the Qeshmineh shop by village), found in Volume 5 of this report.

Table 12.4.10 Objective of the Qeshmineh Shop

Answer	Village women	QFZO and Qeshm County managers/officers	JPT Iranian experts/staff	Total
The objective is very good, addressing the right issue for Qeshm	1 (100%)	2 (66%)	4 (100%)	7 (87%)
The objective is good, but the adopted method was not the best option	0 (0%)	1 (34%)	0 (0%)	1 (13%)
The objective is not appropriate, as it does not address the right issue	0 (0%)	0 (0%)	0 (0%)	0 (0%)
I do not know	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Total	1 (100%)	3 (100%)	4 (100%)	8 (100%)

Source: JICA Project Team

Overall, 87% of the interviewees think the objective for the Qeshmineh shop, which will create an outlet for Qeshmi handicrafts to a new market, mainly tourists and shopping visitors, in turn developing the livelihood for village women, is very good, as it addresses the right issue for Qeshm.

The reasons why they think this objective is good vary. Representative reasons are as follows. The original expressions given in the interviews are preserved as much as possible in order to give a feel of the various ideas put forward by stakeholders.

Village women

- It seemed to us the best way. In terms of the method, the shop is good and it is located in Qeshm and our products are supplied. But our problem is that we do not know how to get our products into the shop.

QFZO/Qeshm County managers and officers

- Both the goal and the right method have been chosen. There are many meetings for this category.
- The goal and model in terms of performance have been somewhat correct. But it seems that we have had some problems with the available features, especially in the discussion on the shop location.
- If the shop is temporary and already one year old, it is not a good way to introduce Qeshmi crafts.

JPT Iranian experts and officers

- The Qeshmineh shop was not part of the JICA projects, but we saw that rural women suffered from a lack of permanent sales. Spacious and, of course, temporary in many places, there is the opportunity to try to solve the problem of selling handicrafts by setting up a shop. A very good target is the choice but a difficult place. My view is that the time to judge this shop will be in at least two to three years.
- The goal and the method of achieving it are suitable in terms of creating a comprehensive and permanent center for the introduction of crafts on Qeshm Island.
- Both the goal and the method are very good, but there are ongoing problems.

2) Location of the Qeshmineh shop

Table 12.4.11 below shows the interviewees' reported views on the location of the Qeshmineh shop.

Table 12.4.11 Location of Qeshmineh Shop

Answer	Villagers	QFZO and Qeshm County managers/officers	JPT Iranian experts/staff	Total
It would be better if a location with higher visibility and better access could be found in City Center 2 or preferably in City Center 1	1 (100%)	2 (66%)	3 (75%)	6 (75%)
The location in City Center 2 was not ideal, there are better sites within Qeshm City	0 (0%)	0 (0%)	1 (25%)	1 (12.5%)
The present location is not good, the shop should be located in some villages	0 (0%)	1 (34%)	0 (0%)	1 (12.5%)
I do not know	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Total	1 (100%)	3 (100%)	4 (100%)	8 (100%)

Source: JICA Project Team

Overall, 75% of the interviewees think it would be better if a location with higher visibility and better access could be found in City Center 2 or preferably in City Center 1.

Observations and reasons for changing the location of the Qeshmineh souvenir shop are as follows:

Village women

- It is not the right place, but maybe after a while. For example, the City Center lobby could be a good option. We will have fewer customers in Qeshm. We need to have a single storefront and, more importantly, enough visitors. If we have a branch in the villages, especially at tourist sites such as Soheili, Shibderaz and the Naz Islands, there will surely be more sales. If our customers can visit rural shopping centers, then it is possible that the Qeshmineh village branches can also be opened.

QFZO/Qeshm County managers and officers

- We have to choose a place that is crowded and busy. Now the City Center is more attractive than elsewhere. There are foreign tourists in the villages but the audience is special and not public. Rural stores are usually small, which affects the quality of the product.
- It can be transferred to City Center 1 in a space that is comprehensive and has more public access.
- The airport or rural tourism sites, or even the old Qeshm bazaar, could be a more suitable place for this store.

JPT Iranian experts and officers

- The role that I see for the shop is not so much a place and, because of that, the location is not at all important, and so the current location is right. Shopping can now be done in cyberspace and orders can be made online.
- City Center 1 is a much better place. The Free Zone Organization has many years of work experience and investments in the handicrafts sector. To get results across the years, the QFZO should exploit its past experiences fully and provide the shop with all the necessary funds to present our products. Products are compatible with national and local markets.
- No need to be transferred to the city or villages. We are looking to the Qeshmineh shop for market purposes, not cultural promotion.

3) Quality of products

Table 12.4.12 below shows the interviewees' reported views on the quality of the Qeshmineh shop's

products.

Table 12.4.12 Quality of Products

Answer	Village women	QFZO and Qeshm County managers/officers	JPT Iranian experts/staff	Total
The quality is excellent	0 (0%)	0 (0%)	0 (0%)	0 (0%)
The quality is generally good, but varies from item to item	1 (100%)	4 (100%)	2 (50%)	7 (77%)
The qualities are generally not good, with only a limited number of items come with high quality	0 (0%)	0 (0%)	2 (50%)	2 (23%)
The quality is poor	0 (0%)	0 (0%)	0 (0%)	0 (0%)
I do not know	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Total	1 (100%)	4 (100%)	4 (100%)	9 (100%)

Source: JICA Project Team

Overall, 77% of the interviewees think that the quality of products in the Qeshmineh shop is generally good, but it varies from item to item.

Observations and reasons for changing the location of the Qeshmineh shop are as follows:

Village women

- The quality of our work is absolutely awesome because our products go to the shop after checking and passing through the filter of several experts. The quality of our work should be much better; but, if we have the right materials and facilities, we will be better off. Most of our products are good and some products are excellent. We care about the quality of the products given to the shop. The quality of the work is good; but it is better to update the design of each product. Our products are moving from being traditional to being marketable. Various ideas can be used to the point where the principles do not change. We must see tourists and not markets.

QFZO/Qeshm County managers and officers

- One problem that exists on Qeshm is that the products designed in accordance with the taste and desire of residents of this island mostly do not match the tastes of tourists and mainlanders.
- We hold training courses before the goods entering the shop are filtered out and evaluated.
- We need to evaluate the products and continue in the same way, so that the quality of the items in the shop does not go down.

JPT Iranian experts and officers

- Generally, they are not good but there are a few good ones. Customers of these products are looking for functional products.
- Of course, this option is a bit stricter. Of course, the quality of villagers' products has improved after launching this shop; but, in absolute terms, we must compare ourselves with quality crafts from cities like Isfahan. We need to reach the necessary standard to become a brand. Our products have not reached this standard and are wholly dependent on the manufacturer. However, during the launch of this shop, the products have increased significantly, and the views of manufacturers have also changed.
- Since our goal was to help raise the livelihood of rural women, some low-quality products have also been accepted for sale at the shop.

4) Price of products

Table 12.4.13 below shows the interviewees' views on the price of the Qeshmineh shop's products.

Table 12.4.13 Price of Products

Answer	Village women	QFZO and Qeshm County managers/officers	JPT Iranian experts/staff	Total
The prices are generally reasonable	1 (100%)	4 (100%)	4 (100%)	9 (100%)
The prices are generally too high	0 (0%)	0 (0%)	0 (0%)	0 (0%)
The prices are generally too low	0 (0%)	0 (0%)	0 (0%)	0 (0%)
I do not know	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Total	1 (100%)	4 (100%)	4 (100%)	9 (100%)

Source: JICA Project Team

100% of the interviewees think the price of the products sold in the Qeshmineh shop is generally reasonable. Observations and reasons for the views on prices are as follows:

Village women

- Handicrafts are not available on the market. So, given our hard work and the cost of production, our prices are fair. Of course, sometimes, the customer may compare and, given this issue, the price should be proportionate and competitive. For the Qeshm market, our prices are low, but higher prices can be offered at tourist sites.

QFZO/Qeshm County managers and officers

- It is not possible to talk in general. But, generally, prices are reasonable.
- We are sensitive to prices and I think the prices are good
- In the domestic market, the prices are reasonable. But the prices are very low relative to the overseas market.

JPT Iranian experts and officers

- Prices seem to be high, but the qualities should also go up in proportion to these prices. Considering the location of the shop, this is reasonable, but the quality is not good.
- Prices are proportional to the prices of the island's villages.

5) Diversity of products

Table 12.4.14 below shows the interviewees' reported views on the diversity of products in the Qeshmineh shop.

Table 12.4.14 Diversity of Products

Answer	Village women	QFZO and Qeshm County managers/officers	JPT Iranian experts/staff	Total
The products are very diverse and customers can choose any type of product	0 (0%)	0 (0%)	0 (0%)	0 (0%)
The products are not diverse enough, there should be more variety	1 (100%)	4 (100%)	4 (100%)	9 (100%)
The products are not diverse at all	0 (0%)	0 (0%)	0 (0%)	0 (0%)
I do not know	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Total	1 (100%)	4 (100%)	4 (100%)	9 (100%)

Source: JICA Project Team

100% of the interviewees think the products are not diverse enough and there should be more variety. Observations and reasons for their views on the diversity of products are as follows:

Village women

- Given the filtering of the products, the variety of products is low. The variety of products should be higher.

QFZO/Qeshm County managers and officers

- For some of our products, we have a lot of variety, but, in others, there is very little diversity.
- Products that are suitable for children or suitable for men are not available in shop. Local veils for women could also be supplied to the shop.

JPT Iranian experts and officers

- The variety of products is very low. The products of some villages sell well, but less for the rest of the villages.
- Diversity is well established, but not enough. Of course, a lot of variation may lead to a drop in quality. Rural women try to follow new ideas.

6) Attitudes of the village women

Table 12.4.15 below shows the interviewees' reported views on the attitudes of the village women participating in this pilot project.

Table 12.4.15 Attitudes of the Village Women

Answer	Villagers	QFZO and Qeshm County managers/officers	JPT Iranian experts/staff	Total
They are always cooperative and active	0 (0%)	0 (0%)	1 (25%)	1 (12.5%)
Many of them are cooperative and active, but some are not	1 (100%)	3 (100%)	2 (50%)	6 (75%)
Many of them are not cooperative and active, except for some	0 (0%)	0 (44%)	1 (25%)	1 (12.5%)
They are not cooperative and active	0 (0%)	0 (0%)	0 (0%)	0 (0%)
I do not know	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Total	1 (100%)	3 (100%)	4 (100%)	8 (100%)

Source: JICA Project Team

Among respondents who think that many of the village women participating in the Qeshmineh shop are

cooperative and active, 75% believe that this is not universally the case, including for 100% of QFZO/Qeshm County managers and officers and 50% of JPT Iranian experts/staff.

The following are some of the observations and comments.

Village women

- The vendors have not had much support, although they have been active at the shop but have to be able to attract customers. In addition to the vendors, it is best to have a small production sample simultaneously available in the shop. Dealers should give us more feedback to improve or diversify our products. This may not be pleasant, but it will ultimately be in our favor and for the benefit of the shop. Shop orders should be transparent and announced to all manufacturers to avoid pessimism. Orders are even better for members to divide the work.

QFZO/Qeshm County managers and officers

- Most of them have good interactions with each other and they are active.
- Between the second and third options, I am skeptical. But I chose the second option because I think women often do not understand what the JICA wants.
- There is a willingness to cooperate among rural women.

JPT Iranian experts and officers

- Most of these women are active but some are not.
- Part of the support and activation was somehow required for orders or coordination sessions. But cooperation between them is not as it should be, and their teamwork is weak and we cannot be very optimistic. The spirit of cooperation is not so tangible among these ladies.
- In fact, my view is between the second and third options. The problem with women is that they are very weak in terms of teamwork, which has caused many opportunities to be lost. It seems that they are not interested in developing work and are more likely to maintain the status quo.

7) Publicity campaign

Table 12.4.16 below shows the interviewees' reported views on the publicity campaign for this pilot project. This issue was addressed to villagers and QFZO/Qeshm County managers and officers.

Table 12.4.16 Publicity Campaign

Answer	Village women	QFZO and Qeshm County managers/officers	JPT Iranian experts/staff	Total
We carried out publicity campaign activities sufficiently	0 (0%)	0 (0%)	0 (0%)	0 (0%)
We carried out some publicity activities, but not sufficiently	0 (0%)	3 (100%)	2 (50%)	5 (63%)
We carried out some publicity activities, but should have done them in a different way	1 (100%)	0 (0%)	2 (50%)	3 (37%)
I do not know	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Total	1 (100%)	3 (100%)	4 (100%)	8 (100%)

Source: JICA Project Team

Those who think that some publicity activities have been done, but not sufficiently, accounted for 63%, including 100% of QFZO/Qeshm County managers and officers and 50% of JPT Iranian experts/staff.

The following are some of the observations and comments.

Village women

- In the brochure, village products are not well known. The Qeshmineh shop could also advertise rural shops. Different advertising methods should be applied. For example, encouraging taxi drivers or tour leaders to promote the Qeshmineh shop.
- Advertising on billboards on Qeshm streets can be used. The current location of the shop is small and, therefore, in the larger local area, it is possible to advertise villages by advertising villages' products.

QFZO/Qeshm County managers and officers

- Our advertising is not enough and should be increased. Renting billboards in the city could be a good option.
- In our marketing discussion, we chose the right scale, but we need to do more environmental advertising such as billboards.
- Attending exhibitions and conferences, launching sites and online advertising, and collaboration with relevant organizations and the QFZO can also be very effective.

JPT Iranian experts and officers

- Advertisements in cyberspace and media like TV, etc., should be increased.
- I say things can be done, for example, one or two city-wide billboards are surely needed. But, because of the inadequate budgeting for this project, that is not possible now. Conversely, a lot of money was spent where it was not necessary. Another is TV advertising, which, of course, requires a high cost. Participating in cultural festivals or events can be a great help in introducing the Qeshmineh shop. But, before, I said that, if the goal is to introduce island crafts, then the method should be appropriate for this approach; and, for that purpose, appropriate costs need to be met. I do not feel that there has been serious support for this shop from the whole of the Free Zone Organization.
- I think every business needs a marketer, and every business that does not have a marketer will be confused. It has been advertised enough, but apparently advertising should be in the same direction. We have a marketer, but access to them is very difficult, and therefore we did not have a clear marketing plan.

CHAPTER 13 RECOMMENDATION

(1) Review of Qeshm Island's role and core infrastructures in the national plan

Qeshm Island was designated as an FZ, with the aims of industrial development, the promotion of foreign direct investment and the introduction of advanced technology. The FZ is expected to contribute to the growth of the national economy. One of the advantages of Qeshm Island is its favorable location for international maritime transport in the Persian Gulf. This favorable location is reflected in conditions in which Qeshm Island is connected to industries and markets on the mainland side.

However, Qeshm Island does not enjoy an important status in terms of port development and international airline expansion in the national plan, although international maritime transport and air transport are prerequisites to establish the FZ.

In order to realize the development potential of Qeshm Island, the development of the international port, the international air route and the bridge between the island and mainland need to be specified in the national plan in order to implement these core infrastructures as a national project.

(2) Approval of the ECO-QESHM Master Plan for implementation

The ECO-QESHM Master Plan sets out the expected vision and path to realize its objectives for Qeshm Island. The development of Qeshm should be undertaken in collaboration with central government, provincial government, county government, the QFZO, residents and private companies, whose agreement is necessary to pursue the vision.

When the project is completed, the Final Report will be submitted to the QFZO. It is recommended that the master plan be submitted to the Supreme Council of Iran's Free Trade, Industrial and Special Economic Zones for its approval in order to guarantee an understanding and resources from line ministries and agencies, after the QFZO approves the Final Report.

The QFZO will disseminate and market the "eco-island" brand through collective actions among relevant organizations to Qeshm stakeholders, the mainland of Iran and foreign countries (e.g., using promotional videos and expo opportunities). The QFZO will initiate Qeshm economic development based on the "eco-island vision" and the master plan when the QFZO agrees the budget with the central government, private investment and any other interventions. Environmental management is a prerequisite to attract international private companies to invest in projects reflecting the global environment, social and governance (ESG) trend. To this extent, the "eco-island" brand will be a useful tool for investment promotion.

(3) Enhancement of the capacity of the QFZO

<u>Establishment of the Community Development Department</u>

More than half of the population on the island live in the villages. In the main, those who inherit the culture, tradition and nature of the island are villagers. Pilot projects implemented during the Project have proven that villagers are able to deliver a project via a participatory approach and collaborate with the QFZO.

The current situation and challenges that villagers face vary from village to village. The different departments of the QFZO and the county government have to respond to their needs. It is recommended that a new department, to be in charge of community development, should be established in the QFZO. This department would coordinate with other departments of the QFZO, the county government and the communities. Experts with experience of the participatory approach and knowledge of different sectors and are capable of winning the trust of villagers will be competent to manage or work in the Community Development Department.

If it takes time to establish the Community Development Department, it is recommended that staff in charge of community development are designated with roles and jurisdiction as a temporary measure. The staff will be responsible for liaising with the villagers, the departments of the QFZO and the county government.

Improvement in investment promotion activities

Comprehensive guidance must be prepared in the QFZO to create an efficient and transparent investment environment for prospective investors. According to the guidance, a 'window' will be established to serve as a one-stop service, which will coordinate with other departments; it will also require a designated IT system. A marketing action plan will be formulated to promote investment from the mainland and overseas.

Establishment of the Ecotourism Committee and the Tourism Coordinating Committee

The establishment of the Ecotourism Committee is a must in order to enhance ecotourism on Qeshm as a first step. The committee will include the Cultural, Social and Tourism Deputy, the Tourism Manager, the Geopark Manager and the Environment Manager. In parallel, after the Ecotourism Committee becomes stable, the committee will take the initiative to strengthen cooperation with the tourism-related private sector representatives, such as travel agencies, tour leaders, hotels, local guesthouses and taxi drivers, to discuss tourism-related issues and obstacles and how to solve them. In the long term, the Ecotourism Committee will be expanded into a Tourism Coordinating Committee in the QFZO, comprising investment-related deputies, such as the Economic Investment Deputy and Technical Infrastructure Deputy in addition to members of the Ecotourism Committee. The Tourism Coordinating Committee will be responsible for developing tourism policy.

On the Ecotourism Committee, the Geopark Manager and the Environment Manager will be responsible for improvements in ecotourism-related activities including local guesthouses, while the Tourism Manager will be responsible for the quality of large-scale investments such as hotels.

Introduction of a personnel evaluation system to develop human resources

The objective of human resource development is to develop the best workforce so that the organization and individual employees can accomplish their work goals. Employee evaluation involves the assessment and review of an employee's job performance. Most organizations have an employee evaluation system, wherein employees are evaluated on a regular basis, such as once a year.

The current officials at the QFZO have experience of working in different fields and the potential to guide the island towards realizing the envisaged vision. In order to nurture their abilities and make use of them in an organization, personnel evaluation is recommended as a tool to develop talented people and locate them in the right place within the organization alongside a promotion system and a human resources development program.

(4) Improvement in environmental management system

Review of roles in the DoE in the QFZO and the county government

Environmental management on the island is carried out by two organizations: the DoE within the county government and the QFZO. Both departments are responsible for the EIA, such that their roles overlap. A transparent, reliable and efficient investment environment is a prerequisite to attract investors. The well-coordinated system enables the efficient utilization of human and financial resources. It is recommended that the roles of these two environmentally related departments are reviewed and clearly demarcated to streamline the EIA procedures.

Preparation of an environmental management plan for the Hara Protected Area

A draft management plan for the Hara Protected Area was formulated by the DoE in Tehran in 2002; however, it has not been approved as yet. Jetties have been constructed in villages around the Hara Protected Area. The current situation is different from the conditions at the time when the draft management plan was prepared.

The management plan includes a zoning plan, which is a core document that defines environmental conservation and allowable livelihood-related activities such as ecotourism and fishery for villagers. It specifies: core area(s), which should be exclusively used for conserving biological diversity; buffer zone(s), which can be utilized for permissible activities and facilities compatible with ecological practices; and a transition area, which has a central function in sustainable development. The draft management plan must be finalized and approved with consensus from all parties concerned including the DoE in Tehran, the DoE in the provincial government, the DoE in the county government, the QFZO and villagers.

Preparation of a Geopark master plan

The QIGG was registered on the UNESCO GGN in 2016 again. It is expected to receive an assessment for revalidation every four years. The existing Geopark master plan was prepared in 2009 but is now out of date since a) the territory of the QIGG has expanded from 300 km^2 to 2,063 km^2, b) the regulations of the designation have changed greatly, c) the new geosite does not have any plan in place. On the other hand, a master plan itself is essential in order to obtain the necessary scores during the four-year evaluations. The QFZO should formulate a new Geopark master plan for the whole are of the QIGG in order to determine the envisaged conditions of the geosite and specify the roles of stakeholders. The master plan will set out a path and the necessary actions in order to remain a GGN member in the long run.

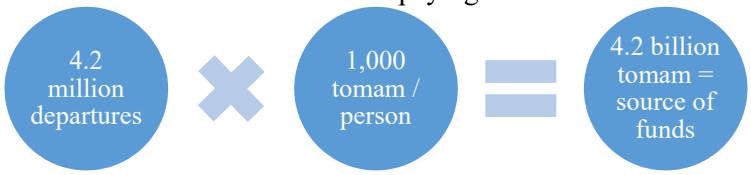
(5) Establishment of a community development fund

The QFZO has been supporting local communities on several projects; however, limited financial resources have undermined the ability to provide consistent support. This has resulted in several uncompleted or delayed projects. It is essential to establish a system for smoothly securing and allocating financial resources and agreeing budgets in order to build trust between governmental authorities and local communities, to empower local communities and to enhance the local economy. For instance, new ecotourism products and services, which the JPT has supported as pilot projects, provide examples of potential income streams in the near future. This is not limited to tourism; however, new sources of income for local communities should be developed continuously. Seed money for start-up activities is necessary.

Source of the fund

A fee will be charged to passengers who depart from the island, at each departure point, i.e., Qeshm Airport and every port. In 2017, 4.2 million passengers departed from the island, meaning that, if each had passenger paid 1,000 toman (equivalent to 10,000 IRR), this would have accumulated 4.2 billion toman, which is equivalent to the budget of pilot projects arranged by the JPT.

It is recommended to charge a fee to all visitors; however, this could be commenced gradually, such as on a voluntary basis or charging an entrance fee at each geosite (e.g., Hara Mangrove Protected Area or Dolphin Bay) to enable visitors to become used to paying fees.



It is recommended to charge a fee to all the visitors, however it can start gradually such as voluntary basis or entrance fee at each geosite like Hara Mangrove Protected Area, Dolphins bay, to let visitors to become used to pay for it.

Fund management

1) Principles of the fund

- The fund should be separate from the QFZO's budget and mobilized every year
- The policy change should not reflect the operation of the fund

2) Institutional status

Non-profit, non-business and non-trade

3) Roles on the managing committee of the fund

A managing committee should be established for which a secretariat (minimum: one administrator and one accountant) will be hired for the purposes of daily operations and the coordination of members of the managing committee and local communities. The main roles of the managing committee are:

- To make decisions about the development strategy of the fund
- To mobilize funds for local communities
- To increase the awareness of the fund for both visitors and local communities
- To support and facilitate a process for applying to the fund from the side of local communities
- To monitor an implementation process for selected projects for the fund
- To support and facilitate a process for sharing experiences and good practices among fund beneficiaries

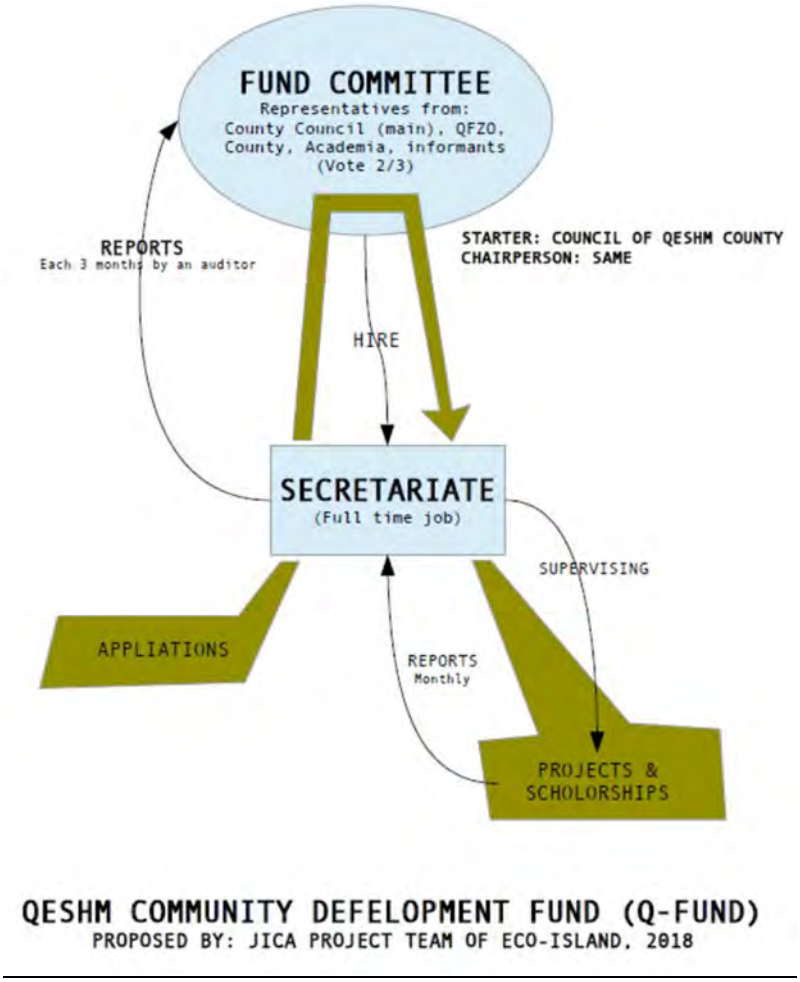
4) Proposed members of the managing committee

The mandate of the chairperson is three years. The representative of each organization must be an expert with full rights in decision-making. Two thirds of the managing committee must be present for an official meeting to be quorate.

(a) Member of the managing committee
- ✓ Representative of the council members of Qeshm County (chairperson)
- ✓ Representatives of the Chamber of Commerce
- ✓ Respected individuals
- ✓ Academics
- ✓ Representative of Qeshm County
- ✓ QFZO

(b) Third persons
- ✓ Adviser
- ✓ Auditor (lawyer)

5) Organization chart (proposed)



Transparency and accountability of fund management

Securing financial transparency and accountability are key to maintaining the sustainability of the fund. It also helps to avoid any corruption as well as build trust between local communities and the organization. Preparing for comprehensive budget reports, which clearly show the process of budget preparation, approval, execution and accountability and its disclosure system every three months, should be pursued.