

Implementation Assistance for the Port Vila
Lapetasi International Multi-Purpose Wharf
Development Project
in the Republic of Vanuatu

Project Completion Report

June 2018

Japan International Cooperation Agency (JICA)

The Overseas Coastal Area Development Institute of Japan

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Abbreviations

ADB	Asian Development Bank
AusAID	Australian Agency for International Development
AusDFAT	Australian Department of Foreign Affairs and Trade
CCA	Community Conservation Area
CT	Container Terminal
CY	Container Yard
D/D	Detailed Design
DEPC	Department of Environmental Prevention and Conservation
DOF	Department of Environment, Protection and Conservation
DWR	Department of Water Resources
EIA	Environmental Impact Assessment
F/S	Feasibility Study
FIRR	Financial Rate of Return
GDP	Gross Domestic Product
IMM	Ifira Marine Management
IPDS	Ifira Port Development & Services Co. Ltd.
IWS	Ifira Wharf Stevedoring
JICA	Japan International Cooperation Agency
LA	Loan Agreement
LC	letter of credit
MIPU	Ministry of Infrastructure & Public Utilities
MOU	Minutes of Understanding
NISCOL	The Northern Islands Stevedoring Company Limited
NZ	New Zealand
OMR	Office of Maritime Regulator
pH	potential of hydrogen
PMD	Department of Port and Marin
PMD	Ports & Marine Department
PPP	Public-Private Partnership
PQ	Pre-Qualification
PSO	Port Security Officer
PVLIMPWDP	Port Vila Lapetasi International Multipurpose Wharf Development Project
PVMC	Port Vila Municipality Committee
PVUDP	Port Vila Urban Development Project
PWD	Public Works Department
SOLAS	Safety Of Life At Sea
SPEC	Specification
SS(mg/L)	Suspended Silt
SSS	South Sea Shipping Company
TEU	Twenty Feet Unit
TMSpro	The Operation Software and System named as TMSpro
TOS	Terminal Operation System
VAIP	Vanuatu Airport Infrastructure Project
VISSP	Vanuatu Inter-island Sipping Support Project
VPMU	Vanuatu Project Management Unit
VTIP	Vanuatu Tourism Infrastructure Project

1. Background and Purpose of the Work

1.1. Background of the Work

Vanuatu has been achieving high economic growth with tourism and the construction industry as the main driving force. On the other hand, development of economic infrastructure, such as, roads and ports, remains inadequate.

Vanuatu government regards the improvement of Port Vila harbor facilities as vitally important in its Priorities & Action Agenda 2006-2015 and mid-term national development plan (2007-2011). In this regard, the Japanese government assisted with the implementation of “The Project for Improvement of Port Vila Main Wharf (2007-2010)” as an urgent measure for strengthening port security and improving international wharf cargo handling efficiency.

However, Port Vila’s cargo handling volume has been increasing in accordance with economic growth, and the number of vessels including large cruise vessels also has been increasing. Cruise vessels are given top priority as their cruising schedules must be strictly maintained. Therefore, cargo vessels are often forced to interrupt their cargo loading/unloading and stand-by offshore while a cruise vessel is in port. The Vanuatu Government requested AusAID to formulate a general port development plan to expand the international wharf, cargo handling yard and domestic wharf. AusAID completed its feasibility study in July 2010. The Vanuatu Government then applied to the Japanese Government for a Yen-loan for detailed design works and construction works. Both governments agreed to a Japanese Yen loan of forty-nine billion forty-five million for improvement of Vila port in June 2012.

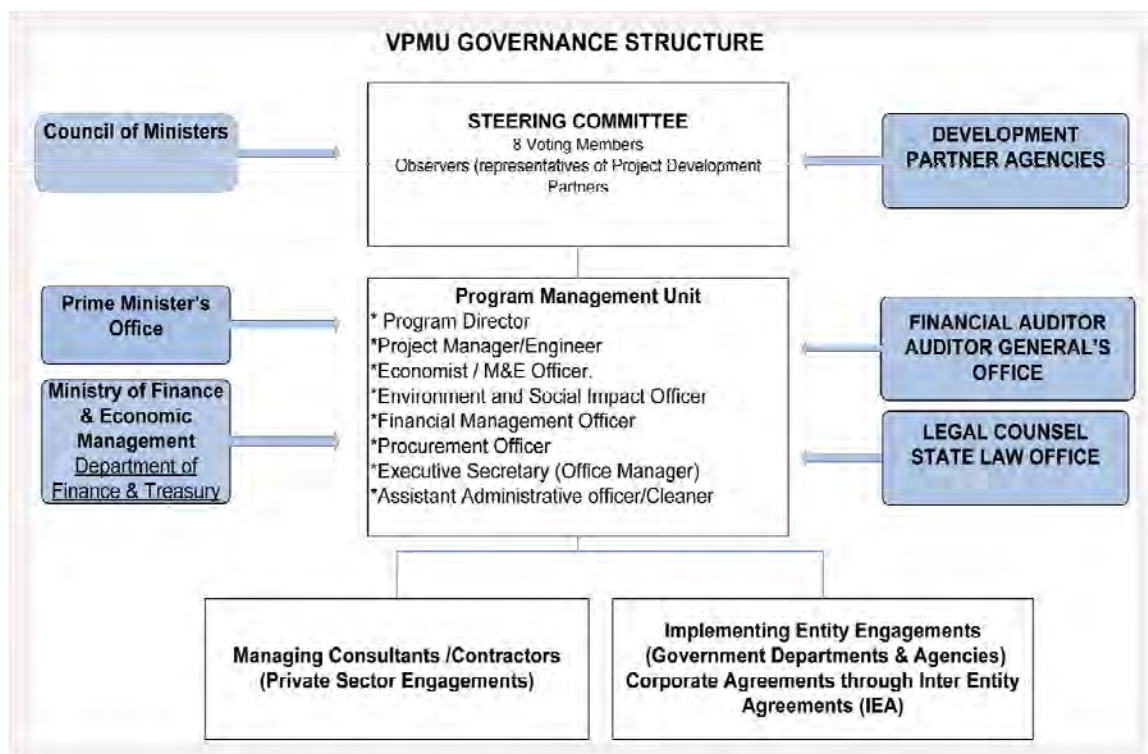
In addition, a project to develop a new domestic wharf to replace the existing superannuated wharf is currently being carried out with the assistance of the Asian Development Bank (ADB) and the New Zealand Government.

1.2. Purpose of the Work

Because Vanuatu government does not have much experience in implementing such large scale port development projects, it is important to assist and advise the Vanuatu government officer in-charge of “Port Vila Lapetasi International Multi-Purpose Wharf Development Project” on such matters as confirmation of tender documents contents, implementation of tender, selection of contractor, construction management and approval of payment etc. for smooth and proper implementation of the project. It is also important to assist in coordination work for project implementation, for example, assisting the Vanuatu government officer in dealing with issues prior to commencement of the project and with problems which will arise during the implementation.

The purpose of the work is to strengthen the management and operational capacity of the Ministry of Infrastructure and Public Utility (MIPU), which is responsible for project implementation, and Vanuatu Project Management Unit (VPMU), which will also play an important role in the project. As VPMU was formed just three years ago and this is their first Yen-loan project, VPMU and MIPU may not be well-versed in the procedures for a Yen-loan project.

Expert team will analyze the present state of the project, and support MIPU and VPMU for the smooth implementation of the new wharf development project. Advice and support will be given on such matters as procurement, financing, social and environmental consideration, existing wharf operation and management, coordination with the new domestic wharf development project being financed by ADB and New Zealand Government and soon.



Source: VPMU web-site

Figure: VPMU Organization

2. Basic Policy of Work Implementation

The expert team will assist VPMU and MIPU for the smooth implementation of the “Lapetasi International Multi-purpose Wharf Development Project” by providing guidance on the various procurement activities and on the intricacies related to the implementation of ODA loan projects.

Key matters will be the coordination with related agencies, and/or with the operating bodies of the existing wharves, environmental and social considerations and financial management.

2.1. Work Category

2.1.1. Coordination Work among the Related Parties

- JICA expert team will review and assess the integrity of the concepts and design of the “Lapetasi International Multi-purpose Wharf Development Project” and “Vanuatu Inter-island Shipping Support Project (VISSP)”.
- The efficiency of passenger traffic and cargo handling of the two new projects will be examined and improvement measures will be proposed whenever necessary.
- JICA expert team will review and check the construction schedules and methods of the two new development projects.
- The conditions of the proposed site for the temporary will be examined including the impact of relocation on port users. JICA expert team will propose adjustments if necessary.
- Actions to be taken by VPMU and MIPU so as not to hinder the movement of cargo and passengers of the existing wharf will be identified.
- JICA expert team will check the integrity of the design concepts of the two new development projects, and advise VPMU and MIPU on how to coordinate among related agencies to ensure the smooth and efficient transport of cargo and passengers.
- JICA expert team will assist the VPMU and/or MIPU in holding the steering committee meeting for the sharing of information concerning the two projects.
- JICA expert team will assist the VPMU and/or MIPU in holding other meetings whenever necessary for the sharing of information concerning the two development projects.

2.1.2. Work for Environmental and Social Considerations

- JICA expert team will review the design concepts of two new wharves from the perspective of environmental and social concerns and identify those aspects which may affect one another.
- JICA expert team will examine the construction schedule and the methods of the two projects and recommend measures which should be included in the detailed design for preserving environment and social equality.
- JICA expert team will propose mitigation measures and provide guidance to the VPMU and MIPU to protect the reef and natural environment.

- JICA expert team will advise to VPMU and/or MIPU on the environmental preservation measures that should be agreed among the related agencies.

2.1.3. Work for the Documentation, Procedures and Fund Management

- JICA expert team will advise on the prequalification document of “Lapetasi International Multi-purpose Wharf Development Project”.
- JICA expert team will advise on the tender documents of the project
- JICA expert team will advise on the contract documents for construction of the project
- JICA expert team will advise on the Considerations for the Management of the Fund and the documents related to the procedures of Implementation of the project

2.2. Outline of the Works and Key Considerations

2.2.1. Technical Advice for Documentation and Implementation Procedure

JICA expert team will offer advice and guidance to the Counterparts in a flexible manner to minimize disorder and expedite the project. The team will conduct the following works and offer advice and/or guidance on the following issues.

- Review and evaluate the Prequalification Documents
- Review and confirm the Tendering Process and schedule
- Review and confirm the Prequalification Result
- Review and evaluate the contents of the Bidding Documents
- Review and verify the consultants’ report on the evaluation of the submitted bids.
- Confirm the contents of the contract, such as the works and volume, time schedule, conditions, etc.
- Confirm the progress of the project, measurement of the products, quality verification, safety control
- Review and confirm the fund management plan
- Review and confirm the progress payment
- Review and confirm the completion of project
- Review and confirm the Preservation Plan of the environment and monitoring plan
- Review and confirm the Monthly Report
- Review and confirm the As Built Drawings
- Review and confirm the documents related to the project

2.2.2. Assistance for Maintaining Port Functions during the Construction Period

Because the two new port facilities will be constructed in close proximity to each other, problems could arise unless the proper measures are taken.

It is not possible to remove the existing facility until the replacement facility is in place. Therefore, it is necessary to examine and develop an alternative facility as quickly as possible.

The following actions should be taken.

- Until the completion of the new inter-island shipping support wharf under ADB assistance, the existing domestic wharf in Star wharf needs to be temporarily relocated.
- An appropriate alternative site for the existing container yard managed by the Ifira Port Development & Services Co. Ltd. in Star wharf should be secured and container handling operations should be maintained so as not to hinder port activities.

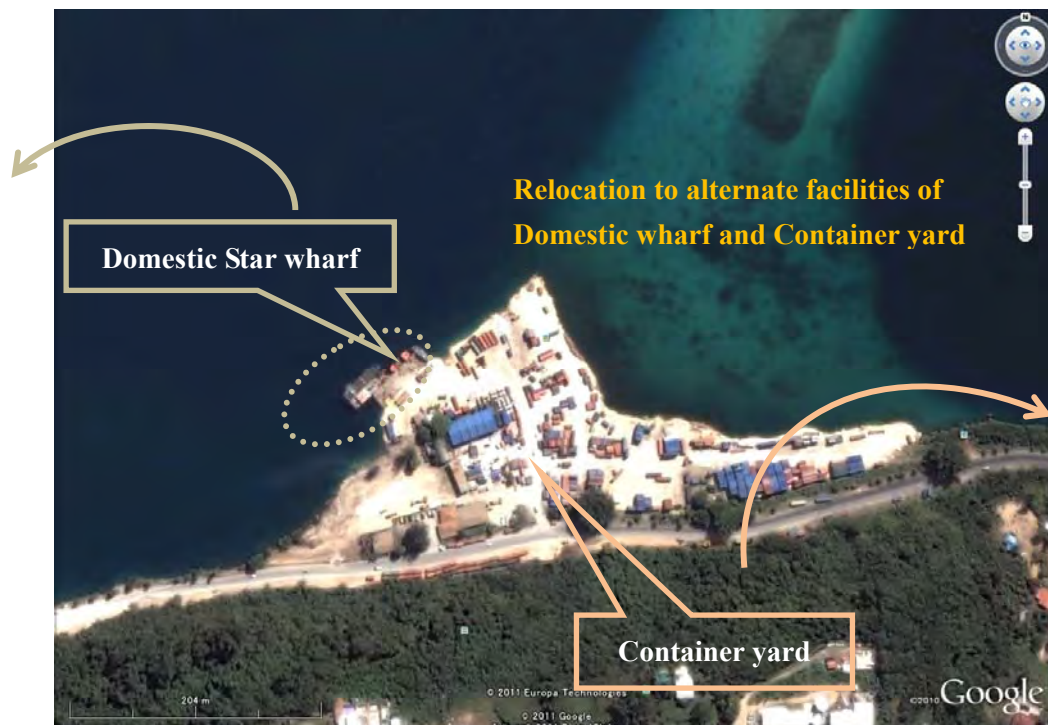


Figure: Relocation of Domestic Wharf and Container Yard

2.2.3. Assistance for Coordination between Two Projects during Construction Work

In order to minimize the impact on the immediate vicinity and region, and also so as not to interfere with the construction projects of each project, it is important to coordinate overall developments by exchanging information, etc.

Therefore the following coordination work is required, and guidance and advice is to be provided to effectively carry out the task.

Two project sites are narrow and close to each other. Therefore, it is important to select an appropriate location for a temporary storage yard outside the construction area.

As equipment and vehicles for construction are concentrated in a small area, it is important to fully understand their movements and pay due attention to safety. Adjustment of the mooring place of work boats, etc. is also required.

2.2.4. Assistance for Coordination with other Donors during the Construction of Facilities

Detailed design of the office administration building to be built in Lapetasi international wharf is included in the Yen-loan package while construction is expected to be carried out by the grant aid of AusDFAT. It is necessary to note the difference in the source of funding and ensure that works are efficiently carried out.

Port security facility package of Lapetasi international multi-purpose wharf (SOLAS Convention support facilities) is not included in the yen-loan assistance. Expert team will assist VPMU in securing a funding source.

2.2.5. Reduction of Environmental Load due to Project Implementation

Vanuatu's most important tourism resource is its beautiful sea and beaches. It is important, therefore, to preserve the environment when the Project is implemented.

(1) Transplantation of Corals

Distribution of coral at the eastside of the development area of the Lapetasi International Multi-purpose Wharf has been confirmed. The corals inside the reclamation area for the wharf development are planned to an area in the bay with a similar depth, where the influence of the construction will be negligible. Since transplantation of the coral must be carried out quickly while controlling water temperature, MIPU/VPMU shall ensure that proper technique are applied in consultation with the coral expert from the Department of Fisheries, Ministry of Agriculture, Quarantine, Forestry and Fisheries (DOF). As the proposed area for the coral transplantation is the east side of the Iriki Island, coordination with the landowner is also necessary. Periodical monitoring of the transplanted corals is necessary in cooperation with the DOF.



Massive Porites sp.



Porites cylindrica

Source: Report on the Preparatory Study for the Project on International Multi Modal Port at Star Wharf in Port Vila (Environmental Study), JICA, 2012

Photo : Corals Necessary for Transplantation

(2) Consideration for the Corals in the Surrounded Area

The corals outside of the reclamation area are planned to be conserved naturally. However, a

proper implementation plan for the construction is necessary to avoid any impact to the corals by activities such as dredging, pile driving and anchoring by the work vessels which produce turbidities and stirrup suspended solids.

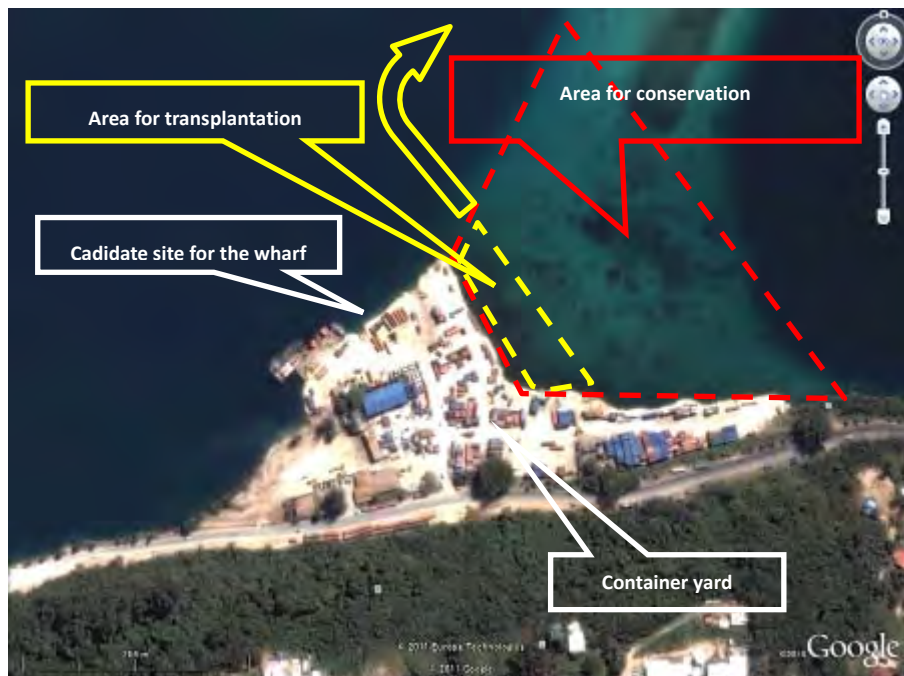


Figure : Image of the Area Necessary for Transplantation and Conservation of the Corals

(3) Reuse of Dredged Material

It is planned that the dredged materials in the Project will be reused for reclamation. In case surplus material is generated, the material shall be used for the reclamation in the inter-island shipping support development project to reduce the environmental load. Therefore, schedule linkage between the two projects is necessary.

If reuse of the dredged material is not possible, environmental consideration for proper transportation and disposal of the material is necessary. In case alternative reclamation material is necessary, a study to minimize environmental load caused by the work shall be conducted.

(4) Environmental and Social Consideration on Development of Temporary Alternative Facility for the Domestic Wharf

During the implementation of the Project, a temporary alternative facility is necessary for use as a domestic wharf. Careful selection of the location from the viewpoint of environmental and social consideration is required, because corals are distributed around the existing wharfs and the project area, and a spring and wooded area which have historical and cultural importance are found.

(5) Other Environmental Considerations and Proper Execution of Environmental Management Monitoring

Although environmental management measures such as disposal of waste materials, measures for noise and dust, management of waste oil, prevention of oil pollution and waste water management are listed in the Environmental Management Monitoring Plan approved by the EIA, those have not materialized yet. Therefore, it is necessary to ensure that those measures are carried out properly based on the Pollution Control Act enforced in 2013. As part of the Environmental Management Monitoring Plans after the operation phase starts, long-term monitoring of coral and water quality shall be conducted by the Department of Geology, Mine and Water Resources, Ministry of Land and Natural Resources (DGMWR) and DOF, and, therefore, a sustainable monitoring method must be considered.

2.2.6. Others

As the access road from downtown to the two projects is not very wide, the concentration of construction vehicles could lead to traffic congestion. Consideration on minimizing the impact on public transportation by construction vehicles is required.

Frequent information exchange with the operator of the Main Wharf regarding construction schedule and position of the construction vessels is required so as not to hinder the entry and departure of other vessels.



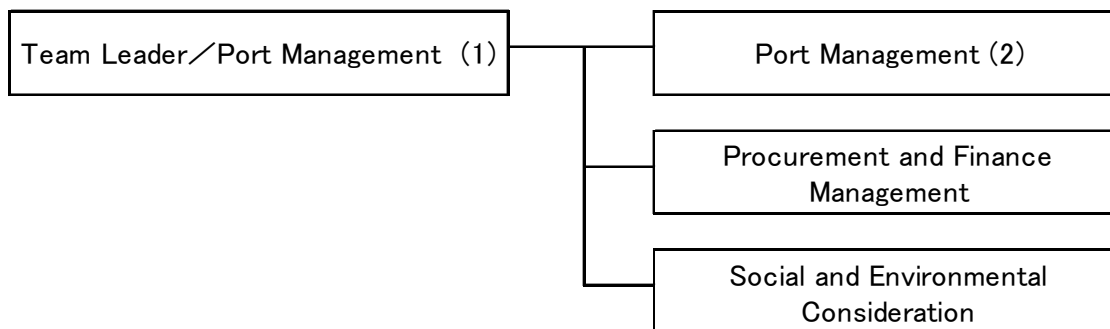
Source: Google Earth

Figure: Star Wharf and Lapetasi Wharf

3. Organization of Expert Team and Member

3.1. Organization of the JICA Expert Team

The organization of the JICA expert team is shown below;



3.2. JICA Expert Team Member

The JICA expert team consists the following four members.

	Role (field of expertise)	Name
1	Team Leader/Port management (1)	Mr. Kazuyuki YAMAGUCHI
2	Port Management (2)	Mr. Susumu KIMURA
3	Procurement and Finance Management	Mr. Osamu KUNITA
4	Social and Environmental Consideration	Mr. Yoichi HARADA
5	Coordinator	Mr. Mitsuhiro FUJIMOTO (Feb.2014 – Apr. 2015) Mr. Yuuichi TANJI (May. 2015 – Apr. 2017) Mr. Kunio SATO (May. 2017 – Jun. 2018)

4. Phase 1 Work Implementation

4.1. Work Program

4.1.1. Preparatory Work in Japan

—Preparation of Draft Work Plan

A draft Work Plan shall be prepared and submitted to JICA. The draft Work Plan includes 1) Purpose of the project, 2) Basic Policy of Work Implementation, 3) Schedule of Work, etc.

4.1.2. First Work in Vanuatu

Draft Work Plan is prepared in Japan and presented for discussion with the Counterparts on the occasion of the first work in Vanuatu. Work Plan will be finalized by mutual consent of JICA Expert Team and the Counterparts.

1-1 Review of Integrity between Lapetasi International Multi-purpose Wharf Development Project and Inter-island Shipping Support Wharf Development Project

1-1-1 Survey of existing port facilities and project site conditions

JICA Expert Team will survey current usage and cargo handling activities of the main wharf and star wharf together with the Counterparts. From the view point of effective cargo handling and passenger transport, JICA Expert Team will examine measures to be included in the detailed design.

JICA Expert Team will also survey the usage and existing site condition of Lapetasi international multi-purpose wharf development project site together with the Counterparts. JICA Expert Team will examine the facilities to be shifted prior to project commencement as well as the timing and site of the relocation.

1-1-2 Examination of design concept and contents of new Lapetasi international multi-purpose wharf development project

JICA Expert Team will examine the design concept and contents of Lapetasi international multi-purpose wharf development project together with the Counterparts.

1-1-3 Examination of design concept and contents of new inter-island shipping support wharf development project

JICA Expert Team will examine the design concept and contents of inter-island shipping support wharf development project together with the Counterparts.

The cargo handling equipment which is to be procured with assistance by AusDFAT will be examined.

1-1-4 Check of integrity between two projects design concept

JICA Expert Team will check the integrity of two wharves development project in design concept and contents whether they meet the development requirement to increase capacity of Vila port and solve the issues.

1-2 Recommendations on Measures to be Included in the Detailed Design

From the view point of effective cargo handling and passenger transport, JICA Expert Team will recommend measures to be included in the detailed design.

1-3 Review of Construction Method and Schedule of Two Wharves Project

1-3-1 Review of construction method and schedule of Lapetasi international multi-purpose wharf project

JICA Expert Team will review the construction method and schedule of the “Lapetasi International Multi-purpose Wharf Development Project”. JICA Expert Team will also review the schedule of tender document preparation, and contents of pre-qualification documents.

1-3-2 Review of construction method and schedule of new inter-island shipping support wharf project

JICA Expert Team will review the construction method and schedule of the new inter-island shipping support wharf development project. Expert team will also monitor the status of the cargo handling equipment being procured with support from AusDFAT.

1-4 Examination of Temporary Replacement Facilities for Domestic Wharf and Container Yard

1-4-1 Examination of the required replacement facility

Until the new inter-island shipping support wharf being built is completed, a replacement facility for the current domestic wharf in the Star wharf is required. Replacement facility will be examined based on the monthly and annual container handling volume of the current domestic wharf.

1-5 Assistance for Maintaining Functions of the Existing Wharf and Development of the new International Wharf

1-5-1 Maintaining port operation in the existing wharf

The construction sites of the two projects are narrow and close to each other. The access road to the project sites is also narrow. As construction progresses, an increase in the number of vehicles using the access road is anticipated. Therefore, necessary support will be given to the counterparts to ensure that there is minimum interference with cargo handling and passenger transportation in the existing wharf.

1-6 Coordination with New Inter-island Shipping Support Wharf development Project for Efficient New International Multi-purpose Wharf Development

1-6-1 Coordination for development of the Administration Building

Detailed design of the Administration building is being done under the Japanese Yen-loan package while construction is being funded by AusDFAT. Therefore, the JICA Expert Team will assist the Counterparts in coordinating these separate aspects.

1-6-2 Funding for port security facility development

As funding for port security facility has not yet been secured, JICA Expert Team will support Counterparts in exploring funding sources.

1-6-3 Coordination works for efficient operation of the two new wharves

JICA Expert Team will support the Counterparts in carrying out the necessary coordination works to secure effective cargo and passenger transport between the two new wharves. As the two new wharves are close to one another, the possibility of sharing basic components (such as a parking lot, access road etc.) will be examined.

2-1 Review on the Concept and Efficiency of the Two Wharves Projects (Environmental Consideration)

The Environmental Impact Assessment (EIA) conducted for both projects will be reviewed to confirm whether the results are appropriate in light of the contents of the Environmental Management Monitoring Plan. Environmental aspect related to the temporary domestic wharf facility will also be reviewed.

2-2 Advice on the Environmental Measures Included in the Detailed Design (Environmental Consideration)

Construction methods and schedule specified in the tender document will be reviewed with the counterparts, and measures or alternatives, which shall be included in the detailed design, will be discussed from the viewpoint of environmental and social consideration. Effectiveness of the countermeasures in preventing turbidity will be reviewed and alternatives will be proposed if necessary.

2-3 Assistance with Implementation of Environmental Consideration Measures

To mitigate any impact to the natural environment, the JICA Expert Team will propose environmental consideration measures.

2-3-1 Confirmation of the environmental status at the project site

Environmental status of coral, which is to be transplanted to an area outside the project site, will be confirmed.

2-3-2 Confirmation of the plan for coral transplantation

The coral transplant and monitoring plan will be confirmed and the necessary coordination for sustainable growth will be supported.

2-4 Assistance with Implementation of the Environmental Management Monitoring Plan

The contents of the Environmental Management Monitoring Plan and the implementation structure including the DOF and DGMWR will be discussed and assistance with implementation

will be provided.

3-1 Assistance with Prequalification

JICA Expert Team will contact key persons of related agencies, such as executing agencies of the project, Consultants, and other donors of the port related project.

3-1-1 Review of Prequalification documents

JICA Expert Team will review the prequalification documents and recommend revisions if necessary.

3-2 Assistance with Tender Documents

JICA Expert Team will review the schedule and contents of tender documents, and recommend revision if necessary

3-3 Assistance with Contract Documents

JICA Expert Team will review the schedule and contents of contract documents, and recommend revision if necessary

3-4 Assistance with Fund Management

JICA Expert Team will offer advice on the management of funds and documents related to the procedures for implementing the Lapetasi International Multi-purpose Wharf Development Project. The aims are to avoid cost overruns and delays in the implementation of the new international terminal as well as to ensure that the repayment is realistic.

4-1 Assistance with Holding Steering Committee Meetings

For the effective implementation of the two projects, JICA Expert Team will assist the counterparts holding steering committee meetings where necessary information among the related parties can be shared.

4-2 Assistance with Coordination Work with Related Parties

4-2-1 Effective use of surplus dredged material

Surplus dredged material in the project will be used as reclamation material for inter-island shipping support wharf development project to the extent possible.

4.1.3. Preparation of Progress Report 1

After completion of the first work in Vanuatu, JICA expert Team will prepare Progress Report 1 and submit it to JICA.

4.1.4. Second Work in Vanuatu

1-4 Examination of Temporary Replacement Facilities for Domestic Wharf and Container Yard

1-4-2 Confirmation of replacement facility plan and schedule

It is necessary to make temporary relocation plans of the domestic wharf and container yard etc., and to complete the relocation of facilities before commencement of new wharf construction. The status of the relocation plans will be confirmed with the counterparts. JICA Expert Team will assist the counterparts if modifications to the plans are required.

1-5 Assistance for Maintaining Functions of the Existing Wharf and Development of the new International Wharf

1-5-1 Maintaining port operation in the existing wharf

The construction sites of the two projects are narrow and an increase in the number of vehicles using the access road is anticipated. Assistance will be given to the counterparts to ensure that there is minimum interference with cargo handling and passenger transportation in the existing wharf.

1-6 Coordination with New Inter-island Shipping Support Wharf development Project for Efficient new International Multi-purpose Wharf Development

1-6-1 Coordination for development of the Administration building construction

JICA Expert Team will assist the Counterparts coordination works related to Administration building development.

1-6-2 Funding for port security facility development

JICA Expert Team will assist the Counterparts in securing funding for port security facility development.

1-6-3 Coordination works for efficient operation of the two new wharves

JICA Expert Team will support the Counterparts in carrying out the necessary coordination works to secure effective cargo and passenger transport between the two new wharves. As the two new wharves are close to one another, the possibility of sharing basic components (such as a parking lot, access road etc.) will be examined.

2-3 Assistance with Implementation of Environmental Consideration Measures

To minimize the impact to the natural environment, the JICA Expert Team will assist the Counterparts to prevent turbidity and ensure that the monitoring of transplanted coral is being properly carried out.

2-4 Assistance with Implementation of the Environmental Management Monitoring Plan

JICA Expert Team will assist the Counterparts in preparing measures and alternatives to be included in the detailed design which address environmental and social concerns.

3-2 Assistance with Tender Documents

JICA Expert Team will offer advice on documents related to the tender, and recommend division if necessary.

3-3 Assistance with Contract Documents

JICA Expert Team will review the contents of contract documents, and recommend revision

if necessary

3-4 Assistance with Fund Management

JICA Expert Team will offer advice on the Management of Funds and documents related to the procedures for implementation the new international terminal Development Project

4-1 Assistance with Holding Steering Committee Meetings

For the effective implementation of the two projects, JICA Expert Team will assist the counterparts holding steering committee meetings where necessary information among the related parties can be shared.

4-2 Assistance with Coordination Work with Related Parties

4-2-1 Effective use of surplus dredged material

Surplus dredged material in the project will be used as reclamation material for inter-island shipping support wharf development project to the extent possible.

4.1.5. Preparation of Progress Report 2

After completion of the second work in Vanuatu, JICA Expert Team will prepare Progress Report 2 and submit it to JICA.

4.1.6. Third Work in Vanuatu

1-4 Examination of Temporary Replacement Facilities for Domestic Wharf and Container Yard

1-4-2 Confirmation of replacement facility plan and schedule

It is necessary to make temporary relocation plans of the domestic wharf and container yard etc., and to complete the relocation of facilities before commencement of new wharf construction. The status of the relocation plans will be confirmed with the counterparts. The expert team will assist the counterparts if modifications to the plans are required.

1-5 Assistance for Maintaining Functions of the Existing Wharf and Development of the new International Wharf

1-5-1 Maintaining port operation in the existing wharf

The construction sites of the two projects are narrow and an increase in the number of vehicles using the access road is anticipated. Assistance will be given to the counterparts to ensure that there is minimum interference with cargo handling and passenger transportation in the existing wharf.

1-6 Coordination with New Inter-island Shipping Support Wharf development Project for Efficient new International Multi-purpose Wharf Development

1-6-3 Coordination works for efficient operation of the two new wharves

JICA Expert Team will support the Counterparts in carrying out the necessary coordination

works to secure effective cargo and passenger transport between the new wharves.

2-3 Assistance with Implementation of Environmental Consideration Measures

2-3-3 Monitoring of transplanted corals

Monitoring status of transplanted corals will be confirmed with collaboration from the DOF. If an issue arises, the JICA expert team will assist with formulating countermeasures.

2-3-4 Measures to contain turbid water

Measures to contain turbid water such as installing a silt curtain may be taken and monitoring the impact of dredging and other marine construction works will be carried out. If any issues arise, the expert team will assist with formulating countermeasures.

2-4 Assistance with Implementation of the Environmental Management Monitoring Plan

2-4-1 Review of the draft Environmental Management Monitoring Plan

Draft version of the environmental monitoring plan and the construction plan prepared by the contractor will be reviewed to confirm whether the contents are satisfactory. JICA Expert Team will also assist the Counterparts in obtaining approval of the plan.

2-4-2 Status of the Environmental Management Monitoring Plan

The status of field work proposed in the Environmental Management Monitoring Plan will be confirmed. If the work is not being carried out in a satisfactory manner, corrective action will be taken.

3-4 Assistance with Fund Management

The team will provide guidance on the following issues.

- Issues related to the Payment Plan according to the contract

- Issues related to the partial completion and payment

- Procedural issues when a schedule change is proposed

- Issues related to the Monthly Report

4-1 Assistance with Holding Steering Committee Meetings

For the effective implementation of the two projects, JICA expert team will assist the counterparts holding steering committee meetings where necessary information among the related parties can be shared.

4-2 Assistance with Coordination Work with Related Parties

4-2-2 Assistance with ensuring traffic safety and alleviating congestion

As the two construction sites are close to one another, traffic congestion may arise due to the increase of construction related vehicles. Moreover, when cruise vessels stay in the port, heavy congestion is anticipated. Effective coordination work with relevant parties is required to ensure that traffic flows smoothly. In addition to construction work to progress on schedule, working vessel will be managed properly.

4.1.7. Preparation of Interim Report

JICA Expert Team prepared Interim Report and submit it to JICA after completion of 1st year's work

4.3. Work Flow Chart

Phase 1 work flow is shown in below.



4.4. Detailed Work Schedule in Vanuatu

Detailed work schedule in Vanuatu is shown in below table.

(1) First Work in Vanuatu February 16 - May 15 in 2014

			AM	PM
February	16	Sun		
	17	Mon		
	18	Tue	9:00 TAG Meeting at VPMU	14:00 Meeting for Seawall design Change at VPMU
	19	Wed	9:00 Meeting at MIPU	14:00 Monthly Meeting at VPMU
	20	Thu	9:00 IPDS Board Meeting 11:00 Meeting with IPDS operation manager	
	21	Fri		
	22	Sat		
	23	Sun		
	24	Mon	9:00 IPDS Bord Meeting	
	25	Tue	10:00 Meeting with JICA office	
	26	Wed		14:00 IPDS Board Meeting
	27	Thu		
	28	Fri		
	March	1	Sat	
2		Sun		
3		Mon	9:00 Weekly Meeting	16:00 VPMU internal Meeting
4		Tue	10:00 Meeting at Primary Minister`s office	
5		Wed		
6		Thu	8:30 Meeting for shortage fund	
7		Fri	8:00 Meeting with Department of Environment	
8		Sat		
9		Sun		
10		Mon	9:00 All Projects Meetinf at VPMU	
11		Tue	9:00 Meeting with IPDS operation manager	
12		Wed		14:00 TAG Meeting at VPMU
13		Thu		16:00 Meeting with JICA office
14		Fri	9:00 Weekly Meeting at VPMU 11:00 Site vist to Bofa dumping area	
15		Sat		
16		Sun		
17		Mon		
18		Tue		
19	Wed			
20	Thu			
21	Fri	9:00 Weekly Meeting at VPMU		
22	Sat			
23	Sun			
24	Mon		13:30 Meeting with JICA office	
25	Tue			
26	Wed			
27	Thu			
28	Fri	9:00 Weekly Meeting at VPMU		
29	Sat			
30	Sun			
31	Mon			

			AM	PM
April	1	Tue	10:00 Meeting with IPDS operation manager	16:00 Meeting with JICA office
	2	Wed	10:00 Steering Committee at VPMU	
	3	Thu		15:00 Meeting with IPDS, Inter-Island Project and Lapetasi Project
	4	Fri		14:00 Weekly meeting
	5	Sat		
	6	Sun		
	7	Mon		
	8	Tue	9:00 Workshop on Urban Development Project	14:00 Workshop on Urban Development Project
	9	Wed		
	10	Thu	10:00 Meeting with JICA office	
	11	Fri		
	12	Sat		
	13	Sun		
	14	Mon	10:00 Meeting with IPDS, Inter-Island Project and Lapetasi Project	15:30 Meeting with MIPU
	15	Tue		
	16	Wed	10:00 IPDS Board Meeting	14:00 Steering Committee at VPMU
	17	Thu		
	18	Fri		
	19	Sat		
	20	Sun		
	21	Mon		
	22	Tue		
	23	Wed		
	24	Thu	9:00 TAG Meeting at VPMU	14:00 IPDS Board Meeting
	25	Fri	10:30 PQ Closing Meeting at VPMU	
	26	Sat		
	27	Sun		
	28	Mon		
	29	Tue		
	30	Wed		13:30 Prequalification Evaluation Meeting at VPMU
May	1	Thu		
	2	Fri		16:00 Prequalification Evaluation Meeting at VPMU
	3	Sat		
	4	Sun		
	5	Mon		14:00 Launching Ceremony at IPDS
	6	Tue	9:00 Prequalification Evaluation Meeting at VPMU	
	7	Wed		14:00 Steering Committee at VPMU
	8	Thu	9:00 Meeting for Tender documents at VPMU	
	9	Fri		
	10	Sat		
	11	Sun		
	12	Mon	10:00 Meeting for Tender documents at VPMU	
	13	Tue	10:00 Meeting with JICA office	15:00 Meeting for Tender documents at VPMU
	14	Wed	8:30 Meeting for Tender documents at VPMU	
	15	Thu		

(2) Second Work in Vanuatu November 1 –December 21 in 2014

			AM	PM
November	1	Sat		
	2	Sun		
	3	Mon	9:00 Technical Bid Evaluation Meeting	
	4	Tue		15:30 Technical Bid Evaluation Meeting
	5	Wed	10:30 Steering Committee Meeting NO.16	
	6	Thu		
	7	Fri		14:00 Site Inspection (Rainwater Discharge Condition)
	8	Sat		
	9	Sun		
	10	Mon		
	11	Tue	9:00 Site Visit (Bouffa Dumping site)	
	12	Wed	10:00 Steering Committee Meeting NO.17	
	13	Thu		
	14	Fri		
	15	Sat		
	16	Sun		
	17	Mon	8:00 VPMU meeting	17:00 VPMU meeting
	18	Tue		
	19	Wed		
	20	Thu	8:00 VPMU meeting	
	21	Fri		Bid Evaluation Report re-submission
	22	Sat		
	23	Sun		
	24	Mon		
	25	Tue	10:30 VPMU meeting (Re: Permits listed in EIA Report)	
	26	Wed		
	27	Thu		13:30 VPMU meeting (Re: Questionnaire of the Appraisal 1st) 15:30 Site Visit (Main road between Main wharf & Lapetasi wharf)
	28	Fri	9:30 VPMU meeting (Re: Questionnaire of the Appraisal 2nd)	
	29	Sat		
	30	Sun		

			AM	PM
December	1	Mon		
	2	Tue		
	3	Wed		
	4	Thu		
	5	Fri	9:30 VPMU meeting (Re: Qestionnaure of the Appraisal & Opening of Price Bids)	14:00 Opening of Price Bids (at VPMU office) 16:00 VPMU meeting
	6	Sat		
	7	Sun		
	8	Mon		
	9	Tue		
	10	Wed	Evaluation Committee: Explanation of "BID EVALUATION REPORT (FINANCIAL) FOR PACKAGE: CIVIL WORKS" (Interim Report) by ECOH	
	11	Thu		
	12	Fri	11:00-15:00 Appreciation party for the Cooperation Teams & relevant organizations of VPMU	
	13	Sat		
	14	Sun		
	15	Mon	10:00 Presentation for Steering Committee	4:00 Explanation of Evaluation of Result of Opening of Price Bids by Consultant
	16	Tue		
	17	Wed	10:00 Presentation for Steering Committee	
	18	Thu		
	19	Fri	9:00 VPMU Meeting (Schedule explanation by Consultant) 10:00 Meeting with JICA/Vanuatu	2:00 VPMU Meeting (Final confirmation of the reply of "Questionnaire of the Appraisal mission")
	20	Sat		
	21	Sun		

(3) Third Work in Vanuatu August 22 – September 28 in 2015

			AM	PM
August	22	Sat		
	23	Sun		
	24	Mon	10:00 Meeting at JICA Office	14:00 Weekly Meeting at IPDS
	25	Tue	9:00 Project Kick Off Meeting at IPDS	15:00 Lapetasi –South Palay bay interface Meeting at VPMU office
	26	Wed	10:00 Steering Committee Meeting (postponed)	
	27	Thu	9:30 Geotechnical Investigation observation (postponed)	
	28	Fri	8:00 Lapetasi –South Palay bay interface Meeting at IPDS 10:30 Site Meeting	15:00 VTIP Groundbreaking Ceremony
	29	Sat		
	30	Sun		
	31	Mon		14:00 Weekly Meeting at IPDS 15:00 Meeting at Main Wharf
September	1	Tue	8:00 Lapetasi–South Palay bay interface Meeting at IPDS (postponed)	
	2	Wed	8:30 Meeting with Acting DG at MIPU 9:00 Lapetasi–South Palay Bay interface meeting at IPDS	
	3	Thu	8:00 Geotechnical investigation inspection	
	4	Fri	9:00 Site Meeting 10:00 Meeting at main Wharf	
	5	Sat		
	6	Sun		
	7	Mon	10:00 Meeting at MIPU 11:00 Internal Meeting at VPMU	13:30 Meeting with DEPC
	8	Tue	9:00 Cargo Loading Equipment Bid Open	
	9	Wed	10:30 Steering Committee Meeting	12:30 VPMU internal meeting 14:00 Meeting with Acting DG at MIPU
	10	Thu		14:00 Meeting with JICA office
	11	Fri	9:00 Site Meeting 9:40 Meeting with IPDS (Container Layout of Main Wharf)	
	12	Sat		
	13	Sun		
	14	Mon		14:00 Weekly Meeting at IPDS
	15	Tue	11:00 Meeting on confirmation of coral distribution	
	16	Wed	7:15 Survey of disembarkation situation of passengers at the time of cruise ship port calls (“Pacific Dawn”) 9:00 Field reconnaissance of coral distribution 10:30 Steering Committee Meeting (Cancelled)	
	17	Thu	9:00 Meeting with JICA office	14:00 Meeting with TOA regarding installment of silt protector 16:20 Meeting with VPMU (Andre-san)
18	Fri	9:00 Site Meeting		
19	Sat			
20	Sun			
21	Mon		14:00 Weekly Meeting at IPDS	
22	Tue		12:00 Meeting with the committee of the Music festival, which VPMU holds a public awareness campaign for the national projects. 15:00 Meeting with JICA regarding public awareness campaign	
23	Wed			
24	Thu		10:00 Meeting with DGMWR regarding water quality monitoring	
25	Fri	9:00 Site Meeting	16:00 Meeting with JICA office	
26	Sat			
27	Sun			
28	Mon			
29	Tue			

4.5. Work Sequence and Progress

4.5.1. Phase 1 Work in Vanuatu

In the table below, details of tasks to be undertaken by the JICA Expert Team are shown in the left column and current state of progress of phase 1 is shown in the right column.

1-1 Review of Integrity between Lapetasi International Multi-purpose Wharf Development Project and Inter-island Shipping Support Wharf Development Project	
1-1-1 Survey of existing port facilities and project site conditions	
<ul style="list-style-type: none"> JICA Expert Team will survey current usage and cargo handling activities of the main wharf and star wharf together with the Counterparts. From the view point of effective cargo handling and passenger transport, expert team will examine measures to be included in the detailed design. 	<p>As current transport operation of container cargo between the main wharf (where vessels berth) and the star wharf (where the stock yard for containers is located) is inefficient, operational efficiency will be improved with the implementation of Lapetashi Wharf development project in which the berth and container yard will be combined.</p> <p>JICA Expert Team will continue to examine measures to improve the project efficiency and quality.</p>
<ul style="list-style-type: none"> JICA Expert Team will also survey the usage and existing site condition of Lapetasi international multi-purpose wharf development project site together with the Counterparts. JICA Expert Team will examine the facilities to be shifted prior to project commencement as well as the timing and site of the relocation. 	<p>To maintain efficient container terminal operation, minimizing construction time is essential. JICA Expert Team drew up a layout plan of container storage plan in Main Wharf and submitted it to VPMU and IPDS as reference. IPDS shall prepare a container operation plan referring to the construction stage plan prepared by the consultant and the layout plan of container storage plan by JICA Expert Team.</p> <p>As maintenance of cargo handling equipment should not be disrupted, a new maintenance shop should be set up before remove the existing maintenance shop.</p>
1-1-2 Examination of design concept and contents of new Lapetasi international multi-purpose wharf development project	
<ul style="list-style-type: none"> JICA Expert Team will examine the design concept and contents of Lapetasi international multi-purpose wharf development project together with the Counterparts. 	<p>Based on the soil test conducted in detailed design, actual soil condition is worse than originally thought and therefore the submerged strut method proposed in the original design is not suitable for the wharf structure. The consultant then examined five alternative wharf structure plans.</p> <p>After comparing the construction cost and schedule of</p>

	<p>the five wharf structure plans, the consultant recommended that the steel pipe sheet pile type be adopted.</p> <p>JICA Expert Team confirms that the steel pipe sheet pile wharf recommended by the consultant is the most suitable from the view point of structural stability and cost.</p>
<p>1-1-3 Examination of design concept and contents of new inter-island shipping support wharf development project</p>	
<p>• JICA Expert Team will examine the design concept and contents of inter-island shipping support wharf development project together with the Counterparts.</p>	<p>Target vessel size of new inter-island shipping support wharf is 36m in length and 2.15m in draft. Required facilities until year 2030 are three berths, two landing points for ramp vessel and one berth for barge.</p> <p>Sea wall structure is combined piles type to cope with earthquake with a return period of 500 years. Same structure is currently adopted in the Solomon Islands.</p> <p>Finally, wharf structure design was changed to a jetty supported by three vertical steel pipe piles. Tender procedures were carried out.</p>
<p>• The cargo handling equipment which is to be procured with assistance by AusDFAT will be examined.</p>	<p>Two fork lifts of 32 ton lifting capacity and two empty container box handlers are planned to be procured.</p> <p>Terminal operation system software and maintenance system software are planned to be introduced.</p> <p>The support from AusDFAT for the purchase of cargo handling machinery has been discontinued, and thus it was decided that the equipped would be procured with a yen loan.</p> <p>The cargo handling equipment to be purchased consists of 2 sets of reach stackers of 45 ton rated load and empty load, and one 45 ton Lifting beam.</p> <p>Bid opening of the cargo handling equipment was held on September 4, and the final evaluation to decide the manufacturer is currently being carried out.</p> <p>JICA Expert Team carried out the technical support by means of creating and providing the comparison tables of offer-prices and specifications of two manufacturers to VPMU for their final evaluation.</p>
<p>1-1-4 Check of integrity between two projects design concept</p>	

<ul style="list-style-type: none"> • JICA Expert Team will check the integrity of two wharves development project in design concept and contents whether they meet the development requirement to increase capacity of Vila port and solve the issues. 	<p>It is quite clear that operational efficiency and safety will be improved with implementation of Lapetashi Wharf development project in which the berth and container yard will be combined in one place.</p> <p>Introduction of container cargo handling equipment will further increase efficiency and safety of terminal operation.</p>
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<p>1-2 Recommendations on Measures to be Included in the Detailed Design</p>	
<ul style="list-style-type: none"> • From the view point of effective cargo handling and passenger transport, JICA expert team will recommend measures to be included in the detailed design 	<p>JICA Expert Team will continue to examine measures to improve project quality.</p> <p>From the viewpoint of efficient container handling on the Main Wharf, JICA Expert Team developed a container storage layout plan in Main Wharf to cope with the increase of containers being stored.</p> <p>In addition, JICA Expert Team created the "Cruise-Passenger Walkway Layout of the Main Wharf (Plan A)" in consideration of safety of passengers when a cruise ship calls the port. (Refer to APPENDIX.)</p> <p>At the moment, the safety management of passenger traffic from cruise ships in the Main Wharf is performed by SSS (South Sea Shipping Company), which was commissioned from MIPU. In addition, security has been entrusted to the private security company from SSS. In the future, the department responsible for the safety management of the passengers will become the PMD.</p> <p>JICA Expert Team will offer advice for improving the safety of the passage where passengers disembark based on the walkway layout mentioned above.</p>

<p>1-3 Review of Construction Method and Schedule of Two Wharves Project</p>	
<p>1-3-1 Review of construction method and schedule of Lapetasi international multi-purpose wharf project</p>	
<ul style="list-style-type: none"> • JICA Expert Team will review the construction method and schedule of the "Lapetasi International Multi-purpose Wharf Development Project". JICA Expert teams will also review the schedule of tender document 	<p>Application for pre-qualification closed on April 25. Consultant submitted pre-qualification evaluation report to VPMU on May 8.</p> <p>JICA Expert Team reviewed tender documents and pointed out the need for amendments and additional items</p>

<p>preparation, and contents of pre-qualification documents.</p>	<p>to be included in tender documents.</p> <p>Issue of tender documents and site visit were implemented on August 13 with the participation of three pre-qualified Japanese companies.</p> <p>On October 24, three companies tendered their proposals and technical bids were opened.</p> <p>Consultant evaluated technical bids and submitted the evaluation report to the procurement committee.</p> <p>Steering committee accepted the consultant's evaluation results (i.e., all three companies passed the technical bid).</p> <p>Price bid was opened on December 5. Contract is expected to be concluded in March.</p>
<p>1-3-2 Review of construction method and schedule of new inter-island shipping support wharf project</p>	
<ul style="list-style-type: none"> • JICA Expert Team will review the construction method and schedule of the new inter-island shipping support wharf development project. Expert team will also monitor the status of the cargo handling equipment being procured with support from AusDFAT. 	<p>Implementation of soil tests in remote islands is behind schedule. Preliminary test report was submitted in March. Construction work is expected to start in January 2015.</p> <p>New access sailing route to new inter-island shipping support wharf is currently being examined. The west side of Iririki island or Pontoon Bay side is the two candidate routes.</p>
<ul style="list-style-type: none"> • Due to the change in the location of the access channel for the VISSP site, dredging work of 50,000m³ work would be necessary and a disposal method of the dredged soil has to be determined. 	<p>According to the VISSP project consultant, the dredged soil consists of sand and coral. Therefore, 25,000 m³ of the dredged soil can be used for terminal reclamation and 5,000 m³ for land fill up. A disposal area for the remaining dredged soil needs to be secured.</p> <p>As the area of VISSP site is limited, utilizing the dredging soil deposit area which would be developed in Lapetasi wharf side is one idea being examined.</p> <p>Prior to Lapetasi wharf dredging work, VISSP dredging work will be conducted using a cutter suction dredger.</p> <p>Accordingly, dredged soil from Lapetasi side would be overlaid on the coral sand from VISSP.</p> <p>It is necessary to examine ways to increase the capacity of deposit area either by expanding the area or by increasing the height of the pile up soil. Some volume of dredged soil with high water contents may need to carry outside, as it cannot be piled up high.</p>

1-4 Examination of Temporary Replacement Facilities for Domestic Wharf and Container Yard	
1-4-1 Examination of the required replacement facility	
<p>• Until the new inter-island shipping support wharf being built is completed, a replacement facility for the current domestic wharf in the Star wharf is required. Replacement facility will be examined based on the monthly and annual container handling volume of the current domestic wharf.</p>	<p>There were a few candidate sites for the temporary replacement facility for the domestic wharf. It was eventually decided that a barge (about 15m x 30m) would be used as a temporary quay to reduce the investment cost.</p> <p>A budget of 55 million Vatu has been earmarked for purchasing, installing and maintaining the barge.</p> <p>A barge was purchased from New Caledonia and towed to site in January; operation commenced in July 2015.</p> <p>Site preparation work and barge mooring work were implemented in February.</p> <p>Since the collection and management of port data has not been done properly, the JICA Expert Team will examine the data by cargo type and handling volume of the domestic wharf along with the container handling volume in the Lapetasi International Multipurpose Wharf.</p> <p>In addition, the JICA Expert Team will recommend that MIPU prepare annual statistical data tables and be responsible for managing data.</p>
<p>• The replacement facility for continuing the operation may be required during construction of the current container yard in the Star wharf. Support for "the study of installation and allocation of necessary replacement facility" to continue the operation during construction will be carried out using the monthly and annual container handling volume of the Star wharf which is to be provided by the counterparts.</p>	<p>JICA Expert Team carried out its analysis after obtaining the actual container handling volume from 2011 to 2014 and the forecast of 2014. (Appendix 1 in Progress Report 1 "Study on Area of Container-Storage Yard of Lapetasi International Multi-purpose Wharf")</p> <p>JICA Expert Team calculated the container storage volume in each Phase during the construction period in the Star Terminal and drafted a container storage plan as a reference in the main wharf. (Appendix 2 in Progress Report 1 "Layout of Container-Storage in Main Wharf")</p> <p>The counterparts are planning to utilize the main wharf for container handling and temporary storage place as a temporary replacement facility during the construction of Star wharf.</p> <p>JICA Expert Team assisted in preparing the responses to the Questionnaire of Appraisal by VPMU. At that time,</p>

	<p>the actual annual container volume and forecast values up to 2020 were submitted by IPDS. A GDP growth rate of 4.5% was assumed for forecasting volumes after 2015.</p> <p>The Main wharf may be used for the handling and storage of containers while construction works are being carried out at Lapetasi wharf.</p> <p>"MAIN WHARF LAYOUT" has been provided by IPDS; it is based on the layout plan which the JICA expert team submitted to IPDS for reference.</p> <p>JICA Expert Team will propose ways to improve the layout and increase the container storage volume in the Main wharf during the next visit.</p> <p>Container storage capacity using the container storage layout in the Main Wharf created by IPDS is insufficient. JICA Expert Team developed a container storage layout which will increase the container storage capacity (including reefers), and presented it to the IPDS and VPMU.</p> <p>IPDS, a container handling company, created a final container storage layout incorporating the actual operation after reviewing the draft of container storage layout which the Expert Team has presented to IPDS and VPMU. (Refer to APPENDIX, "Layout of Main Wharf (Layout of Containers stocked)".)</p>
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<p>1-5 Assistance for Maintaining Functions of the Existing Wharf and Development of the new International Wharf</p>	
<p>1-5-1 Maintaining port operation in the existing wharf</p>	
<p>• The construction sites of the two projects are narrow and close to each other. The access road to the project sites is also narrow. As construction progresses, an increase in the number of vehicles using the access road is anticipated. Therefore, necessary support will be given to the counterparts to ensure that there is minimum interference with cargo handling and passenger transportation in the existing wharf.</p>	<p>Lapetasi wharf construction work is scheduled to be constructed in nine phases over a period of two years so as to be able to continue container handling in the Star wharf.</p> <p>JICA Expert Team assumed container storage volume and number of calls of passenger ships based on the past data and examined the storage volume in each phase of construction as described in the preceding paragraph 1-4.</p> <p>JICA Expert Team explained its results to the Counterparts.</p>

	<p>In the past few years, the number of cruise ships calling Port Vila has increased and 95% of the passengers disembarked, traversing the main road between the Main wharf and the Star wharf by taxi or limousine. Container transport vehicles cannot pass the road between the Main wharf and the Star wharf when a cruise ship is at berth.</p> <p>10 to 15 Passenger ships call at the Main wharf in a month. They come to the main wharf around 7:30am and depart around 5:00pm.</p> <p>The Main wharf may be utilized as a temporary replacement facility for container handling and storage during the construction period of Star wharf. When the storage capacity of the Main wharf is reached, excess containers should be stored temporarily in the yard of the Star wharf. Accordingly, it is necessary to develop a road between the two wharves.</p> <p>Although road maintenance and expansion works are being carried out under the Port Vila Urban Development Project (PVUDP), the arrangement of equipment needed for the road rehabilitation plan and traffic control seems to fall under the jurisdiction of VPMU. Jurisdictional matters needs to be clarified.</p>
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1-6 Coordination with New Inter-island Shipping Support Wharf development Project for Efficient New International Multi-purpose Wharf Development	
1-6-1 Coordination for development of the Administration Building	
<ul style="list-style-type: none"> Detailed design of the Administration building is being done under the Japanese Yen-loan package while construction is being funded by AusDFAT. Therefore, the JICA expert team will assist the Counterparts in coordinating these separate aspects. 	<p>AusDFAT, which had planned to invest in an administration building, has decided that it will not provide funding. It may be difficult to obtain financial assistance.</p> <p>JICA decided to provide a Yen-loan to develop the administration building and gate house. JICA may also provide a Yen-loan for procurement of cargo handling equipment.</p>
1-6-2 Funding for port security facility development	
<ul style="list-style-type: none"> As funding for port security facility has not yet been secured, JICA Expert Team will 	<p>Design work for a port security facility is also not included in the scope of the yen loan.</p>

<p>support the Counterparts in exploring funding sources and promoting project.</p>	<p>JICA may also provide a Yen-loan to develop the port security facility.</p>
<p>1-6-3 Coordination works for efficient operation of the two new wharves</p>	
<p>• JICA Expert Team will support the Counterparts in carrying out the necessary coordination works to secure effective cargo and passenger transport between the two new wharves. As the two new wharves are close to one another, the possibility of sharing basic components (such as a parking lot, access road etc.) will be examined.</p>	<p>Land boundaries of the two facilities have been settled and access roads have been arranged.</p> <p>The maximum gradient of the access road of the new domestic wharf is around 6.8 percent, a fairly steep gradient.</p> <p>Also, a study on soil-filled protection structures needs to be carried out because the road will be constructed using filling soil.</p> <p>A wider land area may be required depending on the structure.</p>

<p>2-1 Review on the Concept and Efficiency of the Two Wharves Projects (Environmental Consideration)</p>	
<p>•The Environmental Impact Assessment (EIA) conducted for both projects will be reviewed to confirm whether the results are appropriate in light of the contents of the Environmental Management Monitoring Plan. Environmental aspect related to the temporary domestic wharf facility will also be reviewed.</p>	<p>VPMU conducted a study on the temporary wharf in cooperation with MIPU and IPDS, and selected the Kalpovi site which is a reclaimed area on the West side of the Star Wharf. The temporary wharf will be a floating platform utilizing a barge. (Refer to APPENDIX (6))</p> <p>In this program, two pilings in the land area and a floating barge in the sea area will exist temporarily, however, the environmental impact will be minor. It is, thus, considered that these works will not be subject to any legal procedures. VPMU, however, plans to obtain an agreement from DEPC (Department of Environmental Protection and Conservation), that legal procedures are not necessary, explaining the components and environmental considerations.</p> <p>After consulting with DEPC, it was determined that a new EIA for the temporary wharf would be required. As of the end of February 2015, the EIA document has already been prepared by the consultant hired by VPMU. However, it is not approved yet, because public consultation regarding the project is required by the DEPC. VPMU plans to have a public consultation</p>

	<p>through the web page and newspaper, and this plan was agreed by the DEPC.</p> <p>As for the environmental permit for the Inter-island Shipping Support Wharf Development Project, the Initial Environmental Evaluation (IEE) document was approved by DEPC in April 2013. Since a new plan to change the access sea route (from the Palay Bay route on the east side of Iririki Island to the Pontoon Bay route on the west side of the island) was introduced, dredging of the shallow area at the south side of Iririki Island would be necessary. And a new EIA study (e.g. Study on turbidity by dredging; change of water regime; influence to ecosystem) was conducted. VPMU is now examining the report and it will be submitted to the DEPC in the beginning of October. According to the interview with the VPMU, the EIA does not consider the impact of turbidity dispersion by dredging and the impact to the ecosystem. And, therefore, the report will be returned to the consultant to reconsider the impact and its measures.</p>
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<p>2-2 Advice on the Environmental Measures Included in the Detailed Design (Environmental Consideration)</p>	
<p>• Construction methods and schedule specified in the tender document will be reviewed with the counterparts, and measures or alternatives, which shall be included in the detailed design, will be discussed from the viewpoint of environmental and social consideration. Effectiveness of the countermeasures in preventing turbidity will be reviewed and alternatives will be proposed if necessary.</p>	<p>Based on the soil test conducted in the detailed design stage, it was realized that a fairly large amount of the seabed soil on the planned dredging site was not suitable for use as reclamation material and would have to be dumped.</p> <p>The consultant proposed to transport the 40,100m³ of the dredged material to the disposal site, 13km inland from the construction site. Since 6,680 round trips are necessary in case 6m³ capacity dump truck is used, impact to road congestion and the environment will be significant. Therefore, the expert team proposed to modify the plan by disposing of the materials in an area neighboring the construction site that is isolated by seawalls.</p> <p>The environmental permit was approved by the DEPC on April 8th 2014, after submitting a Validation Note</p>

	<p>from the EIA in 2010 based on the instruction by the DEPC.</p> <p>Environmental consideration during the construction phase will be discussed with VPMU based on the Environmental Management Plan prepared by the contractor.</p>
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2-3 Assistance with Implementation of Environmental Consideration Measures

• To mitigate any impact to the natural environment, the JICA Expert Team will propose environmental consideration measures.

2-3-1 Confirmation of the environmental status at the project site

• Environmental status of coral, which is to be transplanted to an area outside the project site, will be confirmed.

Since the possibility of simultaneous implementation of the Lapetasi International Multi-Purpose Wharf Project and the Inter-island Shipping Wharf Project is high, it was confirmed among related organizations (VPMU, IPDS, the Inter-island Wharf Project and the Lapetasi Wharf Project) that following items should be coordinated by frequent information exchange to minimize the impact to the neighboring and surrounding areas and to ensure the projects proceed smoothly.

- It is necessary to pay attention to safety by coordinating works as work vessels and construction vehicles will be concentrated in a narrow area. Also, minimizing the influence on tourism and avoiding the traffic congestion will be important considerations.
- It is necessary to organize the mobilization and demobilization schedules of construction machineries and materials, so as not to interfere with the activities of each project.
- It is necessary to communicate the construction schedule and locations of work vessels to operators of the Main Wharf to prevent interference with other vessel traffic.

Dredging of the sea route has been decided to carry out as part of the Inter-island Shipping Support Wharf Development Project. Accordingly, the impacts to the surrounding ecosystem such as coral must be considered.

	<p>Therefore, discussions regarding environmental considerations for the two projects under the supervision of VPMU will be necessary.</p>
<p>2-3-2 Confirmation of the plan for coral transplantation</p>	
<p>• The coral transplant and monitoring plan will be confirmed and the necessary coordination for sustainable growth will be supported.</p>	<p>Monitoring of water quality and coral in the operation phase as a long-term program conducted by DGMWR (Department of Geology, Mine and Water Resources) and DOF (Department of Fisheries) is ideal, and both departments agreed to this concept. However, the budget is not secured and discrepancies were found in the budget between the two projects. Therefore, mutual coordination between the projects will be necessary.</p> <p>According to the interview with the DOF, they plan to supervise the work for the coral relocation every day to judge the appropriateness of the relocation of each coral, since the relocation work sometimes comes to nothing by breaking into a piece on the separation work of a coral from the foundation. The expenses for the supervision by the DOE will be borne by the VPMU.</p> <p>Conducting regular water quality survey by the DGMWR has been agreed to budget securing by VPMU.</p>

<p>2-4 Assistance with Implementation of the Environmental Management Monitoring Plan</p>	
<p>• The contents of the Environmental Management Monitoring Plan and the implementation structure including the DOF and DGMWR will be discussed and assistance with implementation will be provided.</p>	<p>Construction methodology and schedule in the tender document were confirmed and no discrepancy on environmental consideration was found.</p> <p>Construction procedure and its mitigation measures (e.g. Such as storm water drainage or installation of silt curtains) to reduce the impacts of the construction will be confirmed based on the Environmental Management Plan submitted by the contractor, and proper mitigation measures will be discussed.</p> <p>DGMWR and DOF have agreed to implement wide-range and long-term monitoring. Further coordination for budget procurement developing the monitoring plan and exploring the possibility of cooperation with the Inter-island Shipping Support Wharf Development Project will be targeted. The budget</p>

	<p>will be borne by the VPMU. The water quality monitoring, for both the Lapetasi International Multi-Purpose Wharf Project and the Inter-island Shipping Support Wharf Development Project, will be conducted at the end of September by the DGMWR as a baseline survey before implementation of the projects.</p> <p>The Environmental Management and Monitoring Plan (EMMP) of the Inter-island Shipping Support Wharf Development Project is not prepared yet. And, therefore, a close relationship between the two projects to coordinate the EMMP plans is necessary. An environmental personnel were assigned to the VPMU by the budget of the Inter-island Shipping Support Wharf Development Project.</p>
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3-1 Assistance with Prequalification	
3-1-1 Review of Prequalification documents	
<ul style="list-style-type: none"> • JICA Expert Team will review the prequalification documents and recommend revisions if necessary. 	<p>When JICA Expert Team arrived at the VPMU, the PQ documents had already been sent to JICA for concurrence. Public announcement of PQ was conducted to attract applications from various construction firms.</p> <p>After the closing date of PQ, JICA Expert Team joined the screening committee as an observer.</p> <p>The screening committee conducted the examination effectively. Three Japanese companies qualified following the screening.</p>

3-2 Assistance with Tender Documents	
<ul style="list-style-type: none"> • JICA Expert Team will review the schedule and contents of tender documents, and recommend revision if necessary 	<p>JICA Expert Team reviewed the specifications and examined the drawings of the tender documents proposed by the consultant. JICA Expert Team provided guidance for the purpose to avoid risks in construction works, ensure smooth implementation, and reduce the environmental load. Particularly, the team advised that the excavated soil at the site be reused to minimize the purchasing of stones and sands to reduce the project cost as well as the impact on the environment.</p>

3-3 Assistance with Contract Documents	
<ul style="list-style-type: none"> • JICA Expert Team will review the schedule and contents of contract documents, and recommend revision if necessary 	To be undertaken at a later stage.
<ul style="list-style-type: none"> • The contract documents will be examined together with the counterpart to identify any constraints for implementation of the project. If any constraints are found, JICA Expert Team will propose solutions to VPMU. 	<p>The contract document will be prepared after the bid closing and funds are secured.</p> <p>JICA Expert Team's 2nd visit to Vanuatu coincided with the bid closing.</p>

3-4 Assistance with Fund Management	
<ul style="list-style-type: none"> • JICA Expert Team will offer advice on the management of funds and documents related to the procedures for implementing the Lapetasi International Multi-purpose Wharf Development Project. The aims are to avoid cost overruns and delays in the implementation of the new international terminal as well as to ensure that the repayment is realistic. 	<p>At the time of arrival at Vanuatu, the problem of cost over-runs had emerged as a consequence of the detailed design. The estimated cost based on the latest conditions greatly exceeded the former estimation.</p> <p>JICA Expert Team examined the causes of the cost over-run and proposed countermeasures.</p> <ul style="list-style-type: none"> ● As the causes of the cost overrun, the team identified the fluctuation in the exchange rate, the soil conditions, construction scope, and the improvement of the quality of the facilities. ● The team also proposed two plans in an attempt to reduce costs. <p>However, the team's plans could not lower the construction cost. As a result, the Vanuatu side decided to proceed with the project using the steel tube sheet pile structure that the consultant has recommended.</p>
<ul style="list-style-type: none"> • JICA Expert Team will examine the way VPMU manages the funds including its funding plan and funding records. JICA Expert Team will recommend necessary amendments, if necessary, in consultation with JICA. 	<p>JICA Expert Team's 2nd visit to Vanuatu coincided with the bid closing. The total amount of required funds was clarified as a result of the tender.</p> <p>To obtain additional funding, the team assisted in preparing the responses to the Questionnaire issued by JICA.</p> <p>For FIRR calculations, the team advised the consultant to use the same income estimated in the previous study.</p> <p>At the Steering Committee, the team explained the important points in FIRR calculation and its implications for loan repayment. JICA Expert Team also explained</p>

	<p>that the income projection in the previous study is based on the assumption that both container cargo and tariff rates will increase.</p> <p>Assistance with fund management will be provided during the next visit (May – June) when the contract is scheduled to be signed.</p>
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<p>4-1 Assistance with Holding Steering Committee Meetings</p>	
<p>• For the effective implementation of the two projects, JICA Expert Team will assist the counterparts holding steering committee meetings where necessary information among the related parties can be shared.</p>	<p>The steering committee has been held periodically (every month) since April.</p> <p>Schedule of the meeting in 2015 has been fixed by VPMU.</p>

<p>4-2 Assistance with Coordination Work with Related Parties</p>	
<p>4-2-1 Effective use of surplus dredged material</p>	
<p>• Surplus dredged material in the project will be used as reclamation material for inter-island shipping support wharf development project to the extent possible.</p>	<p>The soil test conducted at D/D stage revealed that a considerable quantity was unsuitable for re-use as filling. The suggestion of the consultant was to carry out the excavated soil of 40,100m³ from the construction site to the Bofa Waste Disposal Site 13km inland. This entails a cost of 288,600,000 yen in total for transportation costs and soil dumping charges, road repair costs and maintenance cost.</p> <p>Assuming a truck can carry 6m³ of soil, 6,680 trips will be required (40,100/6=6,680).</p> <p>The impact on road traffic and the environment will be examined.</p> <p>JICA Expert Team recommended a plan to reserve the area to stock the excavated soil between Lapetasi Wharf and new domestic wharf. A groin is necessary to confine the excavated soil and prevent the contamination of the water.</p> <p>The stock area will be usable for container handling after the artificial consolidation.</p>
<p>4-2-2 Advise and Consultation for the Implementation of Environmental Consideration</p>	
<p>• Public notification and retrieval of the</p>	<p>VPMU considered the stakeholder meeting would not</p>

<p>understanding of the public regarding the construction is necessary and it will be advised.</p>	<p>be necessary, because the meeting was held twice in the past. However, notification to the public, regarding the construction such as traffic control, consideration to the ecosystem and environmental measures is necessary. Based on the suggestion of the JICA Vanuatu Office, a public awareness campaign was planned using the opportunity of public event, such as the Music Festival scheduled for the end of October.</p>
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4.6. Issues to be addressed and Countermeasures

4.6.1. Issues of Work in Vanuatu

(1) Port Management (1)

Due to the delay in the project implementation schedule, intervals in which the JICA Expert Team worked in Vanuatu became much longer than originally planned. Main reasons for the delay are the additional procedures requested to increase Yen –loan amount for the wharf design change and damage from cyclone Pam in March of 2015. Interval between the 1st work and the 2nd work became 5.5 months, 3 months longer than originally planned, while the interval of the 2nd work and the 3rd work became 7.5 months, 3 months longer than planned. Those schedule delays and longer intervals made it difficult for the JICA Expert Team to acquire accurate local information and cope with changes in the situation in timely manners. For smooth implementation of the project, it is necessary to have the flexibility to dispatch experts to Vanuatu and adjust work schedule when required to cope with changes in the external situation.

In Port Vila, four development projects are under implementation simultaneously, Vanuatu Inter-island Shipping Support Project (VISSP), Port Vila Urban Development Project (PVUDP) and Vanuatu Tourism Infrastructure Project (VTIP) in addition to Lapetasi international multipurpose wharf development project. To ensure all projects progress smoothly, proper coordination and interface adjustment are essential. However, due to the insufficient project management capability of VPMU, progress of Lapetasi wharf development might be affected by interface problems with VISSP. It is necessary to support VPMU for project coordination and management to avoid delays in the implementation of the Lapetasi wharf project.

Project	million US\$	Doner
Lapetasi International Multipurpose Wharf Development Project	80.3	
Vanuatu Inter-Island Shipping Support Project	51.6	 
Port Vila Urban Development Project	39.1	 
Vanuatu Aviation Investment Project	59.5	
Vanuatu Tourism Infrastructure Project	13.0	WTO

(2) Procurement and Finance Management

Payments to consultants are conducted monthly and no particular problem has been reported until today. However, from now on, the payment for the main construction work will begin. Since the payment for the main construction work involves a huge amount of money, we should watch whether or not the payment is conducted smoothly. VPMU uses the online system of the government to request and report the payment. However, we have to examine whether it is easy and convenient to use. The team noticed that the person in charge of payments is quite busy. It may be worth examining whether the duties or work method need to be altered. Normally, when the VPMU want to look at the usage of funds, the VPMU can have the consultants show the payment record and related data. However, if VPMU feels it inconvenient to ask consultants about the current status of fund, VPMU could keep the records itself. Given the limited personnel in the VPMU, however, it is not clear whether VPMU should continue to monitor the payment progress. The team is willing to assist in this area if VPMU feels it is necessary.

(3) Social and Environmental Consideration

Inter-island Shipping Support Wharf Development Project will be implemented at the same period and the same area of the Lapetasi International Multi-Purpose Wharf Project. According to the VPMU, the Environmental Management and Monitoring Plan of the Inter-island Shipping Support Wharf Development Project is not prepared yet. Based on the previous experience, it is considered that a very simple plan might be prepared. In that case, unbalance of environmental managements might be occurred in the same area. That is; a detailed management plan as shown in Table 6.1 is considered in one project, while simple management is conducted in another project.

Table Monitoring Plan during the Construction

Monitoring	Contents	Frequency	Implementation body
Surrounding	Monitoring of impact	Daily	Contractor

environment of the construction area	by the construction (Turbidity, pH)		
Environment of the entire bay area	Monitoring of wide area and long-term influence (Marine mammal, coral, water quality)	Regular monitoring	Department of Fishery Department of Geology, Mine and Water Resources

4.6.2. Countermeasures

(1) Port Management (1)

Continuously, main works of the JICA Expert Team in 2nd phase are smooth project implementation, interface coordination with VISSP, maintenance of smooth container terminal operation and so on.

For smooth implementation of the project, it is necessary to have the flexibility to dispatch experts to Vanuatu and adjust work schedule when required to cope with changes in the external situation.

To ensure all four projects progress smoothly, proper coordination and interface adjustment by VPMU are essential. It is necessary to support VPMU for project coordination and management to avoid delays in the implementation of the Lapetasi wharf project.

(2) Procurement and Finance Management

JICA Expert Team collect information regarding payment procedures such as below.

- Payment procedure for construction work should be clearly illustrated in the form of block chart; delays in making payment should be prevented.
- Above chart should contain the relevant contact person, including telephone number and e-mail address.
- Above chart should be renewed periodically and whenever the person is transferred.
- The progress of the payment should be always be reviewed and be easily accessible so that a supervisor may confirm the payment status at any time.
- VPMU should also have the ability to calculate the interest during the payment period.

JICA Expert Team will make a presentation on the repayment of the loan. The income of the port is related to the container handling volume and tariff level. The team will meet with concerned parties to ensure there are no inconveniences concerning repayment issues.

(3) Social and Environmental Consideration

An integrated environmental management through VPMU will be considered in cooperation with the person in charge of environment of Inter-island Shipping Support Wharf Development Project.

4.6.3. Lessons Learned and Proposals to Phase 2

(1) Port Management (1)

(Necessity of enhancing knowledge on port security and disaster prevention)

Port Vila is generally a calm port. However, the unexpected strength of cyclone Pam inflicted huge damage in March of this year and an even more powerful cyclone may hit hereafter due to global warming. As Lapetasi international multipurpose wharf is the only container port in the capital area, damage to the port could have a considerable impact on the national economy. To minimize the damage by natural disaster, it is necessary to prepare a port disaster prevention plan and enhance knowledge on the disaster prevention

As to port security control of the present Main wharf, although some security guards are stationed there, gate access is not controlled properly. In order to comply with the ISPS code, Lapetasi international multipurpose wharf will be equipped with a port security system and equipment with the assistance of a Yen-loan. It is important for port security staff to enhance their knowledge of port security.

(Enhancing knowledge of Port Management and Operation)

The port operation activities in the Main Wharf by DPM (Department of Port and Marine) are limited to acceptance of port entry, pilotage, tug boat and line handling. As mentioned above, although some security guards are stationed on the Main wharf, gate access is not controlled properly.

As the port authority, DPM is expected to be responsible for port security management of Lapetasi wharf. To secure the efficient port management and operation of Lapetasi wharf, effective role-sharing between the Government and private port management body is important. JICA Expert Team will introduce some cases of public and private role-sharing in order to establish an effective port management system.

(2) Port Management (2)

(The need to enhance passenger safety when a cruise ship calls the port)

JICA Expert Team created the "Cruise-Passenger Walkway Layout of the Main Wharf (Draft A) 201509" in consideration of the safety of passengers when a cruise ship calls the port. At the moment, the safety management of passenger traffic from cruise ships in the Main Wharf is performed by SSS (South Sea Shipping Company), which was commissioned from MIPU. In addition, security has been entrusted to the private security company from SSS. In the future, the department responsible for the safety management of the passengers will become the PMD. JICA Expert Team will re-confirm this matter during the next visit. In addition, advice will be given for improving the safety of the passage where passengers disembark based on the walkway layout created by JICA Expert Team. As for the "Improvement of the safety of passenger traffic from cruise ships in the Main Wharf," JICA expert team will examine the management practices of the MIPU and DPM (including the contents to be

reviewed in the future), and also grasp the workflow among DPM, SSS and the private security company.

Finally, JICA Expert Team will propose measures to improve safety for passengers of cruise ships on the Main Wharf.

(3) Procurement and Finance Management

(Necessity of transferring knowledge enhancement on loan repayment procedures)

VPMU is the executing agency of the project, and the consultants have been entrusted with the design and assisting in implementation. Therefore, when VPMU wants to see the usage of funds, VPMU only has to request the consultant to show the data. However, if VPMU would like to keep watching of payment and availability of fund, VPMU must do job in addition to the current job of payment in the online system of the government. Therefore, the team thinks the consultant should continue to monitor the progress of the construction works and availability of the remaining fund.

MIPU and the Ministry of Finance need to be aware that the repayment of the JICA fund is an important issue that has a strong relation to the port fee policy and the container volume. The JICA Expert team once explained the repayment amount and its relation to the container volume and tariff level. However, knowledge on this issue may not be passed down to the next generation. Therefore, the team will make a presentation on the repayment issue once every year.

(4) Social and Environmental Consideration

While the expert team does not stay in Vanuatu, status regarding the environmental matters was updated through e-mail. However, the progress of permits didn't make gain so much, due to the difficulty of communication on e-mail basis. After the JICA Expert Team started the activity in Vanuatu, the permit matters have rapidly progressed. It is considered that this is because of easiness to consult each other on immediate concerns and easy to take action. Other projects in Vanuatu, such as the Inter-island Shipping Support Wharf Development Project and the Urban Development Project, have dispatched local personnel for environmental matters to VPMU.

Although it is considered that the measure like other projects might be difficult, other measures, such as securing longer stay period of each expert or shifting the arrival and departure date of each expert to secure longer period as an expert team, would be necessary.

5. Phase 2 Work Implementation

5.1. Work Program

5.1.1. Work in Japan

Up Dating of Work Plan

JICA Expert Team updated the work plan based on the progress and results of 1st year's work.

5.1.2. Fourth Work in Vanuatu

Draft Work Plan of the 2nd year is prepared in Japan and presented for discussion with the Counterparts on the occasion of the fourth work in Vanuatu. Work Plan will be finalized by mutual consent of the JICA Expert Team and the Counterparts.

1-3 Review of Construction Method and Schedule of Two Wharves Project

Review of construction method and schedule of new inter-island shipping support wharf project

4-2 Assistance with Coordination Work among Related Parties

Due to the location change of the access channel to South Palay Bay of VISSP, 50,000 m³ of dredged soil from channel dredging will have to be disposed. Proper coordination work is necessary to secure the disposal area in a timely manner.

3-4 Assistance with Fund Management

The team will provide guidance on the following issues.

Issues related to the Payment Plan according to the contract

Issues related to the partial completion and payment

Procedural issues when a schedule change is proposed

Issues related to the Monthly Report

5.1.3. Fifth Work in Vanuatu

1-3 Review of Construction Method and Schedule of Two Wharves Project

Review of construction method and schedule of new inter-island shipping support wharf project

1-4 Examination of Temporary Replacement Facilities for Domestic Wharf and Container Yard

1-4-2 Confirmation of replacement facility plan and schedule

It is necessary to make temporary relocation plans of the domestic wharf and container yard etc., and to complete the relocation of facilities before commencement of new wharf construction. The status of the relocation plans will be confirmed with the counterparts. The expert team will

assist the counterparts if modifications to the plans are required.

1-5 Assistance for Maintaining Functions of the Existing Wharf and Development of the new International Wharf

1-5-1 Maintaining port operation in the existing wharf

The construction sites of the two projects are narrow and an increase in the number of vehicles using the access road is anticipated. Assistance will be given to the counterparts to ensure that there is minimum interference with cargo handling and passenger transportation in the existing wharf.

1-6 Coordination with New Inter-island Shipping Support Wharf development Project for Efficient new International Multi-purpose Wharf Development

1-6-3 Coordination works for efficient operation of the two new wharves

JICA Expert Team will support the Counterparts in carrying out the necessary coordination works to secure effective cargo and passenger transport between the new wharves.

1-9 Assistance for Enhancing Passenger Safety When Cruise Ships Call the Port

JICA Expert Team will assist counterparts in enhancing cruise ship passenger traffic safety, as it is expected that the traffic congestion around the port area will worsen due to the increase of construction vehicles.

2-3 Assistance with Implementation of Environmental Consideration Measures

2-3-3 Monitoring of transplanted corals

Monitoring status of transplanted corals will be confirmed with collaboration from the DOF. If an issue arises, JICA Expert Team will assist with formulating countermeasures.

2-3-4 Measures to contain turbid water

Measures to contain turbid water such as installing a silt curtain may be taken and monitoring the impact of dredging and other marine construction works will be carried out. If any issues arise, the expert team will assist with formulating countermeasures.

2-4 Assistance with Implementation of the Environmental Management Monitoring Plan

2-4-2 Status of the Environmental Management Monitoring Plan

The status of field work proposed in the Environmental Management Monitoring Plan will be confirmed. If the work is not being carried out in a satisfactory manner, corrective action will be taken.

4-1 Assistance with Holding Steering Committee Meetings

For the effective implementation of the two projects, JICA Expert Team will assist the counterparts holding steering committee meetings where necessary information among the related parties can be shared.

4-2 Assistance with Coordination Work with Related Parties

4-2-2 Assistance with ensuring traffic safety and alleviating congestion

As the two construction sites are close to one another, traffic congestion may arise due to the increase of construction related vehicles. Moreover, when cruise vessels stay in the port, heavy congestion is anticipated. Effective coordination work with relevant parties is required to ensure that traffic flows smoothly. In addition to construction work to progress on schedule, working vessel will be managed properly.

5.1.4. Sixth Work in Vanuatu

1-5 Assistance for Maintaining Functions of the Existing Wharf and Development of the new International Wharf

1-5-1 Maintaining port operation in the existing wharf

The construction sites of the two projects are narrow and an increase in the number of vehicles using the access road is anticipated. Assistance will be given to the counterparts to ensure that there is minimum interference with cargo handling and passenger transportation in the existing wharf.

1-6 Coordination with New Inter-island Shipping Support Wharf development Project for Efficient new International Multi-purpose Wharf Development

1-6-3 Coordination works for efficient operation of the two new wharves

JICA Expert Team will support the Counterparts in carrying out the necessary coordination works to secure effective cargo and passenger transport between the new wharves.

1-7 Assistance for Enhancing Knowledge on Port Security and Disaster Prevention

Expert team will assist counterparts in enhancing knowledge on disaster prevention and minimizing damage from natural disasters. JICA Expert Team also will provide data and information on security requirements and assist in ensuring that ports comply with the ISPS code.

2-3 Assistance with Implementation of Environmental Consideration Measures

2-3-3 Monitoring of transplanted corals

Monitoring status of transplanted corals will be confirmed with collaboration from the DOF. If an issue arises, JICA Expert Team will assist with formulating countermeasures.

2-3-4 Measures to contain turbid water

Measures to contain turbid water such as installing a silt curtain may be taken and monitoring the impact of dredging and other marine construction works will be carried out. If any issues arise, JICA Expert Team will assist with formulating countermeasures.

2-4 Assistance with Implementation of the Environmental Management Monitoring Plan

2-4-2 Status of the Environmental Management Monitoring Plan

The status of field work proposed in the Environmental Management Monitoring Plan will be confirmed. If the work is not being carried out in a satisfactory manner, corrective action will be taken.

3-4 Assistance with Fund Management

The team will provide guidance on the following issues.

Issues related to the Payment Plan according to the contract

Issues related to the partial completion and payment

Procedural issues when a schedule change is proposed

Issues related to the Monthly Report

4-1 Assistance with Holding Steering Committee Meetings

For the effective implementation of the two projects, JICA Expert Team will assist the counterparts holding steering committee meetings where necessary information among the related parties can be shared.

4-2 Assistance with Coordination Work with Related Parties

4-2-2 Assistance with ensuring traffic safety and alleviating congestion

As the two construction sites are close to one another, traffic congestion may arise due to the increase of construction related vehicles. Moreover, when cruise vessels stay in the port, heavy congestion is anticipated. Effective coordination work with relevant parties is required to ensure that traffic flows smoothly. In addition to construction work to progress on schedule, working vessel will be managed properly.

5.1.5. Seventh Work in Vanuatu

1-4 Examination of Temporary Replacement Facilities for Domestic Wharf and Container Yard

1-4-2 Confirmation of replacement facility plan and schedule

It is necessary to make temporary relocation plans of the domestic wharf and container yard etc., and to complete the relocation of facilities before commencement of new wharf construction. The status of the relocation plans will be confirmed with the counterparts. JICA Expert Team will assist the counterparts if modifications to the plans are required.

1-5 Assistance for Maintaining Functions of the Existing Wharf and Development of the new International Wharf

1-5-1 Maintaining port operation in the existing wharf

The construction sites of the two projects are narrow and an increase in the number of vehicles using the access road is anticipated. Assistance will be given to the counterparts to ensure

that there is minimum interference with cargo handling and passenger transportation in the existing wharf.

1-6 Coordination with New Inter-island Shipping Support Wharf Development Project

1-6-3 Coordination works for efficient operation of the two new wharves

JICA Expert Team will support the Counterparts in carrying out the necessary coordination works to secure effective cargo and passenger transport between the new wharves.

1-7 Assistance for Enhancing Knowledge on Port Security and Disaster Prevention

JICA Expert Team will assist counterparts in enhancing knowledge on disaster prevention and minimizing damage from natural disasters. JICA Expert Team also will provide data and information on security requirements and assist in ensuring that ports comply with the ISPS code.

1-8 Assistance for Enhancing Knowledge on Port Management and Operation

JICA Expert Team will assist counterparts in forming an effective organization for port management and operation by utilizing public and private partnership.

1-9 Assistance for Enhancing Passenger Safety When Cruise Ship Call the Port

JICA Expert Team will assist counterparts to enhance cruise ship passenger traffic safety, as it is expected that the traffic congestion around the port area will worsen due to the increase of construction vehicles.

4-1 Assistance with Holding Steering Committee Meetings

For the effective implementation of the two projects, JICA Expert Team will assist the counterparts holding steering committee meetings where necessary information among the related parties can be shared.

4-2 Assistance with Coordination Work with Related Parties

4-2-2 Assistance with ensuring traffic safety and alleviating congestion

As the two construction sites are close to one another, traffic congestion may arise due to the increase of construction related vehicles. Effective coordination work with relevant parties is required to ensure that traffic flows smoothly.

5.1.6. Preparation of Progress Report 3

After completion of fifth work in Vanuatu, JICA Expert Team will prepare Progress Report 3 and submit to JICA.

5.1.7. Eighth Work in Vanuatu

1-4 Examination of Temporary Replacement Facilities for Domestic Wharf and Container Yard

1-4-2 Confirmation of replacement facility plan and schedule

It is necessary to make temporary relocation plans of the domestic wharf and container yard etc., and to complete the relocation of facilities before commencement of new wharf construction. The status of the relocation plans will be confirmed with the counterparts. JICA Expert Team will assist the counterparts if modifications to the plans are required.

1-5 Assistance for Maintaining Functions of the Existing Wharf and Development of the new International Wharf

1-5-1 Maintaining port operation in the existing wharf

The construction sites of the two projects are narrow and an increase in the number of vehicles using the access road is anticipated. Assistance will be given to the counterparts to ensure that there is minimum interference with cargo handling and passenger transportation in the existing wharf.

1-6 Coordination with New Inter-island Shipping Support Wharf development Project for Efficient new International Multi-purpose Wharf Development

1-6-3 Coordination works for efficient operation of the two new wharves

JICA Expert Team will support the Counterparts in carrying out the necessary coordination works to secure effective cargo and passenger transport between the new wharves.

1-8 Assistance for Enhancing Knowledge on Port Management and Operation

JICA Expert Team will assist counterparts in forming an effective organization for port management and operation by utilizing public and private partnership.

1-9 Assistance for Enhancing Passenger Safety When Cruise Ship Call the Port

JICA Expert Team will assist counterparts to enhance cruise ship passenger traffic safety, as it is expected that the traffic congestion around the port area will worsen due to the increase of construction vehicles.

3-4 Assistance with Fund Management

The team will provide guidance on the following issues.

- Issues related to utilizing the remaining portion of the contingency

- Issues related to the repayment plan

- Issues related to the completion report of the project

3-5 Assistance for Enhancing Knowledge on Loan Repayment Procedures

JICA Expert Team will assist counterparts in enhancing knowledge on loan repayment procedures and fundamental factors, for example, the relation between container cargo handling volume and port tariff.

4-1 Assistance with Holding Steering Committee Meetings

JICA Expert Team will assist counterparts to hold steering committee to summarize projects among the related parties.

5.1.8. Ninth Work in Vanuatu

1-6 Coordination with New Inter-island Shipping Support Wharf development Project for Efficient new International Multi-purpose Wharf Development

1-6-3 Coordination works for efficient operation of the two new wharves

JICA Expert Team will support the Counterparts in carrying out the necessary coordination works to secure effective cargo and passenger transport between the new wharves.

2-3 Assistance with Implementation of Environmental Consideration Measures

Contents of the Environmental Management Monitoring Plan in the operation phase will be reviewed. Since long-term monitoring of coral and water quality is expected to be conducted by the Water Resources Department and the Fisheries Department, advice on the demarcation maintaining tasks will be given by JICA Expert Team to ensure sustainable implementation of the program.

2-4 Assistance with Implementation of the Environmental Management Monitoring Plan

Upon completion of construction works, the expert team will assess whether the Environmental Management Monitoring Plan was properly carried out in collaboration with the Counterparts. Items which should be included in the Environmental Management Monitoring Plan for the operation phase will be identified and assistance will be given to the Counterparts to ensure that the plan will be properly implemented.

3-4 Assistance with Fund Management

The team will provide guidance on the following issues.

Issues related to utilizing the remaining portion of the contingency

Issues related to the repayment plan

Issues related to the completion report of the project

3-5 Assistance for Enhancing Knowledge on Loan Repayment Procedures

JICA Expert Team will assist counterparts in enhancing knowledge on loan repayment procedures and fundamental factors, for example, the relation between container cargo handling volume and port tariff.

4-1 Assistance with Holding Steering Committee Meetings

JICA Expert Team will assist counterparts to hold steering committee to summarize projects among the related parties.

5.1.9. Tenth Work in Vanuatu

2-3 Assistance with Implementation of Environmental Consideration Measures

2-3-4 Assistance with implementation of Coral Offset Program (additional task)

• During the mission on supervision of the social and environmental consideration in March 2017, insufficient effect of mitigation measures for coral was realized, due to the 40% of breaching of transplanted corals, while 8-10% of natural corals. According to the Department of Fisheries, it was considered as a natural phenomenon due to world-wide high-water temperature and it was expected to recover naturally, because the phenomenon was observed in the entire bay of Port Vila, the epiphytic ratio is normally low.

Since the additional area of 81m² was planned to be reclaimed to secure the additional area for dredged materials, further mitigation measures also had to be considered.

• Under the circumstances mentioned above, a new idea of mitigation measures, setting of coral conservation area (Coral Offset area) and conducting monitoring, was proposed by JICA.

• In the 10th dispatch, questionnaire survey was conducted, to know the unitization of the candidate sites of the Coral Offset area by the local communities. The analysis was conducted by JICA, Credit Risk Analysis and Environmental Review Department.

5.1.10. Eleventh Work in Vanuatu

1-10 Preparation of Technical Cooperation for Effective Management and Operation of Lapetasi Wharf (additional task)

JICA Expert Team will prepare Terms of Reference (TOR) for technical cooperation project to enhance the function of public maritime sector of Vanuatu to maximize Lapetasi Wharf function.

2-3 Assistance with Implementation of Environmental Consideration Measures

2-3-4 Assistance with implementation of Coral Offset Program (additional task)

• • In the 11th dispatch, additional questionnaire to supplement the result of the previous survey, the utilization of the Lapetasi area, was conducted. Also following activities were performed.

- Confirmation of procedure for designation of the Offset area,
- Confirmation of the monitoring and management plan of Ifira, and
- Preparation of buoys and sign boards, which will be installed in the future.

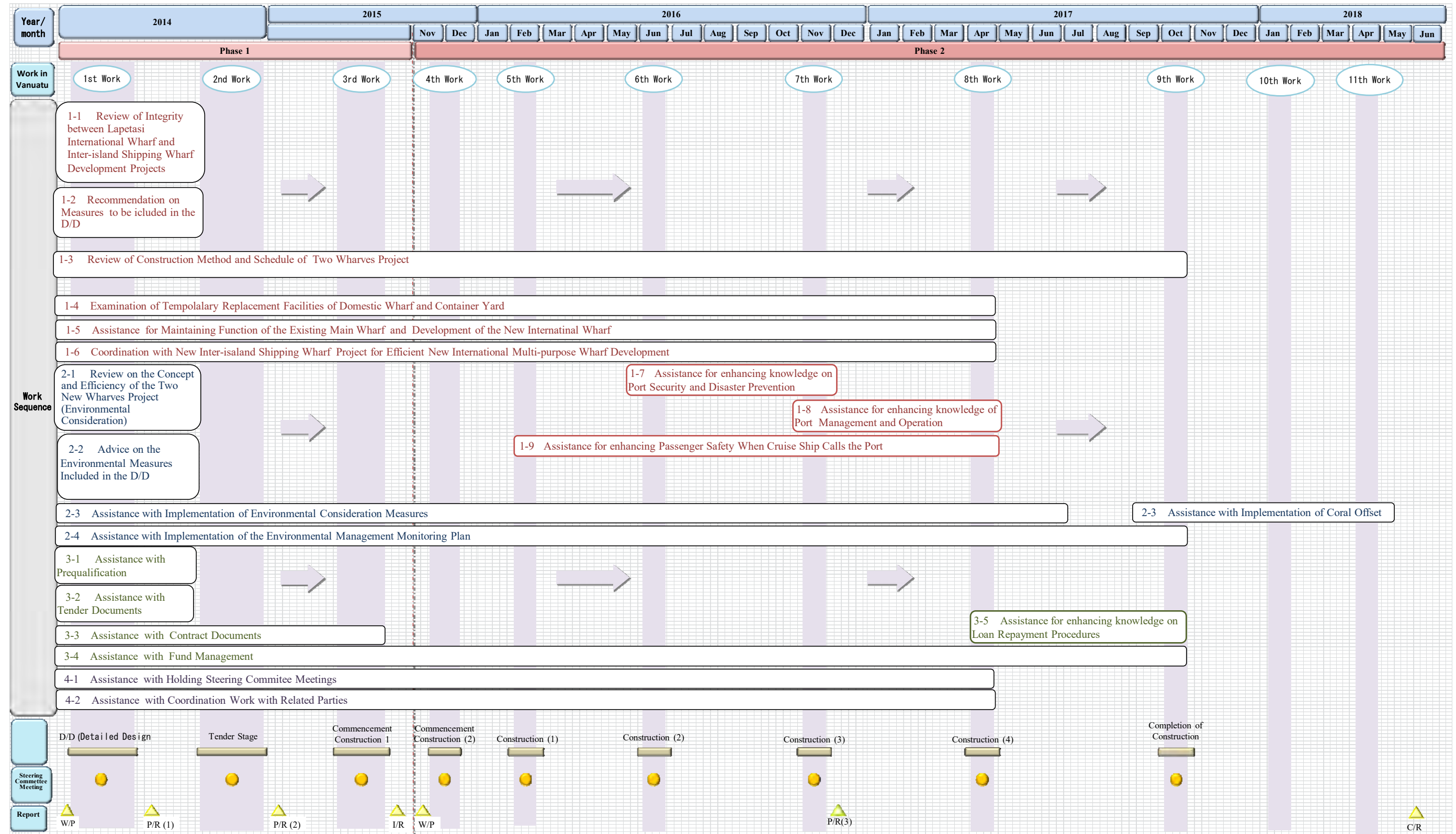
5.1.11. Wrap-up Work in Japan

— Preparation of Work Completion Report

After the work in Vanuatu is completed, JICA expert team will prepare Work Completion Report and submit it to JICA. Work Completion Report is comprised of 1) Outline of Work, 2) Record of Work Activity, 3) Issues and Countermeasures in the Project Implementation, 4) Lessons Learned and Proposal, and so on.

5.3. Work Flow Chart

Phase 2 work flow is shown in below.



5.4. Detailed Work Schedule in Vanuatu

Detailed work schedule in Vanuatu is shown in below table.

(1) Fourth Work in Vanuatu November 16 – December 5 in 2015

			AM	PM
November	16	Mon		
	17	Tue		Arrival at Port Vila
	18	Wed	9:00 Meeting at VPMU, 11:00 Meeting at JICA office	14:00 Meeting with ECOH consultant
	19	Thu	8:00 Meeting at VPMU, 11:30 Meeting about VISSP channel relocation at VPMU	16:00 Meeting at Main Wharf
	20	Fri		
	21	Sat		
	22	Sun		
	23	Mon	9:00 Meeting at VPMU	14:00 Weekly Meeting at VPMU, 16:00 VISSP interface meeting at VPMU
	24	Tue		16:30 Meeting at VPMU (CHE)
	25	Wed		
	26	Thu	10:00 Site safety patrol	
	27	Fri		
	28	Sat		
	29	Sun		
	30	Mon	Public Holiday	
December	1	Tue		14:00 Weekly Meeting at VPMU
	2	Wed		
	3	Thu		Report to JICA Office
	4	Fri	Leave from Port Vila	
	5	Sat		

(2) Fifth Work in Vanuatu February, 20 – March, 26 in 2016

			AM	PM
February	20	Sat		
	21	Sun		Arrival at Port Vila
	22	Mon	Public Holiday	
	23	Tue		14:00 Weekly Meeting at MIPU, 17:00 JICA Office
	24	Wed	10:00 Steering Committee Meeting at VPMU	15:30 Meeting with SV at Main Wharf
	25	Thu	9:00 Safety Committee Meeting	
	26	Fri	8:30 Cruise Ship arrival observation	
	27	Sat		
	28	Sun		
	29	Mon		14:00 Weekly Meeting at Site Office
March	1	Tue		14:00 Interface Meeting with VISSP and VTIP at Site Office
	2	Wed	10:00 Steering Committee Meeting at VPMU	
	3	Thu		
	4	Fri		
	5	Sat	Public Holiday	
	6	Sun		
	7	Mon		14:00 Weekly Meeting at Site Office
	8	Tue	9:30 Site Observation at Container Yard and Main wharf	
	9	Wed	8:30 Interface Meeting with VISSP	
	10	Thu	9:00 Meeting with Fishery Department	14:00 Meeting with DOE, 16:30 Meeting with JICA office
	11	Fri		
	12	Sat		
	13	Sun		
	14	Mon		14:00 Weekly Meeting at Site Office
	15	Tue		
	16	Wed	11:30 Meeting with JICA Office	
	17	Thu		
18	Fri	9:00 Site Meeting	15:00 Site Survey by the Minister of Land Infrastructure of Republic of Vanuatu	
19	Sat			
20	Sun			
21	Mon		14:00 Weekly Meeting at Site Office	
22	Tue			
23	Wed			
24	Thu	9:00 Weekly Meeting at Site Office 9:30 Safety Committee Meeting & Site Patrol	15:30 Meeting with JICA Office	
25	Fri	Good Friday	Leave from Port Vila	
26	Sat			

(3) Sixth Work in Vanuatu July, 30 – August, 21 in 2016

			AM	PM
July	30	Sat		
	31	Sun		Arrival at Port Vila
August	1	Mon	Public Holiday	
	2	Tue		14:00 Site Vist, 16:30 Meeting at JICA Office
	3	Wed	10:00 Steering Committee Meeting at VPMU	14:00 Weekly Meeting at Site Office
	4	Thu	11:00 Main Wharf activity observation	16:00 Clean fill site observation
	5	Fri		
	6	Sat		
	7	Sun		
	8	Mon		14:00 Weekly Meeting at Site Office
	9	Tue		
	10	Wed	10:00 Main Wharf activity observation	
	11	Thu	8:30 Meeting with PDW regarding Building Permit 9:00 Work Shop	16:30 Meeting at JICA Office
	12	Fri	9:00 Meeting with VFD regarding coral monitoring	
	13	Sat		
	14	Sun		
	15	Mon	Public Holiday	
	16	Tue		14:00 Weekly Meeting at Site Office
	17	Wed		
	18	Thu	9:00 Meeting with DEPC regarding EIA for the temporal wharf.	14:00 Meeting with Port Villa Municiparity regarding Building Permit 16:30 Meeting at JICA Office
	19	Fri		
	20	Sat		Leave from Port Vila
	21	Sun		

(4) Seventh Work in Vanuatu October, 29 – November, 26 in 2016

			AM	PM
October	29	Sat		Leave to Vanuatu
	30	Sun		Arrival at Port Vila
	31	Mon	10:00 VPMU Meeting	14:00 Weekly Meeting at Site Office, 16:00 JICA Office
November	1	Tue		
	2	Wed	8:00 Ports and Marine Dep. 10:00 Meeting with ECOH	
	3	Thu		
	4	Fri	10:30 Meeting with SV at Main Wharf	14:00 Meeting with ECOH for Design Change
	5	Sat		
	6	Sun		
	7	Mon		14:00 Weekly Meeting, 14:30 Meeting for Design Change
	8	Tue		
	9	Wed	Move to Santo	14:00 Meeting with Harbour Master Santo and Site Visit
	10	Thu		13:30 Meeting with Harbour Master Santo
	11	Fri	Return to Port Vila	14:00 Meeting with Harbour Master of Port Vila
	12	Sat		
	13	Sun		
	14	Mon		14:00 Meeting wit DEPC, 15:45 Weekly Meeting at Site Office
	15	Tue		14:00 Meeting with IPDS
	16	Wed	8:30 JICA President site Visit	
	17	Thu		13:30 Meeting for Design Change ,15:30 Meeting with DEPC
	18	Fri	9:00 Site Meeting, 10:00 Meeting with IPDS	14:00 Work Shop, 17:00 JICA office
	19	Sat		
	20	Sun		
	21	Mon		
	22	Tue	10:00 Meeting with Ports & marine Dep.	
	23	Wed	8:00 Meeting with ECOH for Design Change	14:00 Weekly Meeting at Site Office
	24	Thu		16:30 VPMU Meeting, 17:30 JICA Office
	25	Fri	Leave from Port Vila	
	26	Sat	Arrive at Tokyo	

(5) Eighth Work in Vanuatu April, 1 – April ,27 in 2017

			AM	PM
April	1	Sat		Leave from Japan
	2	Sun		Arrive at Port Vila
	3	Mon		
	4	Tue	9:00 Meeting with ECOH, 10:00 Meeting with VPMU, 11:00 Meeting at JICA office	
	5	Wed	10:00 Steering Committee meeting (Cancelled)	14:00 Meeting at JICA office
	6	Thu	9:00 Meeting at MIPU office	14:00 Meeting at Ports & Marine Department
	7	Fri	9:00 Weekly meeting	
	8	Sat		Cyclone
	9	Sun		Cyclone
	10	Mon		14:00 Meeting in VPMU
	11	Tue		
	12	Wed	10:00 Main Wharf Cruise ship Observation	
	13	Thu	9:00 Weekly meeting , 11:00 Meeting with MIPU	14:00 Meeting with Main Wharf
	14	Fri	Good Friday	
	15	Sat		
	16	Sun		
	17	Mon	Easter Monday	
	18	Tue	9:00 Main Wharf Cruise ship Observation	14:00 Meeting at Ports & Marine Department (Cancelled)
	19	Wed		13:45 Meeting with Ports & Marine Dep., 14:30 Immigration office
	20	Thu	10:00 Meeting with MoF (Cancelled)	
	21	Fri	9:00 Weekly meeting	13:30 JICA TV meeting about environmental monitoring
	22	Sat		
	23	Sun		
	24	Mon		14:00 Meeting with MOF
	25	Tue	9:30 Meeting with VPMU	3:00 Site Observation
	26	Wed	8:15 JICA office meeting	Leave from Port Vila
	27	Thu	Arrive at Tokyo	

(6) Ninth Work in Vanuatu October ,1 – November, 5 in 2017

		AM	PM
1	Sun		Leave from Japan
2	Mon		Arrive at Port Vila
3	Tue	10:00 Meeting at VPMU	14:00 Site Visit and Weekly Meeting,, 15:30 Meeting with IPDS, 16:30 Meeting at JICA Office
4	Wed		13:30 SiteVisit, 16:00 Meeting at VPMU
5	Thu	Public Holiday	
6	Fri	9:00 MOF, 10:00 MIPU	
7	Sat		
8	Sun		
9	Mon	9:30 Ports and Marine Dep.	14:00 Weekly Meeting, 15:30 MOF, 16:30 VPMU
10	Tue	10:30 TV meeting at JICA Office	14:00 RMO
11	Wed		
12	Thu	9:00 Cruise Ship port security observation	
13	Fri		
14	Sat		
15	Sun		
16	Mon	9:00 DOF, 10:00 MIPU DG	14:30 Weekly Meeting,
17	Tue	9:00 DOF	14:30 VPMU meeting with Director
18	Wed	9:00 Land side Survey for offset monitoring	13:30 DOE
19	Thu	8:30 MOF, 9:30 VPMU meeting,	13:00 DOF, 14:00 Land side Survey
20	Fri	9:00 Underwater Survey for offset monitoring	14:00 Site Inspection
21	Sat	10:00 Interview Survey	
22	Sun		
23	Mon	9:00 MIPU, 10:30 DOE	14:30 Weekly Meeting,
24	Tue	9:00 Underwater Survey for offset monitoring	
25	Wed	11:00 JICA office 9:00 Underwater Survey for offset monitoring	
26	Thu	10:00 Questionnaire survey at local village, Mangiliu,	
27	Fri	9:30 Rapup meeting with VPMU, DEPC, VDF	
28	Sat		
29	Sun		
30	Mon		14:30 Weekly Meeting
31	Tue	9:00 Meeting with Department of water Resources	
1	Wed	8:30 Meeting with Department of Environmental Protection and Conservation	
2	Thu	11:00 Meeting with Department of Fisheries	14:00 Meeting with Ifira Marine Management
3	Fri		15:00 Reporting to JICA Vanuatu Office
4	Sat		Leave from Port Vila
5	Sun	Arrive at Tokyo	

(7) Tenth Work in Vanuatu January, 9 – January, 18 in 2018

			AM	PM
January	1	Mon		
	2	Tue		
	3	Wed		
	4	Thu		
	5	Fri		
	6	Sat		
	7	Sun		
	8	Mon		
	9	Tue		Leaving Japan
	10	Wed		Arrival at Port Vila
	11	Thu	9:30 Meeting with VPMU, DOE, SPREP	14:00 Meeting with VPMU
	12	Fri	9:00 Preparation of questionnaire survey	14:00 Preparation of questionnaire survey
	13	Sat		
	14	Sun		
	15	Mon	9:00 Orientation of questionnair survey	13:00 Questionnaire survey
	16	Tue	9:00 Questionnaire survey	13:00 Questionnaire survey
	17	Wed	9:00 Questionnaire survey	Leaving Port Vila
	18	Thu	Arrival at Japan	
	19	Fri		
	20	Sat		
	21	Sun		
	22	Mon		
	23	Tue		
	24	Wed		
	25	Thu		
	26	Fri		
	27	Sat		
	28	Sun		
	29	Mon		
	30	Tue		
	31	Wed		

(8) Eleventh Work in Vanuatu April ,7 – June,10 in 2018

			AM	PM
April	1	Sun		
	2	Mon		
	3	Tue		
	4	Wed		
	5	Thu		
	6	Fri		
	7	Sat		Leaving Japan
	8	Sun		Arrival at Port Vila
	9	Mon	8:00 VPMU, 10:30 JICA Office	13:30 Main Wharf and VISSP site observation
	10	Tue	10:00 IPDS and Lapetasi Wharf site observation	15:00 Site Visit of temporary wharf
	11	Wed	10:00 OMR	
	12	Thu	10:00 Ports & Marine Department	
	13	Fri	9:00 Pots & Marine Department	
	14	Sat		
	15	Sun		
	16	Mon	9:00 MIPU, 10:00 OMR, 11:00 JICA office	
	17	Tue		
	18	Wed	10:00 OMR, 11:00 JICA Office	
	19	Thu	10:00 VPMU	16:00 JICA Office
	20	Fri		Leaving Port Vila
	21	Sat	Arrival at Japan	
	22	Sun		
	23	Mon		
	24	Tue		
	25	Wed		
	26	Thu		
	27	Fri		
	28	Sat		
	29	Sun		
	30	Mon		

			AM	PM
May	18	Fri		
	19	Sat		Leaving Japan
	20	Sun		Arrival at Port Vila
	21	Mon	9:00 Meeting with VPMU	16:00 Meeting with JICA
	22	Tue	9:00 Questionnaire Survey	13:00 Questionnaire Survey
	23	Wed		14:00 Meeting with Department of Fishery
	24	Thu		15:00 Meeting with Department of Environment, Protection and Conservation (DEPC)
	25	Fri	10:00 Meeting with DEPC	13:00 Meeting with service providers for sign board
	26	Sat		
	27	Sun		
	28	Mon	10:00 Meeting with DEPC	
	29	Tue	10:00 Meeting with DEPC	
	30	Wed	11:00 Meeting with JICA	
	31	Thu	9:30 Stakeholder Meeting	13:00 Meeting with Department of Water Resources
			AM	PM
June	1	Fri	10:00 Meeting with DEPC	
	2	Sat		
	3	Sun		
	4	Mon		13:00 Meeting with service providers for sign board
	5	Tue	10:00 Visiting fishing gear shop for quotation of buoy and rope	13:00 Meeting with service providers for sign board
	6	Wed	10:00 Meeting with DOF	
	7	Thu	10:00 Meeting with DEPC	
	8	Fri		16:00 Meeting with JICA
	9	Sat		Leaving Vanuatu
	10	Sun	Arrival at Japan	
	11	Mon		

5.5. Work Sequence and Progress

5.5.1. Phase2 Work in Vanuatu

In the table below, details of tasks to be undertaken by the JICA expert team are shown in the left column and current state of progress of phase 2 is shown in the right column.

1-3 Review of Construction Method and Schedule of Two Wharves Project	
1-3-2 Review of construction method and schedule of new inter-island shipping support wharf project	
<p>• Due to the change in the location of the access channel for the VISSP site, dredging work of 50,000m³ work would be necessary and a disposal method of the dredged soil has to be determined.</p>	<p>According to the VISSP project consultant, the dredged soil consists of sand and coral. Therefore, 25,000 m³ of the dredged soil can be used for terminal reclamation and 5,000 m³ for land fill up. A disposal area for the remaining dredged soil needs to be secured.</p> <p>As the dredging method and construction schedule of the two projects are different, who bears responsibility for quality management, safety management and schedule management should be clearly defined. It was necessary to secure a deposit area for the VISSP project. Therefore, a new 5,000 m² deposit area for VISSP project was developed between VISSP project site and Lapetasi project site.</p> <p>In response to this change, the Lapetasi deposit area sea side wall had to be shifted parallel to the north to secure the necessary deposit volume for dredging.</p>
1-4 Examination of a Temporary Replacement Facility for the Domestic Wharf during Implementation of the new International Wharf Improvement Project	
1-4-2 Confirmation of situation for problem solving	
<p>The JICA expert team will confirm the implementation status of the temporary domestic jetty facility plan and temporary container yard plan, and will assist the counterparts in adjusting the plans when necessary.</p>	<p><u>Confirm the current condition of temporary domestic wharf:</u></p> <p>Many small boats are calling to load/unload various cargoes such as daily necessities; no major problems are observed.</p> <p>From the viewpoint of safety, it would be desirable to</p>

	<p>install a simple guard (such as a rope or a plastic bar) that restricts the access of persons other than concerned parties. The JICA expert team confirmed that the cargo handling area on the land side of the temporary domestic jetty facility is small, but no major problems have been reported.</p> <p><u>Status of Temporary Container Storage Area</u></p> <p>The construction of the domestic wharf began in earnest in 2016, and at the same time, equipment and materials for construction were carried using containers. Accordingly, the container handling volume at the Main Wharf temporarily increased.</p> <p>As a result, the storage area for laden and empty containers became insufficient. Therefore, both sides of the Main Road from the Lapetasi multipurpose wharf under construction to Main Wharf have been used as temporary storage areas. VPMU, the consultant, IPDS and their contractors agreed that 5,000 m² of the deposit area for dredging materials and 6,000 m² of the yard which will become the container storage area of the Lapetasi international multi-purpose wharf under construction could be used as a temporary storage area for IPDS. As a result, there are five container storage areas which IPDS can use with a total storage capacity of about 1,500 TEUs. The five container storage area are follows;</p> <p>1. Main Wharf, 2. Disposal area for Dredging Material (Lapetasi wharf), 3. New Storage Yard (Lapetasi wharf), 4. NUMBATRI (Empty Container Storage Area), 5. Main Road</p> <p>As a result, if container handling volume does not increase greatly in the future, it is judged that shortage of container storage area will not occur.</p>
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1-5 Assistance for Maintaining Functions of the Existing Wharf and Development of the new International Wharf

1-5-1 Maintaining port operation in the existing wharf

<ul style="list-style-type: none"> • The construction sites of the two projects are 	<p>In the above-mentioned five container storage areas,</p>
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<p>narrow and close to each other. The access road to the project sites is also narrow. As construction progresses, an increase in the number of vehicles using the access road is anticipated. Therefore, necessary support will be given to the counterparts to ensure that there is minimum interference with cargo handling and passenger transportation in the existing wharf.</p>	<p>storing laden containers on both sides of Main Road has the least priority.</p> <p>The JICA expert team provided guidance to IPDS on how to stack containers to ensure the safety of cruise ship passengers, taxis, buses and general cars on the road is given top priority when stacking containers on both sides of Main Road during the construction period.</p> <p>(Refer to APPENDIX, "Recommendation on Container Storage during the construction of Container Yard".)</p> <p>IPDS has agreed with the recommendation of the JICA expert team and has proposed alternative ways of stacking containers in consideration of safety of passengers, taxis, small buses, etc. at the Main Road. IPDS is also considering the safety of passengers, taxis, small buses, etc. at the Main Road.</p>
<p>During the construction of the Lapetasi Wharf, the JICA expert team will recommend that the layout of the Main Wharf be altered so that it can be used as a temporary storage facility for containers; the JICA expert team will also provide guidance on confirming the container storage capacity and securing a safe passage for passengers of cruise ships that call at regular intervals.</p>	<p>Using the terminal operation system "TMSPro" which will be introduced from the end of December 2017, IPDS will start management of all five temporary container storage areas including the Main Wharf (the layout of each storage area needs to be prepared).</p> <p>IPDS intends to manage the carry-in containers (Laden containers) in block units (about 100 to 200 containers per block) during the construction period of the Lapetasi wharf.</p> <p>For the time being, IPDS also plans to perform temporary storage management of the Lapetasi Multi-purpose Wharf in block units, and start the management by "TMSpro" (also preparing the layout of each storage area).</p> <p>The JICA expert team judges that there will be no problem provided that the IPDS implementation plan is correctly followed.</p>
<p>Based on the layout of the Lapetasi international wharf, the JICA expert team will provide guidance on securing an efficient container storage area as an international container yard and securing maintenance space for cargo handling equipment.</p>	<p>Since IPDS is reviewing the layout of the container storage area in an attempt to increase efficiency, the JICA expert team will examine the layout at the next visit and offer guidance as necessary. The maintenance space for cargo handling equipment has already been secured and it is judged that there is no problem with the maintenance of the container handling machines</p>

	such as 4 sets of Reach stackers and Straddle trucks.
<p>The JICA expert team will offer advice for establishing a traffic control management system for the Main Road between the Main Wharf and Star Wharf.</p>	<p><u>Transport capacity of Main Road between Main Wharf and Star Wharf:</u> As described in 1-4-2 above, IPDS has secured 5,000 m² of the deposit area of dredging materials and 6,000 m² of the container yard of the Lapetasi International Multi-purpose Wharf as a temporary storage area. Transportation distance of empty containers will be about 1/6 of the present transport distance between NAMBATRI and Main Wharf. The JICA expert team judged that the transportation work of containers can be carried out during times other than the berthing time (AM 7: 00 to PM 5: 00) of the cruise ship. In addition, the number of tiers of empty containers was increased from 3-stacks at NAMBATRI to 6-stacks at the deposit area (5,000m²) of dredging materials. As a result the total storage volume has been increased.</p>

<p>1-6 Coordination with New Inter-island Shipping Support Wharf development Project for Efficient New International Multi-purpose Wharf Development</p>	
<p>1-6-3 Coordination works for efficient operation of the two new wharves</p>	
<p>• JICA expert team will support the Counterparts in carrying out the necessary coordination works to secure effective cargo and passenger transport between the two new wharves. As the two new wharves are close to one another, the possibility of sharing basic components (such as a parking lot, access road etc.) will be examined</p>	<p>Land boundaries of the two facilities have been settled and access roads have been arranged. The maximum gradient of the access road of the new domestic wharf is around 6.8 percent, a fairly steep gradient. Also, a study on soil-filled protection structures needs to be carried out because the road will be constructed using filling soil. A wider land area may be required depending on the structure.</p>

<p>1-7 Assistance for Enhancing Knowledge on Port Security and Disaster Prevention</p>	
<p>JICA Expert team will assist counterparts in enhancing knowledge on disaster prevention and minimizing damage from natural disasters. Expert team also will provide data and information on security requirements and</p>	<p>VPMU and JICA Expert team held two workshops for enhancing knowledge for disaster prevention and minimizing damage from natural disasters and port security knowledge to comply with the ISPS code. The 1st Work shop was held on 11th of August 2016</p>

<p>assist in ensuring that ports comply with the ISPS code.</p>	<p>and 2nd was on 18th of November 2016.</p> <p>Expert team presented the current situation and identified issues of Vanuatu’s international port security condition in the 2nd work shop. Expert team member surveyed the development situation and port facility security condition of the Main wharf in Santo, Main Wharf in Port Vila and Lapetasi international multipurpose wharf.</p> <p>Details of the two workshops are described in APPENDIX.</p>
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<p>1-8 Assistance for Enhancing Knowledge on Port Management and Operation</p>	
<p>JICA Expert team will assist counterparts in forming an effective organization for port management and operation by utilizing public and private partnership.</p>	<p>JICA Expert team explained the necessity of appropriate role sharing and cooperation with the Ports & Marine Department and IPDS for effective port management and operation as well as port security. Expert team will assist in forming an effective organization and promoting collaboration with the Ports & Marine Department and IPDS for port security control.</p> <p>JICA Expert team made suggestion to MIPU、Ports & Marine Department、Ministry of Finance and Economic Management Treasury Division of MIPU (Ministry of Infrastructure & Public Utilities) and IPDS role share for port security measures, port safety measures, port activity reporting, traffic improvement, contingency planning at the eighth work in Vanuatu.</p>

<p>1-9 Assistance for Enhancing Passenger Safety When Cruise Ship Call the Port</p>	
<p>As the number of construction vehicles increases, traffic congestion is expected to occur when cruise ships berth at the port. Accordingly, the JICA expert team will offer assistance for enhancing the safety of passengers of cruise ships.</p>	<p>According to Harbor Master of PMD (Port Marine Department), the safety of passengers during berthing of a cruise ship is secured as follows. PMD has increased the number of Security personnel from five to ten persons as of November 2016.</p> <p><Department and number of persons in charge of Security of the Main Wharf>:</p> <p>1) Pilot and guard of the cruise ship from the offshore to the wharf: Port Marine Department (PMD), Pilot</p>

	<p>boat</p> <p>2) Security on the Main Wharf when passengers are disembarking:</p> <ul style="list-style-type: none"> · Port Marine Department (PMD) (MIPU): 3 persons · Security assistants: 7 persons (dispatched from IWS, a subsidiary of Ifira group) <p>3) Set-up and removal of rope at the apron and on the Main Wharf: 8 people, a subsidiary of SSS, is in charge.</p> <p>4) Regarding the security of the Main Wharf (PMD's work)</p> <p>1 gang: 3 persons, 3 gangs (total of 9 people), 3 shifts, 24 hour system, AM 7: 40 ~ PM 5: 00 (1 gang is in charge of 8 hours)</p> <p>5) Others:</p> <p>Mooring work on cruise ship: 4 persons (Line-Man)</p> <p><PMD's work></p> <p>1) Ensuring safety of the apron and exit for passengers beside the PMD of the Main Wharf:</p> <p>The JICA expert team believes that the safety of passengers around the apron has been adequately secured. PMD increased the number of guards since September 2015. They check the persons approaching the apron from the land side in Main Wharf.</p> <p>2) Securing the entrances of both sides of Wharf: 2 security personnel in charge.</p> <p>Protection of the main gate on the east side:</p> <p>Many agents of taxies enter through the gate and compete for the acquisition of passengers of a cruise ship. Security at the entrance of the mama's market in main Wharf is necessary apart from the guard of the gate.</p> <p>The JICA expert team will request the harbor master of PMD to make improvements during the next visit and propose limitations on agents of taxies, and also review the number of guards.</p> <p>Protection of the entrance of the west side (far side):</p> <p>Two security personnel are in charge. This is the waiting area of small busses of travel agencies. The JICA Expert Team believes that safety is not a problem</p>
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	<p>here.</p> <p>3) Securing safety within the mama's market: A scramble for passengers is expected to occur when agents of taxies enter the area during periods of congestion. It is necessary to enhance patrol security. JICA Expert Team reviewed the "Cruise-Passenger Walkway Layout of Main Wharf (Plan A)" (Refer to APPENDIX.) and explained it and proposed countermeasures to PMD.</p>
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1-10 Preparation Work of Technical Cooperation Project for Effective Management and Operation of Lapetasi Wharf (additional work)	
<ul style="list-style-type: none"> • JICA Expert team will prepare the Terms of Reference (TOR) for technical cooperation to enhance the function of public maritime sector of Vanuatu to maximize Lapetasi Wharf function. 	<p>JICA Expert team prepared the TOR of technical cooperation to enhance the function of Office of Maritime Regulator (OMR) and explained to Vanuatu Government. Director of MIPU agreed the contents of TOR and promised to apply officially to request Japanese Government.</p>

2-3 Assistance with Implementation of Environmental Consideration Measures	
<ul style="list-style-type: none"> • To mitigate any impact to the natural environment, the JICA expert team will propose environmental consideration measures. 	
2-3-3 Monitoring of transplanted corals	
<ul style="list-style-type: none"> • Transplanted corals will be monitored in cooperation with the Department of Fisheries. In case any adverse effects on the coral are observed due to the construction, countermeasures will be introduced. • Transplanted coral communities should be stable within several months following transplantation; monitoring will be carried out. In case overgrowth of algae or invasion of predators is observed, countermeasures will be introduced. 	<p>At the beginning of 2016, VPMU signed MOU with the Department of Fisheries to conduct the monitoring of transplanted corals, remaining corals, and natural corals in the bay as controls. The monitoring was conducted in June 2016 (6 months after the transplant), in September 2016 (9 months after) and on March 2017 (15 months after), respectively.</p> <p>Since the submission of the monitoring reports by the Department of Fisheries (DOF) was delayed during 2017, the coral status was not confirmed in detail.</p> <p>According to the interview with DOF, the status, such as the transplanted coral and growth of seaweed, was normal during 2016. From the beginning of 2017, however, coral breaching started due to worldwide seawater temperature increasing. DOF assumed this</p>

	<p>phenomenon would recover naturally.</p> <p>During the mission on supervision of the social and environmental considerations in March 2017, insufficient effects of mitigation measures for coral was realized, due to 40% of breaching of transplanted corals, and 8-10% of natural corals. Therefore, JICA decided to revise the coral monitoring plan to analyze the cause of the impact to the transplanted corals.</p> <p>In addition to that, an additional coral area was planned to be reclaimed to secure an additional area for dredged materials in December 2016. And further mitigation measures also had to be considered.</p> <p>Under the circumstances mentioned above, a new idea of mitigation measures, setting of coral conservation area (Coral Offset area) and conducting monitoring, was proposed by JICA.</p>
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2-3-4 Measures against turbidity dispersion

<p>• Regarding marine construction work such as dredging, measures being taken against turbidity dispersion (e.g. silt curtain) will be confirmed. In case measures are deemed inadequate, new countermeasures will be discussed and implemented.</p>	<p>Environmental monitoring report is submitted by the contractor every month. According to the reports, turbidity dispersion is limited within the silt curtains even during dredging work and any impact by the construction is not observed around the construction area.</p> <p>However, a reporting system to JICA by VPMU through MIPU has not established. Thus, the procedure for reporting to JICA was discussed within VPMU.</p>
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2-4 Assistance with Implementation of the Environmental Management Monitoring Plan

2-4-2 Monitoring the implementation of the Environmental Management and Monitoring Plan

<p>• Monitoring to confirm whether the project is managed based on the Environmental Management and Monitoring Plan (EMMP) will be conducted. If undesirable management is realized, correction measures will be discussed and implemented.</p>	<p>Based on the EMMP, monitoring report is supposed to be submitted to JICA regularly, via MIPU from VPMU. However, VPMU staff were apparently unaware of this procedure. Therefore, the submission procedure of the monitoring report was discussed and shared among VPMU staff.</p> <p>Regarding long-term monitoring, water quality monitoring by the Department of Environment and coral monitoring by the Department of Fisheries are</p>
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	<p>scheduled. In October 2016, VPMU signed a MOU with the Department of Fisheries for coral monitoring, including budget securing.</p> <p>According to the interview with the Department of Environment, they plan to conduct water quality monitoring by their own budget.</p>
<p>• Since the VISSP project site is located in the vicinity of the Lapetasi Wharf Project area, effective measures should be taken to avoid adverse effects. The team will assist VPMU in conducting overall management of the environment.</p>	<p>It was confirmed that the EMMPs of the two projects are fairly similar.</p> <p>For the purpose of environmental monitoring, the areas of the two projects will be treated as one area.</p> <p>However, the EMMP on sea route dredging by VISSP has not been prepared yet due to the delay of the plan. The EMMP will be evaluated once it becomes available.</p>

<p>3-4 Assistance in fund management and related procedure</p>	
<p>JICA Expert team will confirm the fund plan of VPMU and the way how the money is spent. If there is some difficulty in using JICA fund, the team will contact JICA and will advise necessary solutions.</p>	<p>VPMU has not created the monthly summary sheet for fund requirement and executed payment.</p> <p>When the payment amount foreseen in the future was asked by the Ministry of Finance on March, the person in charge of finance in VPMU asked the information to the team member.</p> <p>The team member provided the table of fund requirement that are prepared in January.</p> <p>The team member also advised VPMU should tell the consultant to submit latest version, since the design change should be taken into the table.</p>
<p>JICA Expert team will see whether the Visualization of fund management is conducted or not.</p> <p>The technic for the visualization of the fund management will be presented.</p>	<p>The responsible person is aware of the importance of comparing the planned payment and the paid amount. The own sheet paper is also useful.</p> <p>Electronic data is preferable to handwritten data as handwritten characters are sometimes unreadable and errors tend to occur. It is also more time-consuming.</p> <p>However, even in the case of electronic data, a person has to enter data into a personal computer. Data may not be entered in a timely manner if that person is absent (i.e. goes on vacation etc.). To ensure that does not happen, recording the data in a database through the internet is</p>

	<p>useful. By utilizing the internet, others can input the data when the person in charge is absent.</p> <p>Based on the above idea, the team prepared programs for recording payments in the database via the Internet. However, as VPMU became increasingly busy, the team was not able to effectively train VPMU personnel on the proper method for recording the payment data through the internet. As the result, the payment data was not stored in the VPMU's file.</p>
<p>JICA Expert team will confirm whether the VPMU is sending the periodical report to JICA. JICA Expert team will remind VPMU to send the reports in timely manner.</p>	<p>The progress report from the VPMU to JICA has not reached to JICA since the starting of the construction.</p> <p>The reports had been submitted to VPMU from the consultant, however, VPMU have not sent them.</p> <p>VPMU knows this but the action has not been taken. The team also reminded VPMU to send the progress report.</p>
<p>The repayment of the capital of the loan begins in 9 years. The workshop on the port tariff and the repayment will be planned.</p>	<p>After the grace period, the Vanuatu Government has to repay the principal of the Loan.</p> <p>However, based on cargo handling forecasts, it will be necessary to significantly raise port charges.</p> <p>JICA Expert Team held a seminar on the repayment issue in order to deepen understanding of the significance of this issue. However, there is a concern that knowledge acquired in the seminar will not be passed on to the next generation.</p> <p>Since the project will soon be completed, Vanuatu has to renew the concession agreement. JICA Expert Team proposed a mechanism to determine the port fee in the concession contract in which the port fee and the concession fee will be reviewed every two years to ensure sustainable port management and loan repayment.</p> <p>The draft of the concession agreement prepared by the team was submitted to VPMU, MIPU, Maritime Regulator, Ministry of Finance and Prime Minister's Office.</p>
<p>When the project meets the occasions such as the things inapplicable, design change, and additional survey, the team will consult with JICA and advice VPMU how to use the fund</p>	<p>The number of containers in the project site increased sharply in August.</p> <p>This may cause delay of the construction, because of the lack of the working space for construction.</p>

properly.	The container stacking spaces are urgently created at the dumping area to handle this situation.
If there is some delay in the documentation of VPMU, the team will assist expediting of the procedure.	<p>The Toa construction disclosed the delay of payment by VPMU and asked the VPMU to expedite the payment. However, VPMU think that its process has already finished.</p> <p>The reason of delay was that the JICA asked the portion of payment more clearly shown.</p> <p>The team will advise VPMU to ask consultant what portion has finished. And team will tell consultant to inform more about the portion for the payment.</p>
JICA Expert team will confirm whether the payment of the interest of the loan is delayed or not.	Whether the payment of the interest is conducted timely or not will be asked to JICA, and advise VPMU if there is some delay.

3-5 Deepening of understanding on the issues of repayment of the loan	
Repayment of the loan has close relations to cargo increase and the tariff. The understanding of the repayment issues will be deepened.	<p>JICA Expert Team held a seminar on the repayment issue.</p> <p>In addition to the seminar, the team submitted to the Vanuatu Government a draft concession agreement which includes the pricing system of the port tariffs so that the government does not have to allocate the general budget for the repayment.</p>

4-1 Assistance with Holding Steering Committee Meetings	
• For the effective implementation of the two projects, JICA Expert Team will assist the counterparts holding steering committee meetings where necessary information among the related parties can be shared.	The steering committee has been held periodically (every month) since April. Schedule of the meeting in 2015 has been fixed by VPMU.

4-2 Assistance with Coordination Work with Related Parties	
4-2-1 Effective use of surplus dredged material	
• Due to the change in the location of the access channel for the VISSP site, dredging work of 50,000m ³ work would be necessary and a disposal method of the dredged soil has	According to the VISSP project consultant, the dredged soil consists of sand and coral. Therefore, 25,000 m ³ of the dredged soil can be used for terminal reclamation and 5,000 m ³ for land fill up. A disposal area for the

<p>to be determined.</p>	<p>remaining dredged soil needs to be secured.</p> <p>As the dredging method and construction schedule of the two projects are different, who bears responsibility for quality management, safety management and schedule management should be clearly defined. It was necessary to secure a deposit area for the VISSP project. Therefore, a new 5,000 m² deposit area for VISSP project was developed between VISSP project site and Lapetasi project site.</p> <p>In response to this change, the Lapetasi deposit area sea side wall had to be shifted parallel to the north to secure the necessary deposit volume for dredging.</p>
<p>Lapetasi dredging soil deposit area needs to expand again to solve following problems which occurs in the course of project implementation.</p> <p>1st reason is that as the increase of container cargo handling volume and delay of empty container box return, IPDS needs additional 5,000 m² area of temporary container storage area in Lapetasi project site.</p> <p>2nd reason is that the filling soil volume from outside had increased as the dredged soil had found not to meet required quality in specification.</p>	<p>Another 28,000 m³ of dredging soil shall be disposed. Expansion of disposal area is only one possible solution to avoid schedule delay and cost impact.</p> <p>Obtaining of concurrence for design change of JICA is necessary.</p> <p>JICA Expert team assisted VPMU and consultant to prepare explanation report of necessity of design change and environmental impact of design change.</p> <p>DEPC (Department of Environmental Prevention and Conservation) accepted expansion of dredging soil deposit area after some discussions.</p> <p>As Environmental and Social Consideration Supervision Division of JICA also judged that expansion of dredging soil deposit area expansion would not make a significant impact to existing corals, second expansion.</p>
<p>4-2-2 Assistance with ensuring traffic safety and alleviating congestion</p>	
<p>As the two construction sites are close to one another, traffic congestion may arise due to the increase of construction related vehicles. Moreover, when cruise vessels stay in the port, heavy congestion is anticipated. Effective coordination work with relevant parties is required to ensure that traffic flows smoothly. In addition, for construction work to proceed on schedule, working vessels must be</p>	<p>Interface coordination between Lapetasi project and VISSP project is necessary and important. However, no technical data has been provided from VISSP project contractor and consultant.</p> <p>Although the original completion time of the VISSP project was scheduled for October 2016, actual completion time is unknown.</p> <p>Vanuatu Government order to Lapetasi contractor to secure access road to VISSP site through the Lapetasi</p>

<p>managed properly.</p>	<p>construction site until the February of 2017.</p>
<p>Dredged soil from VISSP navigation channel had stockpiled in VIPPS construction area and overflowed to Lapetasi construction area due to the disagreement of land owner to carry outside.</p>	<p>Overflowed dredged soil becomes obstruction to complete Lapetasi wharf development project. Though VPMU ordered to VISSP contractor to remove overflowed soil from Lapetasi construction area, they had not taken any action. Contractor of Lapetasi project removed soil by themselves with consent of VPMU.</p>
<p>4-2-3 Assistance with the Implementation of Environmental Consideration Items</p>	
<p>• Before the commencement of the project, public consensus for the project shall be obtained. The team will assist VPMU in arranging stakeholder meetings etc.</p>	<p>VPMU has carried out 2 stakeholder meetings and do not consider that any more meetings are necessary. However, it is important to announce environmental measures to local residents. After consulting with JICA Vanuatu, a public information campaign was planned. The campaign together with other national projects was carried out at the Music Festival at the end of October 2015.</p> <p>VPMU has been broadcasting information on national projects through a radio program and obtaining public opinions twice a month since April 2016. Information on the Lapetasi Wharf Project was broadcasted on May 2016 by an environmental officer of VPMU. According the officer, nobody has expressed opposition to the project.</p>

6. Issues and Countermeasures in Project Implementation

6.1. Issues related to Work in Vanuatu

Expert team has identified the following issues related to project implementation

6.1.1. Issues related to project implementation

(1) Necessity of close working relationship with VPMU for effective project implementation

The expert team did not visit Vanuatu according to the originally planned schedule due to delays in project implementation arising from design changes to the wharf which increased the construction cost, delays in the tender process and the damage caused by Cyclone Pam. The interval between the 1st and 2nd works was originally planned to be 2.5 months but it was extended to 5.5 months due to the reasons mentioned above. The interval between the 2nd and 3rd dispatches was extended to 7.5 months from the originally planned 4.5 months.

Longer intervals make it more difficult to secure timely information and adequately respond to changes in circumstances. While the JICA Expert Team and VPMU have built a relationship based on trust, it was difficult for the expert team to grasp the local situation during its absence as VPMU did not always share the latest information.

However, since the start of construction works, a weekly meeting has been held and the meeting minutes have been shared with the JICA Expert Team. Setting up a regular information exchange system is recommended to ensure effective communication between relevant parties.

In addition, it is necessary to flexibly adjust the dispatch periods of the JICA expert team in order to respond promptly to issues which may arise in the course of project implementation.

6.1.2. Port Management (1)

(1) Enhanced Support to allow VPMU to Manage Multiple Projects

VPMU has been managing four projects simultaneously. In addition to PVLIMPWDP (Lapetasi International Multipurpose Wharf Development Project), VPMU is also overseeing VISSP (Vanuatu Inter-island Shipping Support Project), PVUDP (Port Vila Urban Development Project), and VTIP (Vanuatu Tourism Infrastructure Project). Effective coordination among the projects is necessary for smooth implementation. Accordingly, it is necessary to build the capacity of VPMU's organization in order to manage plural projects simultaneously.

(2) Necessity of enhancing knowledge on Port Security and Disaster Prevention

Although Port Vila is generally blessed with calm natural conditions, Cyclone Pam attacked the area

in March 2015. Global warming may result in large cyclones such as Cyclone Pam attacking Vanuatu more frequently in future. As Port Vila is the only container handling port in the capital area, damage to Port Vila could cripple Vanuatu's economy and have an adverse impact on the lives of citizen.

To prevent and reduce damages to port facilities, sufficient preparation against natural disasters is required. Accordingly, it is necessary to enhance VPMU's knowledge and understanding on disaster prevention.

Port security system also needs to be improved. Security staff is deployed at the entrance gate of the Main Wharf, but public access control is insufficient and port facility security control has not been enforced.

Although Lapetasi Wharf is equipped with security facilities, a port security system which meets IMO requirements has to be established. In addition, security staff and port officials need to enhance their knowledge on port security in order to comply with the ISPS code and effectively manage and operate Lapetasi Wharf.

6.1.3. Port Management (2)

(1) Handling Ability (Yard management ability) by Reach Stacker of IPDS

IPDS, a cargo handling company of the Lapetasi International Multi-purpose Wharf, recently began to handle containers using a Reach Stacker (previously, containers had been handled by a forklift).

IPDS's lack of experience in operating a Reach Stacker is likely the reason that it took a while to create the layout of the newly created container yard (hereinafter referred to as CY). However, the layout of the CY for container handling has now been completed and cargo handling works are being performed by Reach Stackers.

As the container handling volume increases and IPDS becomes more familiar with cargo handling under the new system, it is assumed that the layout will be reviewed and improved in future.

The new CY is wider than the old one in order to accommodate Reach Stackers. It is necessary for drivers, work instructors and managers to have a firm grasp of Reach Stacker operations in order to perform safe and efficient handling in the container yard.

In order to achieve safe and efficient cargo handling as well as optimize the CY layout, the JICA expert team believes it would be beneficial to visit other container terminals which have extensive experience in handling containers by Reach Stacker and study their operation methods.

(2) Efficiency Improvement of Cargo Handling by TOS

Cargo handling by terminal operation system was planned to be introduced to coincide with the opening of the port, but there has been a delay in introducing the Terminal Operation System (TMSPro). PDS purchased the TMSPro program using an Australian grant, but it could not purchase hardware (server, monitor, keyboard etc) because it could not obtain the approval of the Vanuatu government for purchasing such hardware (which is necessary for the operation of both the terminal

operating system and the computer maintenance management system). If the TOS can not be introduced at an early stage, high work efficiency in the container terminal will not be possible as operators will have to enter data manually.

6.1.4. Procurement and Fund Management

Monthly Payment to consultants was executed regularly according to the reimbursement scheme; there were no particular problems. Payment for the contractor was also executed regularly.

The accountant team of VPMU only handled expenditure work via online system of the government. VPMU had to rely on the consultants regarding fund requirements and payment records. In future, VPMU will have to record payments itself in order to conduct effective fund management but at this time such a level of autonomy is not possible due to VPMU's limited staff size.

6.1.5. Environment and Social Consideration

The Vanuatu Inter-Island Shipping Support Project (VISSP) was supposed to be implemented in line with the Port Vila Lapetasi International Multipurpose Wharf Development Project (PVLIMPWDP). At the pre-construction stage of the VISSP, the consultant team tried to contact with a person who is in charge of environment consideration to harmonize the management plan regarding environmental issues, such as the monitoring plan.

In PVLIMPWDP, environmental monitoring as shown in Table 6.1-1 was conducted, while the environmental plan of VISSP was unknown. Since both projects were carried out at the same area, the environmental management should have been considered uniformly.

Table 6.1-1 Monitoring Plan during Construction (PVLIMPWDP)

Monitoring	Item	Frequency	Implementation body
Environment around the construction site	Impact of the construction (Turbidity, pH)	Daily	Contractor
Environment of entire bay area	Long-term and broad area impact (Marine animal, Coral, Water quality)	At least annually	Department of Fisheries Department of Water Resources

6.2. Measures and Planning

6.2.1. Necessity of Enhancing Support to VPMU

(1) Extending the stay periods of the JICA Expert team in Port Vila

The JICA Expert Team and VPMU have built a relationship based on trust; however, it was difficult for the JICA Expert Team to grasp the local situation during its absence as VPMU did not always share

the latest information.

Therefore, for Phase 2 works, the dispatch interval of JICA Expert Team members was minimized by establishing a flexible dispatch system which ensured that at least one or two expert team members were in Vanuatu as much as possible.

(2) Work Shop for Port Disaster Prevention and Port Security

As disaster prevention and port security are important issues at Port Vila, the JICA Expert Team held two workshops on port disaster prevention and port security.



Workshop on Port Disaster Prevention and Port Security

6.2.2. Port Management (2)

(1) Main Wharf used as Temporary Storage of Containers during the Construction of International Multi-purpose Wharf

A large cruise ship calls the Main Wharf about 9 to 16 times per month at which times passengers are able to enjoy shopping and sightseeing in the city center; the cruise ship is anchored at the wharf from 7 o'clock in the morning to about 5 o'clock in the evening.

Therefore, not only is it impossible to perform container handling when a cruise ships calls the Main Wharf, it is also necessary to relocate containers. For this reason, JICA expert team prepared a layout of the container storage plan considering cruise ship's port call, and explained it to IPDS. IPDS rearranged the layout of the container storage area when cruise ships call the Main Wharf based on this proposal.

(2) Investigation of Container Layout corresponding to Cargo Handling by Reach Stacker of IPDS

On the assumption that the Director of IPDS has abundant experience in container terminal operation, the JICA expert team was slow to offer advice regarding the optimum layout of a CY utilizing a reach stacker system.

In future, we will carefully examine the safest and most efficient layout of the CY considering the shape of CT (terminal with triangular shape) and ensure that our proposals are reflected in the construction drawings rather than relying on the CT operator.

6.2.3. Procurement and Fund management

VPMU's computers are connected to the government's payment system, and the payment procedure was smoothly executed. However, due to the limited number of employees, it was difficult to find a replacement when somebody took a holiday leave.

At this stage, VPMU was only able to do the expenditure work. Information on fund requirements and the amount of used fund was provided by the consultant upon the request of VPMU.

6.2.4. Environment and Social Consideration

During the construction of the PVIMPWDP, the consultant team tried to contact with a person who is in charge of the environment to conduct comprehensive environmental management in both projects. However, it was not achieved, due to the absence of the person during the stay of the consultant team.

After the new appointments of environmental positions in VPMU, the relationship between VPMU and DOE and DOF became tightened. Thus, it is expected that sustainable monitoring will be continued after the PVIMPWDP.

In similar projects in the future, considering the rotation of members, it is recommended that the consulting team members shall try to stay longer in total, even if each member's stay is for a short period. By doing this, there will be more opportunities for communication with counterparts and other related persons.

7. Lessons Learned and Proposals

7.1. Lessons Learned

Expert team learned the following lessons through the implementation of support work for project implementation.

7.1.1. Management and operation system of Lapetasi International Multi-purpose Wharf

The management and operation system of the Lapetasi International Multipurpose wharf is a concession scheme in which the government entrusts management and operation (including maintenance works) to the private operator (IPDS) on a long-term basis.

The government collects fees from the concessionaire (IPDS) and repays the loan to Japan. The following problems were identified in the current concession contract.

(1) Delays in preparing the concession agreement

It took time to prepare a draft of the concession agreement between the Vanuatu Government and IPDS. The construction work was completed in February 2018 which was followed by the handover to IPDS; however, the contract had not yet been completed. Preparatory work on the concession contract should have started at an early stage.

The delay in preparing the concession contract can be attributed to the fact that it was the first time for the Vanuatu Government to construct such large wharf through a loan scheme. Its lack of expertise in port operation also exacerbated the situation.

The Ministry of Finance, the Ministry of Public Works and the Legal office are responsible for concession matter. Accordingly, there should have been a well-organized taskforce team to examine the concession contract.

Although the concession contract and repayment issue are not included in the team's scope of works, it is recommended that seminar be held on concession contracts to help relevant personnel of the Vanuatu Government gain a better understanding on repayment matters and the port tariff.

(2) Clarification of ownership of facilities

It is not yet clear who will own the facilities after the loan is repaid. In most cases, the Vanuatu government, which is currently the owner of the facilities, should conduct maintenance while the private operator borrows facilities and conducts management and operation during the contract period. After the contract period, ownership can be retained by the Government or transferred to the concessionaire.

Although the Vanuatu government currently owns facilities, it intends to impose all responsibilities for maintenance and renewal of facilities and equipment on IPDS. If that is the case, IPDS would expect to become the owner of facilities after the repayment of loan is completed.

(3) Necessity of Proper Pricing of Port Tariff

Since the project cost of Lapetasi International Wharf became twice that estimated in the F/S, loan repayment amounts also exceeded the assumed level. There are basically two methods for repaying loans: One is to allocated funds from the government's budget and the other is to use the fees collected from port users.

Since the Vanuatu Government is already receiving financial assistance from Australia and New Zealand, the general budget of the Vanuatu Government will not be sufficient to cover loan repayments for the Lapetasi International Wharf. Moreover, the general budget is normally used for the employment expenses of government officials, education and welfare purpose. Therefore, repayment of the loan should be made using fees collected from port users.

However, Vanuatu government officials tend to think that IPDS should not make too much profit and thus the port tariff remains relatively low. Unfortunately, this will make it difficult for IPDS to generate sufficient revenue and thus the concession fee paid to the government may not be sufficient to cover loan repayments.

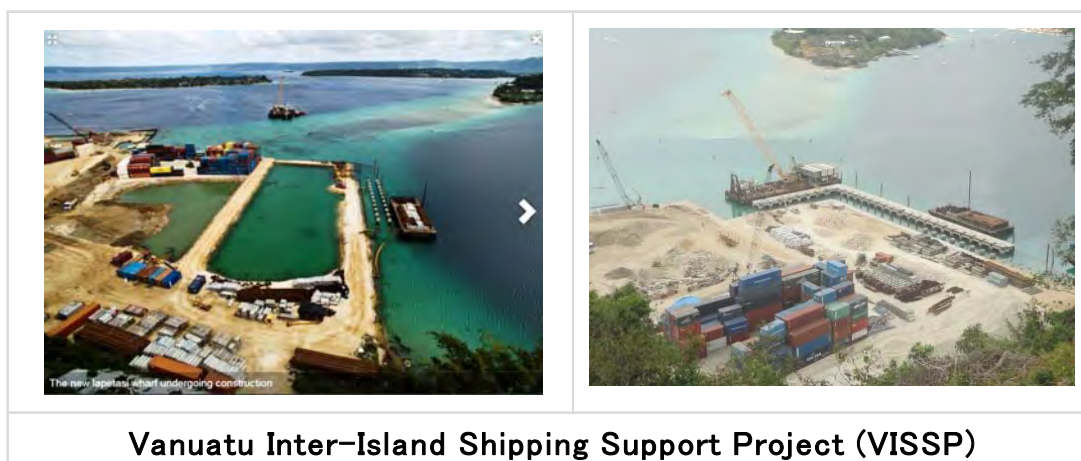
The team believes that IPDS, as a private operator, should benefit from the management and operation of Lapetasi international wharf. If it is able to operate the port in an efficient manner, the people of Vanuatu will also benefit. For example, the cost of imported goods will become lower as the country's competitiveness in foreign trade increases. Once the cargo volume and frequency of calling ships increase, it may be possible to lower the port tariff level.

From the above considerations, JICA Expert Team concluded that the concession agreement should include not only the concession fee, but also a pricing system which allows IPDS to secure a sufficient profit. Based on this idea, the team the submitted a draft concession agreement to the Vanuatu government (See Appendix 1.4 CONCESSION AGREEMENT BETWEEN The Government of Vanuatu AND IFIRA Port Development and Services Company RELATING TO Lapetasi International Terminal).

7.1.2. Delays in the Implementation of other Projects

JICA Expert Team main task is to provide technical assistance to Vanuatu Government for the effective implementation of projects. VPMU has been managing four projects simultaneously. In addition to PVLIMPWDP (Lapetasi International Multipurpose Wharf Development Project), VPMU is also overseeing VISSP (Vanuatu Inter-island Sipping Support Project), PVUDP (Port Vila Urban Development Project), VTIP (Vanuatu Tourism Infrastructure Project). However, some projects have been delayed due to the insufficient project coordination capability of VPMU and the government of Vanuatu.

In particular, the VISSP project, which is situated next to Lapetasi Wharf, has experience enormous delays due to unclear contract conditions, a lack of trust relationship between the Engineer and Contractor, and a lack of leadership by ADB and the NZ Government. It is not clear at this time when the project will be completed.



(1) Management ability of the Vanuatu government side including VPMU

VPMU is carrying out several infrastructure development projects such as Lapetasi International Wharf, PVUDP, VAIP, VTIP and so on. Unfortunately, responses to issues that arise are slow due to the relatively small staff and a shortage of persons with sufficient experience and knowledge in managing such projects.

Moreover, many employees seem to give far more priority to their personal lives than work as absences are frequent. More dedication to the task at hand is required.

Steering committee by stakeholders is regularly held, but resolving problems sometimes takes an inordinate amount of time.

(2) Importance of supporting the project management

JICA Expert Team conducted assistance to increase the capacity of the Vanuatu government, (mainly VPMU) with the support of JICA headquarters, and branch office.

Joining the steering committee and regular meetings among stakeholders, the team ensured that the project progressed on schedule.

Generally, improving logistics infrastructure is essential for the economic growth of developing countries as seen in this work. Many countries require assistance in implementing projects because the capacity of executing agency of the recipient country is generally not sufficient.

7.1.3. Idea for Environmental Consideration and Measures (especially towards Coral)

Since coral is living almost everywhere along the coastline in the Port Vila Bay, measures towards coral are fundamental upon any infrastructure development along the coast.

During the PVIMPWDP, twice (2 times) design change was performed to mitigate impact on existing coral. These changes were not able to be considered in advance, before commencement of the project, since these resulted from the influence of another project or un-predicted natural condition.

Upon the design changes, clearance of environmental requirements from the authorities, such as

Vanuatu and JICA, was important. While the basic policy of Vanuatu environmental authority to a development is necessary, measures shall be taken to avoid damage to coral, due to the stringent requirements of JICA Environmental Advisory Committee, which consists of members from outside.

As a result, the design changes were accepted, after JICA judged that the design changes did not constitute a “major change”, which is stated in the JICA Guideline for Environmental and Social Consideration, because 1) the corals in the impacted area were partly transplanted, 2) the impact to the remaining corals were to be minimized by silt curtains, 3) the development permit has already been accepted by the authority and 4) the amendment of the prepared EIA was not necessary. Moreover, the design changes could be carried out within the pre-determined cost and schedule. However, further design changes may be unavoidable which could delay the project and increase the project cost. Project delay and cost increase would be a significant burden to a small country such as Vanuatu since the loan amount (9 billion Yen) is sizable. As for one of mitigation measures, the Credit Risk Analysis and Environmental Review Department of JICA proposed a Coral Offset Program to compensate the low survival rate of transplanted corals and un-avoided loss of coral due to the design changes.

For international cooperation, it is important to satisfy the requirements, including environmental considerations, from the international community and Japan. It is also important to prepare a strategy of the project beforehand (e.g. discussion in planning stage), consulting with environmental experts in Japan, to avoid additional costs.

It is considered that flexible mitigation measures, such as compensation measures to the impacted area to ease the impact to coral due to design changes, is important to reduce the influence of delay on the project.

Other donors, such as ADB, dispatch long-term environmental advisors to VPMU, as the number of projects is great. This kind of cooperation nurtures a tight relationship between the related persons and leads to solving issues by close conversations. Although the consultant team communicated by e-mail with the counterpart during the absence in Vanuatu, it was difficult to obtain the necessary information in detail. While the permit procedure doesn't progress during the absence of the consultant team, it progressed rapidly during staying in Vanuatu. This is because it is easier to communicate face to face and to take action.

In case of VISSP and the Port Vila Urban Development Project, they hired local staffs to dispatch to VPMU to work in the office daily basis.

Although it is considered difficult in the project case, it is important to consider the schedule of each consultant member to stay longer a team, by rotating the member one by one.

7.1.4. Necessity of Improving the Government of Vanuatu's Capacity to conduct Port Management and Operation

(1) Port Planning

As Vanuatu is an island country, its national economy is deeply connected to the shipping industry.

However, a port development masterplan has not yet been prepared. For effective long-term development, a port master plan is vital.

(2) Improvement of Port Management and Operation System

Responsibilities of PMD (Port and Marine Department) as the management body of the main wharf are to process port entry applications, provide pilotage service, tug boat service and conduct mooring work. Management and operation of Lapetsi International Multipurpose Wharf will be conducted by IPDS.

PPP (Public private partner-ship) system is a management scheme based on public ownership and private management and operation. Adoption of PPP schemes has been increasing at ports throughout the world. Cooperation between the public and private sector should be further promoted in Vanuatu.

(3) Improvement of Port Security System

As Lapetasi International Multipurpose Wharf will be managed and operated by IPDS, IPDS will be responsible for port security of Lapetasi wharf. On the other hand, PMD (Ports and Marine Department) is responsible for security matters pertaining to the Main Wharf. Director of MPD serves as the PSO (Port Security Officer) of both wharves of Port Vila.

PSO needs to oversee the PFSP (Port Facility Security Plan) of both wharves and build up the security system of the whole port.

7.2. Proposal

7.2.1. Improvement of Port Management Capability of the Government of Vanuatu

It is important to make optimum use of the Lapetasi International Multipurpose Wharf and Main Wharf to stimulate economic growth and raise the living standards of people.

Port sector stakeholders including the Ministry of Public Works and Utility, Ports and Marine Department, Office of Maritime Regulator (OMR), and IPDS as the port operator have to establish a cooperative framework to manage and operate the port and provide high-level services. To that end, capacity building and increasing the knowledge of relevant players is essential.

To provide high level services to customers as an international port, the following issues need to be addressed.

- Preparation port development master plan
- Improvement of management for infrastructure development and project implementation
- Improvement of port facility maintenance
- Improvement of port disaster prevention and port security
- Capacity building and strengthening knowledge for port management and operation
- Revision of port charge
- Improvement of cargo handling

- Others

(1) Ministry of Infrastructure and Public Utilities (MIPU)

MIPU is the government organization responsible for port administration. It is necessary to improve and strengthen the following points for enhancement of port administrative function.

1) Preparation of Port Development Master Plan

As Vanuatu is an island country, its national economy is deeply connected to the shipping industry. However, a port development masterplan has not yet been prepared. For effective long-term development, a port master plan is vital.

2) Implementation of Infrastructure and Human Resource Development for Project Management

It is essential to improve the port infrastructure and capacity development of the staff involved in the project including administrative matters. It is important to train staff who can accurately examine the feasibility a project, particularly financial matters. Vanuatu is an island country that stretches across a wide area, and thus it is an urgent matter to improve the infrastructure not only in Port Vila but also in remote islands. Under these circumstances, the Vanuatu government needs to focus on training of human resources by effectively utilizing support from donors.

3) Strengthening of the function of port management

a) Compiling statistics on port calls and cargo handling

It is essential to record port activities such as calling vessels, cargo volume (container cargo, general cargo, liquid bulk cargo etc), and summarize the data in a report. The statistical data should also be open to the public via the internet.

b) Reporting of business plan and financial report

It is essential for a semi-public organization to disclose its business plan and financial condition to maintain sound and transparent management.

4) Improvement of Port Disaster Prevention System

In March 2015, Cyclone Pam tore through Vanuatu and caused massive destruction. Vanuatu is quake prone country due to its close proximity to the Pacific plate border. As Vanuatu is an island country, sea port function is vital for logistics and the movement of people. Port functions have to be immediately restored after a disaster.

Measures for disaster prevention, minimizing damage to port facilities, and quickly restoring port

functions in the wake of a disaster need to be introduced. Accordingly, port facility disaster prevention capability shall be strengthened and Business Continuity Plan (BCP) for the port business sectors shall be prepared and shared.

5) Building a cooperative system among stakeholders for smooth management and operation of the port

It is useful to organize cooperative systems among the concerned parties such as MIPU, PMD, IPDS, Office of Maritime Regulator (OMR), Customs, Quarantine, Immigration Bureau, Tourist Association, etc, for conducting reliable and efficient port activities.

(2) Ports & Marine Department (PMD)

Ports and Marine Department (PMD) which is under the Ministry of Public Works and Utilities needs to enhance their capability to perform port facility maintenance management, port security management, ship safety navigation management and safety management.

1) Port Facility Maintenance Management

As some port facilities are underwater structures, the degree of deterioration can not be detected simply by visual inspection from the land side. Therefore, periodical and detailed inspection plan to grasp the situation of facilities shall be prepared to secure the soundness of facilities. It is also necessary to prepare maintenance and repair plan and secure the necessary budget for maintenance works.

2) Improvement of Port Security System

As Lapetasi International Multipurpose Wharf will be managed and operated by IPDS, IPDS will be responsible for port security of Lapetasi wharf. On the other hand, PMD (Ports and Marine Department) is responsible for security matters pertaining to the Main Wharf. Director of MPD serves as the PSO (Port Security Officer) of both wharves of Port Vila.

PSO needs to oversee the PFSP (Port Facility Security Plan) of both wharves and build up the security system of the whole port.

To further enhance security of Port Vila, it is necessary to address the following issues.

a) Improvement of Port Congestion when a Cruise Ship calls the Main Wharf

The port security management of Main Wharf also needs to be carried out according to the port security plan (PFSP). Security measures which need to be taken regarding Mamas market, which is in operation on the Main Wharf when a cruise ship calls, also have to be included in the PFSP.

Currently, security guards conduct gate control for people at the entrance, but it does not strictly control people associated with Mamas market or other people in the port. Acquaintances of authorized

personnel are easily able to enter the port which indicates that proper security management is not being performed.

The tents of Mamas market which are erected to coincide with a call from a cruise ship are taken down after the ship departs; vendors also leave the port at that time. A restricted area should be established between the area of Mamas market and the pier area when a cruise ship is berthing and two other restricted areas should be established at the port entrance and the pier area.

In addition, as general cargo handling is carried out at the main pier by IPDS, it is necessary to clarify the boundary between general cargo area and Mamas market at the time of berthing of a cruise ship from the viewpoint of ensuring safety and take necessary safety measures (installation of Removable Fence and other countermeasures).



Congestion of Main Wharf with Cruise Ship Passenger

3) Implementing of ship monitoring system

Currently, Vanuatu has no navigation monitoring system for both domestic and foreign ships which are operating in Vanuatu waters. A tracking system of vessels entering and leaving Port Vila, and other busy ports is necessary to maintain safety in ports areas and approaching areas.

(3) Ministry of Finance and Economic Management

The Ministry of Finance will collect the concession fee from the port operators. However, if the port tariffs are not adequate, the concession fee will not cover the amount of repayment. Therefore, the

MFEM should allow the concessionaire to raise the tariff to an adequate level.

1) Pricing of Port Tariffs

Repayment of loans used for the construction of Lapetasi International Wharf is an important issue. This will not be a problem provided the concession fee is sufficient to cover the repayment amount. The expert team thoroughly explained this matter including the FIRR of the Lapetasi International Wharf Project to MIPU and the Treasury during the steering committee. However, there is a concern that such knowledge on loan repayments will not be transferred to subsequent generations which could lead to problems in future.

Therefore, the team thought it was prudent include a pricing mechanism of the port tariffs in the concession agreement and proposed that a review of concession fees and tariffs should be conducted every two years.

JICA Expert Team distributed a draft of the concession agreement to the related organizations (See Appendix 1.4: CONCESSION AGREEMENT BETWEEN The Government of Vanuatu AND IFIRA Port Development and Services Company RELATING TO Lapetasi International Terminal).

The balance of income and expenditure of the port should be monitored periodically in relation to the repayment and port tariffs. Based on the monitoring, it may be necessary to revise port charges at intervals of 2 to 3 years.

If the team has additional opportunities to assist in this matter, the team would like to hold meetings on the port tariff and concession fee with the concerned parties.

(4) Office of Maritime Regulator (OMR)

The Office of Maritime Regulator (OMR) was established in 2017. Both the level of knowledge of staff and the available equipment/facilities are inadequate. Accordingly capacity building and equipment procurement are required.

The functions of the Office of Maritime Regulator are as follows.

- Ship inspection and registration
- Registering and managing seamen
- Port State Control
- Route management, navigation support
- Others

Implementation of technical transfer projects or participation in JICA training courses (port strategy management course), etc. can be considered to assist with capacity building.

(5) Cargo Handling Operator

1) Improvement of Cargo Handling Efficiency

In order to improve the capacity of cargo handling management, it is necessary to improve the planners' capacity to create a CY container layout that promotes safe and efficient CY operations utilizing a reach stacker, and also introduce a TOS (Terminal Operation System).

2) Promotion of Safe Work Practices

It is necessary to prepare various cargo handling operation standards at the port, unify work procedures, and ensure comprehensive safety management. It is also necessary to prepare a procedure manual for the response system when an accident occurs and to establish a communication system. Finally, a work safety management department should be established.

7.2.2. Infrastructure development and capacity building of the project management

In order to develop the entire country, a master plan for infrastructure improvement is necessary. Based on the master plan, it is required to secure the budget and build infrastructure according to the level of priority. The cost effectiveness and profitability of infrastructure development is important. In the past, projects which were not financially viable have been approved. Repayment of loans in such projects could be a heavy burden for the people of Vanuatu.

To improve infrastructure, the capacity building of the concerned parties is necessary. The Vanuatu government is aware of the importance of capacity building and is requesting support from donors.

(1) Ministry of Infrastructure and Public and Utilities (MIPU)

1) Preparation of Master Plan of National Infrastructure Development

It is necessary to prepare a national infrastructure development master plan which covers the entire country. Development of infrastructure will be carried out based on priority rankings indicated in the master plan after securing the required budget.

(2) Ministry of Finance and Economic Management

1) Financial viability of the project

The financial viability of the renovation project of Luganville port on Santo was reportedly not carefully examined.

The Vanuatu government initially planned to repay the loan from the concession fee of a port operator who signed a concession contract. However, the concession fee paid by the port operator was not sufficient enough to cover the repayment amount.

As the result, one - third of the repayment is being borne by the government. Accordingly, it is

necessary to conduct accurate economic and financial analyses.

(3) Vanuatu Project Management Unit (VPMU)

VPMU is managing multi projects simultaneously. In addition to PVLIMPWDP (Lapetasi International Multipurpose Wharf Development Project), VPMU is overseeing VISSP (Vanuatu Inter-island Shipping Support Project), PVUDP (Port Vila Urban Development Project), VTIP (Vanuatu Tourism Infrastructure Project). VPMU employees participate in various daily meetings to promote the projects. However, the size of the staff is insufficient to cope with the various problems that arise which often results in project delays. Accordingly, it is necessary to enhance the capacity of VPMU staff for effective project implementation.

1) Strengthening of Contract Knowledge

VPMU hires consultants to prepare tender documents, to make contracts with contractors and to supervise construction management. However, some projects have been delayed due to insufficient knowledge of contract terms and conditions. It is necessary to strengthen contract-related knowledge of VPMU staff.

2) Strengthening of Engineering Knowledge for Infrastructure Development

VPMU staffs need to understand the contents of contract documents to facilitate effective project implementation. Therefore, acquisition of technical knowledge for structural design, material procurement and construction method is important. It is recommended that relevant personnel participate in JICA's training course on Sustainable Port Development and Planning (for Port Engineer)

7.2.3. Environmental Matters

The ocean environment is an important tourism resource for Vanuatu. A natural port, such as Port Vila Bay, where infrastructure and the natural environment can coexist, is rare. According to the person who is in charge of the environment in VPMU, degradation of water quality in the bay, due to increased waste water caused by population increase and the aging of wastewater treatment facilities is concerning, based on the recent water quality survey. Since degradation of water quality might lead to spoilt scenery, which is a negative impact on the environment and tourism.

Since the Lapetasi wharf performs not only as a container wharf, but also as a cruise ship birth, proper management of runoff water and wastewater may contribute to measures for water quality in the bay.

Upon the planning of renovation or expansion of the wharf in the future, it is recommended to consult with environmental experts during the planning stage to consider an advanced port, such as an environmental friendly port (Green Port) which has enhanced water purification functions or biomutualism function.

8. Assistance for Coral Offset Program

8.1. Background

At the beginning of 2016, VPMU signed MOU with the Department of Fisheries to conduct the monitoring of transplanted corals, remaining corals, and natural corals in the bay as controls. The monitoring was conducted in June 2016 (6 months after the transplant), in September 2016 (9 months after) and on March 2017 (15 months after), respectively.

Since the submission of the monitoring reports by the Department of Fisheries (DOF) was delayed during 2017, the coral status was not confirmed in detail.

According to the interview with DOF, the status, such as the transplanted coral and growth of seaweed, was normal during 2016. From the beginning of 2017, however, coral breaching started due to worldwide seawater temperature increasing. DOF assumed this phenomenon would recover naturally.

During the mission on supervision of the social and environmental considerations in March 2017, insufficient effects of mitigation measures for coral was realized, due to 40% of breaching of transplanted corals, and 8-10% of natural corals. Therefore, JICA decided to revise the coral monitoring plan to analyze the cause of the impact to the transplanted corals.

In addition to that, an additional coral area was planned to be reclaimed to secure an additional area for dredged materials in December 2016. And further mitigation measures also had to be considered.

Under the circumstances mentioned above, a new idea of mitigation measures, setting of coral conservation area (Coral Offset area) and conducting monitoring, was proposed by JICA

8.2. Outline of Coral Offset Program

The Coral Offset Program is an idea to compensate the coral area, which was damaged or lost by a development, by protection or management.

The offset area is scientifically determined by comparison of parameters as listed below in the impacted area.

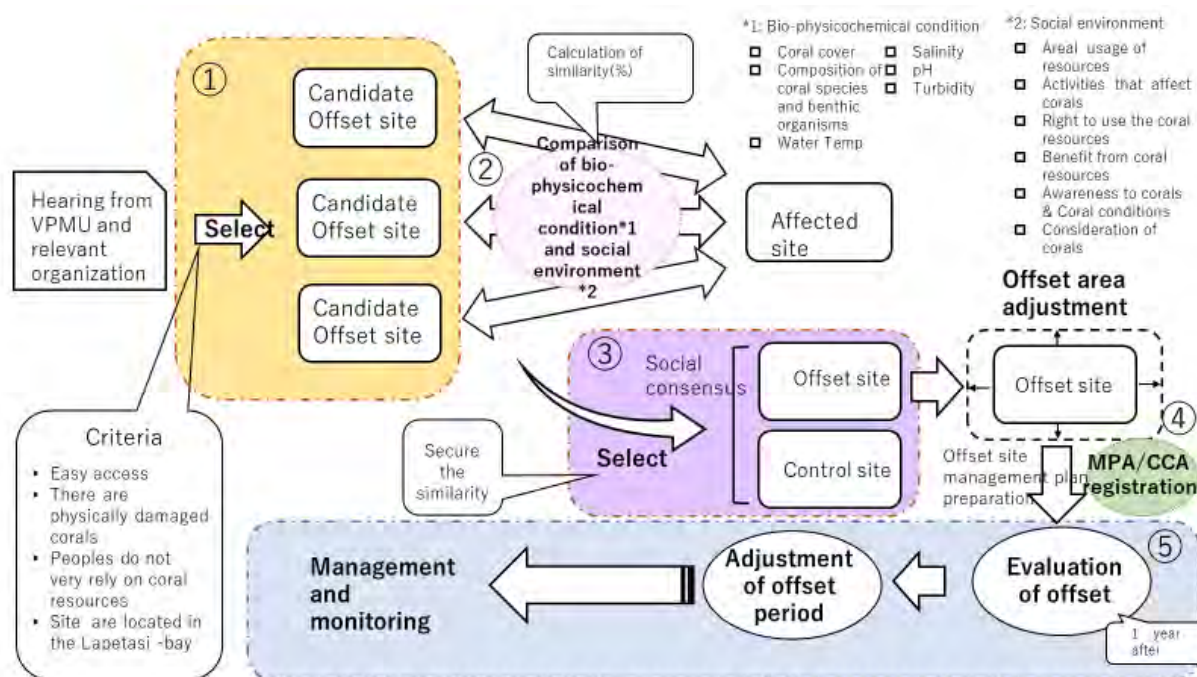
- Socioeconomic condition (utilization of the area, dependence of livelihood on the area) is similar.
- Ecological and physical condition (coral coverage, coral composition, fauna, flora, water temperature, salinity, etc.) is similar.
- Minor difference between the items listed above is adjusted by magnifying/ shrinking the offset area.

Other conditions listed below are also considered.

- Access to the area is easy.
- Moderate numbers/ kinds of corals exist, and physical damage such as leisure diving or anchoring is recognized.
- It is easy to get an agreement of the stakeholders for setup of the offset area.

- The area is not so important for the local residents.

Figure 8.1 shows the flow chart for selection of offset area.



Source: JICA

Figure 8.1 Flow Chart for Selection of Offset Area

8.3. Assistance of the Offset Program

The schedule of the assistance for the Offset Program is shown in Figure 8.2.

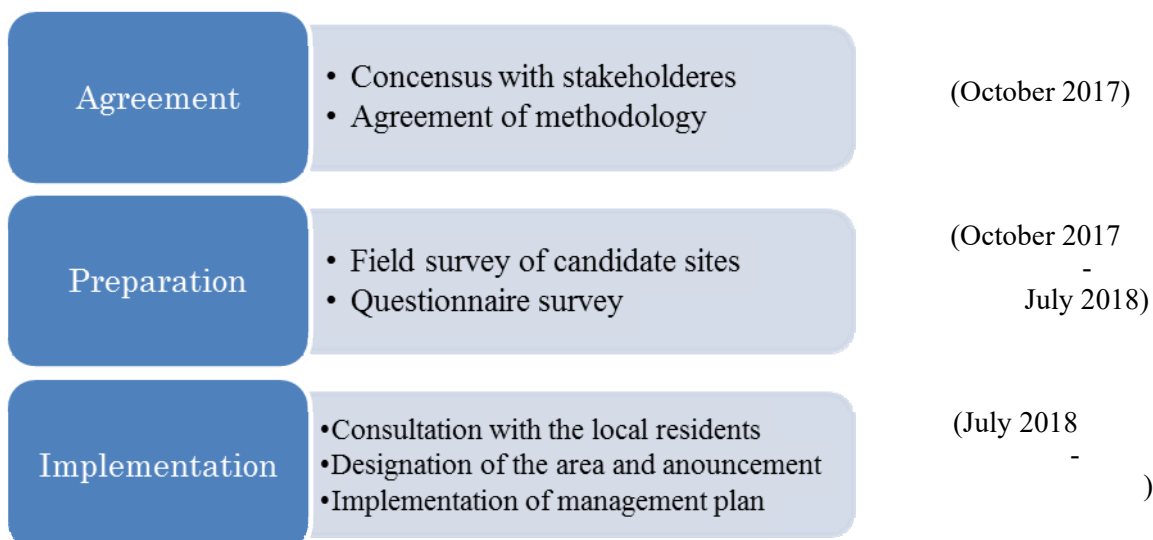


Figure 8.2 Schedule of the Assistance of the Offset Program

8.3.1. Consensus with Stakeholders

After the series of discussions with the Department of Fisheries (DOF) and the Department of Environment, Protection and Conservation (DEPC) under the arrangement of VPMU; using the framework of Community Conservation Area (CCA) managed by DEPC was agreed.

Coincidentally, Ifira Marine Management (IMM) was planning the designation of Port Vila Bay and surrounding area as a CCA, VPMU decided to work together with the related organizations for designation of the Offset Area, with cooperation from the Port Vila Municipality Committee (PVMC) for outreach to the local residents.

Table 8.1 shows the shared roles among the stakeholders.

Table 8.1 Roles of Stakeholders

Organization	Responsibility
VPMU	<ul style="list-style-type: none"> • Implementation of the program • Coordination between related organizations • Communication with Ifira • Budget securement (Monitoring, Sign board, Buoys, Consultation, Personal expenses) • Preparation of application for CCA • Reporting of monitoring results to JICA • Extension and expansion of CCA in cooperation with stakeholders
DOF	<ul style="list-style-type: none"> • Coral monitoring (CCA site and entire bay) • Providing necessary equipment and boats • Support for local consultation • Installation of sign board
DEPC	<ul style="list-style-type: none"> • Support of CCA application • Support for local consultation • CCA registration and announcement
DWR	<ul style="list-style-type: none"> • Water quality monitoring (CCA site and entire bay) • Providing necessary equipment (In-situ water quality meter¹ and laboratory analysis²)
PVMC	<ul style="list-style-type: none"> • Outreach program to the residents
IMM	<ul style="list-style-type: none"> • Management of the offset site • Support of application of CCA • Support of local consultation
JICA	<ul style="list-style-type: none"> • Recommendation of the offset site • Supervision of the program

¹ Expected parameters: Water temperature, Salinity, Ph, DO, Turbidity

² Expected parameters: Total Nitrogen, Total Phosphorus, Coliform bacteria, etc.

8.3.2. Field Survey of Candidate Sites

Field survey was conducted in October 2017, to select the offset site.

(1) Field Reconnaissance

Field reconnaissance was conducted by snorkeling targeting the entire Port Vila Bay to understand the status of coral and its human-caused damage.

Figure 8.3 and Table 8.2 shows the locations of the reconnaissance and its results, respectively.



Figure 8.3 Location of Field Reconnaissance

Table 8.2 Results of Field Reconnaissance

Date: 20 October 2017

Time: 11:30-14:30 (at Low Tide)

Weather: Sunny

	Site name	GPS coordination	Time	Depth (m)	Reef type	Surrounding environment	Coral damage	Accessibility	Remarks
1	Mobile station	17°45,03.6"S 168°18,47.8E	11:50	2-3m	Small amount of patchy corals at reef slope	Near fishery Dep. No2	No	Accessible from the land (10m from the land)	
2	RAP 21	17°44,50.3"S 168°18,47.8E	12:09	3m	Small amount of patchy corals at reef slope	In front of Hotel	No	Accessible from the land (10m from the land)	
3	Water front	17°44,39.2"S 168°18,48.5E	12:18	3m	No corals, rocky slope	Near restaurant	-	Accessible from the land (10m from the land)	<ul style="list-style-type: none"> ▪ Low visibility ▪ Algae dominant
4	Grand Hotel	17°44,29.9"S 168°18,48.6E	12:23	2m	Branched patchy corals at reef slope	Wharf	Yes	Accessible from the land (10m from the land)	Unfixed branched corals on the sand
5	U-power boat tour	17°44,21.4"S 168°18,46.8E	12:30	3m	Small amount of patchy corals at reef flat	Developing water front	Yes (Small amount)	Accessible from the land (15m from the land)	<ul style="list-style-type: none"> ▪ Rocky substrates
6	Big Blue	17°44,13.3"S 168°18,41.3E	12:38	2.5m	Patchy coral at reef slope	Developing water front	No	Accessible from the land (15m from the land)	
7	Anchor Inn	17°44,09.8"S 168°18,37.2E	12:42	2m	Soft/Hard coral mixture and newly recruited hard corals at reef flat	Developing water front	No	Accessible from the land (30m from the land)	<ul style="list-style-type: none"> ▪ No physical damage but there are signs of eutrophication, such as algae
8	Telecom House	17°44,03.2"S 168°18,34.8E	12:49	1m	Soft/Hard coral mixture and algae at	Recreational area	Yes	Accessible from the land (100m from	<ul style="list-style-type: none"> ▪ Eastern mouth of Fatumaru bay

	Site name	GPS coordination	Time	Depth (m)	Reef type	Surrounding environment	Coral damage	Accessibility	Remarks
					reef flat			the land)	
9	Eastern mouth of Fatumatu bay (Shanderis)	17°43,59.0"S 168°18,33.4E	12:57	1.5m	Corals and algae at reef flat	Recreational area	Yes (lots of branched coral damage)	Accessible from the land (100m from the land)	
10	Center mouth of Fatumaru bay (Shanderis)	17°44,02.6"S 168°18,29.3E	13:03	50cm	Soft/Hard coral mixture and algae at reef flat	Recreational area	Yes (branched coral damage)	Not accessible from the land (300m from the land)	▪ There is a landmark rock at water surface
11	Western mouth of Fatumaru bay (Shanderis)	17°44,01.0"S 168°18,22.8E	13:11	1m	Corals, algae and newly recruited corals at reef flat	Recreational area	No	Not accessible from the land (400m from the land)	
12	White sand	17°44,04.7"S 168°17,58.2E	13:16	1m	Corals at reef flat	Fishing area	No	Accessible from the land (20m from the land)	▪ Porites dominant ▪ There are dead corals ▪ Fishing activities are observed
13	Marapog point	17°44,14.0"S 168°17,43.8E	13:20	0.5m	Small amount of corals with newly recruited corals at reef flat	Fishing area	Yes	Accessible from the land (50m from the land)	▪ Low coral cover
14	Ifira edge	17°44,14.0"S 168°17,43.8E	13:30	1m	Corals with newly recruited corals at reef flat	Traditional taboo area	No	Difficult to access from the land because no beach around (100m from the land)	▪ Traditional taboo area ▪ High coral cover

	Site name	GPS coordination	Time	Depth (m)	Reef type	Surrounding environment	Coral damage	Accessibility	Remarks
15	Ifira west	17°44,58.6"S 168°17,23.9E	13:43	2m	Coral with newly recruited corals and small amount of soft corals at reef slope	Dive site	No	Difficult to access from the land because of strong current (50m from the land)	<ul style="list-style-type: none"> There are no recently damaged corals but lots of coral rubble is observed
16	Ifira east	17°44,55.1"S 168°17,56.6E	14:02	1m	Corals (Inc. branched corals) at gentle slope area	Boat mooring site	Yes (branched coral damage)	Accessible from the land (40m from the land)	
17	Ifira east 2	17°44,55.8"S 168°17,56.3E	14:09	5m	Patchy coral at reef slope	Boat mooring site	Yes (branched coral damage)	Difficult to access from the land because of depth (150m from the land)	<ul style="list-style-type: none"> The amount of corals is less Dumped waste is observed in the sea floor
18	Ilikiki west	17°44,47.7"S 168°18,25.4E	14:15	3m	Patchy hard coral / soft coral mixture at reef slope	Recreation site	Yes (branched coral damage)	Difficult to access from the land because of the distance (250m from the land)	<ul style="list-style-type: none"> Low coral cover
19	Ilikiki North	17°44,30.4"S 168°18,29.6E	14:20	1.5~ 2m	Corals with newly recruited corals at reef flat	In front of Hotel	Yes (small amount)	Accessible from the land (100m from the land)	<ul style="list-style-type: none"> signs of eutrophication, such as algae High coral cover
20	Ilikiki East	17°44,33.4"S 168°18,44.6E	14:25	2m	Hard coral/soft coral mixture	In front of Hotel	Yes (small amount)	Accessible from the land (50m from the land)	<ul style="list-style-type: none"> Branched coral dominant

(2) Survey

Based on the results mentioned above, four (4) candidate sites (No. 8, 15, 17 and 20 in Figure 8.3) were selected as candidate sites for the Offset Area. And underwater survey by scuba diving was conducted to survey coral, benthos, algae and water quality.

The results were analyzed by the Credit Risk Analysis and Environmental Review Department of JICA.

8.3.3. Questionnaire Survey

A questionnaire survey was conducted to get social and economic information, targeting the people who might utilize the candidate area.

The survey was conducted by random interviewing in the pre-determined target communities. The number of samples was set at 100 per community.

As a community used to utilize the impacted area, the project area was also included in the survey to confirm the difference of utilization of the area before and after construction.

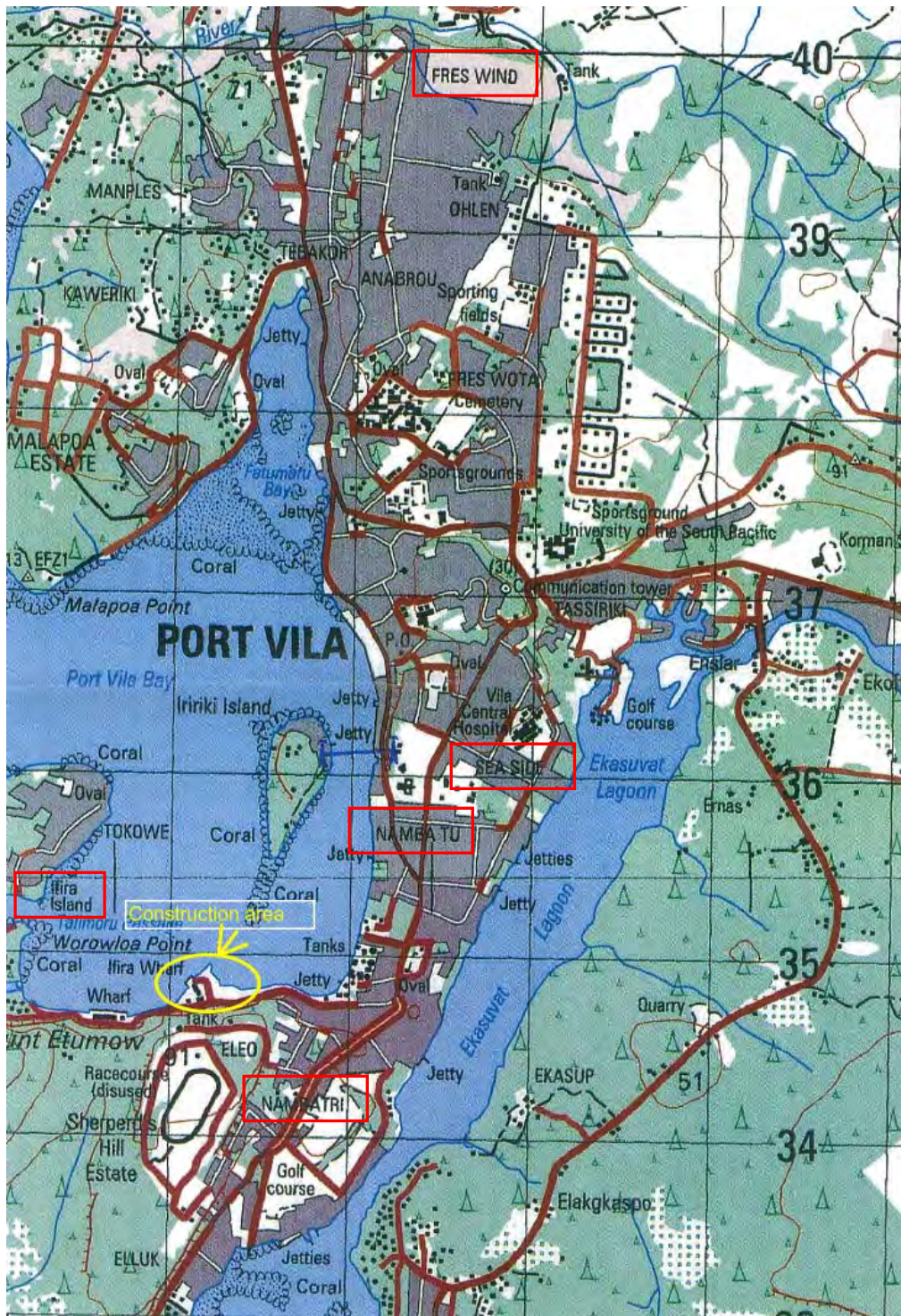
The results were analyzed by the Credit Risk Analysis and Environmental Review Department of JICA.

(1) The First Survey

The first survey was conducted in January 2018, targeting 4 communities as shown.

Table 8.3 Target Communities for Questionnaire Survey and the Offset Candidate Area

Target Community of Questionnaire Survey (refer to)	Offset Candidate Area (The number in () corresponds to the number in Figure 8.3)
Fres Wind	Entrance of Fatumaru Bay (8)
Ifila Island	West side of Ifira Island (15)
	East side of Ifira Island (17)
Sea Side	East side of Iriki Island (20)
Namba Tu, Namba Tri	Impacted area (Project area)



Source: VPMU

Figure 8.4 Targeted Communities of Questionnaire Survey

(2) Second Survey

A supplemental survey was conducted in May 2018, targeting the Ifira Community (see), which is considered as a community that used to utilize the Lapetasi area, since the status of utilization

of the impacted area was not well understood in the first survey.

8.3.4. Stakeholder Meeting

Stakeholder meeting was held to notify the Coral Offset Program to related administration bodies, such as DOF, DEPC, VPMU, JICA, PVMC, IMM.

In the meeting IMM explained the CCA and its management plan and JICA explained the Coral Offset Program. And both plans were accepted without objection by the stakeholders.

8.3.5. Consultation with Local Residents

After the final candidate location of the Coral Offset Program was decided, consultation with local residents was held to get an understanding for the program and sustainable management by the community.

8.3.6. Designation of the Offset Area

DEPC announced the designation of the Coral Offset Area in the Ifira CCA, through the homepage of DEPC.

Four (4) buoys were installed at the corners of the offset area and four (4) sign boards were set up at the shoreline.

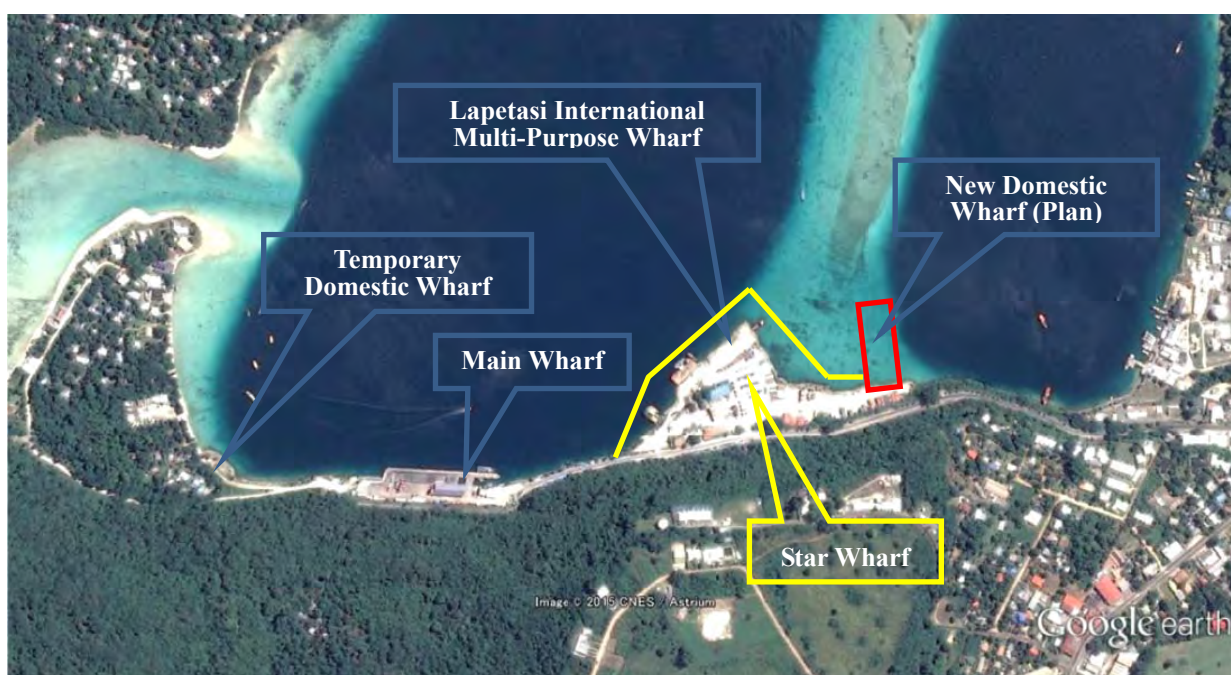
8.3.7. Management Plan

The management plan prepared by JICA was attached to the management plan of Ifira CCA and submitted to DEPC. VPMU in cooperation with IMM will implement the management plan.

9. APPENDIX

9.1. Layout of Related Facilities for Lapetasi International Multipurpose Wharf Development Project

Layout of Related Facilities for Lapetasi International Multipurpose Wharf Development Project is shown below.



Source: JICA Expert Team

9.2. Workshop for Prevention of Port Disasters and Port Security Enhancement

Development of Lapetasi international multipurpose wharf is expected to be completed in October 2017. To fully utilize the new wharf it is necessary to enhance port management.

Due to global warming, the size of natural disasters is expected to increase in future and thus it necessary to introduce preventative measures. As the main port in the capital area, the loss of port functions could cripple the economy and endanger citizens.

In addition, ships and port facilities need to comply with ISPS Code (International Ships and Port Facility Security Code) of the SOLAS Convention.

VPMU and the JICA Expert team agreed to hold a workshop for enhancing knowledge on port security to comply with the ISPS code as well as on disaster prevention in order to minimize damage caused by natural disasters.

9.2.1. 1st Workshop for Prevention of Port Disasters and Port Security Enhancement

The 1st Workshop was held on 11th of August 2016 at the MIPU conference room with 18 participants.

Opening address was given by the Program Director of VPMU while the JICA Expert team made two presentations “Japan Lesson from Coastal Disaster” and “Port Facility Security Plan on ISPS Code”. The participants were from PWD, MIPU, IPDS, Customs, JICA and others.

Through the workshop, participants re-recognized the importance of disaster prevention and enhancement of port facility security.

Invitation to Work Shop

Vanuatu Project Management Unit
Port-Vila Mall Building
Paris Street
PO Box 192
Port Vila, Vanuatu
Tel: (678) 26918 / 26415/33240
Fax: (678) 26419
Email: vpmu@vanuatu.gov.vu



Unité de Gestion du Projet de Vanuatu
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Invitation to Work Shop for Port Disaster Prevention and Port Security Enhancement

To enhance port disaster prevention knowledge and port facility security for Lapetasi International Wharf, we would like to hold work shop 1st round on 10th of August. Your participation is much appreciated.

Time: August 11 (Thursday) from 9:00 to 11:45

Venue: MIPU conference room

PROGRAM

9:00 Opening address **Mr. Johnson Wabaiat Wakanomune**
Program Director, VPMU

9:15 Japan Lessons from Coastal Disaster **Mr. Kazuyuki YAMAGUCHI**
JICA Expert Team

On March 11th in 2011, Great East Japan Earthquake (GEJE) occurred, strength of earthquake and Tsunami were over our estimation. Many people dead and many social infrastructures had destroyed. To restore port facilities, Japan lessoned from disaster.

10:15 Tea Break

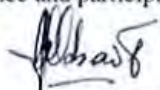
10:30 Port Facility Security Plan on ISPS Code **Dr. Osamu KUNITA**
JICA Expert Team

To maintain international trade function, ships and port facilities need to comply with ISPS Code (International Ships and Port Facility Security Code) of SOLAS Convention. Outline of OCDI manual on security measures (PFSA/PFSP) and manual on security measures of technical standards will be mainly described.

11:30 Question and answers

11:45 Closing

Your presence and participation will be much appreciated.


Johnson Wabaiat Wakanomune
Program Director
Vanuatu Project Management Unit



VPMU, P.O Box 192, Port Vila, Phone: 678 26918 / 678 26415

Attendants List

11 / Aug. / 2016

	Name	Organization	Position	Contact
1	Johnson Wabaiat.	VPMU	AD.	jwabaiat@vanuatu.gov.vu
2	RUSSELL MITCHELL	IPDS	GM	5567722,
3	Andrew Mark Tori	Ports & Marine	C.S.O/A/ASSO	7743241
4	Thomas Henry	VIS	Director	Henry@vanuatu.gov.vu
5	Stephen Willie	VIS	Regulator	willie@vanuatu.gov.vu
6	Yasmine Kamasteia	CSU, MIPU	Shipping Administrator	ikamasteia@vanuatu.gov.vu
7	Charly Koda.	PMD.	Asst. H/M/Asst.	77450755
8	Itsuo Tomaru	P&M.D	volunteer	567-6622
9	ARTHUR FAERUA	VPMU	NRS	arthur@vanuatu.gov.vu
10	Sho Takeeda	ECOH-TV	RE	ystakeeda@mac.com
11	URAVO NAFUKI	PWD	ENV. & SOCIAL OFFICER	urafuki@vanuatu.gov.vu
12	Glenn Bowen.	PWD	Architect	—
13	Shinji Hatazawa	TOA.	P.M.	s.hatazawa@foa-const.co.jp
14	Yoko ASANO	JICA	PFA	Asano.Yoko@jica.go.jp
15	Osamu Kunita	JICA expert	member	kunita@ocdi.or.jp
16	KIERY MANASSAH	VPMU	PRO	kmanassah@vanuatu.gov.vu
17	KAZUYUKI YAMAGUCHI	JICA EXPERT TEAM	LEADER	yamaguchi@ocdi.or.jp
18	Yoichi Harada	"	member	harada@ides-inc.co.jp
19				
20				

WorkShop Materials

Lessons Learned from Coastal Disasters in Japan

Japan Lessons from Coastal Disaster

JICA Expert Team
The Overseas Coastal Area Development Institute of JAPAN

Contents

1. Damage and Restoration

- Damage to Ports and Harbors by the Great East Japan Earthquake
- Restoration of Port Facilities
- Recovery of Damaged Facilities
- Clarification of Disaster Prevention and Mitigation Target

2. Lessons Learned and Measures

- Strengthening of the information system for evacuation
- Introducing Resilient Structure
- Disaster Prevention Base and Earthquake Resistant Berth
- Strengthening cargo handling machineries
- Maintain Waterway Function in Tokyo Bay in an Emergency
- Promotion of Evacuation Countermeasures in Port Area
- Establishment of Business Continuity Plan (BCP) of Port
- Effective Management of Floodgates

3. Summary


1. Damage and Restoration

Damage and Restoration

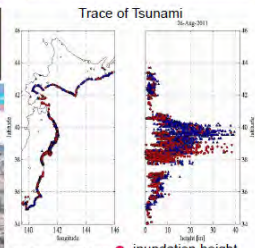
Overview of Damage by the Tohoku Earthquake

The earthquake of magnitude 9.0 occurred on March 11, 2011 and destroyed many lives and properties in the north-east region of Japan.

- Dead and missing toll (as of 10 April 2013) 18,564
- Fully or partially destroyed houses 398,679



Town heavily damaged by tsunami (Ofunato, Iwate)




Trace of Tsunami (11-Apr-2011)

● inundation height
▲ run-up height

Distribution Map of the Epicenter Over Magnitude 5 and Plate Border

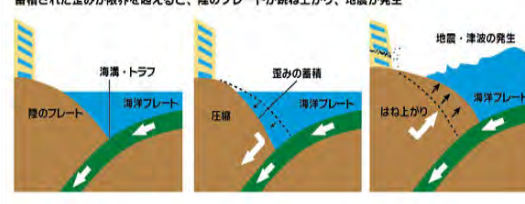
● 1994 ~ 2003年に発生したマグニチュード5.0以上の震源分布図



出典：内閣府HPに参照


Image of Tsunami Occurrence by Plate Strain Energy Release

蓄積された歪みが限界を越えると、陸のプレートが跳ね上がり、地震が発生



地震・津波の発生

Location of Plate Border - Risk of the Epicenter



Damage to Ports and Harbours by the Great East Japan Earthquake

- 29 ports (including local ports) were damaged
- Overall damage to public port facilities : approx. 413.8 billion yen

Damages by Tsunami were significant

Damages by earthquake vibration were significant

Distribution of Tsunami Height

Location	Tsunami Height (m)
① Kushiro	2.1
② Tohachi	2.8
③ Tomonaka	2.5
④ Muroran	1
⑤ Maizuru	2.4
⑥ Mutsu Ogawara	2.5
⑦ Kuchino	6.2
⑧ Kai	8.6
⑨ Miyako	7.3
⑩ Kamachi	8.5
⑪ Oumaraki	9.5
⑫ Ishinomaki	7.7
⑬ Sendai Shirogane (Shirogane Port Area)	4.9
⑭ Sendai Shirogane (Senriwa Port Area)	7.2
⑮ Sohma	3.9
⑯ Onohama	3.3
⑰ Baraki (Haseki Port Area)	4.2
⑱ Baraki (Owa Port Area)	6.2
⑳ Kashima	5.7

Source: Japan Meteorological Agency and Japan Coastal Engineering Committee

Restoration of Port Facilities (Sendai Port)

- Domestic container line restarted after 3 months (June 2011)
- International container line restarted after 6 months (September 2011)
- North American line restarted on January 2012

【Apr. 18, 2011】

【Dec. 12, 2011】

NYK ARGUS 【Jan. 22, 2012】 after 10 months

Restoration of Port Facilities (Hachinohe Port)

- Cargo handling problems had occurred by severe wind and wave in winter with damaged breakwater.
- By putting blocks into the damaged site as early restoration, the cargo handling problems has dramatically reduced.
- Restoration of breakwaters has completed by the end of August 2013.

North Breakwater
Total length: 3,500m

Temporary placing of wave dissipating blocks

Recovery longer 250m

【Mar. 12, 2011】

【Jul. 24, 2012】

Completely collapsed
Half collapsed

Recovery of Damaged Facilities

- Recovery target
- Important port facilities (major public berths) : within 2 years
- Tsunami Breakwaters (Kamaishi and Ofunato) : within 5 years
- Total 373 berths has been recovered

Waterway reopening (by date)

Emergency recovery (by July)

Damage assessment

Full recovery works

Recovery of Damaged Facilities Waterway opening

Clarification of Disaster Prevention and Mitigation Target

- Necessity of preparation for the large-scale tsunami beyond estimation
- Limitation of feasibility to prevent such a large-scale tsunami only by constructing large structures
- Consideration of 2 levels of tsunami scale

Frequently occurring tsunami (Level 1 Tsunami) Return period: Several decades - one hundred and several decades Disaster Prevention Target	Largest class of tsunami (Level 2 Tsunami) Return period: Several hundreds of years - one thousand years Disaster Mitigation Target
Protect human lives	
Prevent tsunami from entering urban area by constructing structures	Allowing inundation into urban area, reduce damage mainly by evacuation countermeasures

Clarification of Disaster Prevention and Mitigation Target

1950 1980 2010

Restoration of infrastructure

Construction of infrastructures for prevention of damage by storm surge & tsunami

Construction of Earthquake-resistant quaywall

non structural measure

typhoon (1953)

tsunami from Chile (1960)

Earthquake (1983)

Source: MLIT

2. Lessons Learned and Measures

Lessons Learned and Measures

Lessons Learned: **Usefulness of GPS Wave Observation Buoys**

- GPS wave observation buoys observed the huge tsunami about 10 minutes before its arrival at the coast.
- Receiving this observation data, Japan Meteorological Agency raised the level of tsunami warnings.

GPS Wave Observation Buoy

Earthquake occurs 14:46

6.3m (15:12)

6.7m (15:12)

4.2m (15:21)

Recording lost

GPS (Offshore Miyako)

Tidegauge (Miyako Port)

GPS (Offshore Kamaishi)

Tidegauge (Kamaishi Port)

Measures: Strengthening of the information system for evacuation

- Strengthen cooperation with Meteorological Agency, so on
- Multiply communication system, and diversify information offering system
- Strengthen power-supply facilities

In-service GPS Buoys (16)
Additional GPS Buoys(2)

GPS Satellites, Data processing center, Website, Japan Meteorological Agency, Base station, Port Office, MLIT, GPS Buoys, Data communication, Transmission on line in real time.

Water depth: 100-400m, Depth 200m, Expected hypocentral region.

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Lessons learned: Tsunami Disaster Reduction by Breakwaters

Kamaishi Great Tsunami Breakwater was damaged by Great East Japan Earthquake

Tsunami Height (inside of port): 8.1 m

Kamaishi Great Tsunami Breakwater

- > Work Term: 30years
- > Cost: nearly \$1.6 billion
- > Length: 1,650m (1mile)
- > Height: 207 feet deep and jutting nearly 20 feet above the water

World's Deepest Breakwater (Guinness World Record)

Source: MLIT

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Lessons learned: Tsunami Disaster Reduction by Breakwaters

- Breakwater at Kamaishi port collapsed by tsunami, but it delayed tsunami overflowing time, and reduced tsunami height and inundation area.

Tsunami height (observation) 6.7 m, Tsunami height (simulation) 13.7 m, Tsunami Run-up height (simulation) 20.2 m, Tsunami Run-up height (simulation) 10 m, Tsunami height (inside of port) 8.1 m, Tsunami Run-up height (simulation) 10 m, Overflowing time (simulation) 28 minutes, Overflowing time (actual) 34 minutes, Overflowing time delayed 6 minutes, MLIT's office.

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Measures: Introducing Resilient Structure

- Breakwater weakens tsunami energy.
- Once damaged, it needs a long time to recover.
- Adopt a "resilient structure" so that it keeps its original function without being broken by an overtopping huge tsunami.

Resilient Structure

Flow with regular geometry, Flow with special top geometry, (3) Special top geometry → controlling overflow, (2) Covering blocks → prevention of scouring, (1) Widening and raising the foundation mound → prevention of caisson sliding, (2) Anti-scouring mat → prevention of mound scouring

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Lessons learned: Effectiveness of earthquake resistant berths

- 6 earthquake resistant berths were available in the disaster area
- Accepting emergency commodities soon after reopening of waterways

Earthquake resistant berth: Specially reinforced berths against earthquake

Name of Port	Facilities	First vessels after disaster	Variety of relief supplies
Hachinohe	Hachitaro Berth N	Feed (Private)	-
Kamaishi	Suga (-7.5m)	General Cargo (Private)	-
Sendai-Shiogama (Sendai)	Nakano Takamatsu Berth	Emergency Commodities (Kyushu RDB, MLIT)	Food (rice, boil-in-the-bag-food), Heating oil
	Nakano Rajin Berth No.2	Emergency Commodities (JCG)	Emergency food
Onahama	Warf No.5 Berth No.1	Coal (Private)	-
Ibaraki (Hitachinaka)	Chuo Berth A	General Cargo (Private)	-

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Lessons learned: Effectiveness of earthquake resistant berths

Normal Quay Walls and Earthquake-resistant berth (Quay Walls) after Great East Japan Earthquake (e.g. Onahama Port, Fukushima)

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Lessons learned: Effectiveness of earthquake resistant berths

Large-Scale Earthquake Behavior of the Differences between Normal Quay Walls and Earthquake-resistant berth (Quay Walls)

Normal Quay Walls: Unavailable. Earthquake-resistant Quay Walls: Available. Resistance force against the soil pressure, Reduce the soil pressure, Lightweight banking, Widening, Implementation of the liquefaction countermeasure.

Source: MLIT

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Measures: Disaster Prevention Base and Earthquake Resistant Berths

Reconsideration of Earthquake Resistant Berths

- Ferry and RoRo vessels played important roles to transport vehicles and people
- Need to utilize disaster prevention base to accept cargo and people for wide-area relief.

Image of Disaster Prevention Base in ports

Current situation of Earthquake Resistant Berths Development (for transporting emergency relief goods)

- Developed or under development (92 ports)
- Undeveloped (24 ports)

Promotion Area on Earthquake Disaster Prevention

Epicerter of major earthquakes after Hanshin-Awaji earthquake 1995

- More than lower 6 maximum seismic intensity

Japan Trench and Okhotsk Trench, Tohoku Tsunami, Tonankai Tsunami

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Lessons learned: Necessity to strengthen cargo handling machineries

Damages by Tsunami About 3.0 m depth flooding above quay surface

Traveling motors were damaged by hitting of drifting objects. Cable winding device was damaged by hitting of drifting objects. Traveling section needs maintenance after 0.6m depth flooding.

Main causes observed

- Hitting of drifting objects such as containers
- Inundation of sea-water and sand into mechanical and electric devices
- Drag of vertical boom by drift of vessels under cargo-handling

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Measures: Necessity to strengthen Cargo Handling Machineries

Point of countermeasure for Cargo Handling Machines
→ To prevent Machineries from flooding

- Raising elevation of the entire container yard
- Placing electronic facilities on higher places in the administration building
- Commoditizing and sharing components of crane materials and equipments

Anti-earthquake measures

Installation of seismic isolation device (Travelling section)

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Lessons learned: Necessity of countermeasures to secure navigation safety in bay areas

Situation of Tokyo Bay (Tohoku Earthquake, 2011)

- 400 vessels
- Tsunami Height: 2.5m (Funabashi), 1.6m (Yokohama)
- A lot of refuge ships stayed within Tokyo Bay
- Crowded with refuge ships until Mar. 15

<Threat > Heavy congestion by refuge vessels in 3 major bays and Seto Inland Sea

On a week ago of the earthquake March 4 (Friday) 2011 14:00 to 24:00
24h (15:00-15:00) OUT: 16 vessels IN: 13 vessels

On a day ago of the earthquake March 10 (Thursday) 2011 14:00 to 24:00
24h (15:00-15:00) OUT: 19 vessels IN: 13 vessels

On the day of the earthquake March 11 (Friday) 2011 14:00 to 24:00
24h (15:00-15:00) OUT: 62 vessels IN: 107 vessels

Crowded with refuge ships

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Measures: Maintain Waterway Function in Tokyo Bay in an Emergency

- Securement of Refuge routes and harborage for large vessels
- Prompt reopening waterways after tsunami attack

Emergency waterways Any obstacles can be removed without delay

Additional harborage for an emergency

Waterway to be developed and maintained

- For usual transport
- For emergency harborage
- Emergency waterway
- Harbour waterway

Earthquake resistant berth

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Measures: Promotion of Evacuation Countermeasures in Port Area

Variety of functions -ware houses -wharves

Particularity of port area Container terminals Industrial Complex

Variety of people -Workers, officers - port visitors

Hazardous materials -power plant, LNG plants, chemical plants

Severe land condition -liquefaction - high groundwater level

Evacuation guideline in port area (Published in Sep, 2013)

Design guideline of refuge facilities (Published in Oct, 2013)

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Measures: Establishment of Business Continuity Plan (BCP) of Port

Indicative Business Continuity Plan (BCP) of port

Action Plan

- Organization plan for emergency restoration
- Securing evacuation route
- Securing acceptability for emergency cargo
- Harmonization with BCP of private sectors

Facility Plan

- Emergency Transportation
- Earthquake Resistant Road for Port Access
- Earthquake Resistant Berth

Transportation of Emergency Vehicles by Ferry

Regional backup system among ports

Oil distribution at the Great East Japan Earthquake

Marine transport

Railway transport

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Measures: Effective Management of Floodgates

Proposal by "Committee for effective management of floodgates" (MLIT and MAFF)

- Top priority to the safety of floodgate operators

Revising "Guideline for management of floodgates in case of tsunami and high tide", Apr.2013.

- Evacuation rule and management system securing the safety of operators a top priority
- "Operator has to escape in an emergency"
- Introduction of automation or remote control system
- Information system for prompt evacuation of residents
- Human resource development of operators
- Technological development and its reflection to the technical standards

Tokyo port


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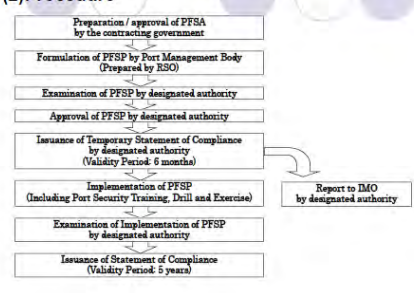
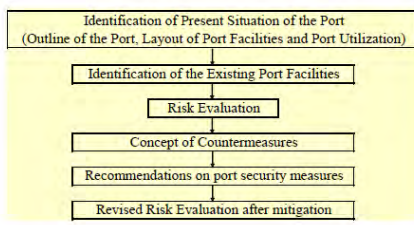
3. Summary

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<p>3. Summary: <i>Summary -1</i></p> <p><u>Countermeasures against Future Earthquake and Tsunami</u></p> <p>1. Strengthening of Disaster Prevention Ability in Port</p> <ul style="list-style-type: none"> - Clarification of disaster prevention target and disaster mitigation target Introduction of 2 level of Tsunami - Evacuation information system utilizing GPS wave observation buoys - Resilient structure for breakwaters - Improvement of liquefaction evaluation method - Necessity of disaster prevention base with earthquake resistant berths - Strengthening cargo handling machines against earthquake and tsunami <p style="text-align: right;">33</p>	<p><i>Summary -2</i></p> <p>2. Securing Maritime Transport Network and Wide-area Mutual Backup System</p> <ul style="list-style-type: none"> - Strengthening core port facilities against earthquake and tsunami - Securement of navigation safety in bay areas in an emergency Amendment of Ports and Harbours Law - Establishment of wide-area mutual backup system among ports <p>3. Countermeasures for saving human lives and BCP</p> <ul style="list-style-type: none"> - Effective management of floodgate – a top priority to lives of operators - Improvement of the evacuation system Evacuation Guideline, Technical standard for evacuation facilities - Establishment of Port's BCP <p style="text-align: right;">34</p>
<p style="text-align: center;">END</p> <p style="text-align: center;">Thank you very much for your attention !</p>	

Manual on Port Security Measures (PFSA/PFSP)

 <p>Manual on Port Security Measures (PFSA/PFSP)</p> <p>The Overseas Coastal Area Development Institute of JAPAN (OCDI)</p>	<p>Contents(1)</p> <p>1 What's PFSA/PFSP Manual?</p> <p>(1) General</p> <p>(2) Procedure</p> <p>2 PFSA Manual</p> <p>(1) Framework of PFSA Manual</p> <p>(2) Formation Flow</p> <p>(3) Present Situation of the Port</p> <p>(4) Identification of the Existing Port Facilities</p> <p>(5) Risk Evaluation</p> <p>(6) Concept of Countermeasures</p> <p>(7) Recommendation on Port Security Measures</p> <p>(8) Revised Risk Evaluation after Mitigation</p>
<p>Contents(2)</p> <p>3 PFSP Manual</p> <p>(1) Framework of PFSP Manual</p> <p>(2) PFSP Form</p> <p>(3) General Provision</p> <p>(4) Security Measures Pegged to Security Level</p> <p>(5) Installation and Maintenance of Facilities</p> <p>(6) Designation of PFSA</p> <p>(7) Training, Drills and Exercises</p> <p>(8) Audit</p> <p>(9) Information Management Method</p> <p>(10) Response to Occurrence of Security Hazard</p> <p>(11) Amendment of PFSP</p> <p>(12) Contrast Chart for ISPS code and PFSP</p>	<p>1 What's PFSA/PFSP Manual?</p> <p>(1)General</p> <p>This manual was discussed and edited by members of ASEAN – JAPAN PORT SECURITY EXPERT MEETING (PSEM), based on a study by the Japan International Cooperation Agency (JICA). The copyrights of this manual are held by JICA.</p>

<ul style="list-style-type: none"> ● The Port Facility Security Assessment (PFSA) is an essential and integral part of the process of developing and updating the Port Facility Security Plan (PFSP) ● To identify the vulnerability of port facilities, to conduct the risk evaluation of PFSA and to recommend the countermeasures in order to appropriately formulate the PFSP 	<p>(2)Procedure</p> 
<p>2 PFSA Manual</p> <p>(1)Framework of PFSA Manual</p> <ul style="list-style-type: none"> ●Formation Flow ●Present Situation of the Port ●Identification of the Existing Port Facilities ●Risk Evaluation ●Concept of Countermeasures ●Recommendation on Port Security Measures ●Revised Risk Evaluation after Mitigation 	<p>(2) Formation Flow of PFSA</p> 

(3) Present Situation of the Port

● Outline of the port

Location of the port, history of the port, situation of circumstances and outline of port activities

● Layout of facilities and equipment

Figure of layout of facilities and equipment, dimensions of the main facilities such as international wharves

● Port utilization

Number of ship calls, volume of cargo and passenger

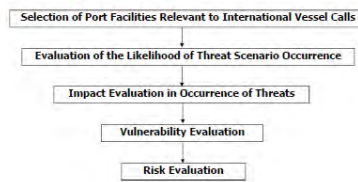
(4) Identification of the Existing Port Facilities

● Situation of all existing facilities, equipment and neighboring area shall be identified and described

Channel	Cargo handling equipment	Power plant	Electricity, city gas & water supply
Anchorage area	Passenger terminal	Bunker point (Fuel)	Pipeline
Wharf	Control center	Storage tank	Service boat
Storage & handling area	Port office	Fresh water supply point	Road, railway & bridge
Warehouse & shed	Substation (Distributor)	Fresh water supply tank	Neighboring Area

(5) Risk Evaluation

● Risk evaluation is conducted according to the following procedures



(5) Risk Evaluation

● Generally, Risk can be represented as the product of the probability and impact of a given security breach as follows

$$R = P \times I$$

Where

R = risk score for a given security breach

P = probability – probability of a security breach. The probability of a security breach can further be defined as the product of threat occurrence (**T**) and vulnerability (**V**).

I = impact – the sum of possible impacts associated with a successful security breach. Impact may be based on impacts to life, economic security, symbolic value, and national defense

(5) Risk Evaluation

- Facilities and equipment that are relevant to international vessel calls shall be identified
- The following nine scenarios which are defined in ISPS Code, B 15.11 shall be considered as envisaged threat scenarios

No	Scenario (ISPS Code, B 15.11)	Assessment	Likelihood of Occurrence	Likelihood Value
1	Attack by explosive devices, arson or sabotage	Some bomb incidents occurred in Indonesia, and likelihood of occurrence of this scenario is high	A	3
2	Hijacking or seizure			
3	Tampering with cargo or ship's store and unauthorized remodeling of important equipment, machinery or systems	Scenario of illegal act in the port such as tampering is possible	B	2
4	Interference with port activities by unauthorized access of stowaways or unauthorized use of port facilities			
5	Smuggling weapons or equipment			
6	Use of the ship to carry terrorists and their weapons	There have been few cases where a ship itself has been used as a weapon. Likelihood of occurrence of terror by small ship with bomb is low	C	1
7	Use of the ship itself as a weapon			
8	Blockage of port channels, etc.			
9	Nuclear, biological and chemical attack			

(5) Risk Evaluation

● Evaluation of the Likelihood of Threat Scenario Occurrence

• Considering the threat motive such as politics, symbolic, economic and fear, the likelihood of occurrence of each scenario shall be evaluated using the following table and three steps: **A** (high), **B** (Middle) and **C** (Low).

• Likelihood value is a quantified numeric of the likelihood of occurrence, **A: 3, B: 2 and C: 1.**

(5) Risk Evaluation

(Example)

No	Scenario (ISPS Code, B 15.11)	Assessment	Likelihood of Occurrence	Likelihood Value
1	Attack by explosive devices, arson or sabotage	Some bomb incidents occurred in Indonesia, and likelihood of occurrence of this scenario is high	A	3
2	Hijacking or seizure			
3	Tampering with cargo, essential ship equipment or systems or ship's stores	Scenario of illegal act in the port such as tampering is possible	B	2
4	Unauthorized access of stowaways or unauthorized use of port facilities			
5	Smuggling weapons or equipment			
6	Use of the ship to carry terrorists and their weapons	There have been few cases where a ship itself has been used as a weapon. Likelihood of occurrence of terror by small ship with bomb is low	C	1
7	Use of the ship itself as a weapon			
8	Blockage of port channels, etc.			
9	Nuclear, biological and chemical attack			

(5) Risk Evaluation

● Impact Evaluation in Occurrence of Threats

• Evaluation items of impact consist of "social", "economic", "environment" and "symbolic" points. Impact value is obtained from the following formula using the total of these four items.

$$\text{Total score} = (\text{Social point}) + (\text{Economic point}) + (\text{Environment point}) + (\text{Symbolic point})$$

Maximum; 12, Minimum; 4

<p>(5) Risk Evaluation</p> <ul style="list-style-type: none"> ● Impact Evaluation in Occurrence of Threats Social point ; degree of effects on casualty toll in case that a port (facility) is destroyed by terrorist attack (Three scoring steps: 1-3) <table border="1"> <tr><td>3</td><td>Numerous deaths</td></tr> <tr><td>2</td><td>Some loss of life</td></tr> <tr><td>1</td><td>Little loss of life or injury</td></tr> </table>	3	Numerous deaths	2	Some loss of life	1	Little loss of life or injury	<p>(5) Risk Evaluation</p> <ul style="list-style-type: none"> ● Impact Evaluation in Occurrence of Threats Economic point ; degree of economic loss in case that a port (facility) is destroyed and damaged (Three scoring steps: 1-3) <table border="1"> <tr><td>3</td><td>National or long term economic loss due to interference with port activities</td></tr> <tr><td>2</td><td>Local or short term economic loss due to interference with port activities</td></tr> <tr><td>1</td><td>Little economic loss due to interference with port activities</td></tr> </table>	3	National or long term economic loss due to interference with port activities	2	Local or short term economic loss due to interference with port activities	1	Little economic loss due to interference with port activities																																																																																																															
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Port facilities	Impact items				Total score	Impact value																																																																																																																						
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(5) Warehouse	1	1	1	1	4	1																																																																																																																						
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(7) Control center	2	3	2	2	9	2																																																																																																																						
(8) Port office	3	2	2	2	9	2																																																																																																																						
(9) Substation (Distributor)	2	2	1	1	6	1																																																																																																																						
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<p>6. Risk Evaluation</p> <ul style="list-style-type: none"> ● Vulnerability Evaluation •In advance of vulnerability evaluation, the issues related to the current security measures at port facilities shall be identified and resolved here <p>Accessibility issues (Example) Gate:Main gate near the international berth is not equipped with a pole to stop cars nor is there a lock. Fence:Some part of the fence is broken and no outrigger is installed. Lighting facilities:Half of the lighting facilities are out of order. Clear zone:Cargo is stored an inch away from the fence. etc</p>	<p>(5) Risk Evaluation</p> <ul style="list-style-type: none"> ● Vulnerability Evaluation Organic security issues (Example) Access control:No access control is conducted for vendors. When persons pay fees and receive receipts, no checking of the individual's identity is conducted. Only external appearances of incoming vehicles are inspected. ID/pass check:Entry pass is not issued for vehicles that pass through the gates. Patrol in port facility:Access channel is not patrolled. etc 																																																																																																																											

(5) Risk Evaluation

- Vulnerability Evaluation**
 - Based on the issues on current security measures, the vulnerability against threat is evaluated using 5 scoring steps (2-6).
 - Evaluation items of vulnerability consist of "Accessibility" and "Organic security" points.
 - Vulnerability value is the total of these two items.

Vulnerability value = (Accessibility point)
 + (Organic security point)
 Maximum; 6, Minimum; 2

(5) Risk Evaluation

- Vulnerability Evaluation**
 - Accessibility point** ; degree of accessibility of the facilities and equipment to the threat incidents (This relates to physical and geographic barriers that deter the threat independently of organic security.) (Three scoring steps: 1-3)

3	No deterrence (ex. unrestricted access to vessel, unrestricted internal movement and facilities and equipment not to withstand specific attack)
2	Good deterrence (ex. single substantial barrier, unrestricted access to within some short distance from vessel and facilities and equipment to withstand specific attack)
1	Excellent deterrence (expected to deter attack, access restricted within some long distance from vessel, multiple physical/geographical barriers and facilities and equipment to withstand specific attack well)

(5) Risk Evaluation

- Vulnerability Evaluation**
 - Organic security point** ; degree of the ability of the security personnel to deter the threat incidents, which includes having in place security capability, guard force, intrusion detection systems, and timeliness of outside law enforcement to prevent threat incidents (Three scoring steps: 1-3)

3	No deterrence capability (ex. no security plan, no guard force, no emergency communication, outside law enforcement not available for timely prevention, no detection capability)
2	Good deterrence capability (ex. minimal security plan, some communications, armed guard force of limited size relative to the vessel, outside law enforcement not available for timely prevention, limited detection systems)
1	Excellent deterrence capability (expected to deter attack, covert security elements that represent additional elements not visible or apparent)

(5) Risk Evaluation

- Vulnerability Evaluation** (Example)

Port facilities	Vulnerability items		Vulnerability value
	Accessibility	Organic security	
(1) Channel (River; a few number of international ship sailings)	3	3	6
(2) Anchorage and basin	2	3	5
(3) Wharf	2	2	4
(4) Storage and handling area (hazardous)	2	2	4
(5) Warehouse	2	2	4
(6) Cargo handling equipment	2	2	4
(7) Control center	3	3	6
(8) Port office	2	3	5
(9) Substation (Distributor)	2	2	4
(10) Fresh water supply point	2	2	4
(11) Fresh water supply tank	2	2	4
(12) Electricity and circ. gas	1	2	3
(13) International ship (Dangerous goods)	2	2	4
(14) Tugboat, Pilot boat	2	2	4
(15) Road	2	2	4
(16) Neighboring Area	3	2	5

(5) Risk Evaluation

- Risk Evaluation**
 - Risk for each threat scenario is evaluated as the product of the likelihood value, impact value and vulnerability value using the following formula.

Risk value = (Likelihood value)
 × (Impact value)
 × (vulnerability value)

(5) Risk Evaluation

- Risk Evaluation**
 - Risk ranks consist of 3 categories for grouping of risk values

M: Mitigate (protective measures and/or procedures to reduce risk for that scenario are needed)
(Risk values: 54-30)

C: Consider (Scenario should be considered and protective measures should be developed on a case-by-case basis)
(Risk values: 29-15)

D: Document (Scenario may not need a protective measure at this time and therefore needs only to be documented)
(Risk values: 14-2)

(5) Risk Evaluation

- Risk Evaluation**
 - Risk evaluation for each scenario shall be conducted as in the following table

(5) Risk Evaluation

- Risk Evaluation** (Example)
- Scenario 1: Attack by Explosive Devices, Arson or Sabotage on Ships or Port Facilities

Port facilities	Likelihood value	Impact value	Vulnerability value	Risk value	Risk rank
(1) Channel (River; a few number of international ship sailings)	3	1	6	18	C
(2) Anchorage and basin	3	1	5	15	C
(3) Wharf	3	2	4	24	C
(4) Storage and handling area	3	2	4	24	C
(5) Warehouse	3	1	4	12	D
(6) Cargo handling equipment	3	2	4	24	C
(7) Control center	3	2	6	36	M
(8) Port office	3	2	5	30	M
(9) Substation (Distributor)	3	1	4	12	D
(10) Fresh water supply point	3	1	4	12	D
(11) Fresh water supply tank	3	1	4	12	D
(12) Electricity and circ. gas	3	1	3	9	D
(13) International ship (Dangerous goods)	3	3	4	36	M
(14) Tugboat, Pilot boat	3	1	4	12	D
(15) Road	3	1	4	12	D
(16) Neighboring area	3	1	5	15	C

(5) Risk Evaluation

- Risk Evaluation
Summary of risk evaluation (it easy to identify the weakness of facilities and equipment) **(Example)**

Port Facility	Threat Scenario No.									Max
	1	2	3	4	5	6	7	8	9	
(1) Channel (River; a few number of international ship sailings)	C	D	C				D	D	D	C
(2) Anchorage and basin	C	D	C				D	D	D	C
(3) Wharf	C	C	C	C	C	C	D	D	D	C
(4) Storage and handling area	C	C	C	C	C		D	D	D	C
(5) Warehouse	D	D	D	D	D		D	D	D	C
(6) Cargo handling equipment	C	C	C				D	D	D	C
(7) Control center	M	C	M				D	D	D	M
(8) Post office	M	C	M				D	D	D	M
(9) Substation (Distributor)	D	D	D				D	D	D	D
(10) Fresh water supply point	D	D	D				D	D	D	D
(11) Fresh water supply tank	D	D	D				D	D	D	D
(12) Electricity and city gas	D	D	D				D	D	D	D
(13) International ship (Dangerous goods)	M	M	C	M	M	M	D	D	D	M
(14) Tugboat, Pilot boat	D	C	D	D	D	D	D	D	D	C
(15) Road	D		D				D	D	D	D
(16) Neighboring area	C	C	C				D	D	D	C
Max	M	M	C	M	M	M	D	D	D	M

(6) Concept of Countermeasures

- The concepts of countermeasures for each scenario are described in the following table. Countermeasures may be recommended referring to the following table. **(Example)**

No	Scenario	Max Risk Rank	Concept of Countermeasures
1	Attack by explosive devices, arson or sabotage		-To implement intensive access control to prohibit terrorists with weapons and vehicles and cargoes concealing weapons from passing gates -To monitor along fence to prevent intrusions -To implement monitoring and patrol of water area to prevent attack from seaside
2	Hijacking or seizure		-To implement intensive access control and monitor fence and its surrounding area to prohibit boarding of potential hijackers -To intensively implement patrol in water area and near wharves and monitor in water area for a ship not to be seized from water area

(6) Concept of Countermeasures

(Example)

No	Scenario	Max Risk Rank	Concept of Countermeasures
3	Tampering with cargo or ship's store and unauthorized remodeling of important equipment, machinery or systems		-To implement intensive access control and monitor cargo storing area to prevent tampering and unauthorized remodeling in the terminal area -To implement intensive access control to prevent weapons from creeping into ship's store and equipment
4	Interference with port activities by unauthorized access of stowaways or unauthorized use of port facilities		-To implement intensive access control at gates and monitor fence area and storage area against stowaways -To intensively monitor cargo storing area against unauthorized use
5	Smuggling weapons or equipment		-To implement intensive access control at gates and intensively monitor cargo storing area against smuggling in the restricted area Customs are basically responsible for smuggling check
6	Use of the ship to carry terrorists and their weapons		-To implement intensive access control at gates -To intensively monitor cargo storing area

(6) Concept of Countermeasures

(Example)

No	Scenario	Max Risk Rank	Concept of Countermeasures
7	Use of the ship itself as a weapon		-To implement offshore patrol to prevent sea hijacking and seizure as well as attack by small boats including hijacked tugboats, pilot boats or traffic boats -Patrol boats are required to furnish communication equipment
8	Blockage of port entrances, channels, etc.		-To take measures mentioned in scenario No. 2 and 7 to prevent a ship colliding with and sinking a large ship in port entrances and channels -To take measures mentioned in scenario No. 1 and 3 to prevent sinking of a ship by blowup of explosives that is illegally loaded into it
9	Nuclear, biological and chemical attack		-To take measures mentioned in scenario No. 1 (To replace "explosives" with "nuclear, biological and chemical weapon")

(7) Recommendations on Port Security Measures

- Based on the risk evaluation, security measures shall be recommended along the following lines at least in order to improve "M (Mitigate)" to "C (Consider)"

- Installation of fence or barrier
- Access control
- Monitoring terminal area
- Monitoring water area
- Communication with related organizations
- Response to emergency
- Training
- Others

(8) Revised Risk Evaluation after Mitigation

- Based on the above recommended security measures, risk for each scenario is reevaluated in this section.
- Basically, vulnerability can be improved by the implementation of the recommended security measures.
- In principle, accessibility point or organic security point can be reduced one point response to the contents of security measures.

(8) Revised Risk Evaluation after Mitigation

Revised Vulnerability Value (Example)

Port facilities	Revised vulnerability items: Revised accessibility	Revised organic security	Revised vulnerability value
(1) Channel (River; a few number of international ship sailings)	3	2	5
(2) Anchorage and basin	2	2	4
(3) Wharf	2	2	4
(4) Storage and handling area (hazardous)	1	2	3
(5) Warehouse	2	2	4
(6) Cargo handling equipment	1	2	3
(7) Control center	2	2	4
(8) Post office	2	2	4
(9) Substation (Distributor)	2	2	4
(10) Fresh water supply point	2	2	4
(11) Fresh water supply tank	2	2	4
(12) Electricity and city gas	1	2	3
(13) International ship (Dangerous goods)	1	2	3
(14) Tugboat, Pilot boat	2	2	4
(15) Road	2	2	4
(16) Neighboring Area	3	2	5

(8) Revised Risk Evaluation after Mitigation

- Using the revised vulnerability value, the risk reevaluation for each scenario shall be conducted as in the following table

(8) Revised Risk Evaluation after Mitigation

Scenario 1: Attack by Explosive Devices, Arson or Sabotage on Ships or Port Facilities
(Example)

Port facilities	Likelihood value	Impact value	Vulnerability value	Risk value	Risk rank
(1) Channel (River; a few number of international ship sailings)	3	1	5	15	C
(2) Anchorage and basin	3	1	4	12	D
(3) Wharf	3	2	3	18	C
(4) Storage and handling area	3	2	3	18	C
(5) Warehouse	3	1	4	12	D
(6) Cargo handling equipment	3	2	3	18	C
(7) Control center	3	2	4	24	C
(8) Port office	3	2	4	24	C
(9) Substation (Distributor)	3	1	4	12	D
(10) Fresh water supply point	3	1	3	9	D
(11) Fresh water supply tank	3	1	4	12	D
(12) Electricity and city gas	3	1	3	9	D
(13) International ship (Dangerous goods)	3	3	3	27	C
(14) Inboard Pilot boat	3	1	4	12	D
(15) Road	3	1	4	12	D
(16) Neighboring area	3	1	5	15	C

(8) Revised Risk Evaluation after Mitigation

Summary of risk evaluation (Example)

Port Facilities	Threat Scenario No.									Max
	1	2	3	4	5	6	7	8	9	
(1) Channel (River; a few number of international ship sailings)	C	D	C				D	D	D	C
(2) Anchorage and basin	D	D	D				D	D	D	D
(3) Wharf	C	D	C	C	C	D	D	D	D	C
(4) Storage and handling area	C	D	C	C	C			D	C	
(5) Warehouse	D	D	D	D	D			D	D	
(6) Cargo handling equipment	C	D	C				D	D	C	
(7) Control center	C	C	C						D	C
(8) Port office	C	C	C						D	C
(9) Substation (Distributor)	D	D	D						D	D
(10) Fresh water supply point	D	D	D						D	D
(11) Fresh water supply tank	D	D	D						D	D
(12) Electricity and city gas	D	D	D						D	D
(13) International ship (Dangerous goods)	C	C	C	C	C	C	D	D	D	C
(14) Inboard Pilot boat	D	C	D	D	D	D	D	D	D	C
(15) Road	D		D						D	D
(16) Neighboring area	C	C	C						D	C
Max	C	C	C	C	C	C	D	D	D	C

3 PFSP Manual

(1) Framework of PFSP Manual

- PFSP Form
- General Provision
- Security Measures Pegged to Security Level
- Installation and Maintenance of Facilities
- Designation of PFSP
- Training, Drills and Exercises
- Audit
- Information Management Method
- Response to Occurrence of Security Hazard
- Amendment of PFSP

(2) PFSP Form

- Cover page
- Main part
- Supplementary Figures
- Appendices
- Annexes

(2) PFSP Form

Main Part including;

- General Provision
- Security Measures Pegged to Security Level
- Installation and Maintenance of Facilities
- Designation of PFSP
- Training, Drills and Exercises
- Audit
- Information Management Method
- Response to Occurrence of Security Hazard
- Amendment of PFSP

(2) PFSP Form

Supplementary Figures including;

- Location of the Facility
- Location of the Restricted Area
- Layout Plan of the Facility
- Security Organization

(2) PFSP Form

Appendixes including;

- Security Measures during Interim Period
- Access Control
- Monitoring Security
- Maintenance Works
- Document Management Rules
- Emergency Management Plan
- Declaration of Security
- Evacuation Route

(2) PFSP Form

Annexes including;

- Composition of the Port Security Committee
- Emergency Contact List
- Format of DoS
- Format of Security Log
- Contrast Chart for ISPS Code and PFSP

<p>(3) General Provisions</p> <p>General matters of the facility such as;</p> <ul style="list-style-type: none"> • Name of a facility and its general outline • Name of a port administrator and a port operator • Name of a PFSO and contact address • Definitions of words 	<p>(4) Port facility Security Measures Pegged to Security level</p> <ul style="list-style-type: none"> • Procedures of Access Control for Personnel and Cargo • Procedures of Monitoring Security 																																				
<p>(4) Port facility Security Measures Pegged to Security level</p> <p>Access Control</p> <p>Category of Entrance</p> <ul style="list-style-type: none"> • Port User (by foot or otherwise) • Container Truck • Cargo truck • Construction/Maintenance Vehicle • Ships Stores/Equipment • Ships Crew's exit and return entry • Taxi • Emergency Service Vehicle 	<p>(4) Port facility Security Measures Pegged to Security level</p> <p>Port User (by foot or otherwise) (Example)</p> <table border="1"> <thead> <tr> <th>Security Level</th> <th>Level 1</th> <th>Level 2</th> <th>Level 3</th> </tr> </thead> <tbody> <tr> <td>Foot or Vehicle Entry</td> <td> <ul style="list-style-type: none"> •Request to stop •Ask all entering persons to show ID card </td> <td> <ul style="list-style-type: none"> •Same as the left column •Check ID photo and the face for 10 out of every 100 </td> <td>Port shall be closed</td> </tr> <tr> <td>Baggage</td> <td> <ul style="list-style-type: none"> •Check appearance of baggage </td> <td> <ul style="list-style-type: none"> •Confirm contents of baggage for 10 out of 100 </td> <td></td> </tr> </tbody> </table> <p>If the level is reached to Level 3, port users shall immediately be evacuated from the restricted area following the instruction of PFSO.</p>	Security Level	Level 1	Level 2	Level 3	Foot or Vehicle Entry	<ul style="list-style-type: none"> •Request to stop •Ask all entering persons to show ID card 	<ul style="list-style-type: none"> •Same as the left column •Check ID photo and the face for 10 out of every 100 	Port shall be closed	Baggage	<ul style="list-style-type: none"> •Check appearance of baggage 	<ul style="list-style-type: none"> •Confirm contents of baggage for 10 out of 100 																									
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<p>(5) Installation and Maintenance of Port Security Facility</p> <ul style="list-style-type: none"> • Basic Performance and Specifications of the Port Security facilities • Procedures for Both Daily and Periodical Inspection 	<p>(6) Designation of Port Facility Security Officer</p> <ul style="list-style-type: none"> • In Accordance with article 17 of ISPS code A • Name of PFSA • Contact Address • Duties of PFSA 																																				

<p>(7) Training, Drills and Exercises on Port Facility Security</p> <ul style="list-style-type: none"> Detailed items of Training Detailed items of Drills Detailed items of Exercises 	<p>(8) Audit Regarding Works for Ensuring Security of Port Facility</p> <ul style="list-style-type: none"> Items on internal audit and security check Timing Responsible person Record of result Information management
<p>(9) Document Management Rules</p> <p>PFSA } Confidential Documents PFSP }</p> <p>need to establish management rules</p> <ul style="list-style-type: none"> Custody of the documents organization 	<p>(10) Response to Occurrence of security Hazard</p> <ul style="list-style-type: none"> Procedures of Emergency Management Plan Emergency Contact List Format of the Security Log

<p>(10) Response to Occurrence of security Hazard Emergency Management Plan (Example)</p>	<p>(10) Response to Occurrence of security Hazard Emergency Contact List</p> <p>Security Officer</p> <table border="1"> <thead> <tr> <th>Organization/Title</th> <th>Name</th> <th>Tel.</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td>PFSO</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Deputy PFSO</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>Port of XXXXX</p> <table border="1"> <thead> <tr> <th>Organization/Title</th> <th>Name</th> <th>Tel.</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td>ADPEL</td> <td></td> <td></td> <td></td> </tr> <tr> <td>KPLP/PFO</td> <td></td> <td></td> <td></td> </tr> <tr> <td>KPPP</td> <td></td> <td></td> <td></td> </tr> <tr> <td>PORT HEALTH</td> <td></td> <td></td> <td></td> </tr> <tr> <td>IMMIGRATION</td> <td></td> <td></td> <td></td> </tr> <tr> <td>CUSTOMS</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Organization/Title	Name	Tel.	Remarks	PFSO				Deputy PFSO				Organization/Title	Name	Tel.	Remarks	ADPEL				KPLP/PFO				KPPP				PORT HEALTH				IMMIGRATION				CUSTOMS			
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<p>(10) Response to Occurrence of security Hazard Form of the Security Log</p> <ul style="list-style-type: none"> Test, Maintenance & Breakdown Record for Security Equipment and Devices Security Threats and Security Incidents Training Drills and Exercises Change in Security Level Completion of DoS ISPS Inapplicable Ship Calling at the Port and Security Measures Conducted Enforcement of Audit 	<p>(11) Amendment of PFSP</p> <ul style="list-style-type: none"> In what cases the PFSP should be amended (Example) <p>PFSO shall amend the Plan in the following cases:</p> <ol style="list-style-type: none"> Order from the Port Security Committee Revision of Port Facility Security Analysis Occurrence of serious incident Revision of structure or usage of the wharf A fault found by audit or security inspection Necessity of change found by other reasons 																																								

(12) Contrast Chart for ISPS Code and PFSP (Example)

ISPS Code No.	ISPS Code	PFSP
Part A		
18.1	General	1.1 Feature of the Plan
18.2	Approval of the Plan	(duty of the Contracting Government)
18.4	Combined with port security plan	not applicable
18.6	Format and protection of the Plan	7 Information management method ~
18.7	Protection from unauthorized access	same as above
18.8	PFSP for more than one port facility	1.2 Application
17.1	Designation of PFSP	4.1 Designation of PFSP
17.2	Duties and responsibilities of PFSP	same as above
17.3	PFSP support	same as above
18	Training Drills & Exercises	5 Training, drills and exercises on port ~
Part B		
18.1	PFSP's responsibility to prepare PFSP	4.2 Duties of the PFSP
18.2	PFSA and PFSP	1.1 Feature of the Plan

Manual on Port Security Measures (Technical Standards)

Manual on Port Security Measures (Technical Standards)

The Overseas Coastal Area Development Institute of JAPAN (OCDI)

Contents

- 1 What's Technical Standards ?**
 - (1) Background
 - (2) Adoption
- 2 Framework of Technical Standards**
 - (1) Framework
 - (2) Two Group of Port Facilities
- 3 Contents of Technical Standards**
 - (1) Restricted Areas
 - (2) Barriers
 - (3) Security Lighting Equipment
 - (4) Surveillance Camera Unit
 - (5) Intrusion Detection Sensors
 - (6) Hand Luggage Inspection Equipment
 - (7) Telecommunication Equipment
 - (8) Power Supply Facility
 - (9) Maintenance of Port Security Facilities

1. What's Technical Standards ?

(1) Background

Important Element for Port Security

- Establishment of Restricted Area
- Protection of Boundaries of Restricted Area
- Access Control
- Monitoring etc.

↓

For this Purpose

Organic Measure

Facilities and Equipment

Technical Standards

Facilities and Equipment should be developed based on Technical Standards

This manual was discussed and edited by members of ASEAN – JAPAN PORT SECURITY EXPERT MEETING (PSEM), based on a study by the Japan International Cooperation Agency (JICA). The copyrights of this manual are held by JICA.

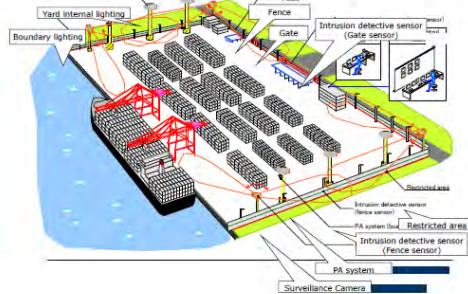
1. What's Technical Standards ? (2) Adoption

- Technical Standards show functional requirements and standard specification
- Practical specific action should be **determined on an individual basis** in consideration of the actual using conditions
- Any specifications that deviate from the standards may be adopted if they are considered **equivalent in functionality**

2. Framework of Technical Standards (1) Framework

- Contents:
- ① Restricted Areas
 - ② Barriers
 - ③ Security Lighting Equipment
 - ④ Surveillance Camera Unit
 - ⑤ Intrusion Detection Sensors
 - ⑥ Hand Luggage Inspection Equipment
 - ⑦ Telecommunication Equipment
 - ⑧ Power Supply Facility
 - ⑨ Maintenance of Port Security Facilities
- Each Section has 4 items:
- ① Functional Requirements
 - ② Standards Specifications
 - ③ Interpretation
 - ④ Reference

Overview of Port Security Facilities & Equipment



Port Security Facilities & equipment



2. Framework of Technical Standards (2) Two Group of Port Facilities

Group A

Container berths
Hazardous material berths
Passenger berths

Port facilities which need strict security measure

Group B

Bulk material berths
Multi purpose berths

Other Port facilities

Port Security Facilities & equipment of each Group (1)

Port Security Facilities and Equipment	Group A		Group B	
	Container / Hazardous material (Dedicated)	Passenger (Linear)	Others	Passenger
1. Barrier				
1-1 Fence (fixed)	⊕ (H: 2.4m or over)	⊕ (H: 2.4m or over)	⊕ (H: 1.8m or over)	⊕ (H: 1.5m or over)
1-2 Fence (mobile)	⊖	⊖	⊖	⊖
1-3 Gate	⊕ (H: 2.4m or over)	⊕ (H: 2.4m or over)	⊕ (H: 1.8m or over)	⊕ (H: 1.5m or over)
1-4 Vehicle-Stopping Equipment	⊕	⊕	⊖	⊖
2. Security Lighting Equipment	⊕	⊕	⊕	⊕
3. Surveillance Camera Unit	⊕	⊕	△	△

Port Security Facilities & equipment of each Group (2)

Port Security Facilities and Equipment	Group A		Group B	
	Container / Hazardous material (Dedicated)	Passenger (Linear)	Others	Passenger
4. Intrusion Detection Sensor (Fence Sensor / Gate Sensor)	△	△	△	△
5. Inspection System of Belongings (X-ray inspection device/Metal detector)	-	⊖	-	△
6. Telecommunications Equipment				
6-1 Between Ships & Port Facilities	⊕	⊕	⊕	⊕
6-2 Within Port Facilities	⊕	⊕	⊕	⊕
6-3 With Police and Other	⊕	⊕	⊕	⊕
7. Power Supply Facility				
7-1 Uninterruptible power supply (UPS)	⊕	⊕	△(DC/TV)	△(DC/TV)
7-2 Emergency power generation facility	△	△	△	△

3. Contents of Technical Standards (1) Restricted Area

- [Functional requirements]
- Restricted area shall be designated based on the layout of the port, situation of ship calling/cargo and passenger etc.
 - Sufficient understanding of the ISPS code is necessary
- [Purpose of restricted area (ISPS CODE)]
- Protect the **Passenger, ship's personnel, port facility personnel and visitors**
 - Protect the **port facility**
 - Protect **ships** using, and serving, the port facility
 - Protect sensitive security locations and areas within the port facility
 - Protect security and surveillance equipment and system
 - Protect **cargo and ship's stores** from tampering

3. Contents of Technical Standards

(2) Barriers

a) Fixed Fences

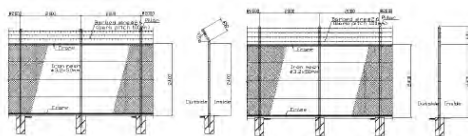
[Functional requirements]

- ① Sufficient height to prevent any person from easily intruding
- ② Sufficient strength and durability to withstand assumed loads
- ③ Wire mesh or grid rod diameter that will not be easily cut
- ④ Structure of a construction that will not allow detour for entry at water edge sections of borders with neighboring land
- ⑤ Signs posted to prohibit any trespassing
- ⑥ Clear zone provided on both sides of fences

[Standard Specifications]

- ① Effective height of 2400 mm or over for Group A facilities and 1800 mm or over for Group B facilities
- ② Spike added on top as overhung outward (length of 450 mm or over, angled 30 deg or over outward and barbed)
- ③ The assumed load is wind load (standard speed of 34 m/sec)
- ④ Mesh of a size (diamond side of 50 mm or less) or grid of a width (50 mm or less) that will not provide foothold
- ⑤ Mesh wire diameter of 3.2 mm or over (without cladding) and grid rod diameter of 6.0 mm or over
- ⑥ Prevention against any curling up, or construction against any crawling under the fence
- ⑦ Fences that are used at port must be highly resistant to corrosion in consideration of salt damage
- ⑧ Intrusion prevention fence must provided as on large-sized drainage trench that passes across under the fence
- ⑨ Intrusion prevention fence must provided on structures or communicating passage that pass across over the fence
- ⑩ Standard clear zone should be 3 meters inside the fence and some width on the outside as necessary for the early detection of any unauthorized intrusion.

Fence with correct-direction top guard / Fence with erect top guard



Effective height of fence

- The effective height of fence is calculated at the height **except those of top guard and basement**, because the basement can function as a step when somebody is going to come over the fence.



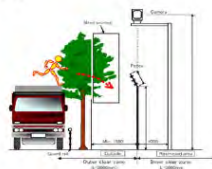
Top guard toward the outside

Effective height of fence
 (The height of fence looks like over 2.4 m. However, the effective height of fence should be calculated from the top of concrete base to the top of fence.)

The height of concrete base should be exclusive because it can be a step.
 (The thing in front of fence should be removed because this can also be a step.)

Outside the restricted area (road)

Clear Zone



- Both widths of inside and outside clear zone are set at 3 m as a standard. The width of outside clear zone should be over 1.5 m.
- If it is impossible to secure 3 m of clear zone. If it is impossible to secure outside clear zone anyhow, the effective height of fence has to be secured inevitably.

Grid Fence (Improvement)

- Grid fence is mainly applied in Indonesian ports and its interval is 100 mm without top guard.



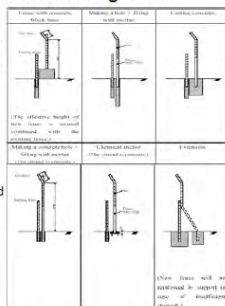
[Improvement plan of existing fence]

- ① Grid bar should be added between the existing grids to reduce its interval to below 50 mm.
- ② Correct-direction top guard should be installed on the existing fence.
- ③ There is a wide space between the ground and the lowest edge of the fence. This space should be reduced to below 50 mm by installing the additional horizontal beam.



improvement plan of the existing fence

- ① Net or grid can be used in the whole surface of new fence though net or grid is not needed for its lower half. Barbed wire can be installed in the lower half instead of net or grid.
- ② The position of new fence is as near as possible from the existing fence not to invade from in-between.
- ③ In case to put new fence apart from the existing fence, over 1.7 m should be away from each other.

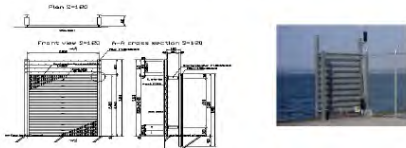







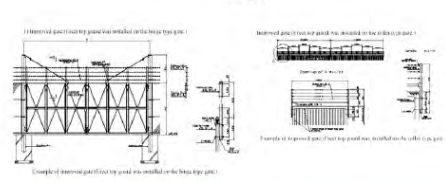


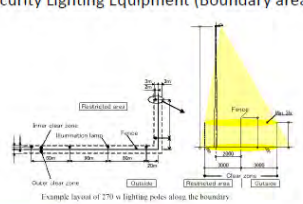
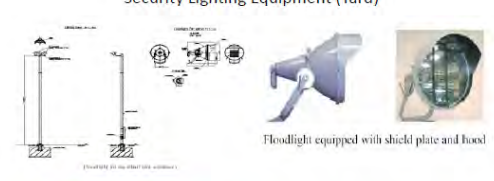

Before improvement



After improvement


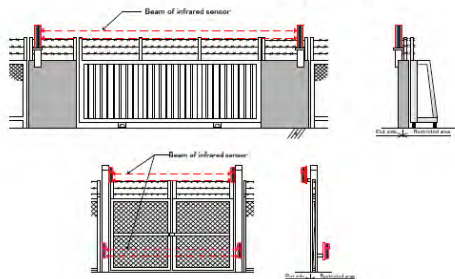







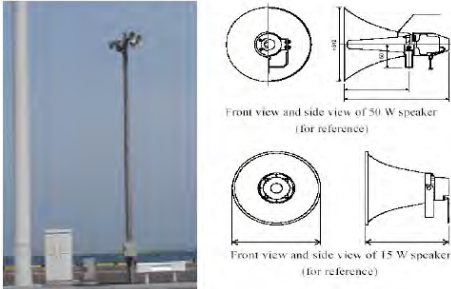
<p>Prevention wall from making a detour to avoid a fence</p>  <ul style="list-style-type: none"> • To set a plat wall along a berth line prevents from making a detour to avoid a fence. • This advantage is no projection into the sea. 	<p>Prevention fence from making a detour to avoid a fence①</p>  <ul style="list-style-type: none"> • To set a projecting fence into the sea from the berth prevents from making a detour to avoid a fence. • It will be more effective to install barbed wire on the prevention fence.
<p>Prevention fence from making a detour to avoid a fence②</p>  <ul style="list-style-type: none"> • The lower end of prevention fence should be down to the surface of apron. • Top guard should be installed on the fence. • Barbed wire should be installed on an extended projecting fence. • Fence and gate should also be improved. 	<p>Prevention measures from invading through a drainage</p> 
<p>Prevention measures from invading along a belt conveyor over the fence</p> 	<h3>3. Contents of Technical Standards</h3> <h4>(2) Barriers</h4> <h5>b) Mobile Fences</h5> <p>[Functional requirements]</p> <ol style="list-style-type: none"> ① Ability to clearly indicate the boundaries to restricted areas to identify any intruder ② Signs posted to prohibit any trespassing ③ Clear zone provided
<p>Mobile Fences</p>  <p>[Standard Specifications]</p> <ol style="list-style-type: none"> ① It has self-supported construction that will not easily fall ② Width of clear zone on both sides should be enough for early detection of any unauthorized intrusion 	<p>Where the following conditions are met, Mobile fences may be used as substitute for part of the fencing.</p> <ol style="list-style-type: none"> ① The relevant pier facilities are used primarily for domestic navigating ships and rarely used by international ships. ② Sufficient clear zones can be secured as because the back of the pier facilities is unused land area. ③ Before demarking the restricted areas by moving fences, inspections are conducted with the cargoes and goods in the restricted areas. ④ Where moving fences fail to meet the standard specifications of fixed fences, additional guards are deployed to watch for any intrusion from outside while the restricted areas are being demarked by the moving fences.

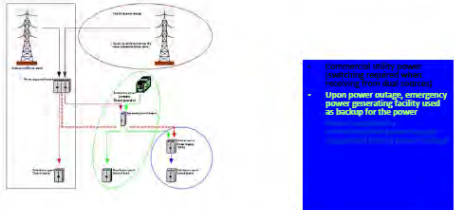
<p>3. Contents of Technical Standards (2) Barriers c) Gates</p> <p>[Functional requirements]</p> <ol style="list-style-type: none"> Gates shall have the same height as fixed fences and shall be of a construction of strength and durability to withstand assumed loads. Car bump or cross bar shall be provided at the gate Gate shall be of a construction that allows locking. When locked, the lock and key shall not allow any easy removal, replacement or replication. The construction shall allow separate access control of humans and vehicles. 	<p style="text-align: center;">Gates</p>  <p>[Standard Specifications]</p> <ul style="list-style-type: none"> The standard specifications shall be the same as with fixed fences.
<p>3. Contents of Technical Standards (2) Barriers d) Vehicle Stopping Equipment</p> <p>[Functional requirements]</p> <ol style="list-style-type: none"> Devices that clearly indicate the instruction to stop to the vehicle Devices that make a vehicle driver recognize the need to stop 	<p style="text-align: center;">Vehicle Stopping Equipment</p>  <p>[Standard Specifications]</p> <ul style="list-style-type: none"> The equipment shall have a construction that will easily prevent any vehicle from intrusion
<p>3. Contents of Technical Standards (3) Security Lighting Equipment</p> <p>[Functional requirements]</p> <ol style="list-style-type: none"> Enough illuminance for surveillance of any suspicious individual behaviors by naked eyes or through surveillance camera No light source is within the scope of the cameras Properly location for prevent any intrusion across the fence Lighting shall be able to illuminate the entire apron, yard Uniform illuminance at the borders for surveillance cameras Sufficient illuminance at any narrow places Sufficient illuminance at the gate for viewing certificate documents Emergency power source for the surveillance of the boundary 	<p style="text-align: center;">Security Lighting Equipment (Boundary area)</p>  <p>[Standard Specifications]</p> <ol style="list-style-type: none"> The illuminance should allow surveillance by cameras. The illuminance and lighting equipment are to be determined based on the capacity of the camera. The illuminance should basically be 3 lx that will allow surveillance by the naked eye. The equipment shall be of a construction that will easily prevent any vehicle from intrusion as by onrushing, running over or under.
<p style="text-align: center;">Security Lighting Equipment (Yard)</p>  <p>[Standard Specifications]</p> <ul style="list-style-type: none"> Work lighting should be utilized and any deficiency be supplemented by providing additional lighting. 	<p style="text-align: center;">Security Lighting Equipment (Gate)</p>  <p>[Standard Specifications]</p> <ul style="list-style-type: none"> Spot lighting shall be provided at the position of the standing sentry. The standard illuminance should be 30-50 lx that will allow reading 10 point (approximately 3.5 mm) characters almost effortlessly.

<p style="text-align: center;">Security Lighting Equipment (Other)</p> <p>[Standard Specifications]</p> <ul style="list-style-type: none"> • Backup measures shall be provided for any power outage to ensure the minimum level of surveillance functionality including the surveillance of boundary areas. • Group A facilities shall be equipped with emergency power source. With Group B facilities, while having emergency power source is recommended, alternative measures may be used as enhancing the patrol surveillance upon any power outage. 	<p>3. Contents of Technical Standards (4) Surveillance Camera Unit</p> <p>[Functional requirements]</p> <ol style="list-style-type: none"> ① Must be able to cover all boundary areas of the restricted area for surveillance. ② Must be able to watch any particular area in the camera operating range within the restricted area. ③ With the combination of surveillance equipment and lighting equipment, it must be possible to identify specific actions of any suspicious person when such person's intrusion or tampering with the fence is underway. ④ Camera images must be recorded for a certain period of time. ⑤ The functionality of the surveillance equipment must be maintained for a certain period of time upon any power outage.
<p style="text-align: center;">Installation policy on CCTV camera system</p> <ol style="list-style-type: none"> ① CCTV cameras should be disposed with an interval in-between which CCTV cameras can monitor the motion of suspicious person under 3 lx during the night time. Considering the capacity, its number, monitoring area and the target (yard, passenger terminal, etc) of CCTV camera, the layout of CCTV camera should be determined. ② The layout should ensure that there is no blind spot by warehouses and stacking cargo to CCTV cameras and CCTV cameras can monitor the main route in the yard. ③ In the wharf, the layout should ensure that CCTV cameras do not obstruct cargo handling and there is no blind spot by cranes and handling cargo to CCTV cameras. ④ The setting level of CCTV camera should be determined to minimize the blind spot around the fence and by stacking cargo with considering the ease of the maintenance. 	<p style="text-align: center;">CCTV camera system</p> <p>Example of installation of CCTV camera</p> <p>Down slope CCTV camera for inside the building (for reference)</p>

<p style="text-align: center;">CCTV Camera System</p>	<p>3. Contents of Technical Standards (5) Intrusion Detection Sensors a) Fence Sensor</p> <p>[Functional requirements]</p> <ol style="list-style-type: none"> ① Must always be able to monitor any intrusion from the periphery of the restricted area and any tampering with the fence (by the provision of automatic detection functionality) and to notify the sentinel. ② The sensor shall detect any intrusion from the fence (as by climbing over, cutting or clash-breaking) and any tampering with the fence. ③ The fence intrusion sensor shall be designed to execute its predetermined functions in combination with the motions of the surveillance camera, after the sensor zone is determined from the preset position of the camera and the field of view of the camera at the moment.
<p style="text-align: center;">Fence Sensor</p> <p>[Standard Specifications]</p> <ol style="list-style-type: none"> ① Fence sensors should be installed when they are necessary for any particular purpose. They are not essential conditions for the security facilities. ② Candidates shall be vibration sensor, optic fiber sensor, tension sensor, infrared ray sensor, electric field sensor, and image sensor, among which selection is to be made based on the criteria of adaptability, reliability, serviceability, and ease of installation. 	<p style="text-align: center;">Fence Sensor (Tension Sensor / Vibration Sensor)</p>

<p style="text-align: center;">Fence Sensor (Vibration Sensor)</p> 	<h3>3. Contents of Technical Standards</h3> <h4>(5) Intrusion Detection Sensors</h4> <h5>b) Gate Sensor</h5> <p>[Functional requirements]</p> <ol style="list-style-type: none"> ① Must have automatic detection functionality to detect any suspicious person and have the capability to report the detection to the sentinel. ② The sensor must detect any intrusion from the gate (as by climbing over, cutting and clash-breaking) or any tampering with the gate. ③ The gate sensor must be in alert mode while the gate is closed and non-alert mode while the gate is open. The system must be designed to preclude any possibility of non-alert mode while the gate is closed.
<p style="text-align: center;">Gate Sensor</p> <p>[Standard Specifications]</p> <ol style="list-style-type: none"> ① Gate sensors should be installed when they are necessary for any particular purpose. They are not essential conditions for the security facilities. ② Candidates shall be tension sensor, infrared ray sensor, electric field sensor, and image sensor, among which selection is to be made based on the criteria of adaptability, reliability, serviceability, and ease of installation. 	<p style="text-align: center;">Gate Sensor (Beam of infrared sensor)</p> 
<p style="text-align: center;">Gate Sensor (Beam of infrared sensor)</p> 	<h3>3. Contents of Technical Standards</h3> <h4>(6) Hand Luggage Inspection Equipment</h4> <p>Hand Luggage Inspection Equipment</p> <p>[Functional requirements]</p> <ul style="list-style-type: none"> • Must be able to easily detect weapons, explosives and other objects that are prohibited to bring onto the ship. <p>[Standard Specifications]</p> <ul style="list-style-type: none"> • It is desired that international passenger facilities that international regular passenger liners routinely come and go and are visited by a lot of passengers be provided with X-ray inspection devices and portal-type metal detectors for the inspection as of hand luggage. 
<p style="text-align: center;">X-ray inspection device</p>  <p>[Standard Specifications]</p> <ol style="list-style-type: none"> ① Must display the whole of an object being inspected ② Must have sufficient capacity to distinguish ③ Must have sufficient penetrating power ④ Must be able to obtain information on the material of any explosives or any other hazardous objects 	<p style="text-align: center;">Metal detector</p> <p>[Standard Specifications]</p> <ol style="list-style-type: none"> ① Must be able to detect metallic objects irrespective of their directions and positions ② Must be able to detect stainless steel and non-ferrous metals such as aluminum ③ Must be sensitivity adjustable ④ Portal type metal detector and handheld metal detector are used for the inspection of personal effects of the passengers 

<p>3. Contents of Technical Standards (7) Telecommunication Equipment</p> <p>[Telecommunications between Ships and Port Facilities] [Functional requirements]</p> <ul style="list-style-type: none"> • Must provide capability for direct communication with ships <p>[Communications with Police Organizations and Other Security Organizations] [Functional requirements]</p> <ol style="list-style-type: none"> ① Shall be able to communicate immediately and securely with the relevant organizations (Maritime Security Agency, police, fire defense authority, port management etc.) ② Shall be able to make phone calls immediately and securely at times of emergency as by speed dialing. 	<p>Telecommunication equipment</p> 
<p>[Communications within Port Facilities] [Functional requirements]</p> <ol style="list-style-type: none"> ① Security personnel shall be able to make voice calls promptly at times of emergency. ② Upon any occurrence of harmful acts by unlawful intruder(s), the emergency reporting system shall be able to notify the security personnel immediately. ③ At times of emergency, the security personnel must be able to inform the workers within the restricted areas and give them instructions. ④ There shall be ability to simultaneously transmit the same broadcast to the entire restricted areas (including bridges of the ships). 	<p>Public Address System</p> 

<p>3. Contents of Technical Standards (8) Power Supply Facility</p> <p>[Functional requirements]</p> <ol style="list-style-type: none"> ① Must supply consistent and sufficient amount of electric power to the security facilities. ② Even at times of power outage in the emergency situation, power must be supplied to keep the surveillance equipment functional in order to continuously capture the situation of the site while reporting to the police and other relevant organizations. 	<p>Power Supply System (Backup)</p>  <p>Commercial main power switching required when normal power absent Upon power outage, emergency power generating facility used as backup for the power</p>
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<p>Uninterruptible Power Supply (UPS)</p> <p>Example figures of UPS device within back-up time of 10 minutes (for reference)</p>  <table border="1"> <thead> <tr> <th>Power kVA / kW</th> <th>Dimension (mm) (W1*W2)*H1 x D</th> <th>Weight (kg)</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td>20 / 16</td> <td>1020(400, 620) x 1400 x 760</td> <td>700 (160/540)</td> <td>Base type</td> </tr> <tr> <td>15 / 12</td> <td>1020(400, 620) x 1400 x 760</td> <td>700 (160/540)</td> <td>Base type</td> </tr> <tr> <td>10 / 8</td> <td>1020(400, 620) x 1400 x 760</td> <td>700 (160/540)</td> <td>Caster type</td> </tr> <tr> <td>7.5 / 6</td> <td>1020(400, 620) x 1400 x 760</td> <td>700 (160/540)</td> <td>Caster type</td> </tr> <tr> <td>5.2 / 4.16</td> <td>1020(400, 620) x 1400 x 760</td> <td>700 (160/540)</td> <td>Caster type</td> </tr> </tbody> </table>	Power kVA / kW	Dimension (mm) (W1*W2)*H1 x D	Weight (kg)	Remarks	20 / 16	1020(400, 620) x 1400 x 760	700 (160/540)	Base type	15 / 12	1020(400, 620) x 1400 x 760	700 (160/540)	Base type	10 / 8	1020(400, 620) x 1400 x 760	700 (160/540)	Caster type	7.5 / 6	1020(400, 620) x 1400 x 760	700 (160/540)	Caster type	5.2 / 4.16	1020(400, 620) x 1400 x 760	700 (160/540)	Caster type	<p>3. Contents of Technical Standards (9) Maintenance of Port Security Facilities</p> <p>[Functional requirements]</p> <ul style="list-style-type: none"> • In order to properly maintain the functions of port security facilities, inspections and services shall be conducted on a regular basis.
Power kVA / kW	Dimension (mm) (W1*W2)*H1 x D	Weight (kg)	Remarks																						
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5.2 / 4.16	1020(400, 620) x 1400 x 760	700 (160/540)	Caster type																						

Outline of the maintenance work		
Maintenance category	Purpose	Action
Routine inspection	Visually inspect the equipment for any unusual conditions. Or, check in the course of daily operations for any fault.	-Check the inspection items and follow the inspection procedures in accordance with the using instructions. -Actions by the operators
Scheduled inspection	Check the operating conditions of each piece of the equipment and at the same time conduct the maintenance with the sections that cannot be checked in routine inspections for early detection of any fault and for prevention of fault that may arise as a result of deterioration by ageing.	-To be conducted based on the scheduled inspection contract. -To be conducted by the maintenance service contractors or equipment manufacturers.
Maintenance	Take remedial actions upon any accidental malfunction or fault.	-To be conducted by on-call maintenance service contracts. -To be conducted by the maintenance service contractors or equipment manufacturers.

THANK YOU !!

9.2.2. 2nd Workshop for Prevention of Port Disasters and Port Security Enhancement

The 2nd Workshop was held on 18th of November 2016 at VPMU conference room with 12 participants.

Opening address was given by the Program Director of VPMU. Resident representative of JICA Vanuatu office stressed the importance of disaster prevention and port security. JICA Expert team made two presentations: “Port facility Security Issues of Vanuatu Ports” and “Study of Turn-over of Containers Countermeasures against Strong Wind in the Container Yard”. The participants were from Ports & Marine Department, IPDS, Niscol, JICA and others.

Through the workshop, participants re-recognized the importance of disaster prevention and enhancement of port facility security.

Invitation to Work Shop

Vanuatu Project Management Unit
Port-Vila Mall Building
Paris Street
PO Box 192
Port Vila, Vanuatu
Tel: (678) 26918 / 26415/33240
Fax: (678) 26419
Email: vpmu@vanuatu.gov.vu



Unité de Gestion du Projet de Vanuatu
Bâtiment Port-Vila Mall
Rue de Paris
BP 192
Port Vila, Vanuatu
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Fax: (678) 26419
Email: vpmu@vanuatu.gov.vu

Delivering Services through Partnership | Rendre Service a Travers le Partenariat

Invitation to 2nd Work Shop for Port Disaster Prevention and Port Security Enhancement

To enhance port disaster prevention knowledge and port facility security for Vanuatu ports, the VPMU office is planning to hold a second follow up workshop on 18th of November 2016. You are hereby invited to participate at the said workshop. Your participation is much appreciated.

The detailed program of the day is outlined below:

Time: November 18 (Friday) from 14:00 to 16:30
Venue: MIPU conference room

PROGRAM

14:00: Opening address **Mr. Johnson Wabaiat Wakanomune**
Program Director, VPMU

14:15: Port Facility Security Issues of Vanuatu Ports
Mr. Kazuyuki YAMAGUCHI
JICA Expert Team

To maintain international trade function, ships and port facilities need to comply with ISPS Code (International Ships and Port Facility Security Code) of SOLAS Convention. Each commercial ports of Vanuatu are required to further improve on the respective service functions as well as port management and delivery standards.

15:00: Tea Break

15:15: Study of Turn-over of Containers
Countermeasures against Strong wind in the container yard
Mr. Susumu KIMURA
JICA Expert Team




Introduction of "How to check the Turn-over of Containers in strong wind", "Operational standards dealing with high wind" and "Countermeasures against strong wind in the container yard"

Attendants List**2nd Work shop on November 18**

	Name	Orgaization	Position	Contact
1	RUSSEU MITCHELL	IPDS	GM	5567722
2	Phillip Ryan	NISCOM	CEO	7777121
3	Wendy Manderson	Ports and Marine	Training pilot	7712390
4	Masafumi ITO	ECOH-JV	PM	7713894
5	Johnson Waband	VPMU	Director	5636238
6	Toyoaki ISUBO	JICA	RR	
7	KAZUYUKI YAMAGUCHI	JICA EXPERT TEAM	LEADER	
8	Lulle Beaudi	PORTS & MARINE	Trainer	7756048
9	Tomaru Itsuo	Ports & Marine	adviser	867-6622
10	Mark Tari	Port & Marine	CSO	7355863
11	Tella Resly	Port & Marine	Trg master	5933032
12	Susumu KIMURA	JICA Expert Team	Member	8312473
13				
14				
15				

Workshop Presentation Materials

Port Facility Security Plan in Vanuatu Ports

<div data-bbox="336 439 772 734"> <h3 style="text-align: center;">Port Facility Security Plan in Vanuatu Ports</h3> <p style="text-align: center;">JICA Expert Team November 18, 2016</p> </div> <p style="text-align: right;">1</p>	<div data-bbox="887 439 1319 734"> <h3 style="text-align: center;">National Authority and Recipient</h3> <ul style="list-style-type: none"> * National Authority Responsible for Port facility Security - SOLAS regulation XI-2/13.1.1 Ports and Marine Department * Recipients of Ship-to shore security alerts - SOLAS regulation XI-2/13.1.3 * Recipients of marine security related communications from other Contracting Governments - SOLAS regulation XI-2/13.1.4 Vanuatu Maritime Services </div> <p style="text-align: right;">2</p>																		
<div data-bbox="336 831 772 1149"> <h3 style="text-align: center;">IMO (International Maritime Organization) Registration Facilities in Port Vila</h3> <table border="1"> <tr><td>* BP Petroleum Terminal</td><td>VUVLI-0001</td><td>2004-10-18</td></tr> <tr><td>* Main Wharf</td><td>VUVLI-0002</td><td>2004-06-07</td></tr> <tr><td>* Mobile Petroleum Terminal</td><td>VUVLI-0003</td><td>2004-06-07</td></tr> <tr><td>* Origin Energy LPG Terminal</td><td>VUVLI-0004</td><td>2004-06-07</td></tr> <tr><td>* Star Wharf</td><td>VUVLI-0005</td><td>2004-06-07</td></tr> </table> <p>IMO Port facility number and Date of Port Facility Security Plan (PFSP) approval BP Petroleum Terminal and Mobile Petroleum Terminal are currently under the management of Pacific Energy</p> </div> <p style="text-align: right;">3</p>	* BP Petroleum Terminal	VUVLI-0001	2004-10-18	* Main Wharf	VUVLI-0002	2004-06-07	* Mobile Petroleum Terminal	VUVLI-0003	2004-06-07	* Origin Energy LPG Terminal	VUVLI-0004	2004-06-07	* Star Wharf	VUVLI-0005	2004-06-07	<div data-bbox="887 831 1319 1149"> <h3 style="text-align: center;">Port Facilities Layout in Port Vila</h3>  </div>			
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* Main Wharf	VUVLI-0002	2004-06-07																	
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<div data-bbox="336 1267 772 1585"> <h3 style="text-align: center;">IMO Registration Facilities in Santo</h3> <table border="1"> <tr><td>BP Petroleum Terminal</td><td>VUSAN-0001</td><td>2004-10-18</td></tr> <tr><td>* Main Wharf</td><td>VUSAN-0002</td><td>2004-06-07</td></tr> <tr><td>* Origin Energy LPG Terminal</td><td>VUSAN-0003</td><td>2004-06-07</td></tr> <tr><td>* Shell Petroleum Terminal</td><td>VUSAN-0004</td><td>2004-06-07</td></tr> <tr><td>* Simonsen's Wharf</td><td>VUSAN-0005</td><td>2004-06-07</td></tr> <tr><td>* Wong's Wharf</td><td>VUSAN-0006</td><td>2004-06-07</td></tr> </table> <p>IMO Port facility number and Date of PFSP approval BP Petroleum Terminal and Shell Petroleum Terminal are currently under the management of Pacific Energy</p> </div> <p style="text-align: right;">5</p>	BP Petroleum Terminal	VUSAN-0001	2004-10-18	* Main Wharf	VUSAN-0002	2004-06-07	* Origin Energy LPG Terminal	VUSAN-0003	2004-06-07	* Shell Petroleum Terminal	VUSAN-0004	2004-06-07	* Simonsen's Wharf	VUSAN-0005	2004-06-07	* Wong's Wharf	VUSAN-0006	2004-06-07	<div data-bbox="887 1267 1319 1585"> <h3 style="text-align: center;">Port Facilities Layout in Santo</h3>  </div>
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<div data-bbox="336 1659 772 1977"> <h3 style="text-align: center;">Santo Main Wharf before Rehabilitation (2013)</h3>  </div>	<div data-bbox="887 1659 1319 1977"> <h3 style="text-align: center;">Luganville Main Wharf Rehabilitation Project</h3> <ul style="list-style-type: none"> * Construction Schedule: July 2015 - July 2017 Construction Scope <ul style="list-style-type: none"> ➢ Wharf Extension 152 m+130m →152m+130m+76m = 358m ➢ Cruise Passenger Terminal (1F Passenger Terminal, 2F Related Government office) ➢ Copra Shed 2 unit ➢ Concrete Pavement ➢ Fence & Gate house * Total Cost : 65 million US\$ </div> <p style="text-align: right;">8</p>																		

<p>Luganville Main Wharf Rehabilitation Project</p>  <p>9</p>	<p>Wharf and Cruise Passenger Terminal</p>  <p>10</p>
<p>Entrance Security Gate House and Fence</p>  <p>11</p>	<p>Preparation of Revised PFSP of Main Wharf</p> <p>Rehabilitation Work will complete July of 2017</p> <ul style="list-style-type: none"> Port Security Facilities (Gate, Fence, CCTV camera, Etc.) will be equipped <p>↓</p> <ul style="list-style-type: none"> Port Facility Security Assessment (PFSA) and Revised Port Facility Security Plan (PFSP) is necessary for IMO registration <p>↓</p> <ul style="list-style-type: none"> Task Force Team (VMC, Ports & Marine Dep, Customs, Quarantine, Immigration, Niscol) has formed PFSP 2nd revision was formulated and approved 2009 SPC (South Pacific Community) will assist to formulate revised PFSP <p>12</p>
<p>Present Situation of Main Wharf Port Security in Port Vila</p>  <p>13</p>	<p>Congestion of Main Wharf with Cargo Stock</p>  <p>14</p>
<p>Congestion of Main Wharf with Cruise Ship</p>  <p>15</p>	<p>Congestion of Main Wharf with Cruise Ship (2)</p>  <p>16</p>

Present Situation of Main Wharf Port Security in Port Vila

Port Facility Security Plan (PFAP) was revised in 2016
 * IMO Audit 2017

↓

- * Cruise Ship Call has been increasing.
- * Handling cargo volume has been increasing

↓

- * Proper access control shall be implemented
- * Restricted area shall be clearly secured , especially cruise ships berthing time
- * Some security facilities need improvement

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Security Facilities need to be improved

- * Public address system
- * CCTV camera system
- * Security gate control system
- * Security fence
- * Fire hydrant
- * Etc.

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Example Layout of Public Address System

Example Layout of Public Address System
 Container terminal (Container arrangement plan)

19

Example of CCTV Cameras (Closed-circuit television)

Turret type CCTV camera (monitoring capacity within 300 m)
 480W x 460H x 460D mm

Fixed type CCTV camera (monitoring capacity within 80 m)
 130W x 200H x 45D mm

Dome shape CCTV camera

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Example Layout of CCTV Cameras

Example Layout of CCTV Camera
 Container terminal (CCTV Camera arrangement plan)

21

Example of Sliding Gate

22

Example of Swinging Gate

23

Example of Vehicle Stopping Equipment

24

<h3>Example of Security Fence Replacement</h3>  <p>25</p>	<h3>Bird's-Eye View of Lapetasi Wharf</h3>  <p>26</p>
<h3>Layout Plan of Lapetasi International Multipurpose Wharf</h3>  <p>27</p>	<h3>Development of Lapetasi Multipurpose International Wharf Work Scope</h3> <p>Total Area : 64,000 m²</p> <ul style="list-style-type: none"> * Berth : length 200m, depth 12.3m * Container Storage Area : 32,600 m² * Reefer Container Storage capacity : 36 TEU * Administration Building : 3F, 1,620 m² * Container Freight Station (CFS) : 800 m² * Work Shop : 380 m² * Container box washing bay : 520 m² * Lighting tower : 7nos * Container Handling Equipment Reach Stacker 4nos <p>28</p>

<h3>Construction Progress Photo</h3>  <p>29</p>	<h3>Container Handling Equipment (Reach Stacker)</h3>  <p>30</p>
<h3>Issues of Lapetasi International Multipurpose Wharf</h3> <p>Development work is expecting to complete October of 2017.</p> <ul style="list-style-type: none"> * Port Security physical facilities (Gate, Fence, CCTV camera, Lighting, etc.) will be equipped. <p>↓</p> <ul style="list-style-type: none"> * Implementation of Port Facility Security Assessment (PFSA) and Port Facility Security Plan (PFSP) are necessary for IMO registration <p>↓</p> <ul style="list-style-type: none"> * Port facility security shall be managed properly with cooperation of Ports & Marine Dep. and IPDS <p>31</p>	<h3>Procedure for Issuance of Compliance Statement</h3>  <pre> graph TD A[Preparation / approval of PFSA by the contracting government] --> B[Formulation of PFSP by Port Management Body (Prepared by BSO)] B --> C[Examination of PFSP by designated authority] C --> D[Approval of PFSP by designated authority] D --> E[Issuance of Temporary Statement of Compliance by designated authority (Validity Period: 6 months)] E --> F[Implementation of PFSP (Including Port Security Training, Drill and Exercise)] F --> G[Examination of Implementation of PFSP by designated authority] G --> H[Issuance of Statement of Compliance (Validity Period: 5 years)] E --> I[Report to IMO by designated authority] </pre> <p>32</p>

9.3. Assistance for enhancing security of passengers of cruise ships

See attached "Cruise-Passenger Walkway Layout of Main Wharf (Plan A)".

9.3.1. Cruise-Passenger Walkway Layout of Main Wharf (Plan A)

Cruise-Passenger Walkway Layout of Main Wharf <Plan A>

(During the construction of Lapetasi International Multi-Purpose Wharf)

Project Name: "Lapetasi International Multi-Purpose Wharf"

* Date: Rev.1: November 11, 2016 (September 12, 2015)

* Designed by: JICA Expert Team



Temporary Fencing (Existing Fence)



Temporary Fencing (GHL TempFence)



Temporary Fencing (Existing Fence)

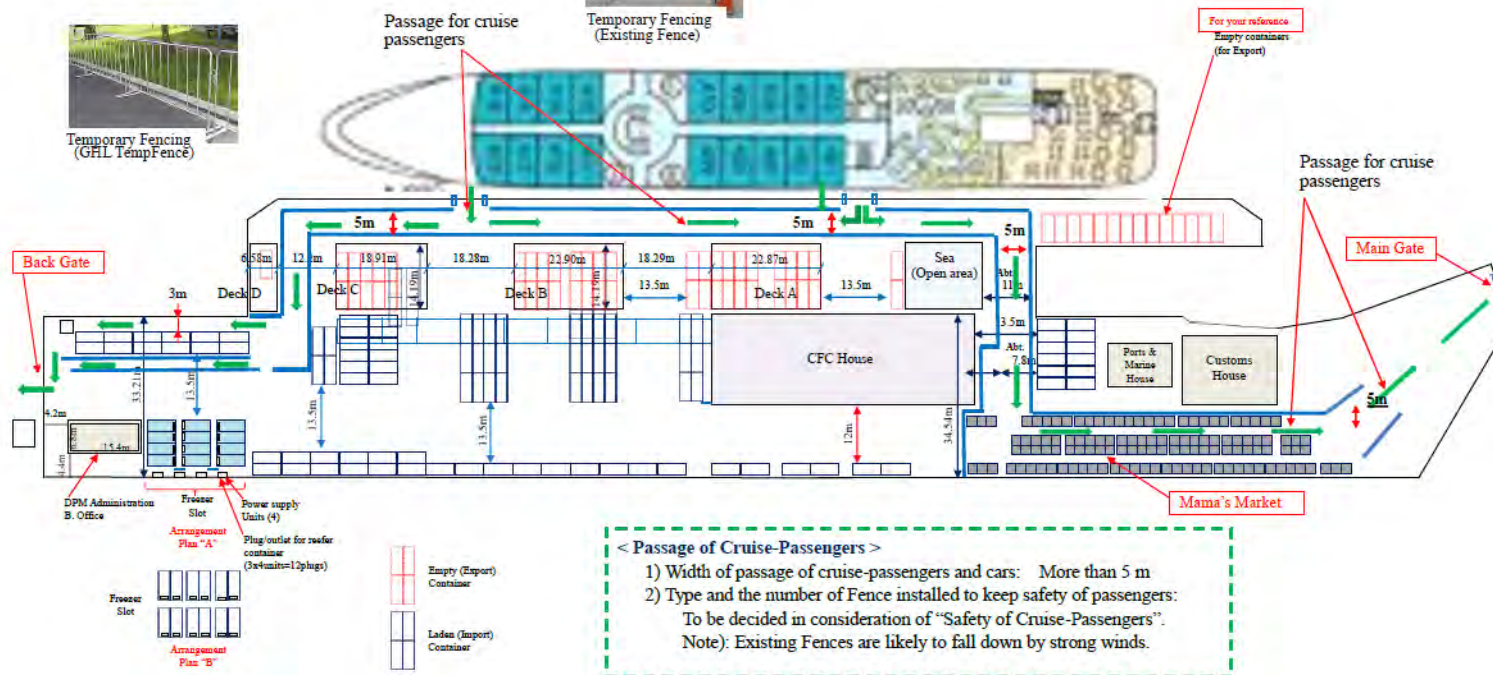
Security for Passengers and Fence Installation

* Party/Department in charge: PMD (MIPU)

* Security and fence installation personnel: Total 13 persons (Existing) → 18 persons (November 2016)

Security: 8 persons (September 2015) → 10 persons (November 2016)
 1 Supervisor → 3 persons (PMD)
 7 checkers → 7 persons (IWS: Ifira group)

Installation of fences: 5 persons → 8 persons (Gnty: SSS group)
 Mooring of Cruise ship → 4 persons (PMD)



9.3.2. Layout of container storage area in Main Wharf to ensure safety during call by cruise ship

The layout of containers stocked in Main Wharf to ensure passenger safety when a cruise ship calls is shown below.

Layout of Main Wharf (Layout of Containers stocked)

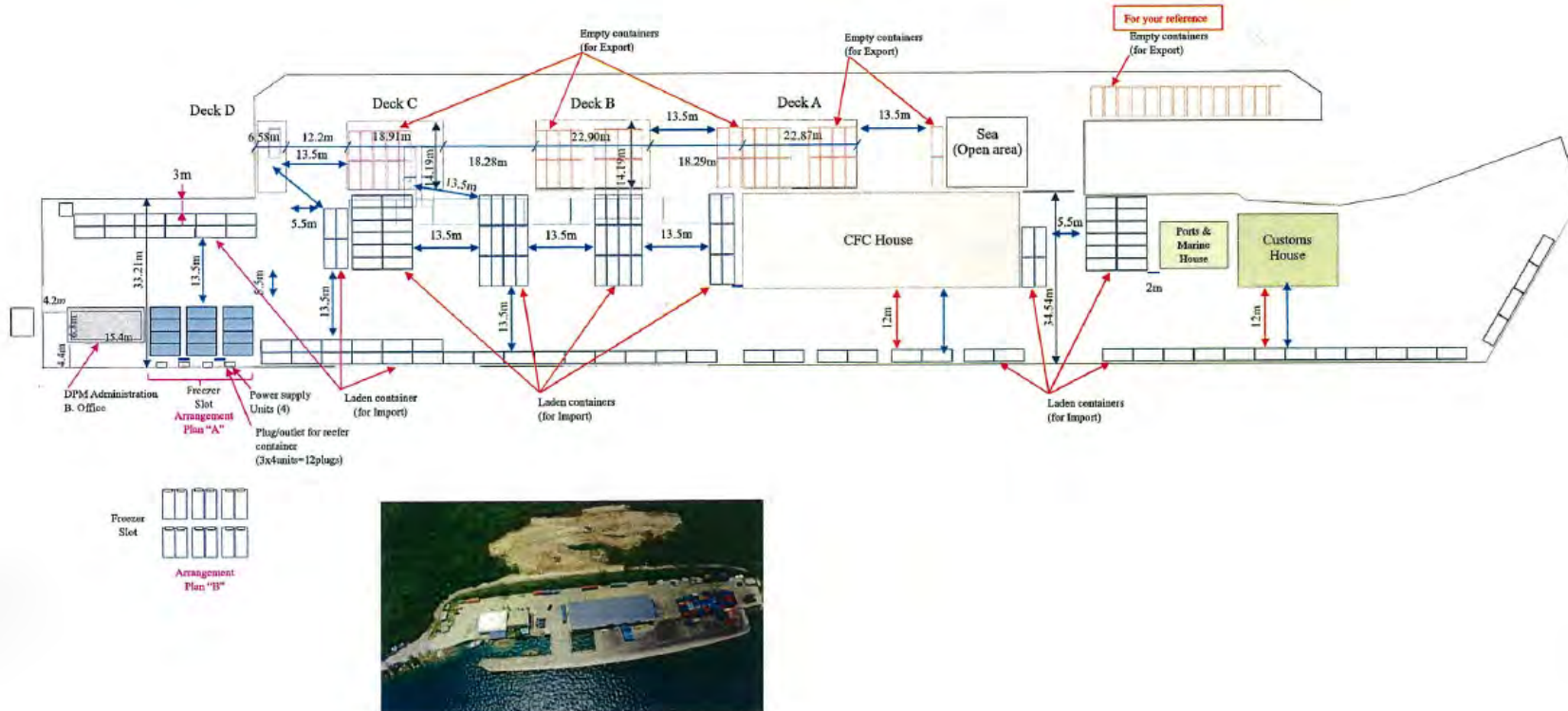
(During construction of Lapetasi International Multi-Purpose Wharf)

Project Name: "Lapetasi International Multi-Purpose Wharf"

* Date: September 08, 2015

* Revised 1: September 11, 2015

* Designed by: Susumu Kimura, JICA Expert Team



9.4. Alleviation of congestion in the Container Storage Area

"Recommendation on Container Storage during the construction of Container Yard of Lapetasi International Multi-Purpose Wharf" is shown below..

Recommendation on Container Storage during the construction of Container Yard of Lapetasi International Multi-Purpose Wharf

Implementation Assistance for the Port Vila Lapetasi International Multi-Purpose Wharf Development Project in Vanuatu

Recommendation on Container Storage during the construction of Container Yard of Lapetasi International Multi-Purpose Wharf

A. Summary of current situation
IPDS can use the following areas as container storage during the construction of new Lapetasi wharf.

No	Location (See the figure)	Container Storage Place	Area (m ²)	Number of Ground slot (TEU)	Maximum Storage capacity (TEU)
1	Mu X	Main Wharf (Area for Container Storage) Lapetasi International M.P. Wharf			450
2	Da A	Disposal area for Dredging Material	5,000		350
3	Le B	New Storage Yard NUMBATRI	6,000		420
4	Ec D	Empty container deposit NUMBATRI	3,200	(3-stacks)	150
5	Mu C	Main Road in front of Lapetasi Int. MP Wharf			125
Total					1,495

Amount of temporary container storage volume: About 1,500TEUs


The priority order to use as a storage area is as follows: ()

- 1) Main Wharf
- 2) Disposal area (Lapetasi International M.P. Wharf)
- 3) New Container Yard (Lapetasi International M.P. Wharf)
- 4) NUMBATRI (Empty container deposit)
- 5) Main Road

The locations of these container storage areas are shown in the figure below:

Container Storage Area (Temporary storage area) during the construction of New Wharf:

1. Main Wharf: Mu X

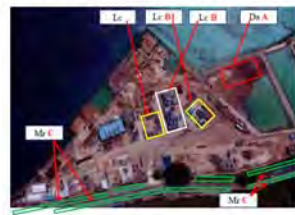


For Empty container: Maximum 6 stacks
For Laden container: Maximum 4 stacks

When the cyclone approaches to Port Vila, the safety measures such as changing from present container stacks to three-tier stacks regarding laden containers and two or three-tier stacks regarding empty containers will be carried out.


2. Disposal Area for Dredging Material: Da A
3. Container Yard: Le B (or Le B1 & Le B2)

The shape of this area will be adjusted in accordance with the progress of construction.




3. Main Road (in front of the Lapetasi International Multi-Purpose Wharf): Mu C
See the figure above.
The priority order of the usage of both side of Main Road is the last.
This is due to safety concerns of walking of Cruise passengers, and also cars, taxis and buses passing through Main Road.

When the cyclone approaches, the stacked containers will be removed or number of stacks will be changed to two tiers or one-tier.
The storage range of the container in the storage area of Main Road is between the gate of the Lapetasi Multi-Purpose Wharf and Main Wharf, the container arrangement is planning to be 2 tiers by two rows (one row depending on the location) on both sides of the road.
4. Empty Container Deposit: "NUMBATRI" (Temporary storage area)
Location of NUMBATRI: Empty container storage Deposit



Area of NUMBATRI: About 3,200m² (40m x 80m)
Number of stacks: 3-Tiers
Due to the lift of the forklift, it can be only stacked up to 3 stacks.
If a reach stacker is introduced here, empty containers can be stacked in 4 or 5 tiers.



Container storage stacks in NUMBATRI

B. Recommendation on Container Storage during the construction of Container Yard

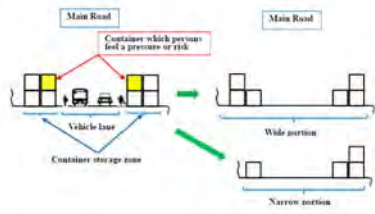
The recommendation of JICA Expert Team is as follows:

1. Number of container stacks of Main Road storage area
The number of container stacks of temporary storage area on both side of Main Road should be within 2 tiers. In detail, the number of stack for 1st row from the center of road must be one-tier, and for the number of 2nd row (near side) may be two-tiers. In the narrow portion of the storage width, only one-tier of one-row can be permitted in consideration of safety.

Refer to the figure below

This consideration is necessary to avoid a risk of falling of a container on taxis, buses and cruise passengers walking on the Main Road.

- Number of stack of 1st row: 1 tier
- Number of stack of 2nd row: Max. 2 tiers

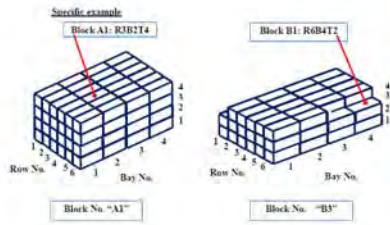


2. Address management using a computer (For example, management with EXCEL)

At present, IPDS adopts "Block storage management" for import containers unloaded from each container ship.

In case of the adoption of "Block storage management", the mapping of each "Block" of import containers is useful because it can be picking up quickly to deliver a container to the final destination.
The mapping of each block can be easily created with EXCEL using a computer and the "Container address-management" every block can be carried out easily.

When the address management is adopted, the terminal operator can immediately recognize where each container is stowed at which block, which row, which bay and which tier of the storage area. And then, the terminal operator can perform efficient cargo handling without container slapping mistake and loss of current address.



9.5. Support for Conclusion of Contract

9.5.1. A proposal for simplification of the pricing of concession

A proposal for simplification
of the pricing of concession

Concession

What level of gross revenue is required to ensure a sustainable business?

- Ans.
- $A=5$ (million US\$) for 12,000 TEU
- $\text{Rate} = 5,000,000 / 12,000 = 417$ (US\$/TEU)



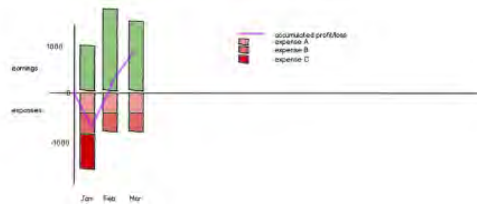
How much is required for repayment of the Yen Loan?

- Ans.
- Since interest is negligible, repayment amount can be regarded as:
- $100 \text{ million US\$} / 30 \text{ year} = 3.3 \text{ million US\$} / \text{year}$



Then, what is the gross revenue required to ensure a sustainable business and repay the yen loan?

- ANS.
- $C=A+B=5+3.3=8.3$ (million US\$)



4

Tariff should be raised to obtain the required revenue. But by how much?

- Ans.
- $\text{Rate} = C/A = 8.3/5 = 1.6$
- (1.6 times of current tariff)
- $\text{Unit Price} = 417 \times 1.6 = 667$ US\$/TEU



5

What share of the gross revenue can be taken by the operating company?

- Ans.
- $b = A/C = 5/8.3 = 60\%$
- (Concessionaire can take 60% of the gross revenue)
- (The landlord will take 40% of the gross revenue)



6

Why are shares taken from gross revenue?

- Ans.
- Because it is simple and easy to calculate.
- Because both parties can obtain the required money.



7

Cargo volume has changed. Exchange rate has changed. How do we cope with such changes?

- Ans. Tariffs and the share should be adjusted.
- Lets adjust the tariffs and concession fee every 2 years.



8

Suggestions for simplification of the Pricing of concession fee.

- After the grace period (ten years) , the repayment of capital money begins.
- The repayment amount after 10 years is about 100 (US\$ million)/30(year)=3.3 (US\$ million).
- The repayment amount should be included in the tariff.
- That will be 1.6 times of the current Tariff.
- The tariff should be raised gradually for 10 years.
- However, after ten years, the tariff can be lowered and the rate of concession charge can be lowered, if the cargo volume increases.

9

9.5.2. Concession Agreement (Draft)

<p>Draft Concession Agreement 2017_10_16</p> <p>1. DEFINITIONS AND INTERPRETATION</p> <p>1.1. THE following definitions apply unless the context otherwise requires. Other terms are defined in the Schedule:</p> <p>1.2. The concessionaire means the IPDS as the operator of the Lapetasi International Terminal hereinafter referred to as "LIT"</p> <p>1.3. 'Arrangement' means the arrangement and transactions contemplated or evidenced by this agreement.</p> <p>1.4. 'Authorization' includes any consent, authorization, registration, filing, lodgment, permit, franchise, agreement, notification, certificate, permission, licence, approval, direction, declaration, authority or exemption from, by or with a Government</p> <p>1.5. 'Both parties' means the government and the concessionaire.</p> <p>1.6. Concerned party includes both parties and the entities that are allowed to participate in the discussion or voting.</p> <p>1.7. Concerned authority means the organization that is stipulated by law as the due authority to make decision on the issue in the referred matter.</p> <p>1.8. Lapetasi International Terminal (LIT) includes Lapetasi International Wharf, its supporting facilities, its backup area, facilities in the premise and facilities until the connecting boundary.</p> <p>1.9. The port users mean all the persons or entities who use LIT directly or indirectly.</p>	<p>2</p>
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<p>Draft Concession Agreement 2017_10_16</p> <p>CONCESSION AGREEMENT</p> <p>BETWEEN</p> <p>The Government of Vanuatu</p> <p>AND</p> <p>IFIRA Port Development and Services Company</p> <p>RELATING TO</p> <p>Lapetasi International Terminal</p> <p>(Drafted by Osamu Kamita, JICA for the purpose of reference)</p> <p>THIS AGREEMENT is made</p> <p>BETWEEN</p> <p>THE GOVERNMENT OF THE REPUBLIC OF VANUATU (hereinafter referred to as "the Government")</p> <p>AND</p> <p>IFIRA PORT DEVELOPMENT AND SERVICES COMPANY LIMITED, a local company registered under the Law of Vanuatu and having its registered offices situated at PO Box 68 Port Vila (hereinafter referred to as "the concessionaire" or "IPDS")</p>	<p>1</p>
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Draft Concession Agreement 2017_10_16

2. IT IS HEREBY AGREED AS FOLLOWS

- 2.1. THE government extends its exclusive grant to the concessionaire and the concessionaire accepts to carry out the following duties
- 2.2. Handling of international and Coastwise ships making use of the Lapetasi International Terminal
- 2.3. All operations dealing with the loading and unloading of International Cargoes of ships on the on the Wharf or at Anchorage.
- 2.4. All operations dealing with the stowing and shifting of cargo with the exception of Hydrocarbons and Liquefied Petroleum Gases in bulk.
- 2.5. All operations dealing with the transfer of cargoes from a ship's hold or deck on to the Wharf or onto a barge or into the sea; and,
- 2.6. Where international cargoes are landed or discharged as such areas as may be agreed between the parties from time to time, the concessionaire shall be deemed responsible for their handling.
- 2.7. All transportation of cargo load of containers from the wharf to their respective customer and the delivery of containers from such customer to the wharf

Draft Concession Agreement 2017_10_16

3. Facilities and Equipment that are agreed for rent

- 3.1. The facilities and equipment that are agreed for rent are listed in Attachment-1.
- 3.2. The drawings and main specifications of the above are indicated in Attachment-2.
- 3.3. The listed facilities can be used freely by the concessionaire to play the role of the operator.
- 3.4. The concessionaire should perform proper maintenance to attain the maximum optimum performances.
- 3.5. The maintenance and repair cost shall be borne by the concessionaire.
- 3.6. The concessionaire shall protect the facilities and equipment from fire, damage, theft, disaster, and weathering.
- 3.7. Should the facilities be severely damaged, the concessionaire shall inform the government without delay, and both parties should agree on how to restore the facility as soon as possible.

<p>Draft Concession Agreement 2017_10_16</p> <p>4. Tariffs and Charges</p> <p>4.1. Tariffs and charges for the Lapetasi International Terminal (LIT) shall be set to secure the sufficient income to operate the terminal and to repay loans.</p> <p>4.2. The rate of the share for both parties shall be based on (4.1).</p> <p>4.3. The concessionaire shall collect the charges and the share for the government shall be remitted by the concessionaire to the account of the government every month, not later than 10 days from the end of the previous month.</p> <p>4.4. The tariffs and the rate of share will be updated every two years.</p> <p>4.5. The concessionaire will create a draft of tariffs for the LIT and will propose the rate of share based on (4.2).</p> <p>4.6. Concerned parties will examine the proposed tariff, expected income and the share.</p> <p>4.7. The concerned authorities should meet together and decide the tariffs, and the rate of share of the money for the LIT based on the principle mentioned in (4.4),(4.5), and (4.6).</p> <p style="text-align: right;">5</p>	<p>Draft Concession Agreement 2017_10_16</p> <p>5. Responsibilities of the Concessionaire regarding daily activities</p> <p>The concessionaire shall:</p> <p>5.1. Extend good services to the port users.</p> <p>5.2. Maintain compliance with the international maritime code.</p> <p>5.3. Keep the environment clean: Attention should be paid to reducing air pollution, odor, noise, and glaring lights; in addition, LIT should be frequently cleaned and the scenic view should be pleasant.</p> <p>5.4. Introduce a 'safety first' policy when conducting operations</p> <p>5.5. Take necessary fire prevention measures</p> <p>5.6. Provide sufficient information to port users.</p> <p>5.7. Maintain good relations with citizens through dialogue and listening to their concerns.</p> <p>5.8. Keep copies of tender drawings and the specifications, and approved drawings, in the designated locker of the concessionaire for proper maintenance and quick repairs.</p> <p style="text-align: right;">6</p>
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Draft Concession Agreement 2017_10_16

7. Accounting

- 7.1. The concessionaire shall submit, not later than three months after the end of the Financial Year, detailed account for that year.
- 7.2. Such accounts which shall be certified by a Chartered Accountant to be to be true and correct, shall include the following:
 - 7.3. A balance sheet and details of assets required or sold during that Financial Year, and;
 - 7.4. A profit and loss account showing itemized Revenue Headings and Itemized Working Expenses.
- 7.5. In addition to the presentation of its annual account as provided therein, the concessionaire shall produce a budget to the Government for the forth coming year forecasting traffic levies, revenue and expenditure.
- 7.6. The concessionaire shall take out all Risk Insurance to cover cargo in the Dockshed or on the Dockside, and shall take out Public Liability Insurance as required for its cargo handling activities.

Draft Concession Agreement 2017_10_16

6. Compliance

- 6.1. The concessionaire shall obey the port regulations stipulated by the Government.
- 6.2. The concessionaire shall obey the harbor master's safety instructions.
- 6.3. The government may inspect the terminal operation according to the government regulations.
- 6.4. The government may make recommendations based on the government regulations and the concession agreement.

8. Term of Contract

- 8.1. Subject to the provisions of this agreement, this concession shall be valid for 50 years commencing in January 2018.
- 8.2. The concessionaire may terminate this concession by giving to the Government six months' notice in writing of its intention and its reasons.
- 8.3. The Government may terminate this concession, in case that the terminal operation stops frequently, by giving to the concessionaire six months' notice in writing of its intention and its reasons.
- 8.4. The government can start operation of the IIT, whenever it is necessary in the case of (8.3) and (8.4).
- 8.5. In the event of the breach of the Agreement, the Government shall require the concessionaire to rectify the breach within three months of the breach being made known to the concessionaire. In the event that the concessionaire willfully fails to rectify the breach, the government may terminate the agreement.
- 8.6. Six months before this concession would normally end, it may be extended by mutual agreement.

9. Amendment Process

- Since the contract term is very long, the surrounding conditions will change,
- 9.1. Both parties can propose the amendment of this agreement in writing of its intention and its reasons, whenever it is deemed necessary to conform to the needs of the era.
- 9.2. Concerned parties shall meet and discuss proposed amendments when it is proposed.

Draft Concession Agreement 2017_10_18

Attachment-I

1.1 List of Facilities

Name of Facility	Structure Type	Size or Dimensions	Note
Wharf	Steel Pipe Sheet Pile	200m x 20m -12.3m	With Collision Protect, Fenders, Bollards
Revetment	Sheet Pile or Stones in slope	Approx. 500m	
Yard Pavement	Inter locking Blocks	Approx. 33,000m ²	
Warehouse	Steel Framed	Approx. 40m x 20m	C. F. S
Workshop	Steel Framed	Approx. 27m x 14m	
Administration Building	Steel Framed	Approx. 18m x 30m 3 stories	Steel Roof with solar panel
Fence and Gate			With Monitor Camera
Lighting Poles, Towers, Substation	Radio Electric		

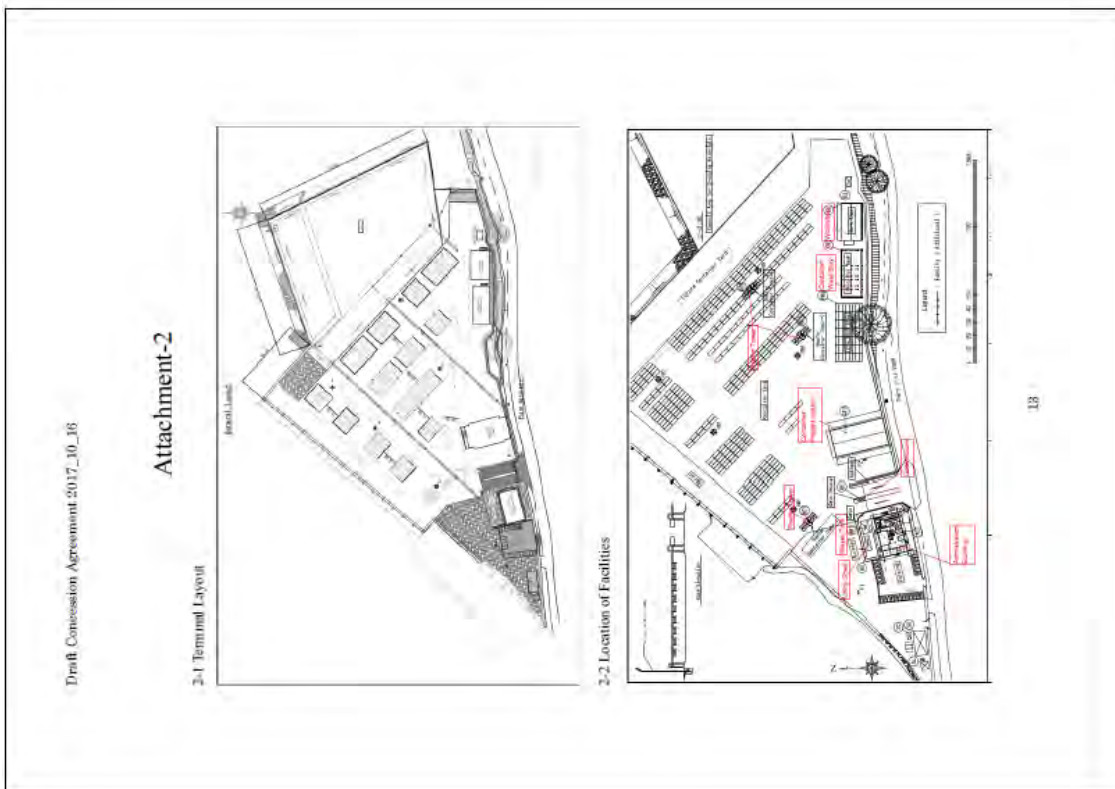
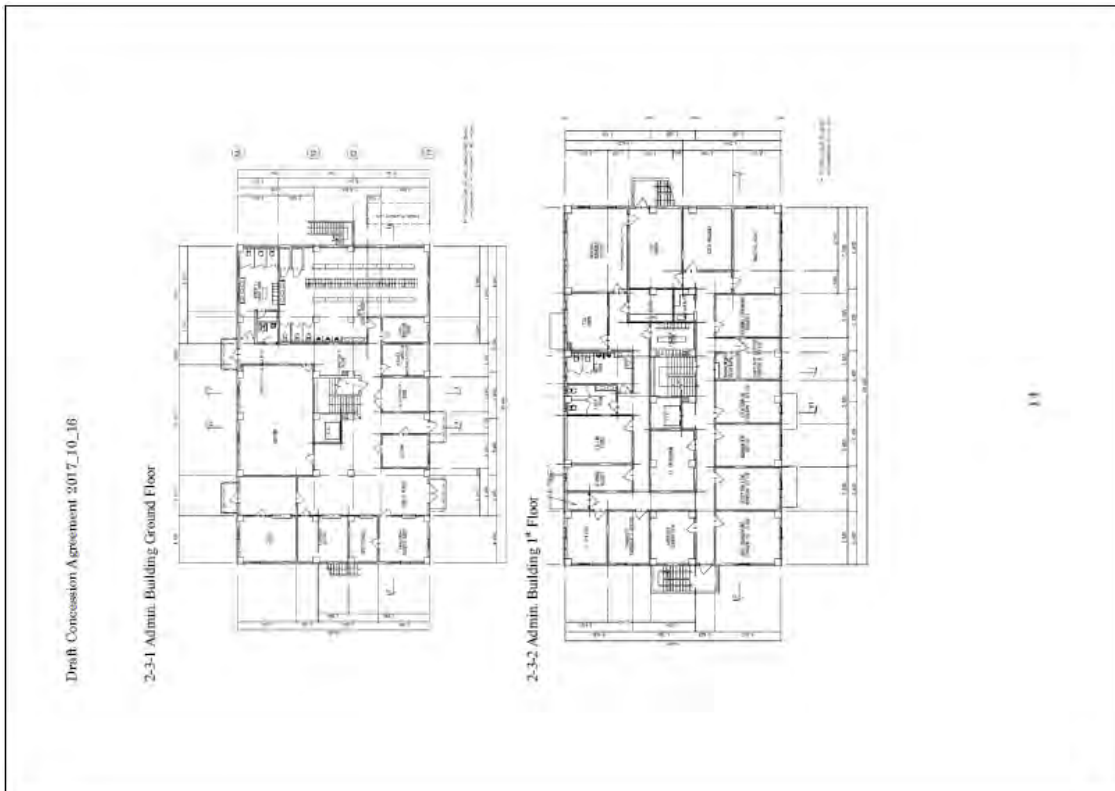
1.2 List of Equipments

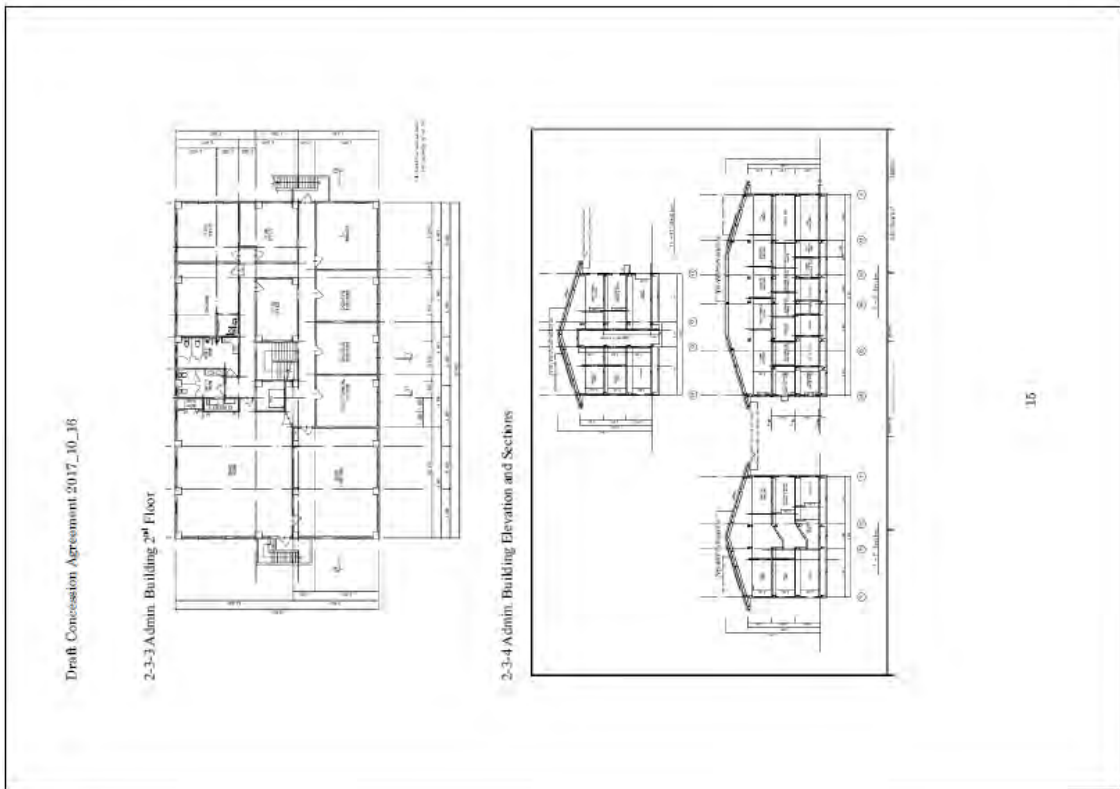
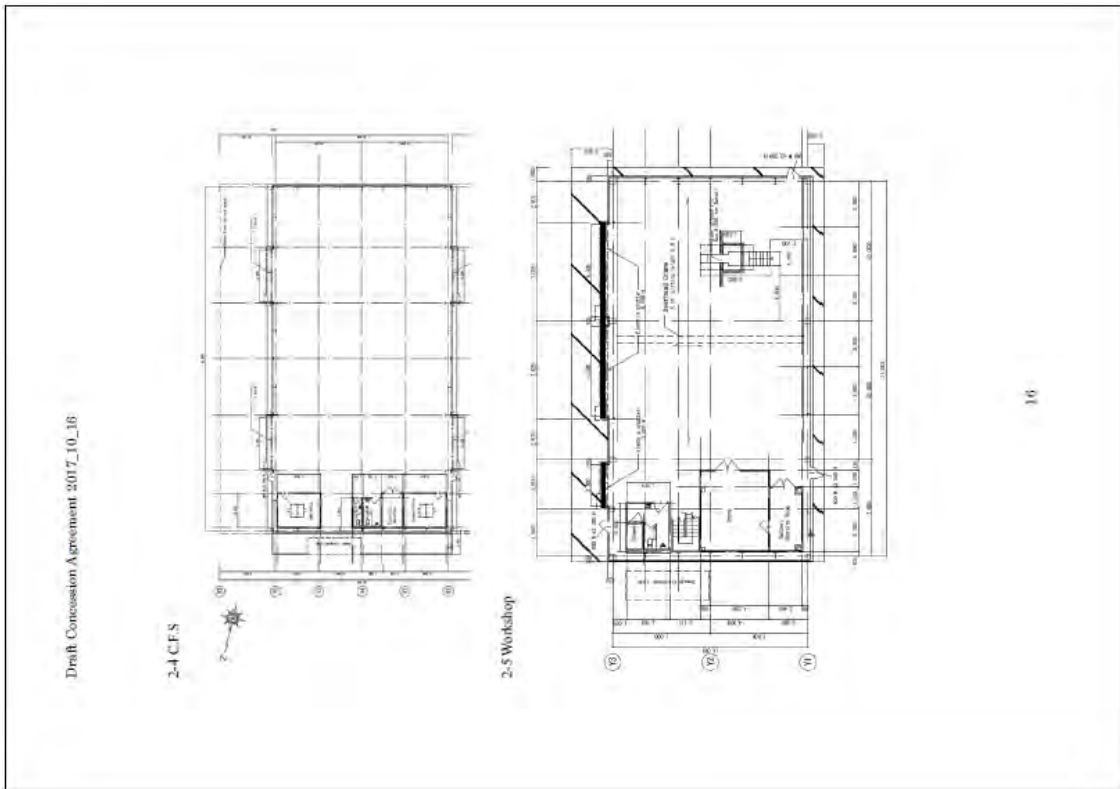
MAKE/MODEL	DEPT.	Safe Work Load	STATUS	REG. NO
Sany Reach stacker x 2	Transport	2 X 45 TON	Existing	
Sany Reach stacker x 2	Transport	2 X 10 TON	Existing	

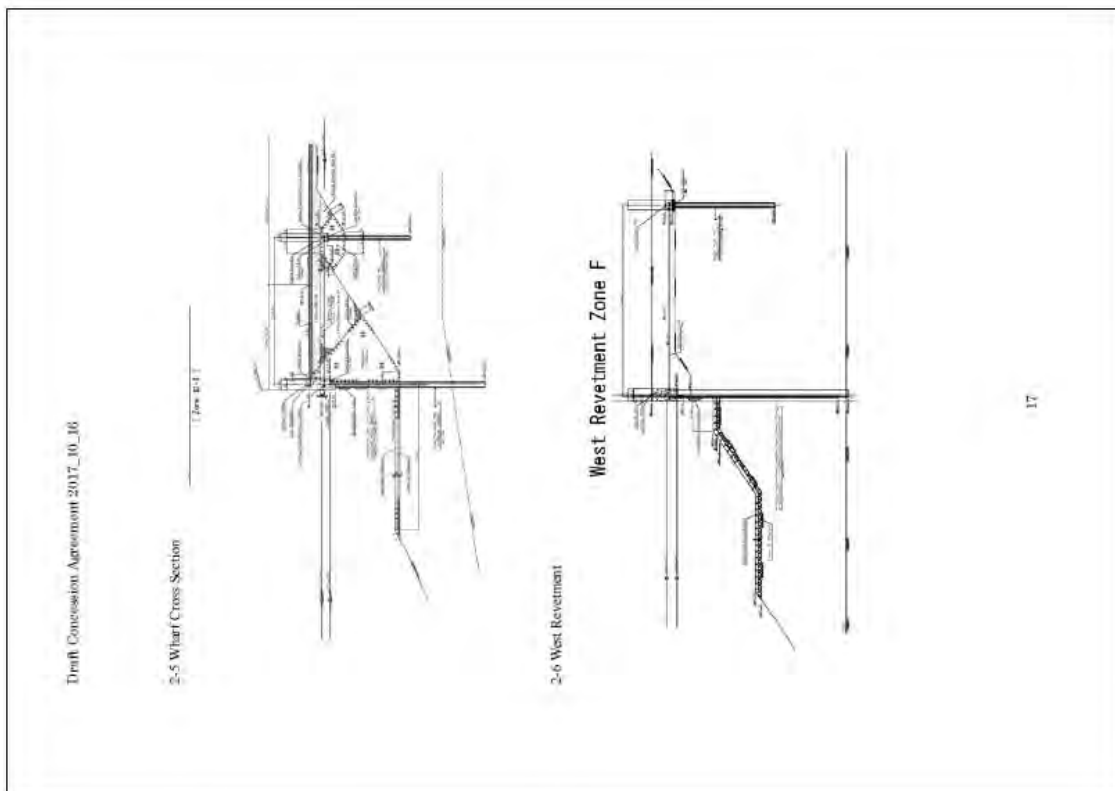
Draft Concession Agreement 2017_10_18

10. Dispute Resolution

The law governing this concession shall be Vanuatu Law.







9.6. Coral Monitoring

The report on coral monitoring (March 2016 and December 2016) is attached below.

9.6.1. Report on coral monitoring (March 2016)

Lapetasi Coral Relocation Report



**CORAL RELOCATION REPORT FOR THE LAPETASI MULTI-PURPOSE WHARF
PROJECT AT PARAY BAY, PORT VILA HARBOUR, VANUATU**



MARCH 3, 2016

JEREMIE KALTAVARA, SOMPERT GEREVA & ROCKY KAKU

VFD RESEARCH & AQUACULTURE DIVISON

**Port Vila.
VANUATU**

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INTRODUCTION

International and domestic shipping services are important to enable goods and services to be delivered throughout Vanuatu, and the importation and export in and out of the country respectively. Improved accessibility for cargo vessels will help to maintain economic growth in the country. The Lapetasi Multipurpose Wharf Development project funded by the Government of Japan aims to demolish the current Star Wharf facilities and build a new wharf for international cargo vessels.

Construction of the new wharf will result in the destruction of the nearby shallow coral reef within the construction area as per the engineering design plan of action. The Vanuatu Fisheries Department (VFD) Research Team through an internal agreement with Vanuatu Project Management Unit (VPMU) and other partners, were tasked to relocate live coral colonies to a new site, away from the possible impacts of the construction works from the wharf site.

Coral relocation is not a new activity to mitigate from potential impacts caused by such infrastructure construction works. Infrastructure construction in similar environments have seen coral colonies being relocated for the same purpose, as in countries like Qatar, Jordan and Jamaica (KOTB et al., Gayle et al., 2005, Jokiel et al., 2005, Kilbane et al., 2009). In Vanuatu however, this relocation activity is the first of its kind for such major infrastructure development. The coral relocation was carried successfully despite some challenges during the process.

This activity being the first in Vanuatu will help to increase public awareness and appreciation on the important services that coral reef provide to maintain a functional, healthy reef ecosystems that has cultural, social and economic significance. It is anticipated that future coastal developments will benefit from the lessons learn from this coral relocation activity.

CONTEXT/ OBJECTIVES

The objectives of this study are:

- To survey and relocate healthy coral reefs and mobile invertebrates from the Lapetasi multipurpose wharf site to a new site.
- To complete all coral relocation activities before commencement of the Lapetasi project.
- To conduct long-term coral monitoring on translocation site and two control sites in the Port Vila Harbour.

MATERIALS AND METHODS

Study Area

The study was conducted in the Port Vila harbour area. Port Vila, situated on the south coast of Efate island in SHEFA province, is the economic and commercial centre of Vanuatu. The harbour provides access, support and storage facilities for domestic inter-coastal and international vessels. The fringing reefs along the Port Vila harbour are of extreme environmental, social, economical and cultural importance. The reef system is diverse with numerous fish species, invertebrate species and visiting marine mammals. The designated Lapetasi multi-purpose wharf site has scattered reef colonies dominated by branching, tabular and massive corals of the *Porities* spp and branching corals of the *Acropora* spp. These reefs are found scattered nearshore along the Lapetasi site and along the adjacent shoal towards the southern end of Iririki Island

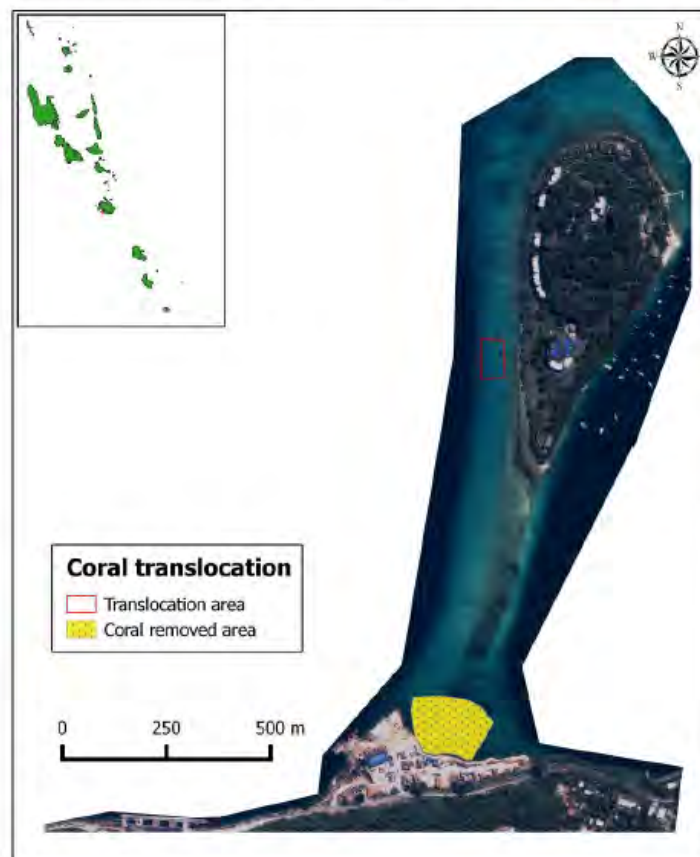


Figure 1: Map of the study site. Shaded in yellow is the donor area, the red framed box is the receptor area.

Detaching, translocation and fixing of coral colonies

Transplantation activities includes detaching of the coral colonies from the donor site, translocating and re-attaching of these corals at the receptor site (Fig.1).

Corals colonies to be harvested were marked using cable ties and plastic tags (Fig. 2). Chisels and hammers were used to detach the corals at the pre-marked sites (Fig. 3). Corals were gathered and transported using a cage (1.5m × 1m × 1m in size) made from plastic PVC pipes and plastic mesh net and manufactured specifically for this purpose¹ (Fig. 4)

The cage was tied and kept submerged and buoyant beneath a boat at a depth of less than 1.5m depth, using ropes to avoid further stress to these corals, which may consequently affect their survival rate. The cage was transported at low speed to avoid the displacement of the corals and associated fauna (coral fish species and invertebrates).

The coral colonies were transported for less than 1km to the receptor site at 3 to 9m depths similar to their original site.

At the donor site, corals were fixed to degraded bommies using Humebond™ epoxy mortar to fix their bases to the hard/dead substrate. Spacing of coral were at 5-10cm apart to minimize antagonistic behaviour by the corals (Fig. 5 & 6).

Monitoring tags will be attached to the corals after two weeks of reattachment, to minimize disturbance of the epoxy (Fig. 7).

¹. Over +300 corals were transported exposed, on board an outboard small vessel to the recipient site by the previous contractor. Less than 50 remaining corals were relocated by the VFD using the 'cage' technique.

Coral cover estimation and Survey of the donor and receptor sites

Area of coral cover at the donor site was estimated using a flexible tape measure prior to harvesting. Estimated coral cover at the donor site were estimated using similar technique prior to translocation.

A detailed survey was conducted for the donor and the receptor sites to define the corals to be relocated and to verify the exact location ideal for the success of the translocation (Ref: Selection report).

The degraded bommies at the south western end of Iririki island were selected as receptor sites for a number of reasons including; environmental condition correlation, the area is a customary fishing ground infrequently accessed by the land owners (Ifira people) and ease of monitoring the VFD.

Monitoring programme

The monitoring programme will be implemented using the “*Korel lukluk*” method, a technique employed by the VFD (Dumas et al., 2009).

Monitoring will commence on the month of March 2016 following agreed protocols. These ‘periodical checks’ will be after the first month of relocation, once every four months during construction works and once every six months after construction works²

² Terms of Reference for coral relocation works for the Port Vila Lapetasi International Multi-purpose Wharf Development Project (Vanuatu, 2015).

RESULTS:**1. Implemented Activities**

DATE	SITE	ACTIVITIES COMPLETED
8/12/15	Lapetasi wharf –donor site	Mapping and identification of corals to be relocated
9/12/15	Lapetasi wharf –donor site	Harvesting of corals at pre-marked colonies
10/12/15	Lapetasi wharf –donor site	Harvesting of corals at pre-marked colonies
11/12/15	Lapetasi wharf/ SW Iriiki	Translocation of corals from donor to recipient site
12/12/15	SW Iriiki- receptor site	-Reattachment of corals at receptor site.
14/12/15	SW Iriiki- receptor site	-Reattachment of corals at receptor site.
15/12/15	SW Iriiki- receptor site	-Reattachment of corals at receptor site.
16/12/15	SW Iriiki- receptor site	-Tagging/ inspection & maintenance of loosely attached corals
17/12/15	SW Iriiki- receptor site	-Tagging/ inspection & maintenance of loosely attached corals

Brief comments:

- Most Coral harvesting and transfer were implemented by a local dive contractor, Taiford Dive and Salvage company.
- All relocated corals were fixed after 2 days in of relocation.

2. Relocation outcomes

Table 1. Number and descriptions of corals relocated from the Lapetasi site to SW Iririki Island.

SECTOR	HARD CORAL TYPES			Total number of corals
	BRANCHING	TABULAR	SUBMASSIVE	
A	32	25	142	199
B	50	27	114	191
C	2	5	5	12
Total number of relocated corals				402

Donor Site

The Lapetasi site is dominated by sandy bottom areas with scattered coral colonies. The dominant species were *Porities* spp., and *Acropora* spp. Coral species-level identification was not possible due to their variable nature. Accurate identification is possible through chemical analysis, but beyond the scope of this study. Corals harvested were selected based on appearance (little signs of bleaching, no attached algae, size is less than 50cm in diameter).

Divided into three sectors, the total area of works was 6,820m² and approximately 30% of corals were harvested for relocation.

Receptor site

Most corals in the area have died and is characterized by degraded bommies scattered at depths of 5 to 9m. Several bommies are covered by calcareous and other macro-algae.

The relocated corals were established on bommies and small degraded reefs at depths of 4-7 with a total area of works of 5,272 m². In total, 402 corals were translocated, most of these were hosted on four large pommies and the rest of the corals were hosted on the smaller reefs.

DISCUSSION

The coral reefs of the Lapetasi site is adjacent to the recently demolished inter-costal wharfage. These reefs have offered for a long time an important fishing ground for the Ifira people as well as the Port Vila community. The rebuilding of the new multi-purpose wharf will significantly damage the coral reef habitat. Therefore, coral relocation in the Port Vila harbour specifically the Lapetasi area, is a mitigation measure recommended in the EIA study of the new multi-purpose wharf project. However, due to the extent of the colonies as well as equipment limitations, selective harvesting was implemented to harvest and relocate corals that were able to readapt and recolonize a new habitat, in this case the southwestern end of Iririki Island.

The southwestern end of Iririki Island as the receptor site has a similar habitat as compared to the Lapetasi site. The site has historically been a fishing ground frequented by the Ifira people, and later a dive site for the Iririki Island resort. However, due to natural as well as anthropogenic effects, most corals have died leaving bare bommies and degraded reefs with little to no instances of recovery.

The translocation process has contributed to saving a significant amount of coral cover, which could have been damaged by construction activities of the new multi-purpose wharf.

A total of 402 hard corals of various forms were relocated from the Lapetasi to Iririki site. The donor area was 6,820m² and receptor area was 5,272m², a decrease of approximately 30% of total surface area.

Since the corals were relocated by two different teams including a private contractor and the VFD, these corals were tagged in order to differentiate during monitoring.

Coral monitoring at the relocation site will commence later in the month of March 2016. Monitoring is important to provide information on changes such as coral cover, as well as invertebrate as well as fish abundance. Monitoring will consist of standardized UVC coral surveys by the VFD using the “*Korel Lukluk*” method (Dumas et al., 2009).

The success of this project will provide a benchmark for future activities of this nature, specifically the simple method used to harvest, transport and reattach corals. Additionally, this activity presents the possibility for effective corals and marine invertebrates relocation in a coastal ecosystem. Longterm data through regular monitoring will be required to evaluate the success of this relocation activity. Moreover, the use of the translocation technique provided a new approach for educating and raising awareness on the value of coral reefs and the importance of conservation.

APPENDIX



Fig 2: Coral inspection by a VFD diver.



Fig 3: Corals being harvested by a diver.

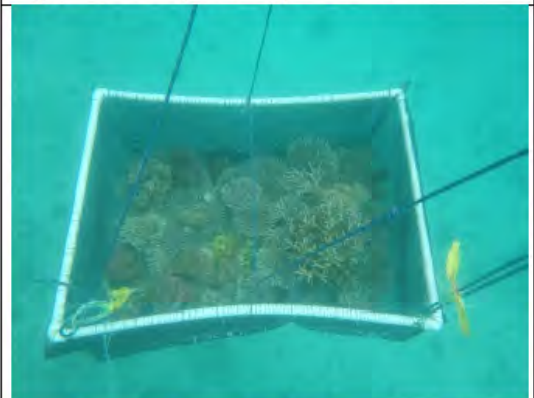


Fig 4: Corals transported in cage to relocation site.



Fig 5: corals being planted at a pre-selected bommie by a VFD diver using SCUBA gear..



Fig 6: corals being planted at pre-selected bommies by a VFD diver using SCUBA gear.



Fig 7: corals planted on a pre-selected bommie at the relocation site.

ACKNOWLEDGEMENT

This activity was carried out as part of the Port Vila Lapetasi Multi-purpose Wharf Development project, funded by the Japan International Cooperation Agency (JICA). The authors are grateful to John Shanahan (Fletcher Construction Company Limited), Yvonne Qualao (Lapetasi Multi-purpose Wharf Development Project), Henry Taiford (Taiford Dive and Salvage), the VISSP team and the VPMU team for fruitful collaboration and support.

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9.6.2. Report on coral monitoring (December 2016)
Lapetasi Coral Monitoring Report



**CORAL MONITORING REPORT FOR THE LAPETASI MULTI-PURPOSE
WHARF PROJECT BEING FOR JUNE AND NOVEMBER 2016 AT PARAY BAY,
PORT VILA HARBOUR, VANUATU**



DECEMBER 1, 2016
JEREMIE KALTAVARA, SOMPERT GEREVA & ROCKY KAKU
VFD RESEARCH & AQUACULTURE
Port Vila.

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1.0 INTRODUCTION

This coral monitoring report is part of the collaboration between the Vanuatu Fisheries Department (VFD) and the Port Vila Lapetasi International Multi-purpose Wharf Development Project, to monitor and the corals that were relocated from the Lapetasi wharf site and also the natural corals in the surrounding Port Vila harbour area.

The purpose of this brief report is to monitor the status and trend of coral health at the relocation site and control sites.

The activity was undertaken by the VFD Research Team with assistance from the Vanuatu Project Management Unit (VPMU).

2.0 CONTEXT/ OBJECTIVES

The objectives of this study are:

- To inspect the relocated corals at the relocation site.
- To assess the status of the coral reef habitat at the control sites.

3.0 MATERIALS AND METHODS

3.1 Study Area

The study was conducted in the Port Vila harbour area. Port Vila, situated on the south coast of Efate Island in SHEFA Province, is the economic and commercial centre of Vanuatu. The harbour provides access, support and storage facilities for domestic inter-coastal and international vessels. The fringing reefs along the Port Vila harbour are of extreme environmental, social and cultural importance. The reef system is home to a diversity of fish species, invertebrates and marine mammal species.

Below is the areas surveyed including the control sites and the coral relocation area (Fig 1.0).

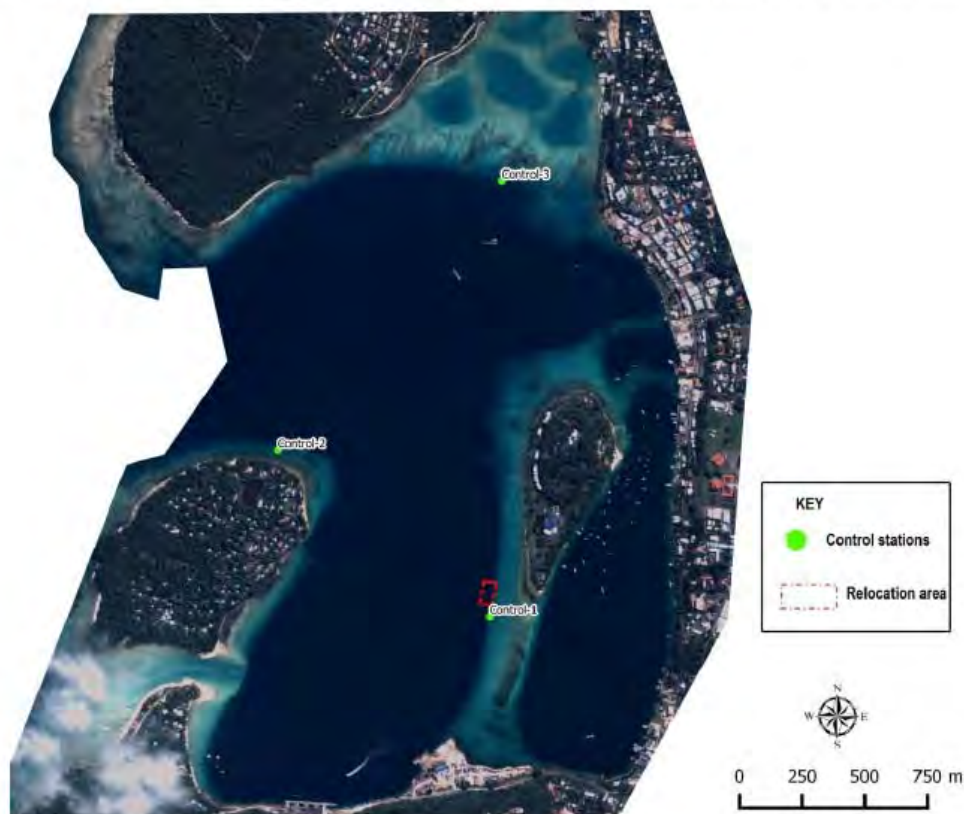


Figure 1: Map of the study site. Shaded in yellow is the donor area, the red framed box is the receptor area.

3.2 Monitoring protocol

Two different assessment methods were used to assess the coral habitats. The '*Korel lukluk*'¹ method was implemented at the control site, and basic enumeration or counting of live and dead relocated corals was implemented at the relocation site.

Classification of corals were based on their physical appearance, corals were deemed alive if more than 60% of coral surface had the presence of live coral tissue. Corals with less than 40% of live tissue were deemed dead.

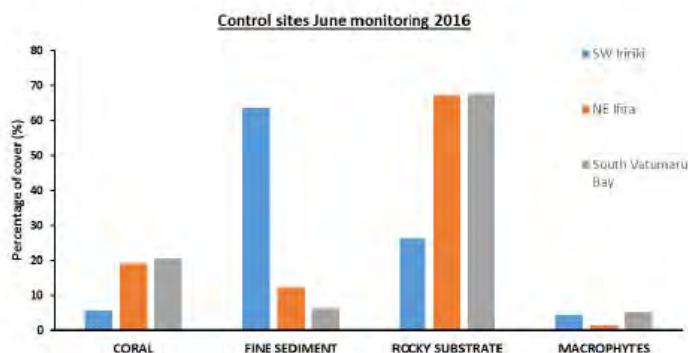
The percentage of findings was reported to indicate the overall status of corals in the relocation area.

Distinguishing between natural and relocated corals was easier as the relocated corals were planted in rows in close distance to each other, the presence of remaining tags and upon close inspection of the coral stems for the presence of underwater epoxy which has an unnatural grey colour distinctly different from the natural substrate.

¹ Terms of Reference for coral relocation works for the Port Vila Lapetasi International Multi-purpose Wharf Development Project (Vanuatu, 2015)

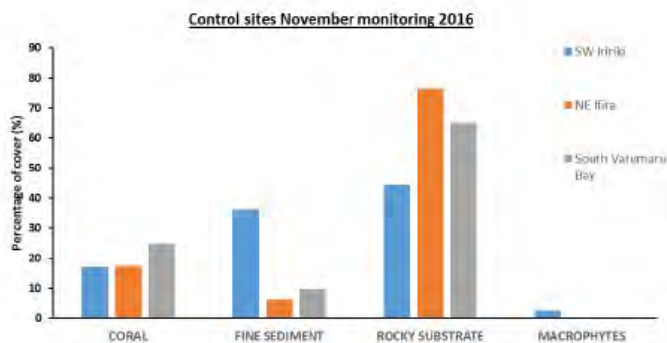
4.0 RESULTS & DISCUSSION:

4.1 Control sites JUNE 2016



Observation of the 3 control sites shows that there were relatively high abundance of live corals in NE Ifira and Vatumaru Bay Sites. All 3 sites are characteristically similar in that they have significantly higher percentage cover of rocky substrates. These are mostly remnants of once healthy coral habitats. From these 3 sites, Vatumaru bay has an unusually turbid water, presumed to be the direct result of the adjacent infrastructure works directly opposite, at the Vatumaru bay area.

NOVEMBER 2016

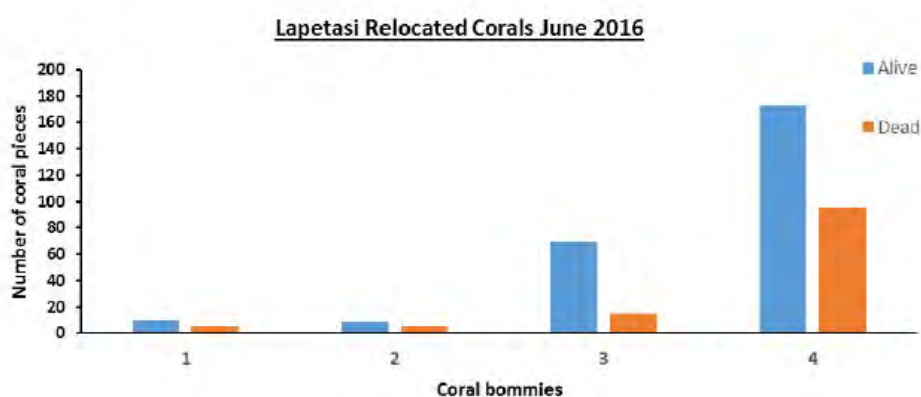


Observation of the sites, shows an increase of live coral covers from all 3 sites. Visual comparison between the 3 sites after the June survey shows no significant changes in all four substrate categories. These observations were carried out a few days before the Paray Channel dredging occurred.

4.2 Relocation site

JUNE 2016

RELOCATION SITES Lapetasi wharf	Assessment June 2016			% Alive
	Alive	Dead	Total	
Bommie 1	10	5	15	67
Bommie 2	8	5	13	62
Bommie 3	70	15	85	82
Bommie 4	173	96	269	64
	Total Inspected		382	
	Total Relocated		402	
	Total Missing		20	



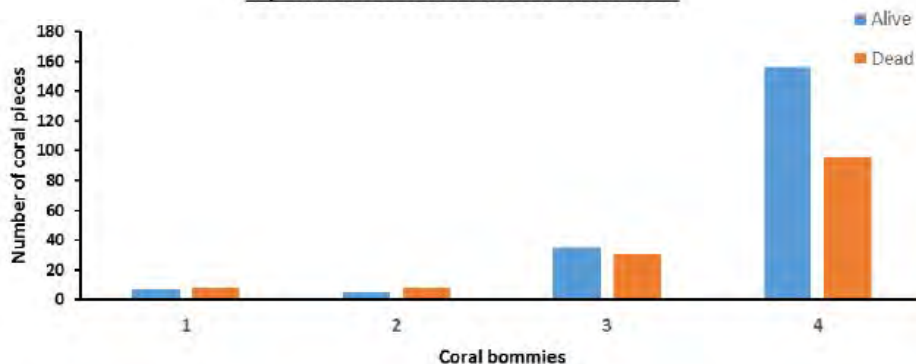
A total of 402 corals were relocated to the SW end of Iririki Island in December 2015 (fig xx). From observation, a total of 382 corals were located with 20 corals were missing. Factors presumed to have impacts on live corals were; the ongoing El-nino, wave and tide actions, detachment of corals due to contact with fish and inverts species, and from entangled light reef fishing lines. Overall, the corals were observed to be in relative good condition with an established ecosystem of both invertebrates and finfish.

Visual observations made around the relocation site seems to suggest that the introduction of corals have induced the establishment of a potentially thriving coral reef ecosystem. Six months after relocation, there in indeed an increase in the abundance of mainly herbivorous fish species such as parrotfish (*Scarridae spp*), butterflyfish (*Chaetodonidae spp*) and surgeonfish (*Acanthuridae spp*).

NOVEMBER 2016

RELOCATION SITES	Assessment November 2016			% Alive
	Alive	Dead	Total	
Lapetasi wharf				
Bommie 1	7	8	15	47
Bommie 2	5	8	13	38
Bommie 3	35	31	66	53
Bommie 4	156	96	252	62
Total Inspected			346	
Total Relocated			402	
Total Missing			56	

Lapetasi Relocated Corals November 2016



A total of 346 corals were observed at the relocation site. Of these, 56 corals were missing which is a marked increase of 36 corals compared to the June 2016. Relocated corals in bommies 1 and 2 were observed to have a higher mortality count, whereas healthier corals were observed in bommies 3 and 4. Observations made at the immediate relocation site saw the increase in young coral species scattered between and around the relocated coral pieces. From the time of observation, there were a significantly higher number of coral reef associated fish species, particularly at the western drop off toward Ifira Island.

4.3 Corals relocated from D & E colonies

A total of 111 coral reefs were relocated from colonies ‘D’ and ‘E’ adjacent to the wharf site by a local company². An inspection was conducted by the VFD & ECOH-JV personnel during the June 2016 inspection. Overall, the VFD is satisfied that, the majority of corals which are highly likely to generate in a ‘new’ area were relocated, and that area and the overall Lapetasi project can be regarded as cleared, unless there is any further opinions from the Vanuatu Department of Environmental Protection and Conservation and other relevant stakeholders.

² NEC. 2016. Coral Relocation report for Paray Channel, Port Vila Harbour, Vanuatu.

5.0 Discussion

Throughout Vanuatu, coral reefs have been in a state of decline, due to both natural and anthropogenic impacts. In Port Vila harbour, the latter seems to be the major factor for the decline of coral health. The Lapetasi and other infrastructure projects in the immediate Port Vila harbour are of concern to the natural environment. However, relocation efforts by the Lapetasi project is a venture sought by the project to ensure the natural coastal environment is not impacted hugely.

This report summarises the status and trends of both relocated and natural corals in the Port Vila harbour area.

Analysis presented shows that in within a year of the project's commencement, particularly the reclamation activities, there were no adverse impacts to the natural corals at the control sites located a few kilometres from the project site. Although, it should be noted that all existing infrastructure projects within the harbour are all active at this point of time, and the Paray Channel dredging is about to commence, therefore, it is likely that the trend of good coral health may decrease in the near future.

The VFD recognizes that there will be some impacts of the construction phase on the immediate Lapetasi wharf area. In addition, most juvenile corals have been removed and the remaining corals are old and would not survive relocation.

In the relocation sites, there has been no significant changes in the conditions of the corals. Although, it is evident that the coral reef ecosystem is slowly changing towards reaching an equilibrium, between the associated coral reef species. This is evident from the presence of marine flora and fauna, and most importantly the presence of young coral species that before the relocation activity were low in abundance and morphology.

Whilst the general consensus is that the future of coral reefs is uncertain due to the effects of climate change, there are some reasons for a brighter outlook in the Port Vila harbour area, thanks to the environmentally friendly activities from the infrastructure projects, specifically the Lapetasi Multipurpose Wharf Infrastructure project.

6.0 APPENDIX



Fig 2: Bommie 1 in relocation site

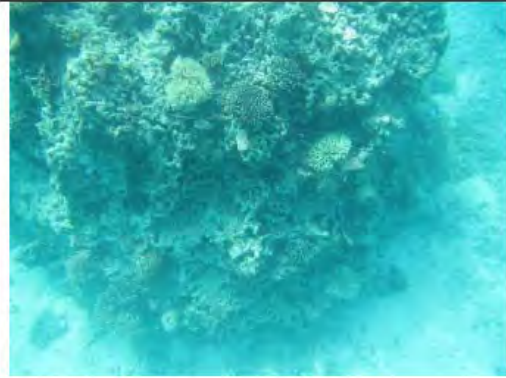


Fig 3: Bommie 2 in relocation site



Fig 4: Juvenile coral in relocation site.



Fig 5: Juvenile coral in relocation site.

9.7. Environmental Monitoring

<Monitoring in the vicinity of the construction area by the contractor>

Environmental monitoring in the vicinity of the construction area has been continuously conducted by the contractor since October 2015.

In the land area, activities such as waste management, measures against oil spills, traffic control, measures against dust dispersion, wastewater management, measures against rain water and sanitary management are carried out. In the marine area, water quality monitoring and sea traffic control are conducted.

The results of water quality monitoring up to June 2016 are summarized in TableA-1. The values of pH and SS (Suspended Solid) do not exceed the standard value, suggesting that there have been no negative influence from construction works. The monitoring locations are shown in FigureA-1.

Table Summary of water quality monitoring in the vicinity of the construction area

Year, Month	pH		SS(mg/L)		Major construction
	Observed value	Standard value	Observed value	Standard value	
Oct., 2015	8.1-8.1, 8.1	7.8-8.3	<1.3	3.3	Demolition of existing wharf, Excavation at wharf face pile line
Nov. 2015	8.0-8.2, 8.1		<1.3	3.3	ditto
Dec., 2015	8.0-8.1, 8.1		<1.3	3.3	Excavation at wharf face pile line, Piling
Jan., 2016	8.0-8.1, 8.0		<1.3	3.3	Construction of east revetment access
Feb., 2016	8.0-8.2, 8.1		<1.3	3.3	ditto
Mar., 2016	8.0-8.1, 8.0		<1.3-3.0, 1.4	3.3	Construction of east revetment
Apr., 2016	8.0-8.1, 8.1		<1.3-1.5, 1.3	3.3	Construction of east revetment, Piling, Excavation
May, 2016	8.0-8.1, 8.1		<1.3-1.4, 1.3	3.3	Piling, Dredging (Zone 1, 2)
jun., 2016	8.0-8.1, 8.1		<1.3	3.3	Piling, Dredging (Zone 1 - 4)

Source: Monthly report

Note: Observed values express Minimum, Maximum, Average, respectively.

SS is converted from turbidity value.

The standard value of SS applies the value (Average value of the background +2mg/L).
If the values are less than the detection limit (1.3mg/L), the value is expressed as 1.3mg/L.

<Water quality monitoring is conducted across a wide area by the Department of Environment>

Water quality monitoring across a wide area was conducted in September 2015 by the Department of Environment. No construction works were conducted during this period of the monitoring, and the water quality is good except for high turbidity at the north part of the bay.

According to an interview with a representative of the department, monitoring would only be conducted once this year due to budget constraints.

“MONITORING FORM (Revised)” and “PORT VILA HARBOR COASTAL WATER QUALITY MONITORING PROGRAM” are shown below.

9.7.1. MONITORING FORM (Revised)

Attachment 15

MONITORING FORM (Revised)

The Ministry of Infrastructure and Public Utilities conduct environmental monitoring. The result of monitoring will be reported to JICA by this form as a part of the Progress Report.

1. Responses/Actions to Comments and Guidance from Department of Environmental Protection and Conservation (DEPC)

Monitoring Item	Monitoring Results during Report Period	Comments from DEPC
ALL	AS BELOW	RESULTS ACCEPTED WITH NO FURTHER COMMENT - MS. N. TOR, EIA OFFICER, DEPC

2. Ecosystems

1) Animals occurrence around the Project site (at any time)

Item	Remarks (Found date & locations, numbers)
Dugongs	No animals sighted since the start of the project
Sea Turtles	No animals sighted since the start of the project
Others	Substantial aggregation of coral reef-associated fish and macro-inverts at the relocation site. There was a Humpback whale at the northern end of the Port Vila Harbour (over 1km away from the site) on June 23, 2017.

※Please write the latest information and the date you observed the above animals.

Attachment 15

3. Corals and Water Quality

Monitoring site	Status of corals (% live cover based on Coral Lukluk Method ⁽⁴⁾)		Water temp (°C)	Salinity (‰)	pH			Turbidity (NTU)			Remarks	
	Result	Baseline ⁽⁷⁾			RANGE	RANGE	RANGE	Baseline	Standard	Measured value (MAX)		Baseline
Coral relocation site ⁽³⁾	Bommie 1	33%	100%	27.0 – 28.4	33.2 – 33.3	8.02 – 8.16	7.8-8.3 ⁽²⁾	0.0		<9.5 ⁽¹⁾	No baseline data available ⁽⁵⁾	
	Bommie 2	38%	100%									
	Bommie 3	45%	100%									
	Bommie 4	60%	100%									
Permanent monitoring site of coral	S4T2 (Fatumar-u Bay) ⁽⁸⁾	19%	※ This cell will be filled by JICA by checking of previous results. (2010Feb-Mar)	27.4 – 28.2	32.9 – 33.4	8.02 – 8.16	7.8-8.3 ⁽²⁾	0.0		<9.5 ⁽¹⁾	No baseline data available ⁽⁵⁾	
	S2T1 (Ifraki) ⁽⁸⁾	22%	※ This cell will be filled by JICA by checking of previous results. (2010Feb-Mar)	27.0 – 28.1	33.1 – 33.3	8.01 – 8.13	7.8-8.3 ⁽²⁾	0.0		<9.5 ⁽¹⁾	No baseline data available ⁽⁵⁾	
	S3T3 (Ifriki)	8%	※ This cell will be filled by JICA by checking of previous results. (2010Feb-Mar)	27.0 – 28.4	33.2 – 33.3	8.02 – 8.16	7.8-8.3 ⁽²⁾	0.0		<9.5 ⁽¹⁾	No baseline data available ⁽⁵⁾	
Construction site	M-1			26.8 – 29.6	30.9 – 33.5	8.02 – 8.16	8.15	7.8-8.3 ⁽²⁾	0.0	0.0	<9.5 ⁽¹⁾	Works as noted ⁽⁶⁾
	M-2			26.8 – 29.6	31.3 – 33.4	8.04 – 8.13	8.16	7.8-8.3 ⁽²⁾	0.0	0.0	<9.5 ⁽¹⁾	Works as noted ⁽⁶⁾

Attachment 15

	M-3			26.9 – 29.8	32.2 – 33.6	8.01 – 8.14	8.14	7.8-8.3 ⁽²⁾	0.0	0.0	<9.5 ⁽¹⁾	Works as noted ⁽⁶⁾
	M-4			26.9 – 29.9	31.8 – 33.6	8.01 – 8.13	8.15	7.8-8.3 ⁽²⁾	2.7	0.0	<9.5 ⁽¹⁾	Works as noted ⁽⁶⁾
	M-5			27.0 – 30.0	32.2 – 33.7	8.00 – 8.12	8.14	7.8-8.3 ⁽²⁾	5.5	0.0	<9.5 ⁽¹⁾	Works as noted ⁽⁶⁾
	M-6 ⁽¹⁰⁾			27.0 – 27.9	33.0 – 33.4	8.02 – 8.06	8.19	7.8-8.3 ⁽²⁾	10.2 ⁽⁹⁾	0.0	<9.5 ⁽¹⁾	Works as noted ⁽⁶⁾
	M-7 ⁽¹⁰⁾			27.0 – 28.2	32.2 – 33.4	8.01 – 8.07	8.16	7.8-8.3 ⁽²⁾	4.9	0.0	<9.5 ⁽¹⁾	Works as noted ⁽⁶⁾
Permanent monitoring site of water	C-1			26.9 – 29.7	31.7 – 33.6	8.00 – 8.16	8.15	7.8-8.3 ⁽²⁾	0	0.0	<9.5 ⁽¹⁾	Works as noted ⁽⁶⁾
	C-2			26.8 – 30.0	32.0 – 33.7	8.00 – 8.15	8.15	7.8-8.3 ⁽²⁾	0	0.0	<9.5 ⁽¹⁾	Works as noted ⁽⁶⁾
	C-3			27.0 – 29.8	32.3 – 33.7	8.00 – 8.14	8.16	7.8-8.3 ⁽²⁾	0	0.0	<9.5 ⁽¹⁾	Works as noted ⁽⁶⁾

Temperature and salinity is used to judge if turbidity is due to the project activities or storm water.

THIS DATA COVERS THE PERIOD OF APRIL 1 – JUNE 30, 2017 except as noted below

(1) Standard of fisheries water in Japan - Background + 2mg/L. The limit of the standard for the particular day with the highest result at the monitoring point is shown

(2) Environmental standard of the Basic Environment Act in Japan.

(3) The Location of S3T3 is close to the relocated coral community and therefore it is allowed to use the coordinate and monitoring data of the relocated coral communities for S3T3.

(4) The Corel Lukluk Method is the method used by Fisheries Department to determine live coral cover. The percentage noted here is the live percentage of coral at a location; where 100% would be the total coral (both live and dead). Bleached Corals are counted as live as they still have the potential to regrow. For the points S3T3, S2T1 and S3T3 the result is for all naturally occurring coral. For the coral relocation site, the percentage refers only to transplanted corals. *The result shown in this form is for Coral Monitoring carried out on March 2017. There has been no further inspection of sites since March 2017 by the Vanuatu Fisheries Department.*

(5) The baseline pH and Turbidity are not available for the Coral Monitoring & Coral Relocation Sites as the Contractor's Baseline Survey conducted from October-November 2015 did not include these sites

(6) Dredging at Wharf Zone I-V, West Revetment and East Side of Wharf; by Cutter Suction, Excavator and Clam Shell. Pouring of Pile Plug at Zone IV & West Revetment. Excavation and Backfilling at West Revetment. Pouring Lean Concrete at Zone V. Pouring Coping Concrete at Zone III, Zone V, East Transition, and West Revetment Anchor. Slope Trimming at East Revetment Zone D (Additional Deposit Area).

(7) The relocated coral percentage is based on all live corals successfully transplanted.

(8) The coral relocation & coral monitoring sites were monitored once a month from April – June 2017 and the results are as shown.

(9) Turbidity was high due to strong wind and current

(10) M6 & M7 were not recorded in April as they were within the silt curtain set up for the cutter suction dredge and the additional deposit area construction. M7 data recommenced recording May 11, 2017. M6 point was moved 10m north as the old point was now located in the newly reclaimed additional deposit area.

Attachment 15

4. Grievance

Grievances from Project Affected Persons	Responses of Executing Agency and Results	Remarks
Custom Landowners – complained in newspaper on April 20 that the Contractor (TOA Corporation) was carrying out quarrying (dredging) without a permit and taking royalties	VPMU responded that the company is carrying out works on behalf of Vanuatu Government and has not received any royalties for this material. Further the Quarry permit was renewed and is held by IPDS with TOA carrying out the dredging on their behalf	See attached newspaper article and email response by VPMU

NEWSPAPER ARTICLE FROM DAILY POST

LOCAL NEWS WINDWARD COAST | 11:45 AM | 10 FEBRUARY 2016

Malapoa College project construction workers go on strike

...expect to begin work today



The workers striking to work yesterday

Workers who worked as normal receiving their salaries ahead lunch break yesterday.

By Gisela Wille

MAJORITY OF THE 150 construction workers of the Malapoa College Extension Project refused to work yesterday following delay of their salaries and other concerns faced at the job site.

The ni-Vanuatuan workers told Daily Post that they are not happy over their working conditions including delay of salary payment, unnecessary deductions in salaries, salaries handed over to workers are not placed professionally inside envelopes, and no pay slips given when receiving their pays.

They also alleged that they work from Sunday to Sunday and even on Public Holidays but they are not receiving the amount of money they are expecting to be paid with.

"We do not have enough time to spend with our families because we had to work every day, from 7am to 6:30pm and even to as far as 2am the following day," they alleged.

Meanwhile, in response to the claims, Yanjian Group, the Chinese Construction Company facilitating the project argued that the delay in payment of salaries is due to the long Easter break and the fact that bank process are done only during working days.

"We usually pay our workers on the 17th of the month and on the 2nd of the following month. The 17th of this month was a public holiday and the bank started processing the worker's pays on Tuesday enabling the workers to receive their salaries today (Wednesday)," spokesperson from Yanjian stated.

He added that they are working in compliance with the laws, ensuring the workers got paid accordingly and their biggest goal is to complete the project within the given timeframe.

The Yanjian Construction Company is currently executing a \$11.7 billion extension of Malapoa College project, providing jobs to more than 100 locals and their aim is to contribute towards the development of Vanuatu and strengthen friendship ties between China and Vanuatu.

Daily Post understands the Chinese Embassy is aware of the issue.

School Principal, Mr. Reginald Garcia who was at the job site yesterday confirmed he had talks with the spokesperson for the workers and were able to come up with an agreement understanding on the situation.

The principal thanked the chief and leaders within the Malapoa area for ensuring the situation is calm. He also thanked the Yanjian Group for their commitment and making their every effort to help the ni-Vanuatuan workers.

Garcia also assured the Chinese Embassy that the situation is dealt with and work should resume to normal today.

Several workers who have worked as normal yesterday received their salaries before lunch break. The rest of the workers received theirs at 5:00pm yesterday.

All workers are expected to resume work this morning.

Landowners accuse Toa over Lapetasi

VPMU says all Gov't regulations and laws are being complied with

THE CONTRACTOR COMPANY TOA Corporation Tokyo Japan, which is constructing the Port Vila Lapetasi International Multi-Purpose Wharf, has been accused by the Custom Landowners, the Matanau Tefele (Mira), of both breaching the Quarry Permit Act No. 9 of 2013 and taking royalties and aggregates from the seabed that Toa is now dredging.

As per the VPMU website that deals with the Lapetasi Wharf Project: <http://vpmu.gov.vu/index.php/projects/lapetasi>; it states, "In executing the services, the Consultant will follow the relevant regulations, guidelines and procedures of the GOV and the Japan International Cooperation Agency".

In accordance with the Vanuatu Project Management Unit (VPMU) Newsletter issued in February 2017, TOA Corporation was planning to dredge 85,000 cubic metres of the seabed in the Lapetasi wharf area.

Spokesperson for the Matanau Tefele (Mira) Mr. Basil Sopo stated since the dredging in the areas had commenced the previous week, the Custom Landowners had not signed any agreement with the Director of Geology and Mines to issue a Quarry Permit for the dredging to be carried out by TOA Corporation.

"This amounts to a total disregard for Vanuatu Laws and 'stealing' of the royalties and aggregates of the seabed belonging to the rightful custom land owners," he alleged via a statement.

"The custom landowners claim that on November 30, 2016 a letter was sent to Mr. Johnson Wallislet, the Programme Director of the VPMU, regarding the dredging permit however no response was received.

"Since the Government and TOA Corporation have ignored the Quarry Act and the right of the custom landowners, they will be compiling two reports.

"The first one will be against TOA Corporation for 'stealing' seabed royalties and aggregates from the Custom Landowners," Sopo alleged.

"The report will be submitted to both the Police and the Public Prosecutor for possible criminal offences and demanding prosecution of the TOA Corporation Management.

"The second report will be submitted to the Office of the Ombudsman for possible breaches of the Leadership Code.

"Various Ministries and Ministries are directly connected to the Lapetasi International Multi-Purpose Wharf Development Project and as such the report will target and name senior civil servants to their mistakes."

But the VPMU pointed out Toa is not in Vanuatu to itself as they are here on contract to carry out a government project and all government regulations and laws are being complied with.

"The Lapetasi Project is a government project contracted to Toa Corporation," the VPMU stated.

"Toa are working very closely with all relevant authorities of government to realize the project.

"In addition the government works closely with interested landholding parties to ensure the project is completed and handover on schedule.

"It should be made clear that under relevant laws, quarry materials under seabed, which is below six metres belong to the state under the Mines and Minerals Act."

In relation to the quarry permit, the Mira Ports Development Services (MPDS) should seek an extension to the quarry permit which was last issued in 2012 but because of the delay in the start of the project, quarry or dredging has only now commenced.

The VPMU says it is aware that Mr. Sopo and his clan have written to VPMU or government concerning the VPMU Inter Island Shipping Support Project (VITSSP), but not the Lapetasi project.

Mohor, Kalsakau Parole Tomorrow

Custom Front Page

It said the granting of parole comes with conditions that the parolee will have to abide to outside the Correctional Centre.

"If they breach their conditions, we will inform the parole board leading to a recall order."

Former Prime Minister, Moana who was convicted with a total of 18 charges altogether and serving 4 years imprisonment for each count concurrently will remain in custody for at least another 7 more months before being eligible for parole in October this year.

The Correctional Services Director added that while they are aware that it is up to the Public Prosecutor whether to pursue a retrial for the conspiracy case or not, the paramount concern will be processed for parole because currently they are free of the conspiracy charges.

Daily Post has inquired with the Public Prosecutor in regards to the issue and was informed a decision will be issued in the near future.

Mohor is a prominent and long-time serving politician who managed to hold on to the leadership of the Union of Moderate Party even behind bars.

He was re-elected the President of UMP even in his absence and reports are that supporters have welcomed his imminent release.

RESPONSE BY VPMU

From: Catherine Malosu <catherine.malosu@gmail.com>
Sent: Thursday, 20 April 2017 1:15 PM
To: Yoko ASANO
Cc: Johnson Wabaiat; 岩沢 伸治 (HATAZAWA Shinji); 中川 昌之 (NAKAGAWA Masayuki); shotakeda; Ito (ECOH); Yvonne Qualao; Harold Qualao; Yamaguchi[OCDEI]; Kiery Manassah; Itsubo.Toyoaki.2@jica.go.jp; Roqara Jone; Anna M Sakwa; Remah Arthur; Sam Namuri; George Junior; Chris Marlow
Subject: Re: JICA)Newspaper article today on Lapetasi
Attachments: Quarry Permit_Renewal.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Good Afternoon Yoko-san,

If i may provide a quick response here, per the article that was published today

First and foremost, VPMU **is not** the permit holder for all the permits issued under the Port Vila Lapetasi project. Ifira Port Development and Services Company Ltd (IPDS) is the permit holder for all the permits, therefore, it would be considered proper if IPDS can respond, particularly to the media in that respect. VPMU only assisted IPDS by facilitating the process to apply for the permits, including supporting documentations.

Secondly, a Quarry Permit has been issued for the Port Vila Lapetasi project and expires in December 2017. A copy is attached for your reference. The permit was first issued in February 2011 but the validity of the permit had since elapsed. Since time was pressing on and permits had to be updated and in place prior to commencement of works, the Commissioner of Mines advised that a formal request be submitted for the renewal of the permit. The latter was accomplished and the permit renewed and issued to IPDS.

Thank you for your understanding

Regards,

Catherine

On Thu, Apr 20, 2017 at 8:13 AM, Yoko ASANO <asano.yoko@jica.go.jp> wrote:

Dear Director,

We found a newspaper article 'Landowners accuse Toa over Lapetasi' in Daily Post dated 20 April, 2017.

Please read it and take appropriate measures against the article.

Thank you in advance.

Attachment 15

Yoko ASANO

Project Formulation Advisor

JICA Vanuatu Office

4th Floor Air Vanuatu Building, Rue de Paris/PMB 9005, Port Vila Vanuatu

Tel: (+678) 23546, Mobile: (+678) 552 3678

9.7.2. PORT VILA HARBOR COASTAL WATER QUALITY MONITORING PROGRAM



**PORT VILA HARBOR
COASTAL WATER
QUALITY MONITORING
PROGRAM**

SEPT 2015 REPORT

REPORT PREPARED BY:

ERIE SAMI
Hydro-geologist

INTRODUCTION:

The following report provides a summary of the September 2015 coastal water quality-monitoring event of Port Vila Harbor. The report provides a summary of the work program and presentation of the water quality results. A map showing the location of sampling points provided in Figure 1.

Figure 1: Map of sampling sites



WORK PROGRAM:

On September 25th 2015, WRU Staff and PMU Staff conducted a coastal water quality analysis of the Port Vila Harbor. The following parameters were analyzed in-situ using portable HACH Water Quality Monitoring Equipments: Temperature, conductivity, , PH and Turbidity.

Samples were collected and freighted to the Department's Water Quality Laboratory for analysis of Total Coliform and E. Coli Bacteria using Membrane Filtration method followed by 24 hour incubation on m-ColiBlue24 Media.

ANLYTICAL RESULTS:

SiteName	SampleDepth(mbs)	Temperature	Conductivity	DissolvedOxygen	pH	Turbidity
B 3	0.2	28.4	12.16	6.5	7.78	3
B4	0.2	28.3	15.57	6.4	7.82	5
B5	0.2	28.3	52.4	6.6	8.17	2
B16	0.2	30.1	53.1	6.7	8.28	10
B 2	0.2	28.4	52.9	6.4	8.16	0
B11	0.2	28.3	53.2	6.6	8.16	1
B 6	0.2	27.8	53.1	7.5	8.14	2
B 14	0.2	27.1	53	6.5	8.06	2
B 7	0.2	26.7	52.8	6.5	8.1	2
B15	0.2	27.6	53.4	6.8	8.15	0
B 20	0.2	27.2	52.9	6.4	8.08	2
B10	0.2	27.4	53.3	6.5	8.07	0
B 17	0.2	30.2	53.2	6.7	8.19	2
B 18	0.2	28.2	51.9	6	8.23	1
B 19	0.2	27.2	52.6	6.6	8.12	0
B20	0.2	27.2	53.2	6.4	8.08	2
B21	0.2	27.7	53.1	6.5	8.05	0
B 22	0.2	27.2	53	6.3	8.08	1

Table 1: Physical and chemical water quality results

Notes:*mS - micro Seimens**mbs - meters below water surface*

SiteName	Total Coliform(cfu/100ml)	E.coli(cfu/100ml)
B 3	TNTC	6
B4	52	12
B5	31	0
B16	21	3
B 2	44	1
B11	19	0
B 6	21	0
B 14	43	0
B 7	TNTC	58
B15	46	1
B 20	22	0
B10	61	0
B 17	15	0
B 18	14	0
B 19	55	0
B20	22	0
B21	31	10
B 22	43	0

Table 2: Bacteriological water quality results

Notes:*TNTC – Too Numerous To Count*

Parameter	PH	Temperature	DO (mg/l)	Turbidity (ntu)	Conductivity (mS/cm)	E.coli (cfu/100ml)
EPA Recreational water quality guideline	6.5 – 8.5	< 32	5 -7	<5	-	200

Table3: EPA recreational water quality guideline

CONCLUSION:

The results of the September 2015 Coastal Water Quality Monitoring Program affirm that all sample sites except B16 and B4 within the Port Vila Harbor meet EPA water quality guidelines for recreational waters.







RECOMMENDATION:

Continual monitoring of Port Vila Harbor

9.8. Photo Album

9.8.1. Construction of Lapetasi International Multi-Purpose Wharf

a) Status before Starting Construction

	
<p>Lapetasi Site (Star Wharf)</p>	<p>Star Wharf</p>
	
<p>Star Wharf Container Yard Status</p>	
	
<p>Star Wharf Container Yard Status</p>	<p>Quay side of Star Wharf Status</p>

b) Status during Construction

<March 2016>



Quay Wall Piling Work



Quay Wall Piling Work



Whole View of Construction Site









Foundation of Administration Building



Temporary Storage Area of Dredging Soil

<November 2016>

	
<p>Quay Wall Construction Work</p>	<p>Administration Building</p>
	
<p>Workshop</p>	<p>Reach Stacker newly introduced</p>
	
<p>Temporary Storage of Containers</p>	<p>Construction of Domestic Wharf (VISSP)</p>







<April 2017>



Overall view under construction of Lapetasi International Multi-Purpose Wharf

(As of the end of March 2017)

A ground-level photograph of the construction site. In the foreground, there are some green plants and a concrete wall. In the background, several cranes are visible against a blue sky with light clouds. The site is filled with construction materials and equipment.	A close-up photograph of the quay wall construction. The image shows a concrete wall with several horizontal rebar rods protruding from it. The ground in front of the wall is covered with loose soil and gravel. A crane is visible in the background.
<p>Whole View of Construction Site</p>	<p>Quay Wall Construction Work</p>

	
<p>Construction of Quay Wall and Dredger</p>	<p>Container Yard Paving</p>
	
<p>CFS (Container Freight Station)</p>	<p>Workshop</p>
	
<p>Temporary Storage of Containers</p>	<p>Administration Building</p>

c) Status after Completion

<April 2018>



Source: Website of VPMU

Completion status of Lapetasi international Multi-Purpose wharf

A photograph showing a concrete revetment structure along a shoreline. The structure is a low wall made of concrete blocks. Behind it is a rocky beach and a small building. The background is a lush green hillside under a blue sky.	A photograph of a concrete quay wall extending into the water. The wall has a series of yellow and white bollards along its edge. In the background, there are some buildings and a cloudy sky.
<p>Revetment</p>	<p>Quay Wall</p>



Quay Wall and Apron Pavement



Container Yard



Administration Building









CFS (Container Freight Station)

	
<p>Workshop</p>	<p>Entrance Gate</p>
	
<p>Temporary Storage Area of Dredging Soil</p>	







9.8.2. Temporary Domestic Wharf

The photos of “Temporary Domestic Wharf” are shown below.

	
<p align="center">Barge used as a Wharf</p>	<p align="center">Status of Temporary Domestic Wharf</p>
	
<p align="center">Status of Surrounding Area of Temporary Domestic Wharf</p>	
	
<p align="center">Status of Surrounding Area of Temporary Domestic Wharf</p>	

9.8.3. Status of Main Wharf at berthing of Cruise Ship

Images of the Main Wharf when a Cruise Ship calls are shown below.

	
<p style="text-align: center;">Cruise ship berthing at Main Wharf</p>	
	
<p style="text-align: center;">Status around the Gate</p>	<p style="text-align: center;">Containers stocked in Main Wharf</p>
	
<p style="text-align: center;">Passengers getting off the Cruise Ship</p>	

9.8.4. Status of Mama's Market

<March 2016>

a) Location of Mama's Market, Main Wharf and Lapetasi Wharf



b) Boom Gate (Temporary Gate Control for Traffic Regulation)





Cruise Ship berthing at Main Wharf



Cruise Ship and Mama's Market

c) Status of Main Wharf and in front of Gate after Berthing of Cruise Ship

<April 2014>

	
<p>Passengers getting off the Cruise Ship</p>	<p>Mama's Market in Main Wharf</p>
	
<p>Mama's Market installed in Main Wharf</p>	