

Rehabilitation Project of Carabela Port, Timor-Leste

Environmental Management Plan

February 2026

PACIFIC CONSULTANTS CO., LTD.

Ides Inc.

ENVIPRO QUINOFAR

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Appendix-1 Participants of Stakeholder Consultation

List of Abbreviations

Abbreviations	Official Name
ADB	Asian Development Bank
ANM	National Minerals Authority
APC	Civil Protection Authority
APORTIL	Administrative dos Portos de Timor Leste
BTL	Bee Timor-Leste/ Timor Leste Water Corporation
CI	Conservation International
DNMG	National Directorate of Meteorology and Geophysics
DNRAS	Direção Nacional para a Regulação de Água e Saneamento
DNTM	National Directory of Maritime Transportation
DWT	Deadweight Tonnage
EDTL	Electricidade de Timor-Leste
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
FS	Feasibility Study
GDP	Gross Domestic Product
IBAT	Integrated Biodiversity Assessment Tool
ICUN	International Union for Conservation of Nature and Natural Resources
IEE	Initial Environmental Examination
IGTL	Geosciences Institute of Timor-Leste
IMO	International Maritime Organization
IPG	Institute of Petroleum and Geology
ISPS	International Ship and Port Facility Security Code
JCC	Joint Coordination Committee
JICA	Japan International Corporation Agency
KBA	Key Biodiversity Area
MAF	Ministry of Agriculture and Fisheries
MCI	Ministry of Commerce and Industry
MTC	Ministry of Transports and Communication

Abbreviations	Official Name
MOAF	Ministry of Agriculture and Fishery
MoD	Ministry of Defense
MOF	Ministry of Finance
MOJ	Ministry of Justice
MoT	Ministry of Tourism, Trade and Industry
MPS	Major Projects Secretariat
MPSI	Ministry of Planning and Strategic Investment
MPW	Ministry of Public Works
MPM	Ministry of Petroleum and Mineral
MPSI	Ministry of Planning and Strategic Investment
MTCI	Ministry of Tourism, Commerce and Industry
NBSAP	The National Biodiversity Strategy and Action Plan
NAEL	National Agency for Environmental License
NDLP	National Directory of Land & Property
NOAA	National Oceanic and Atmospheric Administration
ODA	Official Development Assistance
PAM	Pollution Assessment and Management
PDM	Project Design Matrix
PMOT	Municipal Land Management Plans
PMU	Project Management Unit
PO	Plan of Operation
PPP	Public-Private Partnership
SEA	Strategic Environmental Assessment
SEA	Secretary State of Environment
SDP	Strategic Development I
SOLAS	International Convention Safety of Life at Sea
SSB	Suai Supply Base
TIMOR-GAP	TIMOR-GAP E.P.
TOR	Terms of Reference
UNDP	United Nations Development Programme
UNCTAD	United Nations Conference on Trade and Development

Abbreviations	Official Name
UNTL	Universidade Nacional Timor-Leste
USAID	US Agency for International Developmen
WB	World Bank
ZEEDOA	Special Zone Economic Development Oecussi Ambeno
ZEESM (ZEEDOA)	Special Zones for Social Market Economy

1. Executive summary

Environmental survey around existing Carabela Port to renovate the facility for enhancing maritime logistics leading to economic growth was conducted.

Available information was collected and organized and scoping study was conducted to understand insufficient information to be collected. Based on the study, environmental field survey was conducted. Using those data, impact assessment study was carried out. And Environmental Management Plan (EMP) to minimize the impact caused by the project was prepared and Monitoring Plan to understand the effectiveness of the environmental management was also prepared.

Requirements concerning environmental categories associated with development are stipulated in Decree-Law No. 5/2011. For port-related projects, the development of port facilities capable of mooring vessels exceeding 500 gross tons is designated as Category A.

However, this project is a rehabilitation of existing facility in the existing area with a national initiative requiring urgency. And no new land acquisition is necessary.

Also based on the results of the environmental field survey, the environmental impact was deemed minor. It is considered that the project will not cause significant adverse environmental impacts and does not involve characteristics prone to causing impacts or vulnerable areas.

Furthermore, no derivative or secondary impacts, cumulative impacts, or inseparable integrated projects are planned.

Therefore, this project is classified as Environmental and Social Considerations Category B.

During construction, it is recommended to monitor the situation of environmental status following the Monitoring Plan. If any change of environmental status is realized, intensive study shall be conducted to know its causes. And if it is caused by the project, cease of construction activities must be planned until countermeasures is secured and the causes are resolved.

Since important marine ecosystem, such as coral and seagrass, exist in the area, consecutive occurring of turbid water might cause negative impact to the ecosystems. Therefore, continuous monitoring is fundamental and proposed in the monitoring plan.

2. Details of the project proponent

Name: Ministry of Transport and Communication

Address:

Contact Person:

Phone number:

E-mail Address:

3. Details of the EIA consultants

This study was conducted by a joint team as follows:

- JICA Survey Team: PACIFIC CONSULTANTS CO., LTD., Ides Inc.
- Local consultant: EnviPro Quinofar

PACIFIC CONSULTANTS has been deeply involved in the development of social infrastructure both in Japan and abroad for over 70 years as a leading construction consulting company since its foundation in 1951. With a total of over 1,300 high skilled civil engineers, it is expanding globally to solve social issues. PACIFIC CONSULTANTS CO., LTD. is a lead company of the JICA Survey Team on the JICA project on Preparatory Survey on the Project for Development of Carabela Port in Timor-Leste.

Address: 3-22 Kanda Nishikicho, Chiyoda-ku, Tokyo 101-8462, Japan

Website: <https://en.pacific.co.jp/>

Ides Inc. has been actively involved in various international cooperation projects, providing comprehensive consultation services for numerous port/transport infrastructure projects. Its services range from policy development, master plan and feasibility studies, advice for operation and management improvement, to capacity building of human resources. The company also put strong emphasis on sustainable development by taking into consideration the environmental/social impacts and by consulting wide range of stakeholders.

Ides Inc. supervised the environmental and social study this time.

Address: Matsuki Bldg. 3F, 1-3-8 Shibakoen, Minato-ku, Tokyo, 105-0011, JAPAN

Phone: +81 3 3434 0038

Email: info@ides-inc.co.jp

Website: <https://ides-inc.co.jp/>

EnviPro Quinofar (EnviPro) is a local Timorese firm that operates in environmental consultancy and management services for individuals and organizations seeking professional guidance in meeting environment-related requirements for environmental protection and safeguarding human health.

EnviPro offers services such as conducting environmental impact assessments (EIA) as required by national regulations in Timor-Leste, conducting environmental baseline study to investigate the original state of the environment in the area before beginning project development work, and performing environmental monitoring to examine the quality of the environment based on specific parameters to fully quantify the impact of an activity or project on the environment.

Address: Beco Maloa Kraik I, Rio de Janeiro, Bairro-Pite, Dom Aleixo, Díli, Timor-Leste

Phone: +670 7714 9760 /+670 7459 4303

Email: enviproconsultancy@gmail.com

Website: <https://enviproquinofar.business.site/>

4. Description of the project

4-1. Identification of the project

This project aims to rehabilitate the existing facilities to establish maritime network for contribution to the promotion of economic activities in the country by ensuring the safe and efficient operation of passenger and cargo transportation at the Port of Carabela in the Baucau region.

4-2. Category of the project

Requirements concerning environmental categories associated with development are stipulated in Decree-Law No. 5/2011. For port-related projects, the development of port facilities capable of mooring vessels exceeding 500 gross tons is designated as Category A.

However, this project is a rehabilitation of existing facility in the existing area with a national initiative requiring urgency. And no new land acquisition is necessary.

Also based on the results of the environmental site survey, the environmental impact was deemed minor.

It is considered that the project will not cause significant adverse environmental impacts and does not involve characteristics prone to causing impacts or vulnerable areas.

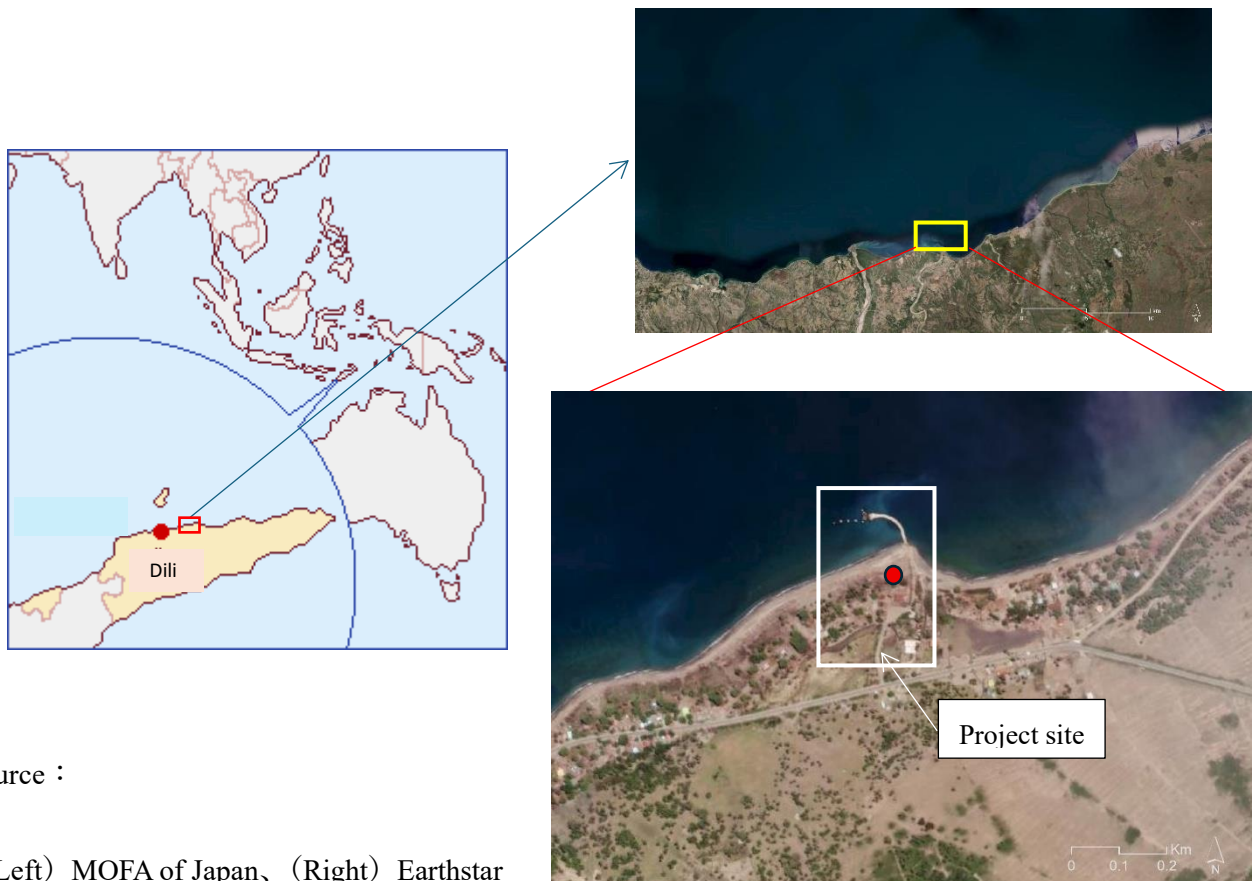
Furthermore, no derivative or secondary impacts, cumulative impacts, or inseparable integrated projects are planned.

Therefore, this project is classified as Environmental and Social Considerations Category B.

4-3. Brief explanation of nature, size and size of the project

4-3-1 Location

Figure 1 shows the location of the project site.



Source :

(Left) MOFA of Japan、(Right) Earthstar

Figure 1 Project Site Location

(1) GPS coordinate

126°16'30.59"E, 8°28'54.60"S (Location of the red dot shown in Figure 1.

(2) Existing features

① Watercourse and water bodies

Refer to Figure 2.



Figure 2 Water course and water bodies

② Facilities and Equipment

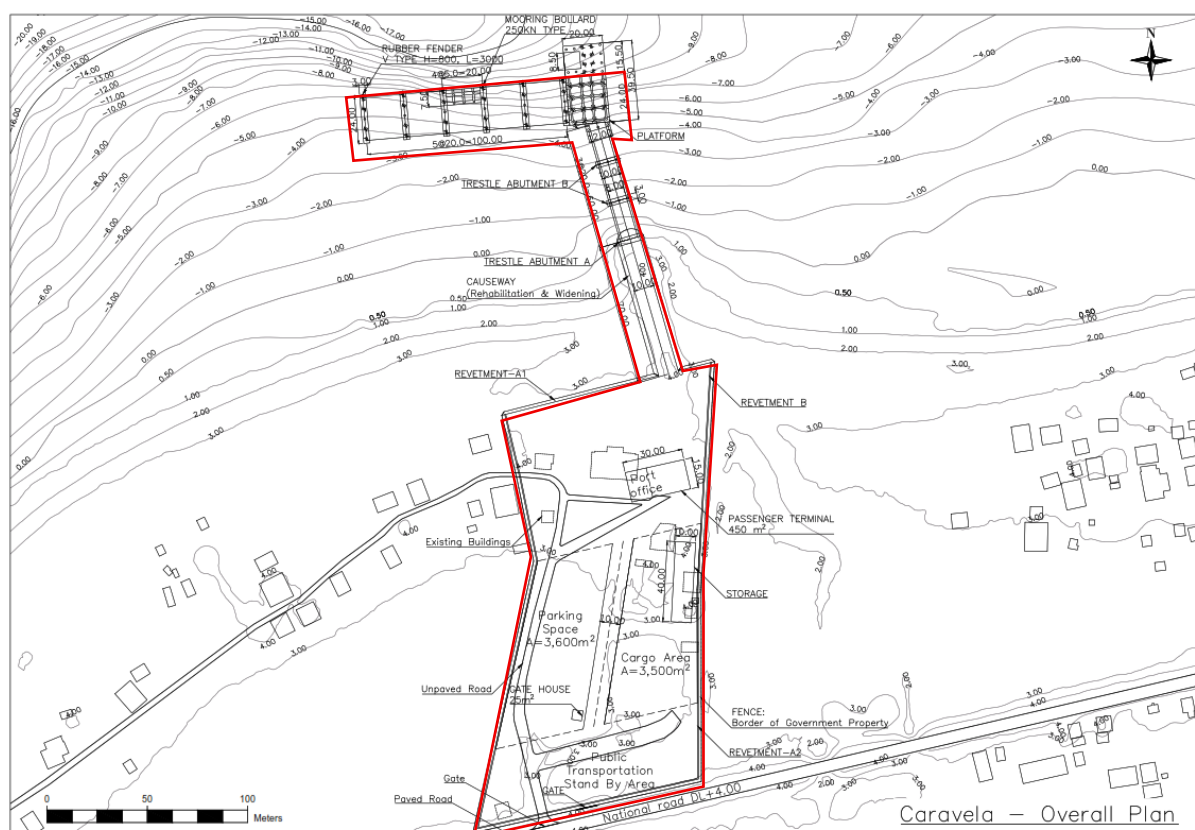
- A mooring pier capable of accommodating ferries and cargo ships
- Boarding/Alighting platform
- Connecting bridges and walkways
- Buildings (terminal building and warehouse (planned))
- Embankments, ICB/concrete pavement, revetments/retaining walls
- Civil engineering facilities ancillary to the above facilities, including lighting, water supply, power supply, and firefighting systems
- Drainage channels surrounding the port area

Table 1 shows the overview of the project.

Table 1 Project overview and scale

Facility Name	Plan details	Specification
Preparatory work	Removal of existing facilities	Existing Jetty, Dolphin Existing buildings
Ferry Jetty	1) Jetty Style (1) Ceiling Height: D. L+3.5m (2) Planned water depth: D.L-6.0m 2) Ancillary Facilities (1) Fender (2) Ship post. (3) Ladder (4) Anti-corrosion (5) Car stop (6) Corner Protector (7) Beacon Light (8) Lighting equipment	Jetty part: L=66m (2 spans) PC bridge section: L=17m, dolphin section: L=17m V600H: 4 bases, V400H: 7 bases 250kN: 5 bases, 150kN: 5 groups 1 base Coated anti-corrosion, anti-corrosion 1 on the Jetty, 2 azimuth markers (at sea). 2 Base
Platform	1) Jetty style (1) The height of the top end of the quay wall: D. L+3.5m (2) Planned water depth of the quay wall: D.L-6.0m 2) Ancillary Facilities (1) Ship post (2) Ladder (3) Corrosion prevention (4) Car stop (5) Corner Protector (6) Beacon Light (7) Lighting equipment	Jetty: L=35m (2 spans) 250kN: 1 base 1 base Coated anti-corrosion, anti-corrosion 1 on the platform 1 base
Connecting Bridge	1) PC Hollow Bridge 2) Ancillary Facilities (1) Corrosion prevention (2) Guard Pipe (3) Handrails (4) Lighting equipment	L=43m 2 Piers (steel pipe pile type) and 1 abutment (gravity type). Coated anti-corrosion, anti-corrosion 4 Base
Land Development	1) Causeway 2) Embankment and grading (ground height: DL+3.5m) 3) Revetments and retaining walls 4) Drainage 5) Pavement	L=71m, concrete pavement V=8,320m ³ Gravity revetment (R1): L=82m Gravity retaining wall (R2): L=445m Sheet pile revetment (R3): L=82m Box Culvert: L=93m ICB Paving: A=10,150m ²
Passenger terminal	RC building one-story building	Building area 64m ² / Total floor area 697m ² Building height 6.1m
Warehouse building	RC building one-story building	Building area 468m ² / Total floor area 458m ² Building height 6.925m
Guard House	RC building one-story building	Building area 3.4m ² / Total floor area 3.4m ² Building height 4.1m

Source: JICA Survey team



Source : JICA Survey team

Figure 3 Horizontal layout of the port after rehabilitation (red line)

4-4. Jurisdiction and need for the project

4-4-1 Beneficial Effects

The project is highly feasible, as it is expected to contribute not only to the residents of the northern coastal region served by existing routes and planned new routes, but also to the economic development of the “Democratic Republic of Timor-Leste,” thereby extending beneficial effects to the entire population.

4-4-2 Consistency with Long-Term Development Plans

In the Strategic Development Plan (SDP), the long-term development plan for Timor-Leste, port infrastructure development is positioned as a key policy to ensure the country's economic growth, making this project highly consistent with the SDP. Furthermore, with the transfer of cargo functions to Tibau Port, Dili Port is expected to serve as a maritime and land transportation hub, including an international passenger terminal and ferry terminal. The development of Calabela Port will enhance connectivity and expand these functions, making this project highly appropriate.

4-4-3 Securing alternative transport routes

Landslides, floods, and other severe disasters associated with climate change are occurring frequently

in Timor-Leste. The damage from the cyclone in April 2021 was particularly devastating, causing numerous casualties and damaging much infrastructure, including urban flooding and road disruptions. This project will secure maritime transport routes for emergency supplies during such disasters.

4-4-4 Consistency with Major Foreign Policies

Timor-Leste is located in a strategically important region along the sea lanes connecting the Indian Ocean and the Pacific Ocean. This initiative also contributes to “multi-layered connectivity,” one of the pillars of the Free and Open Indo-Pacific (FOIP) initiative.

4-5. Proponent’s endorsement of the Simplified EIS

As a proponent of this project, Ministry of Transport and Communication endorses the Environmental Management Plan.

4-6. Features of existing or past land use

4-6-1 Current land use

Land use in Carabela is mostly comprised of settlement areas, agricultural land, livestock husbandry, and vegetation cover. Within the project area, there is an abandoned building formerly used for a cement factory (see Figure 4), with the remaining land covered with vegetation such as palms, coconut trees, and bushes. There are rice fields south of the project area that are only cultivated during rainy seasons. There are also some small businesses, such as local grilled fish restaurants and markets, available along the main road. The west part of Carabela is Vemassee town, where most of the settlement areas are located. These settlement areas are mostly used for community houses, government offices, health clinics, schools, small-scale fisheries, markets, and larger rice paddy fields with irrigation systems and water supply along the main road (also see Figure 5).



Figure 4 A photograph of the abandoned cement factory within the proposed project area in Carabela

4-6-2 Community lands and nearby communities

Carabela Port is an existing port since the Indonesian time. The facilities built for the port are within the Port fence. Currently, no community encroached within the port area. Some communities settle just outside the port fence. The community settled within the east and west side of the port area are between 20-30 households in each side within 300 m radius. Community houses range from traditional housing using palm leaves and trunk (uma bebak or uma tali) to semi concrete and fully concrete housing. It is expected that the rehabilitation of the existing Carabela port will not acquire any community land.

Figure 5 shows the port area.



Note: Within the yellow line is the port area

Figure 5 Port area and community area

5. Legak requirement

5-1. Policies and legislation relevant to the project

5-1-1 Strategic Development Plan

The Government of the Democratic Republic of Timor-Leste recognized infrastructure development in the port sector as one of its priority issues in the Strategic Development Plan 2011-2030 (SDP). In the government program, the development of regional ports was positioned to enable the sea transport of domestic passengers and cargo. Since there are many mountainous areas in Timor-Leste and the road network is under development, sea transport can be an indispensable infrastructure for public transport. Ferry services to rural areas are currently operated between Dili, Oecusse and Ataúro, however, maritime traffic to other regions is not open. While no specific development plan for regional ports has been made due to restrictions on the government budget, it is required to formulate a development plan for the regional ports including consideration of future maritime transport networks for economic development and improvement of living standards of local residents, especially in rural areas. Tibar Bay Port started its official operation from November 2022. The redevelopment plan for Dili Port after the transfer of

cargo handling being completed, has been suspended and alternate plan is expected. However, the reorganization plan of APORTIL, I.P., which operated Dili Port, has not yet been considered. In light of this situation and the need to formulate a strategic port development master plan, the Government of Timor-Leste requested Japan to implement a technical cooperation development plan project and R/D (Record of Discussion) with contents of the investigation was signed in May 2022.

The Strategic National Port Development Master Plan consists of the following three core plans.

Strategic National Port Development Master Plan	Target Year
National ports development plan	2040
Development plan for high priority ports	2030 or 2035 depending on individual port development
Action plan for improvement of port operation and maintenance by APORTIL, I.P	2040

As one of development plan for high priority ports, Carabela Port is listed.

5-1-2 APORTIL, I.P 5-year Strategic Plan

The plan shows rehabilitation plans for Com, Ataúro and Carabela.

5-1-3 Program of eighth constitutional cabinet

The development of maritime transport is also listed as one of the important measures in Program of eighth constitutional cabinet. The development of port infrastructures is essential to enable Timor-Leste to import essential goods and equipment, with a view to strengthening and diversifying the national economy.” Therefore, it will continue to invest in port systems nationwide following Tibar Bay Port, and will carry out the following projects.

- Construction of a port facility at Carabela, Vemasse District, Baucau Municipality, to facilitate access to maritime transport and support the tourism sector.

5-2. Laws and regulations

The role of MTC (Ministry of Transport and Communications) was redefined by Decree-law No.75/2023. According to this Decree, MTC’s role in port development and operation is as follows.

MTC is the government department responsible for national transport and communications policy and legislation in Timor-Leste. The Directorate-General for Transport and Communications (DGTC), the lead agency within the MTC, is responsible for coordinating all the services of the Ministry in the areas of land transport, sea, air, meteorological services and geophysics, postal services, and communications. In addition, DGTC shall collaborate with public service agencies, namely APORTIL, I.P. (port), ANATL (civil aviation), and TIC Timor (communications) to promote intermodal transport. The specific responsibilities of DGTC in terms of ports development are as follows:

Two institutions were indicated as leading this sector, DNTM and APORTIL, I.P: DNTM is the organization primarily responsible for the legal and regulatory framework in accordance with "Decree-Law No. 20/2016", whereas, APORTIL, I.P. is the organization responsible for the ports and anchorages of Oecusse, Tibar, Dili, Dili Pertamina, Hera, Atauro, Carabela (Baucau), Com (Los Palos), Betano, Beaço, and Suai, and it is responsible for all infrastructure, operations, and services under the authority and supervision of the Minister, in accordance with "Decree-Law No. 3/2003".

6. Institutional roles and responsibilities

6-1. Land Ownership

Land owned and managed by communities follows social and cultural norms and customary law, and most of the land used by rural households falls into this category. The primary methods of land acquisition in Timor-Leste are customary law and inheritance (including transfers within families) (Henriques, Narciso, & Branco, 2011). Ignoring customary law has led to land disputes in many municipalities. Ultimately, the President of Timor-Lest signed Decree-Law No. 13/2017 in June 2017, establishing the country's fundamental land legal framework (Yoder & Joreiman, 2019).

The population of the Vemmase district, where the Carabela project site is located, is 11,206 people (5,725 males, 5,479 females) (MoF, 2022). Approximately 20-30 households reside in the vicinity of the project site. Most residents earn their livelihood through fishing and operating eateries that grill and serve fish. The employment rate is approximately 50% for men and 40% for women (according to the interview to Vemmase Municipal Office).

6-2. Social Infrastructure Around the Port Area

Most government facilities and offices are in the Vemasse administrative district. Carabela has one elementary school for grades 1 through 6. Additionally, Vemasse has three more elementary schools, a pre-secondary school (grades 7-9), and a secondary school (grades 10-12). Regarding healthcare and facilities, Carabela has no health center or clinic. Health centers and clinics are in Vemasse, staffed by doctors and nurses with basic medical equipment. The referral hospital is in Baucau, equipped with more comprehensive medical facilities.

6-3. Social Capital

In traditional Timorese society, interpersonal relationships are considered to require the most careful handling. These relationships not only provide security to the individuals and families that comprise them, making them indispensable, but are also multidimensional (Trindade, 2015). The sacred house, ritual house, or cult house known as Uma Lulik is central to the customs of local people because it embodies the collective beliefs and values shared by the community. The vast majority of East Timorese are members of an UmaLulik (Boldoni, 2020).

In Timor-Leste, there are approximately 30 dialects, which serve as markers of ethnicity. The Vemmase

district where the project site is located has two dialects (Galolen and Uaimoa). While Uaimoa is predominantly spoken, Galolen is also used in the project site vicinity (Vemmase Tasi). This dialect is primarily spoken in the northwestern part of the Vemmase district. Furthermore, interviews with residents of Vemmase Tasi revealed that there is no particular discrimination despite the different dialects, and the residents coexist harmoniously. And there are no indigenous peoples or ethnic minority groups in the region.

6-4. Decision-making Bodies Around the Port

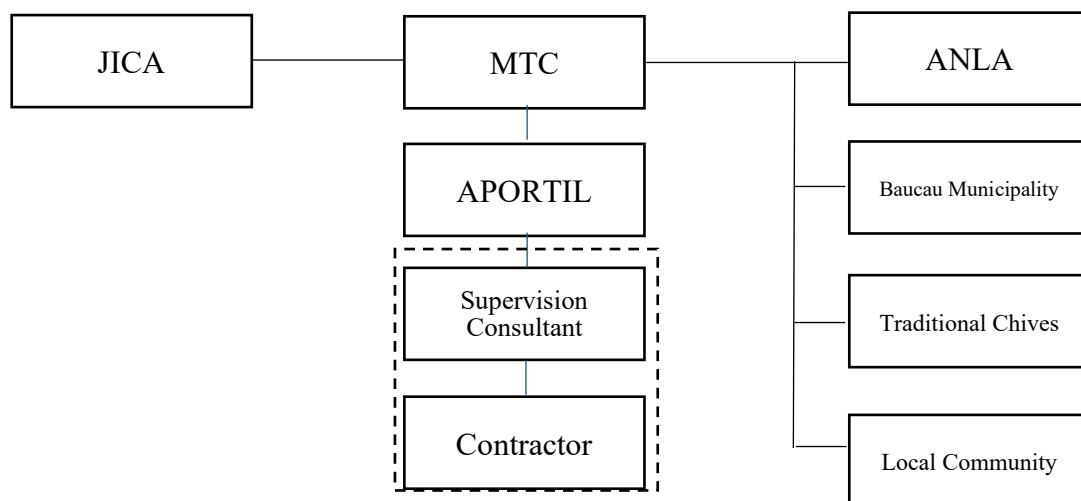
At the local government level, the 12 municipalities (excluding Oecusse, which belongs to the Special Administrative Region) are administered by the Municipal Authority President (Presidente Autoridade do Municipio: PAM). Next, and Administrative Chief is placed under the PAM. Subordinate to the Administrative Chief are the Suco and Aldeia levels, led by the Chief of the Suco and its organization and the Aldeia Chief. Regarding Beço, the decision-making bodies for matters related to cultural elements are the Aldeia Chief, Youth Leaders, and traditional elders. To some extent, the Suco Chief and its organization are involved in the decision-making process.

6-5. Possible institutional constraints

Implementation structure is shown in Figure 6.

The core organizations for the implementation of the project and monitoring compliance with EMP are MTC and APORTIL.

Since APORTIL belongs to MTC, no possible institutional constraints are considered.



Note: Dashed lines indicate construction in progress only.

Source: JICA Survey team

Figure 6 Implementation Structure

7. Summary of impact

Based on a series of studies, such as baseline, scoping, field survey (see Simplified Environmental Impact Statement: SEIS), impact assessment was conducted.

The results of the impact assessment are summarized in Table 1. As the results, anticipated environmental factors, which are indicated as 'B-' in the table) are air pollution, water pollution, waste, noise, sediment, ecosystem, livelihood and working environment.

Table 1 Impact Assessment Results

Item	Impact assessment during scoping period		Impact assessment based on survey results		Evaluation
	Before construction/Under construction	During operation	Before construction/Under construction	During operation	
Air pollution	✓	✓	B-	D	Under construction: Impact from port construction machinery is possible. During operation: Impact is not expected.
Water pollution	✓	✓	B-	B-	Under construction: Water pollution from port construction and oil contamination from construction machinery are possible concerns. During operation: Oil contamination and wastewater pollution from operating vessels are possible concerns.
Waste	✓	-	B-	D	Under construction: Impacts such as construction waste and hazardous material emissions may occur. During operation: Impacts are not expected as the facility will be managed by port authorities.
Soil contamination	-	-	D	D	Since no soil is discharged outside the system, soil contamination is not anticipated.
Noise and vibration	✓	✓	B-	B-	Under construction: Noise may be generated from port construction machinery. During operation: Impacts may occur due to an increase in port users. For vibration, no impact is anticipated since the geology is of coral origin and vibration is not expected to propagate far.
Ground subsidence	-	-	D	D	There is no significant groundwater pumping, and no impact is expected.
Odor	-	-	D	D	Waste is generated, but no impact is expected since it is typically managed appropriately.
Sediment pollution	✓	✓	B-	B-	Under construction: Sediment contamination from harbor construction machinery is possible.

Item	Impact assessment during scoping period		Impact assessment based on survey results		Evaluation
	Before construction/Under construction	During operation	Before construction/Under construction	During operation	
					During operation: Impact from navigating vessels is possible.
Protected areas	-	-	D	D	There are no protected areas in the vicinity.
Ecosystems	✓	-	B-	D	Under construction: Construction may impact coral. During operation: No impact is expected.
Hydraulics and Hydrology	-	-	D	D	No impact on hydrology or hydromechanics is anticipated.
Topography and geology	-	-	D	D	No impact on topography and geology is anticipated.
Land acquisition, Resident relocation	-	-	D	D	This involves modifications to existing port facilities, with no land acquisition or resident relocation required.
Livelihood	✓	-	B-	D	Under construction: Fishing vessel navigation may be interfered. Employment promotion is necessary to improve the livelihoods of local residents. During operation: No negative impact on daily life or livelihood is anticipated.
Socially vulnerable individuals	-	-	D	D	Activities that could adversely affect socially vulnerable individuals are not anticipated.
Cultural heritage	-	-	D	D	There are no cultural heritage sites (tangible or intangible) within the project site or its surrounding areas. While there is a community hall used by residents, it will not be affected.
Landscape	-	-	D	D	No impact on the landscape is anticipated due to the renovation of existing facilities.
Minority people, indigenous people	-	-	D	D	Activities that adversely affect ethnic minorities and indigenous people are not anticipated.
Working environment	✓	-	B-	D	Under construction: Construction labor conditions must be ensured in accordance with relevant laws and regulations. During operation: No impact, as the facility is managed.

Item	Impact assessment during scoping period		Impact assessment based on survey results		Evaluation
	Before construction/Under construction	During operation	Before construction/Under construction	During operation	
Health, Safety and Security of Local Communities	✓	-	B-	D	Under construction: The influx of construction workers may lead to the spread of infectious diseases. The use of main roads by construction vehicles may increase the risk of traffic accidents. During operation: Since it is managed by the facility, no impact is considered.

Note:

A+/-: Significant positive/negative impact is expected.

B+/-: Positive/negative impact is expected to some extent.

C: Extent of impact is unknown. (A further examination is needed, and the impact could be clarified as the study progresses)

D: No impact is expected.

N/A : Impact assessment is not conducted because the item was categorized as no effect in scoping phase.

Source: JICA Survey team

8. Description of proposed mitigation measures

Table 2 summarizes mitigation measures for all items rated B- in the above impact assessment. The table includes the implementation agency and responsible agency for supervision. Since these mitigation measures do not require special equipment or techniques, the associated costs shall be included in the construction costs and in the operating costs after commissioning.

Table 2 Mitigation Measures and Their Costs

[Before construction/Under construction]					
Item	Expected impact	Mitigation measures	Implementing agency	Responsible agency	Cost
Air pollution	Exhaust gases from port construction machinery and transport vehicles	Enclose the perimeter of the construction site with fencing or similar barriers.	Contractor	MTC/APORT IL	Include in the construction costs.
		Choose a car with low emissions.	Contractor	MTC/APORT IL	
		Implementation of regular air quality monitoring	Contractor	MTC/APORT IL	
	Dust from transport vehicles	Watering the field	Contractor	MTC/APORT IL	

[Before construction/Under construction]					
Item	Expected impact	Mitigation measures	Implementing agency	Responsible agency	Cost
Water pollution	Water turbidity caused by port construction	If turbidity is detected, suspend construction, identify the cause, and implement countermeasures. Proper operation and maintenance of sedimentation basins.	Contractor	MTC/APORT IL	
	Discharge of port construction machinery and facilities	Proper operation and maintenance of wastewater treatment facilities	Contractor	MTC/APORT IL	
		Properly check for any oil, fuel, waste, hazardous substances, etc., that may have leaked or been discharged into surrounding waters and clean up immediately.	Contractor	MTC/APORT IL	
Waste	Generation and increase of illegally dumped waste	Compliance with waste management procedures and the regulations of the relevant country	Contractor	MTC/APORT IL	
Noise and vibration	Noise and vibration from port construction machinery	Select equipment with low noise and vibration levels.	Contractor	MTC/APORT IL	
		Store facilities away from susceptible receptors.	Contractor	MTC/APORT IL	
	Noise from transport vehicles	Select vehicles with low noise levels.	Contractor	MTC/APORT IL	
Sediment pollution	Soil contamination caused by port construction machinery	Use appropriate construction machinery to reduce pollution	Contractor	MTC/APORT IL	
Ecosystems	Impact on the valuable ecosystems around the port	Refrain from driving stakes or anchoring near identified important coral species.	Contractor	MTC/APORT IL	
		If any changes are observed in the coral or its habitat, construction shall be suspended and countermeasures implemented.	Contractor	MTC/APORT IL	

[Before construction/Under construction]					
Item	Expected impact	Mitigation measures	Implementin g agency	Responsible agency	Cost
Livelihood	Interfere with fishing vessels navigation Enhancement of local employment	Take measures such as establishing navigation routes to ensure fishing vessels can navigate safely. Consideration of enhancement of employment for local residents is necessary,	Contractor	MTC/APORT IL	
Working environment	Deterioration of workers’ labor environment	Distribution of appropriate protective gear and heat countermeasures, regular safety briefings Prohibition and monitoring of child labor and forced labor	Contractor	MTC/APORT IL	
Health, Safety and Security of Local Communities	Infectious disease Traffic accident	Regular hygiene guidance Dispatch of traffic control personnel	Contractor	MTC/APORT IL	
[During operation]					
Item	Expected impact	Mitigation measures	Implementin g agency	Responsible agency	Cost
Water pollution	Water pollution caused by vessel navigation and port terminal operations	Implementation of regular vessel inspections	Operator	APORTIL	Include in the operation costs.
		Proper management of wastewater treatment systems	Operator	APORTIL	
Sediment pollution	Sediment contamination by operating vessels	Regular vessel inspection	Operator	APORTIL	
Noise and vibration	Noise from vehicles using the facility	Speed limit management	Operator	APORTIL	

Source: JICA Survey team

9. Governing parameters

9-1. Standard values to be used

Among the anticipated factors, air quality (PM2.5 and PM10) and noise shall be monitored during construction.

The standard values to be used are shown in Table 3.

Table 3 Standard values to be used for monitoring

Environmental factor	Parameter	Methodology	Value	Evaluation period	Source
Air quality	PM2.5	Digital dust meter	50 $\mu\text{g}/\text{m}^3$	Daily average	WTO AQG (2005/2000)
			20 $\mu\text{g}/\text{m}^3$	Annual average	
	PM10		50 $\mu\text{g}/\text{m}^3$	Daily average	
			20 $\mu\text{g}/\text{m}^3$	Annual average	
Noise	Noise level (Residential, educational, and public facilities)	Noise meter	55 dBA	Day time	IFC EHS Guideline
			45 dBA	Night time	
	Noise level (Industrial and commercial areas)		70 dBA	Day time	
			50 dBA	Night time	

10. Monitoring program

Monitoring will be conducted to verify the impact of the project and the effectiveness of mitigation measures for the items where mitigation measures were implemented as described above.

Table 4 summarizes the monitoring items, methods, frequency, and other details. As stated in the mitigation measures, the costs associated with monitoring will be basically included in the construction costs.

Table 4 Monitoring Program

[Before construction/Under construction]							
Item	Mitigation measures	Monitoring item	Standard	Place	Implementing agency	Period/Frequency	Cost per year (Blank means the monitoring cost is included in the construction cost)
Air pollution	Select vehicles and machinery with low exhaust emissions.	Visual confirmation of whether it is being properly managed	None	Project site	Contractor	Everyday	
	Regular implementation of air quality monitoring	Instrumental measurement of PM2.5 and PM10 Visual confirmation of odors and other issues	WHO Global Air Quality Guidelines	Project site near your residence	Contractor	Once a week	Equipment purchase cost: 200,000 yen
	Watering the field	Presence of dust	None	Project (Construction) site	Contractor	Everyday	
Water pollution	Visual confirmation of turbidity occurrence	Turbidity (silt protector shall be deployed in case turbidity occurs)	None	Construction area and surrounding waters	Contractor	Regular: Once a week During operations likely to cause turbidity: Everyday	
	Rainwater runoff countermeasures	Visual inspection	None	Project site	Contractor	During rainfall	
	Proper operation and maintenance of wastewater	Regular sludge removal	None	Treatment facility	Contractor	Once a month	

[Before construction/Under construction]							
Item	Mitigation measures	Monitoring item	Standard	Place	Implementing agency	Period/Frequency	Cost per year (Blank means the monitoring cost is included in the construction cost)
	treatment facilities						
	Proper management of oil, fuel, and waste spills	Whether it is appropriate	None	Project site	Contractor	Everyday	
Waste	Compliance with waste management procedures	Amount of waste disposed	None	Project site	Contractor	Once a week	
Noise	Noise level verification	L _{Aeq}	IFC standard	Project site near your residence	Contractor	Once a week	Equipment purchase cost: 300,000 yen
	Store facilities away from susceptible receptors.	Distance	None	Project site	Contractor	Once a week	
	Select vehicles with low noise levels	Whether it is selected	None	Project site	Contractor	Once a week	
Sediment pollution	Use appropriate construction machinery to reduce pollution	Whether it is used	None	Project site	Contractor	Once a week	
Ecosystems	Refrain from pile driving and anchoring near valuable ecosystems to protect ecosystems.	Underwater visual inspection	None	Coral at the project site	Contractor	Twice a year	Subcontracting fees (including charter fees): 250,000 yen per instance

[Before construction/Under construction]							
Item	Mitigation measures	Monitoring item	Standard	Place	Implementing agency	Period/Frequency	Cost per year (Blank means the monitoring cost is included in the construction cost)
	If changes are observed in the coral or its habitat, suspend construction and consider countermeasures.						
Livelihood	Do not obstruct the navigation of fishing vessels by establishing routes or other means. Enhancement of local employment.	Route utilization Employment rate	None	Project site	Contractor	Everyday	
Working environment	-Distribution of appropriate protective gear and heat countermeasures -Regular safety briefings (including EHS measures and HIV/AIDS programs) -Prohibition and monitoring of child labor and forced labor	-Confirm appropriate work attire -Safety Guidance (including EHS measures and HIV/AIDS prevention programs) -Monitoring for illegal labor	None	Project site	Contractor	Everyday	

[Before construction/Under construction]							
Item	Mitigation measures	Monitoring item	Standard	Place	Implementing agency	Period/Frequency	Cost per year (Blank means the monitoring cost is included in the construction cost)
Community Health, Safety, and Security	Regular hygiene guidance (included above) Deployment of traffic controllers	(included above) Appropriate deployment	None	Around project site	Contractor	Everyday	

[During operation]							
Item	Mitigation measures	Monitoring item	Standard	Place	Implementing agency	Period/Frequency	Cost
Water pollution	Conducting regular vessel inspection (visual inspection)	Whether it is conducted	None	Within the facility grounds	APORTIL	Every time the ship calls at port	
	Proper management of the wastewater treatment system (visual inspection)	Whether it is proper	None	Within the facility grounds	APORTIL	Once a week	
Noise	Speed limit management	Whether it is followed	None	Within the facility grounds	APORTIL	Once a week	
Sediment pollution	Appropriate maintenance of vessels	Oil spill	None	Within the facility area	APORTIL	Every time vessel comes	

Source: JICA Survey team

11. Reporting requirements

Monitoring results must be reported not only to the relevant government agency but also to the project founder, JICA. In the event of any accident or any non-compliance with any emission limit or environmental quality

The reporting frequencies and types of reports and submission agency are summarized in Table 5.

Monitoring results must be reported (Duration: during construction to 3 years after completion, Frequency: quarterly) not only to JICA but also to the relevant government agency (ANLA) by the implementing organization.

Table 5 Summary of reporting

Type of reporting	Frequency	Mode of reporting	Submission agency
Regular monitoring (internal monitoring, inspection)	Every time monitoring conducted	Written document	Supervision consultant ➔ Project proponent
Incident, accident, emergency	Immediate reporting	Telephone, e-mail	Supervision consultant ➔ Project proponent
	Measuring performance, indicators, interpreting and acting on the incident	Written document	Supervision consultant ➔ Project proponent
Training program	Every time	Written document	Supervision consultant ➔ Project proponent
Monthly report	Every month	Written document	Supervision consultant ➔ Project proponent
Quarterly report	Quarterly	Written document	Project proponent ➔ JICA, ANLA

12. Responsibilities for mitigation and monitoring

The monitoring implementation structure is shown in Figure 6 in the previous section. The core organizations for the implementation of the project and monitoring compliance with EMP are MTC and APORTIL.

Responsibilities for environmental management including mitigation measures are shown in Table 2, and responsibilities for monitoring are shown in Table 4, respectively.

13. Emergency plan

Contractor (see Figure 6) of the project is supposed to prepare Occupational Health and Safety Plan upon commencement of construction.

The plan shall among others include the following:

- Risk assessment and planned safety measures
- Training plan for construction workers
- Organizational structure
- Emergency response plan

14. Decommissioning plan

Not applicable

15. Capacity development

Contractor (see Figure 6) of the project is supposed to train workers for the items of following:

- Waste handling (hazardous, non-hazardous)
- Knowledge of diseases including HIV

16. Public consultation and information disclosure

16-1. Stakeholder analysis

Table 6 summarizes stakeholders related to the project.

Table 6 Stakeholder analysis

No.	Organization/Group Name, etc.	Role	Reason for selection
1	Ministry of Finance	Budget management for national projects	It is important to understand securing project budgets at an early stage.
2	Ministry of State Administration	Management and coordination of the national administrative structure	Nationwide projects require coordination with numerous government agencies.
3	Ministry of Planning & Strategic Investment	National development plan and strategic investment	This project is part of the national development plan and requires strategic investment.
4	Ministry of Public Works	Construction and maintenance of public infrastructure	Ports are part of public infrastructure, and their construction and maintenance require direct involvement.
5	Ministry of Transport & Communications	Policy formulation and management of transportation and communications infrastructure	Ports are a vital part of transportation infrastructure and require communication systems.
6	Ministry of Tourism, Trade & Industry	Promotion and management of tourism, trade, and industry	Port development directly impacts tourism and trade and contributes to the development of local industries.
7	Ministry of Agriculture & Fisheries	Formulation and management of agricultural and fisheries policies	the impact on fisheries due to port development is anticipated.
8	Ministry of Petroleum & Minerals	Formulation and management of petroleum and mineral resources policy	The port under development has the potential to play a significant role in the import and export of petroleum and mineral resources.
9	UPM (Unidade Polísia Marítima)	Securing and maintaining maritime police forces	Port safety and legal compliance are required.
10	Municipality Authority	Local government	Coordination with local governments, port authorities, and local stakeholders is necessary.
11	APORTIL I.P. (Port Administration of Timor-Leste)	Port authority of Timor-Leste	APORTIL I.P. is the project proponent and the implementing body for environmental and social considerations.
12	DNTM (National Direction of Maritime Transportation)	Supervision and management of maritime transportation	Port development is highly likely to impact maritime transportation.
13	DNTT (Direção Nacional de Transportes Terrestres)	Command and management of land transportation	Port development is highly likely to impact land transportation.

No.	Organization/Group Name, etc.	Role	Reason for selection
14	ANLA (Agencia Nacional de Licenciamento Ambiental)	Issuance and management of environmental permits	Port development requires obtaining environmental permits.
15	DNMG (Direção Nacional Meteorologia e Geofísica)	National-level surveys and forecasts concerning weather and other issues	Port development and operation are affected by weather conditions.
16	EDTL,E.P (Electricidade de Timor-Leste Empresa Pública)	Management and maintenance of nationwide power supply	Due to port development, it is necessary to improve the power supply network.
17	TIMOR GAP	Resource development and management as a state-owned oil company	TIMOR GAP is the managing and operation entity for the Tasi-Mane Project, and coordination is required.
18	CI (Conservation International)	International Environmental NGO	Coordination is required in connection with the establishment of protected areas in Timor-Leste.
19	USAID (United States Agency for International Development)	International development and humanitarian assistance	Coordination is required in connection with the establishment of protected areas in Timor-Leste.
20	ADB (Asian Development Bank)	Promoting economic growth and cooperation in the Asia-Pacific region	Coordination is required in connection with the development of Timor-Leste.
21	WB (World Bank)	Poverty reduction and promotion of sustainable development	Coordination is required because this is related to the development of Timor-Leste.
22	IFC (International Finance Corporation)	Promotion of development by the private sector	Coordination is required because this is related to the development of Timor-Leste.
23	MPS (Major Projects Secretariat)	Management and coordination of major projects	Given the scale of this project, cooperation and coordination with MPS is necessary.
24	ANPM (Autoridade Nacional do Petróleo e Minerais)	State management of petroleum and mineral resources	The port to be developed could play a significant role in the import and export of petroleum and mineral resources.
25	SUCCESS (ferry)	Ferry service management	Port development may affect ferry operations.
26	Crossland Shipping Service, Lda	Provision of transportation services	Port development may impact shipping services.
27	Pacific Agency Unipessoal Lda Office	Provision of port-related services	Port development may impact port-related services.
28	Biqueli Ocean Agency	Marine services	Port development may impact on marine services.
29	Bethoven Line Agencias	Provision of maritime transportation services	Port development may impact shipping services.
30	Meratus Line	Provision of maritime transportation services	Port development may impact shipping services.
31	Trans Aslamea Shipping Lda	Provision of maritime transportation services	Port development may impact shipping services.
32	Versado Shipping, Lda.	Provision of maritime transportation services	Port development may impact shipping services.
33	Ariana Oceano Agency Lda	Marine services	Port development may impact on marine services.
34	Crossland Shipping Services, Lda	Provision of maritime transportation services	Port development may impact shipping services.

No.	Organization/Group Name, etc.	Role	Reason for selection
35	Pertamina International Timor, SA	Supply and sale of petroleum products	The port to be developed could play a significant role in the import and export of petroleum and mineral resources.
36	Timor Port	Port operation and management	Knowledge of existing port operations and coordination regarding the operation of newly developed ports are necessary.
37	Bollore Logistics	Provision of maritime transportation and logistics services	Port development may impact maritime transportation and logistics services.
38	Local government to which the target port belongs	Management of public services and regulations in development areas	-The development requires cooperation and approval from the local government. -The local government will be involved in the post-development port operations and regulations.
39	Local community to which the target port belongs	Statement of opinion as a local community	Port development impacts local communities, and their opinions and cooperation are crucial to the success of project.
40	Local residents around target port site	Opinion as local residents	Port development impacts local communities, and their opinions and cooperation are crucial to the success of project.
41	Local fisherman around target port site	Representative of local fishermen	Port development affects local fishermen, and their opinions and cooperation are crucial to the success of project.
42	Local fishery cooperative around target port site	Representative of the local fishery community	Port development impacts local fishing cooperatives, and their opinion and cooperation are crucial to the success of project.
43	Local marine products processor around target port site	Representative of local seafood processors	Port development affects local seafood processors, so their opinion and cooperation are crucial to the success of project.
44	Local tourist agent around target port site	Statement on behalf of the local tourism industry	Port development affects local tourism businesses, so their opinions and cooperation are crucial to the success of project.
45	Local construction company around target port site	Statement on behalf of local construction companies	Port development impacts local construction companies, and their opinions and cooperation are crucial to the success of project.
46	Local shipping company around target port site	Representative of the local shipping industry	Port development impacts local shipping companies, and their opinions and cooperation are crucial to the success of project.

16-2. Names of stakeholders previously consulted

Out of stakeholder listed in Table 6, most likely affected persons such as local community were mainly consulted.

The lists of participants are attached as Appendix 1.

16-3. Date of consultation

Table 7 Summary of consultations

Number	Date	Objective	Venue
1	October 28, 2024	To share project overview and survey details.	Carabela
2	January 6, 2026	To share survey results and mitigation measures.	Vemmase

16-4. Means of consultation

All consultation were held face-to-face.

16-5. Over view of key comments

16-5-1 First consultation

Ahead of the field survey, the first stakeholder meeting was held on October 28, 2024, in the Vemmase Town Hall conference room to share the project overview and survey details. Relevant parties were notified one week before the meeting through the Vemmase Town Hall.

Participants included local government representatives, local residents, customary chief, local elders, youth leaders, farmers, fishermen, women representatives, and others, totaling 84 individuals (75 men, 9 women).

Initially, the project overview and the implementation of the field surveys (geological, topographical, environmental surveys, etc.) for detailed planning were explained, and agreement was obtained.

Participants suggested performing traditional ceremonies to pray for safety before commencing work, including offshore operations. They also requested that local laborers, including women, be considered when manpower is needed and that appropriate mitigation measures be implemented if adverse impacts on the marine environment are anticipated during actual construction.

Indeed, local residents' boats were chartered for use as work vessels, and local residents were employed as workers during the field surveys.



Source: JICA Survey team

Figure 12 Stakeholder Meeting

16-5-2 Second Consultation

The second stakeholder consultation was held on January 6, 2026 to present environmental survey results to the relevant stakeholders at Vemassee district hall in Baucau municipality. The meeting was convened approximately one week prior, with written notice sent to each organization via Vemassee Administration.

A total of 63 participants (58 men, 5 women) attended the meeting, representing communities, government agencies, and partners.

Description by group:

- Community representatives:
Chiefs of villages from 7 Sucos and their structures (Caicua, Loilubo, Ossouala, Ostico, Uaegae, Uato-Lari, Vemassee), Carabela community representatives, Church representative, youth representatives, and youth leaders.
- Government representatives:
APORTIL, ANLA, Administrator, PNTL, Ministry of Transportation and Communications, MAPP/Department of Fisheries.
- Others
NGOs / partners

Key points raised during the meeting included:

- There was no significant opposition from participants regarding the implementation of the project.
- Early and ongoing information disclosure, including advance notice of construction activities
- Local employment and procurement opportunities, with prioritization of Carabela residents for non-specialized jobs during project development

- Land and asset management clarity to avoid future compensation disputes, including engagement of relevant land authorities to explain applicable laws and existing land status.
- Environmental protection of coastal and marine ecosystems (especially coral), and requests for baseline information on fish and aquatic species relevant to fisheries.
- Livelihood considerations, particularly for fishing households and women vendors operating near the port, including avoidance and minimization of impacts and fair compensation where impacts are unavoidable.
- Technical risks (flooding/erosion) that should be considered in rehabilitation design and during construction management.
- Women vendors highlighted the potential risk of disruption to trading activities if construction encroaches on current vending areas. They requested (i) advance notice to enable relocation and continuity of income, and (ii) fair compensation if their businesses are affected. Regarding concerns about sales pressure from a woman, MTC explained to residents that the planned project site is outside the community and that no impact from the project is anticipated.

17. Complaints and grievance mechanisms

In Timor-Leste, the Constitution and the Expropriations Act admit citizens the right to compensation when their property is used for public purposes. However, actual land ownership is complicated by issues such as unregistered land and customary ownership. Consequently, there are no provisions for establishing a so-called grievance mechanism to resolve disputes arising from these issues.

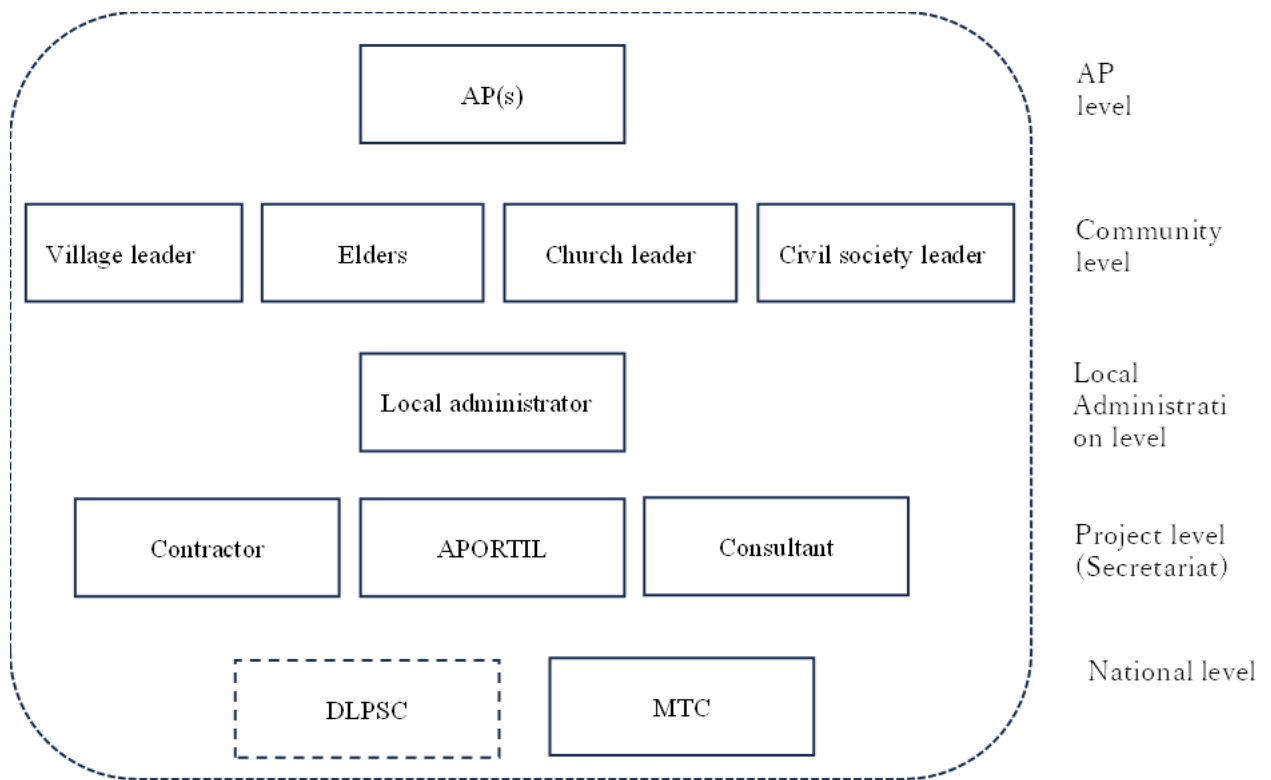
In this section, establishment of a grievance redress mechanism is proposed based on the practice of East Timor.

A grievance mechanism must effectively address the concerns of affected parties regarding their grievances, including understanding, response, and where appropriate, compensation amounts, rehabilitation, and payment delays. Therefore, the mechanism must be simple, accessible, highly transparent, and an effective system.

Figure 7 shows the organizational structure of the grievance redress mechanism.

Affected Persons (APs) may submit grievances to the Grievance Redress Committee (GRC) through village communities, village community elders, other elders, church leaders, or other recognized civil society leaders. The GRC will discuss the validity of the grievance and its resolution, and coordinate with the AP. This project is implemented on land already acquired, so no land issues are anticipated. However, should any arise, support from the Land Acquisition Commission (DLPCS), established by the Ministry of Justice under the provisions of the Land Acquisition Act, will be required.

The composition of the committee shall be adjusted by the secretariat based on the nature of the complaint.



Note: The committee shall be composed of representatives from each organization.

Figure 7 Structure of Grievance Redress Committee

Figure 8 shows the flow of grievance handling.

Complaints from AP are submitted to the Secretariat after mediation by community leaders. If unresolved at that point, the Secretariat will convene a committee and conduct mediation based on the nature of the complaint.

If the issue cannot be resolved at the project level, it will be brought to the local government level. If it remains unresolved there, it will be proceeded to the national level and ultimately be brought to the courts.

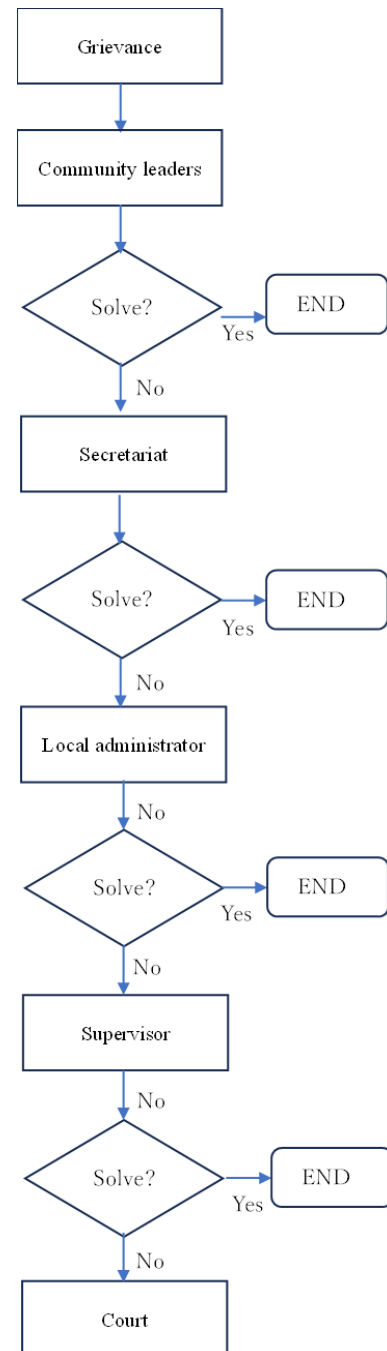


Figure 8 Grievance Handling Flow

18. Work plan and implementation schedule

Table 8 shows the project implementation schedule indication the timing of activities ad operations, together with the related environmental works and inspection and monitoring schedule.

Table 8 Project implementation schedule and environmental work plan

Month		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Civil engineering	Material provision																															
	Preparation																															
	Jetty																															
	Platform																															
	Conneting bridge																															
	Land forming																															
	Embankment																															
	Rubble-mound break water																															
	Gravity retaining wall																															
	Sheet pile wall																															
	Drainage																															
	Pavement																															
	Demolition																															
Monitoring	Baseline srvey																															
	General monitoring																															
	Coral montoring																															
	Reporting																															

Note: Monitoring for some items will be continued for 2 years during operation as shown in Table 4.

19. Cost estimation

The estimated cost is shown in both Table 2 and Table 4, respectively.

Basically, necessary cost for mitigation measures and monitoring is included in the const for construction, except cost for purchasing necessary monitoring equipment.

20. Review of the EMP

Environmental Management Plan shall be reviewed and modified regularly based on the evaluation of the effectiveness of the EMP.

Figure 9 shows the cycle management for evaluation/revision of the EMP.

As for the mechanism for evaluation ad revision, the organizations (MTC-APROTUL-Supervision Consultant-Contractor) shown in Figure 6 will be the core team and other organizations will occasionally be involved for evaluation and revision.

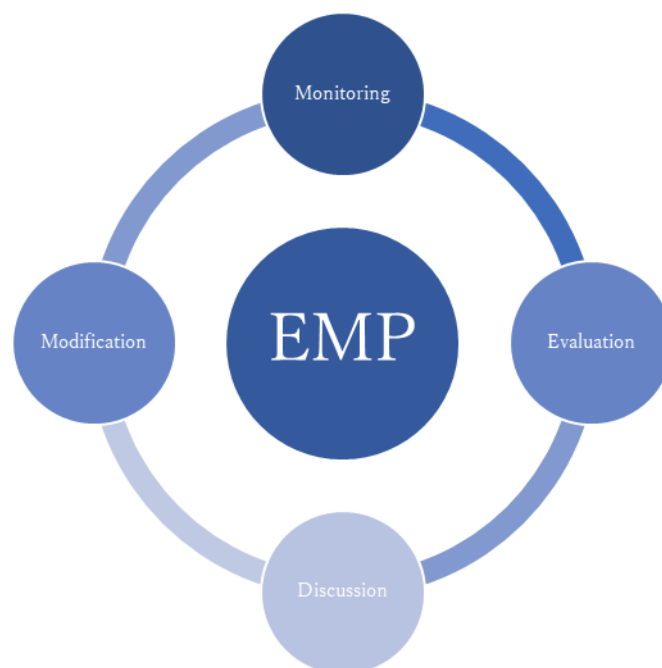


Figure 9 EMP review

21. Non-technical summary

Environmental survey around existing Carabela Port to renovate the facility for enhancing maritime logistics leading to economic growth.

Available information was collected and organized and scoping study was conducted to understand insufficient information to be collected. Based on the study, environmental field survey was conducted.

Using those data, impact assessment study was carried out. And Environmental Management Plan to

minimize the impact caused by the project was prepared and Monitoring Plan to understand the effectiveness of the environmental management was also prepared.

Followings are summary of this document.

21-1. Description of the project

21-2. Details of Proponent

Name: Ministry of Transport and Communication

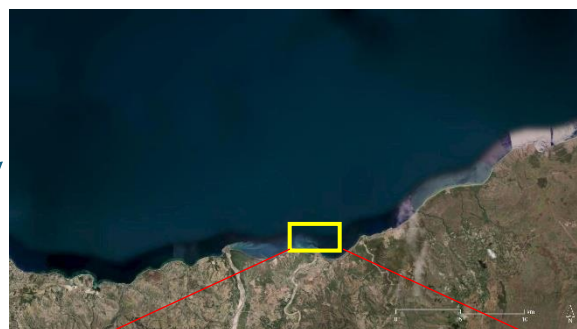
Address:

Contact Person:

Phone number:

E-mail Address:

21-3. Project Location



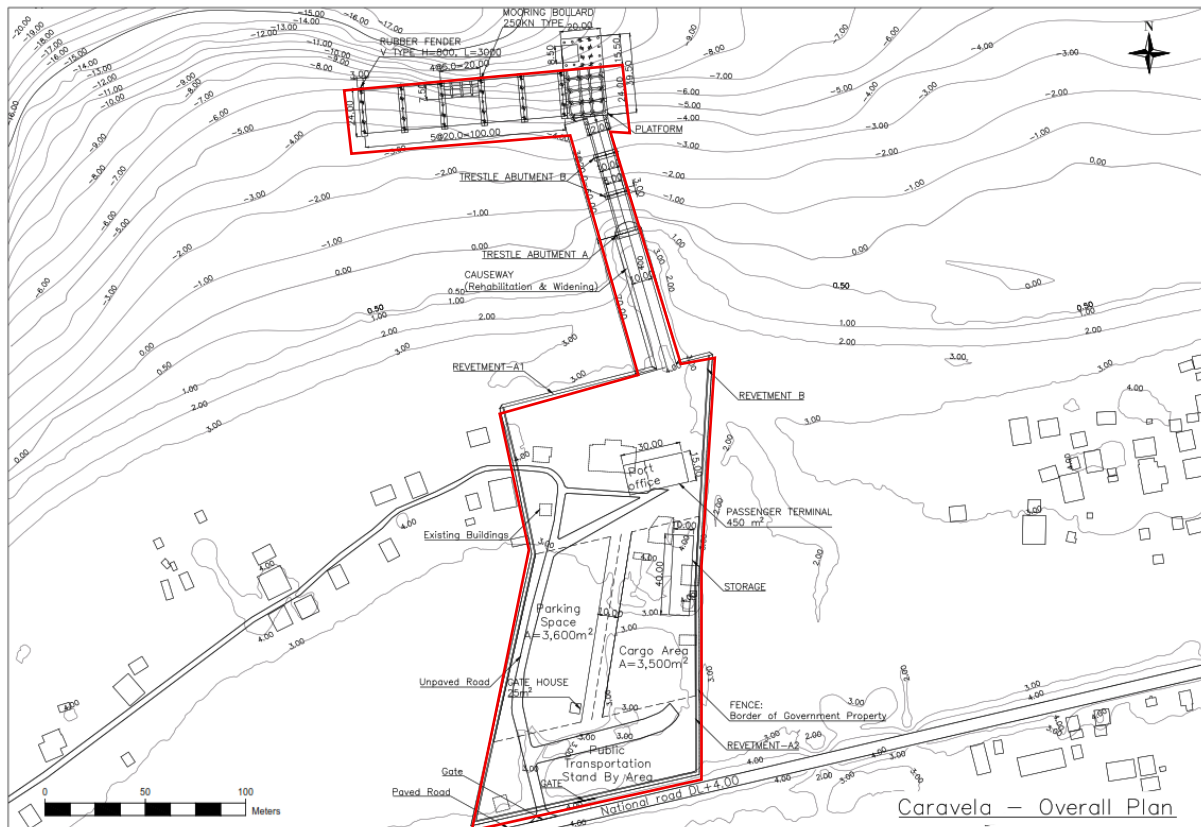
Source :

(Left) MOFA of Japan、(Right) Earthstar

Project Site Location

21-4. Horizontal layout

Horizontal layout of the port after rehabilitation (planned) is shown below in red line.



Source : JICA Survey team

21-5. Summary of environmental impact

There is important ecosystem, such as coral seagrass bed exists around the project area.

As for seagrass, it distributes close to the coast, which is not touched by the project.

Important coral species were found in the survey. However, considering the primary geographic ranges, there are species distributed almost worldwide and not unique to this area. Furthermore, they are not found in colonies but are scattered, attached to boulders. Therefore, the impact from the construction work is considered to be minor.

Although coral is scattered, with the understanding that detailed knowledge of its distribution and location can further mitigate construction impacts, an additional survey was conducted to identify coral distribution.

Results revealed: 1) Many species listed as Vulnerable (VU) or higher on the IUCN Red List were observed, though distant from existing structures; 2) Their distribution consisted of solitary corals attached to boulders, not forming colonies; 3) Few boulders suitable as coral attachment substrates were present around existing structures scheduled for removal, likely due to the impact of the original construction, resulting in limited coral distribution.

Therefore, it is possible to minimize the impact on coral by carefully considering these distributions during construction. The presence or absence of impact can be confirmed through monitoring, thereby ensuring sustainability.

Also based on the results of the environmental field survey, the environmental impact was deemed minor.

It is considered that the project will not cause significant adverse environmental impacts and does not involve characteristics prone to causing impacts or vulnerable areas.

Furthermore, no derivative or secondary impacts, cumulative impacts, or inseparable integrated projects are planned.

However, Environmental Management Plan and Monitoring Plan have been prepared and continuous environmental management will be carried out continuously during the project. Also, continuous monitoring will be conducted to know if the environmental management properly works.

When negative environmental impact is realized, mitigation measures will be taken.

Therefore, this project can be considered sustainable.

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